Effect of the Debt Financing Efficiency of Listed Companies in Tehran Stock Exchange

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ABSTRACT

This study examines the impact of debt financing on the performance of listed companies in Tehran Stock Exchange is paid. For this purpose, a sample of 140 companies listed in Tehran Stock Exchange for the period 1386 to 1391 were studied. This research was financed through debt, both short-term and long-term and in connection with the performance criteria in this study, net profit ratio and operating profit ratio. Statistical methods used in this study, panel data methods to test the hypothesis and GLS models were carried out using a random regression coefficients in the final analysis spss software is used and eviews. The results indicate that short-term debt to asset ratio and profitability and positive relationship between long-term debt to assets ratio and profitability, there is a negative and significant relationship.

KEYWORD
Finance, Debt, Efficiency, Panel Data.

INTRODUCTION

Capital Structure has the especial importance in estimating the value of a company, accurate estimate of equity and the ratio of debt can increase firm value, and reduce the selected cost capital. Therefore, this is particularly noticeable in the changing conditions of economic development. Profitability ratios show the company's ability to generate profits and this proportion are used by companies, financial institutions, etc. to determine the performance of the company. Previous research has explored the relationship between capital structure and profitability that Impact on capital structure on profitability, but different results depending on the process (about positive / negative) are provided. In addition, by studying the relationship between capital structure and profitability; expressing the theory of optimal capital structure of listed companies in Tehran will be possible. Hierarchy theory suggests that companies, at first, give priority to their finance and they prefer to use the local resources, as a last resort, begin to borrow or issue equity, the theory states that stable static or this company select the debt and equity with a balanced mix of benefits and costs of debt generation. Hierarchy theory predicts a negative relationship and the trade-off theory a positive relationship between profitability and penetration power [3]. The purpose of this study is to review the effect of Financing through debt and the performance of listed companies in Tehran Stock Exchange, which are concluded based on the experimental results.

HISTORY OF RESEARCH EXTERNAL RESEARCH

Salawu (2009) [6] in a study, "The Effect of Capital Structure on Profitability" showed that profitability is positively associated with short-term debt and inversely associated with long-term debt. Gill et al. (2011) [5] began to study "The Effect of Capital Structure on Profitability" in American manufacturing and services. Results showed that there is a positive relationship between short-term debts and the total assets and profitability in service industries, and a positive relationship between long-term debts and the total assets and profitability in manufacturing industry. Abu-Rub (2012) [1] in an article entitled "Capital Structure and Firm Performance" discussed it and As a result, he didn’t find statistically significant relationship between short-term debt, long-term debt and the return on assets and return on equity. However, a positive correlation between total debt and return on assets and return on equity were not found. Shubita & Alsawalhah, (2012) [7] and Berzkalne (2013) [3] reviewed on a study, "The relationship between capital structure and profitability" that results showed that there is a negative relationship between Profitability and debt (total

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debt, short term debt, long term debt). Gurmeet Singh (2013) [8] and Chisti et al. (2013) in a study examine "the relationship between capital structure and profitability" found a strong relationship between capital structure and profitability. Amponsah Addae et al (2013) [2] examined "The effect of capital structure on profitability of companies listed on the Ghana". This research results showed a significant positive relationship between income and short-term debt and a significant negative correlation between income and long-term debt.

INTERNAL RESEARCH

M. Ahmadi and M.T.Taghizadeh (2014) [10] evaluated the fund value methods of companies listed on Tehran stock exchanges. The obtained results showed that companies that have used the capital increasing, it doesn’t have, a positive effect on the actual return on equity of firms. However, companies that have used the loans have a positive effect on the actual return on equity of firms. Hadi Amiri, H. Mohammadi Khorzooqyy (2012) [12] studied on a research "the relationship between the debt financing and the interest quality of the companies listed on the Tehran Stock Exchange. The results were as follows that there is a parabolic relationship between the financial supplying through debt and the interest quality of the companies listed on the Tehran Stock Exchange.

Shokrollah Khajavi et al [13] (2010) represent a research entitled with "The effect of capital structure on non-cumulative returns at companies listed on the Tehran stock exchange" The results suggest that financial leverage has a positive and significant effect on cumulative abnormal returns. Ali akbar Arbabian and Mehdi Safari Graily (2009) [11] on studying "The effect of capital structure on profitability of the Companies listed on the Tehran Stock Exchange" concluded that there is a positive relationship between short-term debt to asset ratio and profitability of the company and the ratio of total debt to assets and profitability. And there is a negative relationship between the ratio of long-term debt to equity and profitability. Quadrat Talebnia and Petro Sepehri (2008) [14] began to study on the "Evaluation of the relationship between debt ratio and return on assets in the different industry". The results showed that there is an inverse relationship between debt ratio and return on assets. Mehdi Ahzari et.al(2007) [1] began to "Survey and Analysis of Financial Companies listed on the Tehran Stock Exchange" and the results that were obtained, showed that there is a significant relationship between profit potential and financing through debt.

