The impact of financial leverage sharp increase on earnings management on the accepted firms in Tehran Stock Exchange

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ABSTRACT: The aim of the current study is to see the changes in the amount of benefit management regarding the firms whose liabilities increase to a large extent. The managers of these kinds of firms normally have more motivations to satisfy credit providers through profit management. But it seems that auditors and financial providers' more attention to these firms' leads to having more regular managers and decreasing profit management performance. The tested sample includes 136 firms among the accepted ones in Iran Stock Exchange considering a period of eight years from the beginning of 2000 to the end of 2007. In order to estimate the rate of profit management performance by the use of Jones adjusted model, the optional committed items were calculated. The hypotheses were tested via regression method. The results demonstrated that the increase of most liabilities causes the decrease of profit management performance. In fact, liability makes managers have less access to free cash flows in order to pay the liability and its interest; therefore, they cannot take advantage of the opportunities such as non-optimization investment, extra cost tolerance and earning waste. In other words, the more the liabilities increase, the more regular the managers perform.

KEYWORDS: Profit Management, Accounting, Financial Leverage, Free Cash Flow, Tehran Stock Exchange.

1 INTRODUCTION

From economists' viewpoints, regarding logical behaviors of individuals, it is supposed that all of the people think of their own profit to a high degree and managers are not exceptions to this rule; thus, they are eager to depict an appropriate image of enterprise financial position to stockholders and profit makers in order to maximize personal profit, social welfare and stabilizing occupational position.

Yet, it should be considered that in some cases the increase of managers' wealth is not necessarily along with the increase of wealth in other categories including shareholders. In fact, this represents a disagreement between managers' profits and other categories which take advantage in trade units; therefore, regarding paradox theory between managers and owners, the trade unit managers have sufficient motivation in order to change the profit for maximizing their own benefits.

The capital of a firm is the combination of shareholders' liabilities and salaries. Since the capital structure of most firms consists of shareholders' liabilities and salaries, financial managers are very sensitive and cautious toward getting loan and its effects.

In fact, financial leverage is a criterion to measure the application rate of firm capital structure. The managers of the firms, whose liabilities increase to a large extent, normally have more motivation in order to satisfy credit makers via profit management. On the one hand, the request of annual auditing report made by valid auditing firms, which is mainly one of the conditions of some financial resource providers, makes managers face major constrains and preventions. The fact that what effects liability increase in Iranian firms will have on the amount of profit management, has attracted researchers' attention. The present study is carried out regarding this fact.

The firms, whose liabilities increase to a large extent, attract most credit makers', bankers' and auditors' attention. Since a variety of financial statement users such as investors, who need to know the amount of profit as well as firm stability before investment, managers feel the necessity of the accuracy of these pieces of information more and the significance of this study is clarified more because they require to be aware of the firm financial situation, moreover, banks and financial resource providers need to know the firm ability to repay the loan. The main goal of the current study is to provide more reliable information about profit management in the firms whose liabilities increase to a high degree.

2 REVIEW OF THE RELATED LITERATURE

Today, profit management is considered as one of the most attractive and discussed issued in accounting. Since investors as one of the most prominent factors in decision making pay an abundant of attention to the profit figure, this research is of importance from the aspect of behavior. Moradi [1] conducted a study entitled "The Review of the Relationship between Financial Leverage and Smoothing Profit in the Accepted Firm in Tehran Stock Exchange" and concluded that there is a negative and significant relationship between financial leverage and smoothing profit.

Pourheidari and Hemmati [2] in a study entitled "The Review of the Impact of Liability Contracts, Political Costs, Prize Designing and Owning Profit Management in Tehran Stock Exchange" aimed at determining the effective factors in profit management and showed that in average, there is no positive and significant relationship between liability ratio to shareholders' salaries and profit change. This means that firm managers have no motivation to manage profits by making use of financial providing through liability.

