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The Effect of Leverage and Liquidity on Earnings and Capital Management in Tehran Stock Exchange

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Abstract: *Earnings management is one of the most popular subjects among investors, legislators, analysts, and financial statements' users. According to Fischer, earnings management is the managers' purposeful intervention in the extra organizational financial reporting procedure. Improving the audit quality is one of the ways to reduce earnings management because those companies that manipulate and manage profits are more prone to have a modified audit report (unacceptable). The main aim of the current research is to examine the effect of financial leverage and liquidity on the earnings management and capital in companies listed on the Tehran Stock Exchange. The statistical population of this study is the companies listed on the Tehran Stock Exchange for a six-year period from the beginning of 2011 to the end of 2016. The results of this research designate that there is a significant relationship between financial leverage and the ratio of liquidity variables with earnings management listed on the Tehran Stock Exchange. The results specify that there is no significant relationship between the financial leverage and the liquidity ratio with the capital of the companies listed on the Tehran Stock Exchange.*

Keywords: *Financial Leverage, Liquidity, Earnings Management, Capital*

INTRODUCTION

Those companies that have high financial leverage, if not able to pay their extra organizational financing commitments, will be exposed to bankruptcy risk and will not be able to find new creditors in the future. In such a circumstance, if a company wants to receive a new loan, it will be inspected by the creditors in terms of the debt-paying ability in the upcoming periods; consequently, enough cash is necessary to maintain future activity and profitability. The financial analysts' and investors' growing emphasis on operating cash flows, as a more obvious index of firm performance, has led management to have more encouragement to manage profits in order to offer an appropriate image of operating cash flows and can maintain extra organizational funding; accordingly, compared to other financing sources, companies that have high financial leverage pay special attention to operating cash flows.

Research objectives

The objectives of the current research are:

- Examining the relationship between financial leverage and earnings management in companies listed on the Tehran Stock Exchange
- Exploring the relationship between liquidity ratio and earnings management in companies listed on Tehran stock exchange

- Inspecting the relationship between financial and leverage capital in companies listed on Tehran Stock Exchange
- Studying the relationship between liquidity ratio and capital in companies listed on the Tehran Stock Exchange

Research Hypotheses

1. There is a significant relationship between financial leverage and earnings management in companies listed on the Tehran Stock Exchange.
2. There is a significant relationship between liquidity ratio and earnings management in companies listed on the Tehran Stock Exchange.
3. There is a significant relationship between financial and capital leverage in companies admitted to the Tehran Stock Exchange.
4. There is a significant relationship between the liquidity ratio and capital in companies listed on the Tehran Stock Exchange.

Population and statistical sample

With regard to the subject, the statistical population in this research includes all listed companies on the Tehran Stock Exchange for a six-year period from the beginning of 2011 to the end of 2016, which have the following conditions.

1. They should not be among the insurance, investment, banks or leasing companies.
2. Companies do not change the fiscal year during the research.
3. During the research period, they must be present in the stock exchange.
4. Their fiscal year must end in March.
5. Comprehensive information of the company should be available.

With regard to the above-mentioned conditions, 135 companies were selected as the statistical population.
In the current research, the Cochran's formula was used to estimate the sample size. According to population size, in this study, 100 companies are selected as statistical samples, and these companies are randomly selected from among the companies in the statistical population.

The research model

$$EM_{i,t} = \beta_0 + \beta_1 LEV_{i,t} + \beta_2 LIQ_{i,t} + \beta_3 EBTP_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 MTB_{i,t} + \beta_6 TANG_{i,t} + \beta_7 AGE_{i,t} + \varepsilon_{,t}$$

$$CAP_{i,t} = \beta_0 + \beta_1 LEV_{i,t} + \beta_2 LIQ_{i,t} + \beta_3 EBTP_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 MTB_{i,t} + \beta_6 TANG_{i,t} + \beta_7 AGE_{i,t} + \varepsilon_{,t}$$

Research background

Autukaite and Molay (2010) scrutinized the effect of cash holding and working capital management on the companies' value listed on the French stock exchange. The obtained evidence has confirmed that shareholders have evaluated holding and working capital lower than reality.
Asadi et al. (2011) conducted a study entitled "The Relationship between Capital Structure and Ownership Structure". With regard to the findings, although it is not clear whether the capital structure is the creator of an ownership structure, or vice versa when making investment decisions and validating them, it is necessary for investors and creditors to consider both the capital structure and the ownership structure.
Acheampong et al. (2014) reviewed the relationship between financial leverage, company size, and corporate returns from 2006 to 2010 in Ghana's financial market. They just found a positive and significant relationship between company size and returns and a significant and negative relationship between financial leverage and corporate returns.
Ahangari and Shakeri (2009) surveyed the relationship between earnings management and the company valuation process by measuring the effect of earnings management on earnings relevance and book value to stock market value. The results of this study indicated that weak profit reliance reduces the earnings

relevance. Likewise, earnings management reduces the earnings relevance and increases the book value relevance.