THE RESEARCH HYPOTHESIS

1 - There was a significant relationship between short-term debt to equity ratio and net income ratio of listed companies on the Tehran Stock Exchange.

2 - There was a significant relationship between long-term debt to equity ratio and net income ratio of listed companies on the Tehran Stock Exchange.

3 - There was a significant relationship between short-term debt to equity ratio and operating profit ratio of listed companies on the Tehran Stock Exchange.

4 - There was a significant relationship between long-term debt to equity ratio and operating profit ratio of listed companies on the Tehran Stock Exchange.

RESEARCH METHODOLOGY

This study has been done using data from 2007 to 2013 and extracted annual data of the financial statements of these companies have been used for the analysis, reviews have been done on companies in Tehran Stock Exchange.

REQUIREMENT FOR SELECTED FIRMS IN INDUSTRIES

1- Financial year is a year, which ended March 29

2- During the period of research, its financial year have not been changed.

3- Financial statements data from the year 2007 are available and Audited financial statements are presented regularly.

4- They are not component of investment firms and financial intermediation, Why these company use of the net asset value in its reporting and as well as their business practices are different from other businesses.

Accordingly, after considering the above restrictions, out of 456 companies listed on the Tehran Stock Exchange, 140 companies for the period 2007 to 2013 had the above conditions, that were selected as samples.

THE STUDIED MODEL

To assess the impact of short-term debt and long-term on the ratio of net income and operating income, multivariable regression model is used, to perform the regression; the logarithmic model has been used since the data log have a normal distribution than a simple form of them. Therefore used model in this study are as follows:

\[ \ln I_{t} = \beta_{0} + \beta_{1} L S D R_{t} + \beta_{2} L L D R_{t} + \varepsilon_{t} \]

\[ L O P R_{t} = \beta_{0} + \beta_{1} L S D R_{t} + \beta_{2} L L D R_{t} + \varepsilon_{t} \]

At the presented model, the NI and OPR are Net income ratio and the ratio of operating profit that can be calculated, by dividing net income to sales and dividing operating profit to sales and SDR represents the ratio of short-term debt to assets and LDR is the ratio of long term debt to assets. The symbol L, which brought back any of the variables suggests that the logarithm of each variable is used in the model.

DESCRIBING THE STATISTICAL PROPERTIES OF THE DATA

Table (1), is expressing the descriptive statistics for the considered period of this study from the year 2007 to 2013.
MODEL ESTIMATION

It is necessary to dwell on how we tested the ability of variables, before the estimation of the production function, to ensure non-spurious regression, and the subsequent uncertain results. Breitung test was used for this purpose. According to Table 2, it is observed that Null hypothesis is rejected which indicating that there is a single root for the considered value, Therefore all variables in this model are, locating the surface, respectively.

Table 1. Descriptive statistics

<table>
<thead>
<tr>
<th></th>
<th>LDR</th>
<th>SDR</th>
<th>OPR</th>
<th>NI</th>
</tr>
</thead>
<tbody>
<tr>
<td>The mean</td>
<td>0.153</td>
<td>0.183</td>
<td>0.57</td>
<td>0.086</td>
</tr>
<tr>
<td>Midd</td>
<td>0.121</td>
<td>0.163</td>
<td>0.554</td>
<td>0.048</td>
</tr>
<tr>
<td>The maximum</td>
<td>3.35</td>
<td>1.46</td>
<td>7.6</td>
<td>1.57</td>
</tr>
<tr>
<td>The minimum</td>
<td>-1.23</td>
<td>-1.28</td>
<td>0.037</td>
<td>0</td>
</tr>
<tr>
<td>The standard derivation</td>
<td>0.26</td>
<td>0.2</td>
<td>0.37</td>
<td>0.12</td>
</tr>
</tbody>
</table>

Table 2. Results of static test-residency of variables in level with the width from the source

During the first test, in the cross-sectional data, Time series.