Jelinek [3] studied this issue in the accepted firms in New York Stock Exchange in a research entitled "The Impact of the Major Increase on Profit Management". The results of this study demonstrated that the increase in most liabilities (financial leverage) leads to the decrease of opportunity taking behaviors as well as a reduction in profit management regarding the firms with a high amount of free cash flow. According to the results of this research, the liability causes managers to have less free cash flow in order to pay the liability along with its interest, thus, they are not able to invest on useless cases.

The current study aimed at reviewing the impact of the main increase in firm's financial leverage on profit management range along with an attempt to clarify the concept of profit management by applying some other studies.

3 QUESTIONS AND HYPOTHESES

Q1: How does the sharp increase of financial leverage affect profit management?

Q2: How does the sharp increase of financial leverage affect profit management regarding the firms with a high amount of free cash flow?

In order to provide responses for the posed questions, the following hypotheses have been designed:

H1: The sharp increase of financial leverage leads to less profit management.

H2: Regarding the firms with a high amount of free cash flow, the sharp increase of financial leverage leads to less profit management.

4   RESEARCH METHOD

The research methodology is inductive. It is correlational, meaning that it tries to study the relationship between the variables through regression. Regarding the methodology, it is back event (using past information) which takes the behavior of 136 firms into account. In temporary studies, the information of several firms were considered in one or many fiscal years while periodical studies consider the financial information of a special period of time consisting many years in a firm. Therefore, regarding the total data collection design, this research is correlational and temporary.

After data derivation from Tadbir Pardaz information bank, the hypotheses were tested by the use of SPSS statistical software. Having done a correlational analysis between the variables, the statistical hypothesis in simple regression model at 5% error was considered. The statistical population consisted of Tehran Stock Exchange for a period of eight years from 1380 to 2007. The research steps are as followed:

1) Determining sample firms regarding the expected conditions;

2) Estimating financial leverage for the mentioned firms, arranging them from low to high level and then dividing them into four equal categories for the initial and final years of the sample year;

3) Estimating the total obligation items through the reduction of cash from profit for the mentioned firms;

4) Estimating non-optional obligation items via Jones Modified Model during the event;

5) Estimating optional obligation items via the reduction of non-optional obligation items from the total obligation items;

6) Estimating free cash flow of the considered firms, calculating their median and dividing them into two groups regarding high amount of free cash flow (more than the median) and the firms with low amount of free cash flow (the median and lower than that);

7) In order to review the hypotheses, two methods named student t test and regression model were applied.

4.1.1   DEPENDENT VARIABLES

Profit Management: Generally, the existing studies about profit management are concerned with optional obligatory items that in order to calculate them; the initial point is the total obligation items which is divided into two sections called optional and non-optional. In this study, the optional obligation items are estimated applying the Modified Jones Model [4].

4.1.2   INDEPENDENT VARIABLES

The independent variables of this study are defined and measured as followed:

a) Financial Leverage:

Financial leverage is estimated via the division of the total long-term liabilities by the total long-term liabilities and the book value of shareholders' salaries.

b) Free Cash Flow:

Free cash flow consists of operational cash flow (adding pure profit to depreciation expenses of the stable tangible and intangible assets) subtracted by the capital expenditure and the divided share profit.

5   STATISTICAL TEST DESIGN OF THE HYPOTHESES

In order to test the hypotheses, two statistical methods called student T- test and regression model were used. The followings show regression models:

a) The First Hypothesis Regression Model

As stated before, on the one hand, the managers of the firms whose financial leverage has a sharp increase do profit smoothing for observing the conditions of liability contracts, drawing an appropriate image of firm performance, reducing investment risk in firms and decreasing the interest rate of the received credits. On the other hand, the increase of financial leverage encounters a severe control of loan providers including annual auditing; therefore, managers are less able to smooth profits [5].

It this research, it is supposed that the sharp increase in financial leverage should be along with the decrease of smoothing profit, thus, the first hypothesis is posed as followed:

"The sharp increase of financial leverage leads to less profit management."