Badri and Imenifar (2011) in their research also indicated that the level of leverage inverse relationship with the variables of growth opportunities and profitability and it has a direct relationship with firm size, but the structure of assets is not related to leverage.

Pavia et al. (2016) studied the earnings management in family firms: current state of knowledge and opportunities for future research. In fact, these circumstances are due to the lack of research on earnings management in various types of family firms, and the impossibility of using quantitative and qualitative methods, also the importance of using theoretical frameworks which have a better ability to record and describe the specific characteristics of family firms.

Tavakkolnia and Tirgari (2014) conducted a study entitled "Financial Leverage, Cash Holdings and Firm Value in the Companies Listed in the Tehran Stock Exchange: Investigating Non-linear and Hierarchical Relationships". The results of the research indicate the U-shape relationship between the financial leverage and the level of cash holdings and between the level of cash holding and the company value.

Chen et al. (2011) examined the effect of political costs on earnings management in Chinese companies. They designated that, during the economic transformation, companies faced political pressures by governments. In order to reduce these political tensions, these companies are inclined to profit management. They disclosed that earnings management in non-governmental companies has been more than other companies.

Khalifeh Soltani and Bahrami (2012) conducted a study entitled "The relationship between changes in capital structure and stock liquidity changes". The results demonstrated that changes in capital structure have a significant negative effect on stock liquidity changes, but liquidity changes have no significant effect on capital structure changes.

Khajavi et al. (2014) conducted a study entitled "The relationship between capital structure, ownership structure, and performance by means of the data envelopment analysis approach. The results of the research illustrate that the capital structure (debt ratio) and ownership structure (corporate focus) have a significant positive effect on their efficiency. Similarly, the results of the research revealed that the companies' efficiency has a significant positive effect on their capital structure.

Duru et al. (2013), in a study entitled "Selective Performance, Executive Compensation, and Corporate Leverage", scrutinized the relationship between corporate finance leverage decisions and the characteristics of executive compensation plans. Their results indicated that different models simultaneously and definitely characterize the high level of a company when using the equity return basis to calculate executive compensation or calculate the company performance. It means that the ROA basis is a good basis for calculating executive compensation.

Sadeghi Shahdani et al. (2012) scrutinized the relationship between capital structure and profitability of companies listed on the Tehran Stock Exchange. The results confirmed the hierarchical theory of the relationship between profitability and capital structure in companies listed on the Tehran Stock Exchange.

Faghani and Ahmadi (2016) studied the impact of financial structure, financial leverage and profitability on stock prices of companies listed on the Tehran Stock Exchange. The results of hypotheses testing designate that there is a significant relationship between financial structure and stock price and there is a reverse relationship between financial leverage and stock prices and there is a significant relationship between profitability and stock prices.

Lohrasbi et al. (2015) inspected the auditor's effect size and financial leverage on the stock returns of listed companies on the Tehran Stock Exchange. The findings of the research provided evidence that indicates that there is a positive and significant relationship between the auditor size and the financial leverage with stock returns.

Noravesh and Hosseini (2009) explored the relationship between corporate disclosure quality (including reliability and timeliness) and earnings management. In this research, in order to measure the disclosure quality, two criteria of timeliness and reliability have been used. The findings of this research expressed that there is a significant negative relationship between the quality of corporate disclosure and earnings management. Similarly, there is a significant negative relationship between the timely corporate and managerial profits disclosure.

Research findings:

Descriptive Statistics

A summary of the descriptive statistics of the model variables is given in Table 1.