<table>
<thead>
<tr>
<th>Abbreviation sign</th>
<th>Computational statics</th>
<th>p-value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDRSDR</td>
<td>-5.7</td>
<td>0.0000</td>
<td>Resident</td>
</tr>
<tr>
<td>LLDR</td>
<td>6.49</td>
<td>0.0000</td>
<td>Resident</td>
</tr>
<tr>
<td>LNI</td>
<td>-5.7</td>
<td>0.0000</td>
<td>Resident</td>
</tr>
<tr>
<td>LOPR</td>
<td>0.28</td>
<td>0.0000</td>
<td>Resident</td>
</tr>
</tbody>
</table>

is F- Lymer test.

Table 3. Results of F Lymer test at 5% level

<table>
<thead>
<tr>
<th>The equation</th>
<th>Computational F-lymer</th>
<th>p-value</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24</td>
<td>0.000</td>
<td>The $H_0$ Hypothesis based on a compilation of data is rejected</td>
</tr>
<tr>
<td>2</td>
<td>79</td>
<td>0.000</td>
<td>The $H_0$ Hypothesis based on a compilation of data is rejected</td>
</tr>
</tbody>
</table>

Significance level of $p$-value is shown in the table is less than $5\%$, as a result, the null hypothesis is rejected and the following hypothesis is accepted, it means that the possible hypotheses of consolidated data is rejected in favor of panel data.

After it was found that our data are panel data, on the continuing, it was determined that which random effects method or fixed effects method must be used to estimate, so Hausman test is used for this purpose. The results of this test and the probability of acceptance of the null hypothesis in Table (4) are given. The obtained statistics $\chi^2$ for the model (1) to (2) is small. By comparing these statistics with the obtained statistics from the tables of critical values that are equal to 4.56, we can conclude that appropriate methods for estimating model is the random effects, since the null hypothesis cannot be rejected. Therefore, based on the obtained results for estimating the model, we use the random effects method.

Table 4. Results of Hausman test

<table>
<thead>
<tr>
<th>The equation</th>
<th>The type of computational statistics</th>
<th>The rate of computational statistics</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$\chi^2$ computationa1</td>
<td>0.7</td>
<td>0.712</td>
</tr>
<tr>
<td>2</td>
<td>$\chi^2$ computationa1</td>
<td>0.49</td>
<td>0.879</td>
</tr>
</tbody>
</table>

After determining the appropriate method to estimate the parameters in the previous section, in this section, we express the results of the estimation model for the companies. Because according Hausman test, random effect method is a good way to estimate the model, we use this method. Results of the Eviews program are given in Table (5) and (6).

EQUATION ESTIMATION (1)

To estimate the following equation, the random effects method is used.

$$LNI_{it} = \beta_0 + \beta_1 LSR_{it} + \beta_2 LLDR_{it} + \epsilon_{it}$$

Eviews program outcomes are given for the operating profit ratio in Table (5).
companies in Tehran stock exchange is equal to 4.7 that is larger the table value equal to 2, Therefore second hypothesis of this study is confirmed.

**EQUATION ESTIMATION (2)**

To estimate the following equation, the random effects method is used.

\[ \text{LOPR}_{i,t} = \beta_0 + \beta_1 \text{LSDR}_{i,t} + \beta_2 \text{LLDR}_{i,t} + \epsilon_{i,t} \]

Eviews program outcomes are given for the operating profit ratio in Table (9).

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Coefficient</th>
<th>t-statistic</th>
<th>p-value</th>
<th>R²</th>
<th>D.W</th>
</tr>
</thead>
<tbody>
<tr>
<td>the width from the source</td>
<td>0.14</td>
<td>-0.44</td>
<td>0.0000</td>
<td>0.62</td>
<td>1.89</td>
</tr>
</tbody>
</table>

Durbin Watson statistic is equal to 1/892 and indicates the absence of autocorrelation in the model, the adjusted determination coefficient, is obtained equal to 0.62, therefore 62% of the variability. Mean the ratio of operating profit, is explained by the independent variables, Statistic, F, is calculated as 14.98, that is much larger than the F table; so we can say that the model variables (commonly) have a significant role in explaining the dependent variable and the estimated relationship is quite significant. Based on the obtained results the coefficient of each variable can be interpreted as follows:

- By increasing in short-term debt to assets, up to the rate of 1%, operating profit amount increases to 0.115%. so there the short-term debt ratio to assets has a significant and positive impact on the net income profit.
- By increasing in short-term debt to assets, on dummy variable up to the rate of 1%, the rate of net income profit will be reduced up to 0.079, so the rate of short-term debt to assets on dummy variable of short-term debt to assets have a negative and significant impact on the net income profit.

After estimating the above function, to test the hypothesis 1, the following hypothesis test is used.