The applied regression model to review the hypothesis is:

$$DA = \alpha_0 + \alpha_1 \, LEVINC + \alpha_2 \, \Delta SIZE + e$$

If during the considered period the firm financial leverage has a sharp increase, the LEVINC variable equals 1 and if during the same period the financial has no sharp increase, the LEVINC variable equals zero.

SIZE is a control variable and is regarded as the logarithm of the total firm repossessions being considered at the end of the last fiscal year.

b) The Second Hypothesis Regression Model

Findings of the past studies demonstrate that the leverage increase caused a decrease in managers' opportunity taking behaviors associated with free cash flow. Because liability makes managers have less free cash flow in repaying it as well as its interest. Therefore, it is not simply possible to smooth profit in these firms. As such, the second hypothesis is:

"Regarding the firms with a high amount of free cash flow, the sharp increase of financial leverage causes having less profit management."

$$DA = \beta_0 + \beta_1 \, LEVINC + \beta_2 \, HIGHFCF + \beta_3 \, \Delta SIZE + e$$

If the firm free cash flow is more than the median of firm free cash flow, the HIGHFCF variable equals one. If the firm free cash flow is less than or equal to the median of firm free cash flow, the HIGHFCF variable equals zero.

Data Descriptive Statistics

In order to make the hidden data more tangible and attain some general information about the sample traits, descriptive statistics is designed. In descriptive statistics, data describing indexes is divided into two categories called central index (including mean and median) and dispersion index (including variance and standard deviation). The population information is provided separately in table 1.

Table 1. Descriptive Statistics Related to Population

Variable Name	Number (Firm-Year)	Maximum	Standard Deviation	Median	Mean
Total Obligatory Items	1087	23854131	1512515	68814033	69723
Difference of Received Account Changes	1087	9662746	880340.8	36646.069	6550
Difference of Income Changes	1087	64255621	3500666	17105.69	28683.5
Long-Lived Assets after the Reduction of Collected Depreciation	1087	5342362	1474806	365753.9	66581
Free Cash Flow	1080	18546.21	688.2213	8608896	5.050

Sample Frequency Distribution Based on Financial Leverage Sharp Increase:

The following table depicts sample frequency distribution based on the conditions of the firms whose financial leverage increased to a large extent. In accordance with this, it can be mentioned that during the considered period, about 15 percent of the firms had a sharp increase in their financial leverage.

Table 2. Sample Frequency Distribution Based on the Sharp Increase of Financial Leverage

Financial Leverage Sharp Increase	Collected Percentage	Percentage	Frequency
No	85.3	85.3	927
Yes	14.7	14.7	160
Total	100.0	100.0	1087

Sample Frequency Distribution Based on the High Amount of Free Cash Flow Condition:

In order to review the second hypothesis, firm's free cash flow ought to be measured. Having gained its median, the firms which show more than this amount are considered as the ones with high amount of free cash flow and other firms with low amount of free cash flow. The following table demonstrates the sample frequency distribution based on the condition of the firms having high amount of free cash flow.

Table 3. Sample Frequency Distribution Based on the Condition of Free Cash Flow More than Median

High Amount of Free Cash Flow	Collected Percent	Existing Percentage	Frequency
No	50.1	50.1	541
Yes	49.9	49.9	539
Total	100.0	100.0	1080

Explanation of the First Hypothesis Test:

In order to create the required hypotheses, first a regression model on the total obligation items is calculated:

$$TA_{it} / A_{i,t-1} = \alpha\left(1/A_{i,t-1}\right) + \beta\left(\Delta REV_{it} / A_{i,t-1}\right) + \gamma\left(PPE_{it} / A_{i,t-1}\right) + e_{it}$$

In this equation, α, β and ϒ are the coefficients of Jones Model and are gained through the least squares.