Table 1: Descriptive statistics of the research variables

	Earnings management	Capital	Financial Leverage	Liquidity	Earnings before interest and tax
Mean	-0.000007	1458.570	0.659807	0.126910	604803.1
Median	-0.021955	200000.0	0.635614	0.064143	9122.50
Maximum	0.751039	75000000	4.038921	1.499315	35264243
Minimum	-0.785797	10350.00	0.012734	0.000479	-7204976.
SD	0.188703	6123191.	0.338653	0.198020	2819518.
Skewness	0.513215	8.295962	3.462529	3.665259	7.071059
Kurtosis	5.628993	84.81957	26.84904	19.16927	68.57624
The number of observations	600	600	600	600	600
	Company size	The ratio of book value to market value of assets	The ratio of tangible assets	Company life	
Mean	14.09825	0.336214	0.251459	18.29000	
Median	13.91289	0.381452	0.194350	18.00000	
Maximum	19.14996	4.233169	0.0.849634	49.00000	
Minimum	10.50455	-11.46931	0.000356	6.000000	
SD	1.529323	1.163082	0.185395	7.955234	
Skewness	0.766658	-5.908413	1.084468	1.301953	
Kurtosis	4.055098	52.45868	3.526636	4.778252	
The number of observations	600	600	600	600	

Investigating the first research model

In this section, we will consider the estimation of the first research model and the first and second hypotheses of the research are tested.

To estimate the related model, at first, the type of estimation method must be determined; consequently, the F-limer is calculated to determine whether a data poling method or a data panel method is used.

Table 2: F-Limer test results

Test	Statistic	df	Prob
F	1.954497	(99.493)	0.0000

Due to the fact that p-value is equal to 0.0000, then the null hypothesis of this test is rejected, which indicates that compared with, the data panel method data pooling method is preferred, and the estimation by the data panel method is preferred.

To distinguish between estimation with a constant effect and estimation with a random effect, the Hausman test has been used.

Table 3: Hausman Test Results

Test	Chi-sq. statistic	Chi-sq. df	Prob
Hausman	8.091636	7	0.3246

Since the p-value of the Hausman test is 0.3246, the null hypothesis is confirmed that is based on the equation estimation by the random effects method and the opposite hypothesis is rejected, so the model must be estimated by means of the random effect.
In this section, by means of the data of the years 2011-2016 for the studied companies, we will examine the first research model.

$$EM_{i,t} = \beta_0 + \beta_1 LEV_{i,t} + \beta_2 LIQ_{i,t} + \beta_3 EBTP_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 MTB_{i,t} + \beta_6 TANG_{i,t} + \beta_7 AGE_{i,t} + \varepsilon_{,t}$$

Table 4: Estimation of the first research model

Variable	Coefficient	t	p-value
Financial Leverage	-0.432801	-18.41841	0.0000
Liquidity	0.104722	3.519269	0.0005
Earnings before interest and taxes	0.009258	4.303110	0.0000
Company size	-0.001983	-0.493527	0.6218
The ratio of book value to market value of assets	-0.062965	-9.707802	0.0000
Tangible assets ratio	-0.094588	-3.143958	0.0018
Company life	-0.002272	-3.333022	0.0009
Constant	0.382579	6.370170	0.0000
prob(F)=0.000 D.W=1.76 $\overline{R^2} = 0.80$ $R^2 = 0.81$			

The determination coefficient of this estimation is 0.81, which indicates that the number and type of selected variables were appropriate for modifying the dependent variable in the regression, and the mentioned independent variables could explain the dependent variable. The value of this statistic in this study is equal to 1.76, which indicates that there is no autocorrelation, and it is the optimal condition in the main hypothesis s of the residuals. Heterogeneity of variance in this study is from an adjusted Wald test. The null hypothesis of this test is the consistency of variance and the contrary hypothesis is heterogeneity of variance.

Table 5: The heterogeneity of variance test

Statistics	Value	Probability	Result
Wald's Heterogeneity test	93.84	0.0560	Homogeneity of variance

As it is evident, the probability of this test is 0.0560 and due to the fact, the mentioned value is greater than 0.05, so the null hypothesis of this test is accepted and there is no heterogeneity of variance.
In this section, with regard to the above-mentioned estimation, the first and second hypotheses of research are investigated.
Hypothesis 1: There is a significant relationship between financial leverage and earnings management in companies listed on the Tehran Stock Exchange.
Hypothesis H_0: There is no significant relationship between financial leverage and earnings management in companies listed on the Tehran Stock Exchange.
Hypothesis H_1: There is a significant relationship between financial leverage and earnings management in companies listed on the Tehran Stock Exchange.
In the studied companies, investigating the financial leverage variable designates that the probability of this variable is 0.000; this specifies that there is a significant relationship between financial leverage and earnings management. As a result, the first research hypothesis is accepted which indicates that "There is a significant relationship between financial leverage and earnings management in companies listed on the Tehran Stock Exchange."
Second hypothesis: There is a significant relationship between liquidity ratio and earnings management in companies listed on Tehran Stock Exchange.