It should be mentioned that in the calculation of the model, the data of petrochemical transportation firm are considered as being useless and were put aside from the analyses. After this calculation, Jones Model coefficients are as followed:

α= 13746.153, β=0.163, γ=0.197

Then, the amounts of the non-optional obligation items are calculated:

$$NDA_{it} = \alpha\left(1/A_{i,t-1}\right) + \beta\left[\left(\Delta REV_{it} - \Delta REC_{it}\right) / A_{i,t-1}\right] + \gamma\left(PPE_{it} / A_{i,t-1}\right)$$

Finally, the amounts of optional obligatory items, the total amounts of obligatory items and non-optional obligatory items are:

$$DA_{it} = TA_{it} / A_{i,t-1} - NDA_{it}$$

Hypothesis 1: The sharp increase of financial leverage causes less profit management.

As such, we consider this hypothesis using two various devices.

The First Method: two Sample Independent Student T- test

In order to compare the amount of optional obligation items in two categories, meaning the firms whether had the sharp increase in financial leverage or not, two sample independent student T-test was applied. The hypotheses are as followed:

$$\begin{cases} H_0 : \mu_1 = \mu_2 \\ H_1 : \mu_1 \neq \mu_2 \end{cases}$$

However, before doing this test, first the equal hypothesis of two group variance was considered by the use of Lon test. The result is shown in the table below:

Table 4.   Lon Test for Equal Variance of Two Categories

P value	Test F
0.003	8.728

According to P value in this test, the equal hypothesis of two categories variances at the significant level of 0.05 was rejected. The independent two sample student T-test was applied to compare the median of optional obligation items. The result of the test is depicted in the table below:

Table 5.   Independent Two Sample T-test to compare the Amounts of Optional Obligation Items in two Categories

Certainty Distance 95%		P Value	T-test	Standard Deviation	Median	Sample Volume	Financial Leverage Sharp Increase
Low	High						
0.0767	0.1886	< 0.001	4.656	0.2137	0.0709	144	Yes
				0.6638	0.2037	890	No

Regarding T and P values, it can be concluded that H0 hypothesis is rejected at the significant level of 0.05, meaning that the median of the optional obligation items of two categories are not equal at the significant level of 0.05. In accordance with the median of the amount of optional obligation items in two categories, it can be concluded that the amount of optional obligation items is more in the firms with no financial leverage sharp increase.

The Second Method: Applying Regression Model

The considered regression model is as followed:

$$DA = \alpha_0 + \alpha_1 * \text{LEVINC} + \alpha_2 * \text{SIZE} + \varepsilon$$

SIZE is a control variable and the logarithm of the firms' total repossessions of the past fiscal year are taken into account. The results of the regression model are presented in the table below.

As observed in variance analysis, P and F values confirm the significance of the total regression model (P value is less than 0.05). Also, the amounts of confirming coefficients and the adjusted confirming coefficients equal 0.017 and 0.015, respectively showing a percentage of response variable changes stated by independent variables.

Table 6.   Variance Analysis between DA Response Variable and Independent Variables

P Value	F Test	Adjusted Confirming Coefficient	Confirming Coefficient
< 0.001	9.127	0.015	0.017

Now, we consider the significance of regression coefficients. The significance of fixed amount and independent variables were taken into account using t and p values As observed in 4-7 table, p value is fixed and both independent variables are less than the significance level of 0.05 meaning that the existence of fixed amount and both independent values are necessary in regression model.

Table 7. Calculation of Regression Model Coefficients

P value	Statistic t test	α_i value	Coefficients Regressions
0.020	-2.338	-0.404	α_0
0.020	-2.330	-0.129	α_1
<0.001	3.540	0.048	α_2

Watson statistical amount equals 1/938. Regarding the fact that this figure in close to 2, it confirms non- correlational remains. VIF amount shows non- existence of linear in regression model. Histogram and normal probability chart demonstrate normalization of the remains.
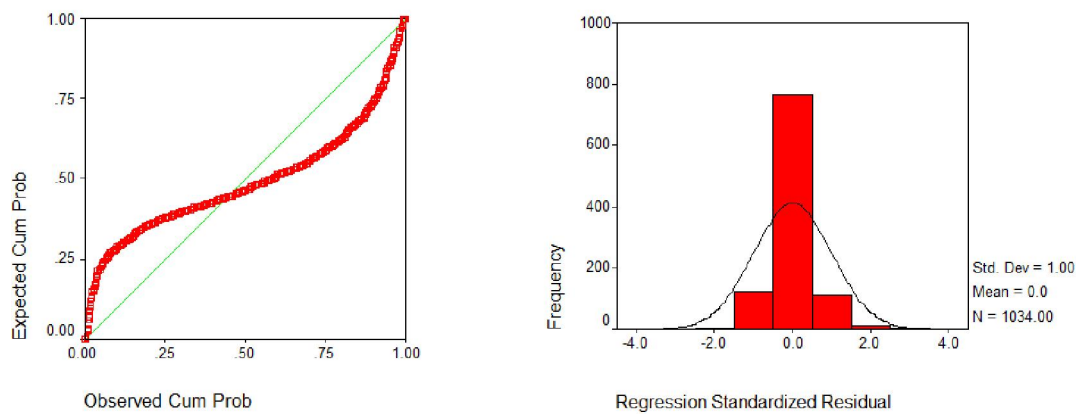

Fig. 1.   Histogram and Normal Probable Charts Related to the First Hypothesis Regression

Finally, the remained standardized chart against the calculated amounts of confirms fixed remained variances.
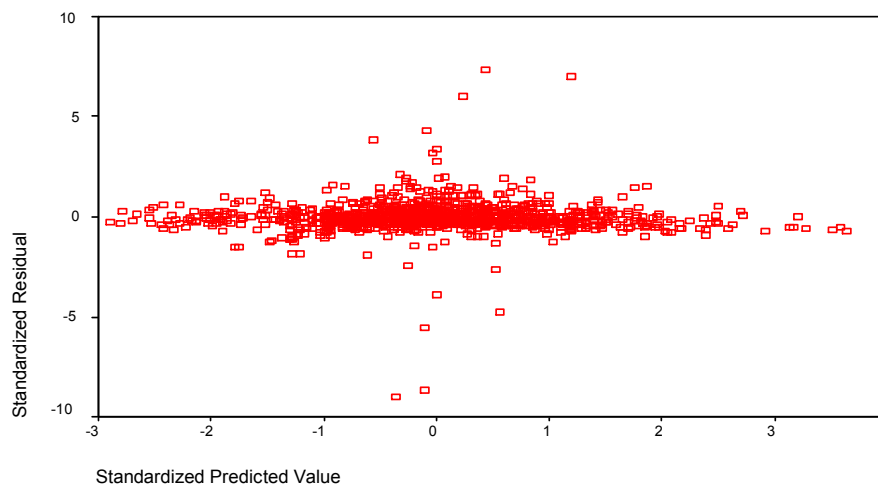

Fig. 2.   Standardized Remained Charts Related to the First Hypothesis Regression

Thus, the calculated regression model to data can be written in this form:

DA= - 0.404 – 0.129 LEVINC + 0.048 SIZE

Explanation of the Second Hypothesis Test

Hypothesis2: Regarding the firms with high amount of free cash flow, financial leverage sharp increase leads to less benefit management.

The First Method: Two Sample Independent Student T-test

First, the firms with high cash flow are selected, then, in order to compare the amounts of optional obligatory items meaning whether the firms have financial leverage sharp increase or not, two sample independent T-test is applied. The hypotheses are as followed:

$$\begin{cases} H_0 : \mu_1 = \mu_2 \\ H_1 : \mu_1 \neq \mu_2 \end{cases}$$

But before doing this test, first equal hypothesis and two categories variances were considered using Lon test. The result can be seen in the following table:

Table 8. Lon Test for Equal Variances in Two Categories

P Value	F Test
0.035	4.488

Considering P value of this test, the equal variances of two categories at significance level of 0.05 is rejected. Two samples independent T-test was used to compare the median of optional obligatory items in two categories. The result is demonstrated in the table below:

Table 9. Two Sample Independent T- tests to compare the Amount of Optional Obligation in Two Categories

Certainty Distance		P Value	T- test	Standard Deviation	Median	Sample Volume	Financial Leverage Sharp Increase
Low	High						
0.0251	0.2060	0.012	2.511	0.2172	0.1151	81	Yes
				0.8110	0.2307	428	No

Regarding t and p values, it can be concluded that H0 is rejected at significance level of 0.05 meaning that at this level, the median of optional obligation items are not equal in two categories. Considering the median of obligation optional items in two categories, it can be concluded that the firms with high cash flow optional obligation items are more in the firms with no financial leverage sharp increase. It means that less profit management is more severe in the firms with higher free cash flow.