Hypothesis H_0: There is no significant relationship between liquidity ratio and earnings management in companies listed on the Tehran Stock Exchange.
Hypothesis H_1: There is a significant relationship between liquidity ratio and earnings management in companies listed on the Tehran Stock Exchange.
Investigating the liquidity ratio variable shows that the probability statistic of this variable is 0.0005, this shows that there is a significant relationship between liquidity ratio and earnings management. As a result, the second research hypothesis is confirmed that indicates, "There is a significant relationship between liquidity ratio and earnings management in companies listed on Tehran Stock Exchange."
In the studied companies, investigating the profit before interest and taxes shows that the probability of this variable is 0.0000, which shows that there is a significant relationship between profit before interest and taxes and earnings management.
Investigating the company size variable expressed that the probability statistic of this variable is 0.6218; this indicates that there is no significant relationship between company size and earnings management.
In the studied companies, examining the ratio of book value to market value of assets shows that the probability of this variable is 0.0000, which indicates that there is a significant relationship between book value to market value of assets and earnings management.
Investigating the variable of the assets ratio demonstrates that the probability statistic value of this variable is 0.0018, which designates that there is a significant relationship between the tangible assets ratio and earnings management.
In the understudy companies, investigating the company's life variable confirms that the probability statistic value of this variable is 0.0009, which signposts that there is a significant relationship between company life and earnings management.

Studying the second model of research

In this section, we inspect the second research model and the third and fourth research hypotheses are tested.
In order to estimate the relevant model, at first the type of estimation method must be determined; consequently, the F-limer is calculated to determine whether a data pooling method or a data panel method must be used.

Table 6: F-Limer test results

Test	Statistic	df	Prob
F	1.230662	(99.493)	0.0813

Due to this fact that the p-value is 0.0813, and then the zero hypothesis of this test is confirmed, which indicates that compared with the data panel method, the data pooling method is preferred and the estimation by means of the pooling data method is preferred.
In this section, by means of the data of years 2011-2016 for the studied companies, we will examine the second model of research.

$$CAP_{\,i,t} = \beta_0 + \beta_1\, LEV_{\,i,t} + \beta_2 LIQ_{\,i,t} + \beta_3 EBTP_{\,i,t} + \beta_4 SIZE_{\,i,t} + \beta_5 MTB_{\,i,t} + \beta_6 TANG_{\,i,t} + \beta_7 AGE_{\,i,t} + \varepsilon_{,t}$$

Table 7: Estimation of the second research model

Variable	Coefficient	t	p-value
Financial Leverage	1.396439	1.893449	0.0588
Liquidity	-1.687818	-1.800512	0.0723
Earnings before interest and taxes	1.233180	18.04512	0.0000
Company size	1.199438	9.637020	0.0000
The ratio of book value to market value of assets	0.173438	0.852267	0.3944
Tangible assets ratio	0.046251	0.050564	0.9597

Company life	0.004384	0.202389	0.8397
Constant	-17.05782	-9.196657	0.0000
prob(F)=0.000 D.W=1.87 $\overline{R^2} = 0.74$ $R^2 = 0.75$			

The determination coefficient of this estimation is 0.75 and this value specifies that the number and type of selected variables were suitable for justifying the dependent variable in the regression, and the stated independent variables could justify the dependent variable. Autocorrelation test is one of the classic regression hypotheses. Heteroskedasticity in this study will be done by modified Wald test. The null hypothesis of this test is the variance consistency and the contrary hypothesis of this test is heteroskedasticity.

Table 8: The heteroskedasticity test

Statistics	Value	Probability	Result
Wald's Heteroskedasticity test	86.92	0.0681	Homogeneity of variance

As it can be seen, the probability statistic value of this test is 0.681 and since this value is greater than 0.05, then the null hypothesis of this test is accepted and there is no heteroskedasticity.

In this section, according to above-mentioned estimation, the first and second hypotheses of the study are considered.

Hypothesis 3: There is a significant relationship between financial leverage and capital in listed companies on the Tehran Stock Exchange.

Hypothesis H_0: There is no significant relationship between the financial leverage and capital of the companies listed on the Tehran Stock Exchange.

Hypothesis H_1: There is a significant relationship between the financial leverage and capital of the companies listed on the Tehran Stock Exchange.

In the studied companies, investigating the financial leverage variable indicates that the probability statistic value of this variable is 0.0588, which designates that there is no significant relationship between financial leverage and capital. Accordingly, the third hypothesis of the study is rejected which indicates that "There is a significant relationship between the financial leverage and capital in the companies listed on the Tehran Stock Exchange."