The Second Method: Applying Regression Model

The considered regression model is:

$$DA = \beta_0 + \beta_1 * \text{LEVINC} + \beta_2 * \text{HIGHFCF} + \beta_3 * \text{SIZE} + \varepsilon$$

SIZE is the control variable and logarithm is considered as the firms total repossessions at the end of the past fiscal year. The result of this regression model calculation to data is summarized in the following tables.

As observed in table 12, F and P values confirm the total significance of regression model (P value is less that 0.05). Also, the confirming coefficients amounts as well as the adjusted ones equal 0.017 and 0.014, respectively showing a percent of changes in response variable by the use of independent variables.

Table 10. Variance Analysis between DA Response Variable and Independent Variables

P Value	F Test	Adjusted Determination Coefficient	Determination Coefficient
0.001	5.924	0.014	0.017

Now, we review the significance of regression coefficients. The significance of fixed amount and independent variables are considered in the model applying T and P values. As can be observed in table 13, fixed P value and independent variables such as LEVINC and SIZE are less than significance level of 0.05. It means that the existence of fixed amount and independent variables such as LEVINC and SIZE are necessary in regression model.

Table 11. Estimating Regression Model Coefficients

P Value	T test	β_i Value	Regression Coefficients
0.034	-2.129	-0.391	β_0
0.020	-2.338	-0.131	β_1
0.952	0.061	0.003	β_2
0.002	3.133	0.047	β_3

Watson statistical value equals 1/938 which confirms no- correlational remains. VIF amounts demonstrate non- linear regression model. Histogram and normal probability chart depict remains normalizations.
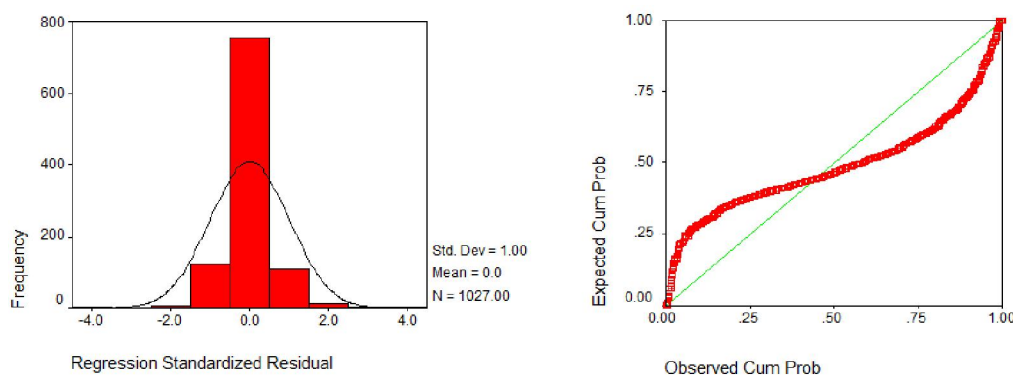

Fig. 3.   Histogram and Normal Probability Charts Related to the Second Hypothesis Regression Model