Hypothesis 4: There is a significant relationship between liquidity ratio and capital in companies listed on the Tehran Stock Exchange.

Hypothesis H_0: There is no significant relationship between liquidity ratio and capital in companies listed on the Tehran Stock Exchange.

Hypothesis H_1: There is a significant relationship between liquidity ratio and capital in companies listed on the Tehran Stock Exchange.

Investigating the liquidity ratio variable indicates that the probability of this variable is 0.0723; this indicates that there is no significant relationship between liquidity ratio and capital ratio. As a result, the fourth hypothesis of the study is rejected that indicates, "There is a meaningful relationship between the ratio of liquidity and capital in the companies listed on the Tehran Stock Exchange".

In the studied companies, investigating the profit before interest and taxes variable indicates that the probability of this variable is 0.0000, which shows that there is a significant relationship between profit before interest and taxes and capital.

Investigating the size of the company shows that the probability statistic of this variable is 0.0000, which indicates that there is a significant relationship between the size of the company and the capital.

In the studied companies, investigating the ratio of book value to assets market value variable shows that the probability of this variable is 0.3944, which indicates that there is no significant relationship between book value ratio and assets market value.
Inspecting the variable of the ratio of the assets shows that the probability statistic of this variable is 0.997; this indicates that there is no meaningful relationship between the ratio of the tangible assets and the capital.
In the studied companies, reviewing the company life variable shows that the probability of this variable is 0.8397, which indicates that there is no significant relationship between company life and capital.

Table 9: Summary of hypotheses testing results

Hypothesis	Description	Results
First	There is a significant relationship between financial leverage and earnings management in companies listed on the Tehran Stock Exchange.	Confirmed
Second	There is a significant relationship between liquidity ratio and earnings management in companies listed on the Tehran Stock Exchange.	Confirmed
Third	There is a significant relationship between the financial leverage and capital in the companies listed on the Tehran Stock Exchange.	Rejected
Fourth	There is a significant relationship between the ratio of liquidity and capital in companies listed Tehran Stock Exchange.	Rejected

Discussion and Conclusion

In the studied companies, scrutinizing the financial leverage variable indicates that the probability of this variable is 0.000, which specifies that there is a significant relationship between financial leverage and earnings management. As a result, the first hypothesis of this research is confirmed. Inspecting the liquidity ratio variable shows that the probability of this variable is 0.0005, which signposts that there is a significant relationship between liquidity ratio and earnings management. As a result, the second hypothesis of this research is confirmed. Inspecting the profit before interest and taxes variable shows that the probability of this variable is 0.0000, this specifies that there is a significant relationship between profit before interest and taxes and earnings management. Exploring the company size variable shows that the probability of this variable is 0.6218, it designates that there is no significant relationship between company size and earnings management. Inspecting the ratio of book value to market value of assets variable demonstrates that the probability of this variable is 0.0000; this shows that there is a significant relationship between book value ratio and asset market value and earnings management. Examining the variable of the ratio of the tangible assets variable displays that the probability of this variable is 0.0018, this specifies that there is a significant relationship between the ratio of tangible assets and earnings management. Investigating the company life variable displays that the probability of this variable is 0.0009, this designates that there is a significant relationship between company life and earnings management. Similarly, examining the financial leverage variable indicates that the probability of this variable is 0.0588; this shows that there is no significant relationship between financial leverage and capital. As a result, the third hypothesis of this research is rejected. Scrutinizing the liquidity ratio variable shows that the probability of this variable is 0.0723, it designates that there is no significant relationship between liquidity ratio and capital ratio. Consequently, the fourth hypothesis of this research is rejected. In the studied companies, investigating the profit before interest and taxes variable shows that the probability of this variable is 0.0000, this designates that there is a significant relationship between profit before interest and taxes and capital. Investigating the size of the company shows that the probability statistic of this variable is 0.0000, which indicates that there is a significant relationship between the size of the company and the capital. In the studied companies, inspecting the ratio of book value to market value of assets variable shows that the probability of this variable is 0.3944, which indicates that there is no significant relationship between book value ratio and market value of assets.

Examining the ratio of the assets variable confirms that the probability this variable is 0.997; this specifies that there is no meaningful relationship between the ratio of the tangible assets and the capital. In the studied companies, studying the company life variable shows that the probability of this variable is 0.8397, which indicates that there is no significant relationship between company life and capital.

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