Finally, the rest of the standardized charts confirm variance remains against the standard values.
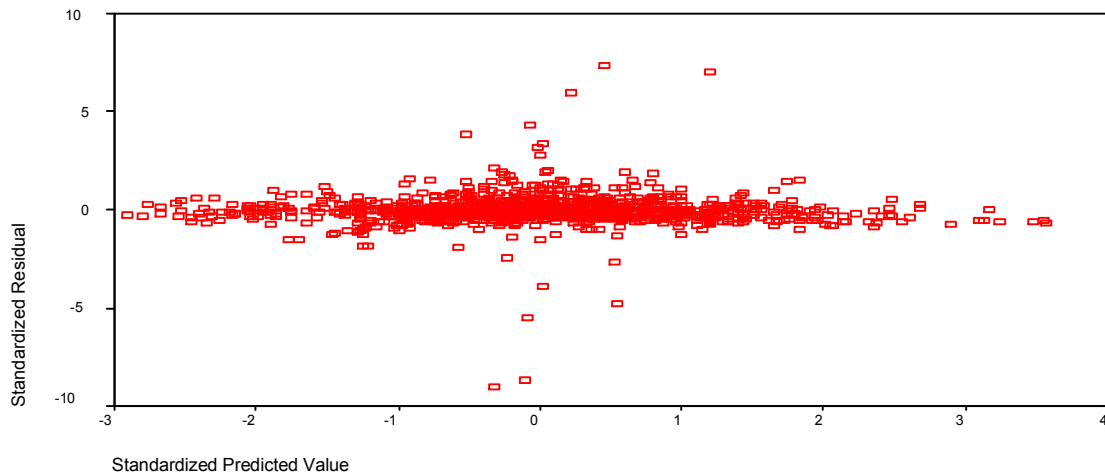

Fig. 4.   The Remained Standardized Charts Related to the Second Hypothesis Regression Model

Thus, the regression model can be written in this form:

DA= - 0.391 – 0.131 LEVINC + 0.047 SIZE

Therefore, by the use of the two mentioned methods, the hypothesis is accepted meaning that among the firms with high cash flow, financial leverage sharp increase causes more reduction of the amount of optional obligation items.

6   CONCLUSION

In the past, various researchers such as Noravesh and et al [5] and Sweeney [6] posed the issue that liabilities increase managers' motivations to smooth profits more. So the amount of profit management will be more in such firms. Based on the first hypothesis, it can be concluded that there is a significant difference between the median of optional obligation items in two categories of the firms whose financial leverage has had a sharp increase and other firms. This result falls in line with Jelink's studies. Although Sweeney came to the conclusion that leverage or liability increase motivates firms to manage profit more. He stated that having published thorough pieces of information along with annual auditing, managers are less able to smooth profits. Thus, liability increase leads to the reduction of profit management. In fact, liability makes managers have less free cash flow in order to repay the loan and its interest; therefore, they cannot have opportunity taking behaviors such as useless investments, tolerating extra costs and wasting incomes. In other words, the more the liabilities increase, the more regular the managers act. However, the second hypothesis demonstrated that leverage increase reduces opportunity taking behaviors in association with free cash flows. Thus, it is not an easy task to smooth profits in these firms. This result is in accord with Jelink and Sweeney studies.

REFERENCES

[1] Moradi, M., "The review of the Relationship between Financial Leverage and Smoothing Profit in the Accepted Firms in Tehran Stock Exchange", *Financial Researches*, No. 24, Page 99, 2008.

[2] Pourheidari, O., Hemmati, D., "The Review of Liabilities Contracts, Political Costs, Prize Plans and Owning Profit Management in the Accepted Firms in Tehran Stock Exchange", *Accounting and Auditing Reviews*, No. 36, pp. 47-63, 2005.

[3] Jelinek, l., "The Effect of Leverage Increases on Earnings Management", *Journal of Business & Economic Studies*, Vol. 13, No. 2, 2007.

[4] Dechow, P.M., R.G. Sloan, and A.P. Sweeney, "Detecting earnings management", *The Accounting Review*, Vol. 70, pp. 193-225, 1995.

[5] Noravesh, I., Sepasi, S., Nikbakht, M., "The Review of Profit Management in the Accepted Firms of Tehran Stock Exchange", *Humanities and Social Sciences, Shiraz University*, No. 43, pp. 165-177, 2006.

[6] Sweeny, A., "Debt Covenany violayion And Managers Accounting Responses", *Journal of Accounting and Economics*, Vol. 17, No. 3, pp. 281-308, 1994.