\{H0: \beta_1 = 0 \}
\{H1: \beta_1 \neq 0 \}

As the results in Table 5 shows, t value is, short-term debt to assets ratio on listed companies in Tehran stock exchange is equal to 5.3 that is larger the table value equal to 2, Therefore first hypothesis of this study is confirmed.

\{H0: \beta_2 = 0 \}
\{H1: \beta_2 \neq 0 \}

As the results in Table 5 shows, t value is, Long-term debt to assets ratio and the ratio of net profits of listed companies in Tehran stock exchange is equal to 5.7 that is larger the table value equal to 2, Therefore second hypothesis of this study is confirmed.

Table 5.The results of regression estimation (1)

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Coefficient</th>
<th>Stats t-value</th>
<th>p-value</th>
<th>R²</th>
<th>D.W</th>
<th>Table of F-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>the width from the source</td>
<td>0.301</td>
<td>0.0000</td>
<td>13</td>
<td>0.53</td>
<td>1.87</td>
<td>4.37</td>
</tr>
<tr>
<td>D. assets ratio</td>
<td>0.115</td>
<td>0.0000</td>
<td>3.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.</td>
<td>0.079</td>
<td>0.0000</td>
<td>-4.7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Computational F statistics = 12.8 p-value =0.0000

Test results in this study are listed in Table Durbin Watson (5), Durbin Watson statistic is equal to 1.878 and because if this statistic is close to 2, Indicates the absence of autocorrelation in the model, Therefore it is concluded that in their model, there is no R², and correlation or adjusted determined coefficient, is equal to 0.53. Therefore 53% of the variability, mean, and the ratio of net profit is explained by the independent variables. Statistic, F, is also indicating the overall significant regression since the F statistics were calculated as the 12.8, much larger than the F table;

So we can say that the model variables (common) have a significant role in explaining the dependent variable and the estimated relationship is quite significant. Based on the obtained results, the coefficient of each variable can be interpreted as follows:

- By increasing in short-term debt to assets, up to the rate of 1%, operating profit amount increases to 0.621%, so there the short-term debt ratio to assets has a significant and positive impact on the net income profit.
- By increasing in short-term debt to assets, on dummy variable up to the rate of 1%, the rate of net income profit will be reduced up to 0.021, so the rate of short-term debt to assets on dummy variable of short-term debt to assets have a negative and significant impact on the net income profit.

After estimating the above function, to test the hypothesis 1, the following hypothesis test is used.

\{H0: \beta_1 = 0 \}
\{H1: \beta_1 \neq 0 \}

As the results in Table 6 shows, absolute value of the
parameter $t$, of short-term debt to assets ratio is equal to 2.6 which is larger the table value that is equal to 2, so there is a significant relationship between the ratios of short-term debt to assets ratio on the ratio of operating profit, therefore second hypothesis of this study is confirmed. To test the fourth hypothesis, the study of the long-term debt to assets ratio on the ratio of operating profit of companies listed on the Tehran Stock Exchange has a significant impact; the following hypothesis test is used.

$H_0$: $\beta_2 = 0$

$H_1$: $\beta_2 \neq 0$

As the results in Table 6 shows, absolute value of the parameter $t$, of Long-term debt to assets ratio is equal to 9.3; is larger the table value is equal to 2, Therefore, the hypothesis is $H_0$ rejected, so its contrast hypothesis resulting is accepted. And there is a significant relationship between the ratios of long-term debt to assets ratio on operating profit, therefore fourth hypothesis of this study is confirmed.

**CONCLUSION**

The result of the first hypothesis, the hypothesis test showed that the ratio of short-term debt to assets ratio of net income is not a positive and significant relationship, so that increase in short-term debt will increase net income.

The result of the second hypothesis, the hypothesis test showed that the ratio of short-term debt to assets ratio of net income, there is not a negative and significant relationship, so that increase in short-term debt will reduce net income.

So the result of Wald statistic which implies overall significant regression showed that, in general, short-term debt to assets ratio and Long-term debt to assets ratio is effective on net income. The result of the third hypothesis, the hypothesis test showed that the ratio of short-term debt to assets ratio with operational interest, there is a positive and significant relationship, so that increase in short-term debt will increase net income.

The result of the fourth hypothesis, the hypothesis test showed that the ratio of short-term debt to assets ratio with operational interest, there is a negative and significant relationship, so that increase in short-term debt will reduce net income. So the result of Wald statistic which implies overall significant regression showed that, in general, short-term debt to assets ratio and Long-term debt to assets ratio is effective on operational interest. Thus, the results obtained in relation to the positive correlation of short-term debt with the profitability indicators can be considered low cost, short-term debt, since the majority of short-term debt instruments without the cost and the other items, cost of short-term financing under normal conditions, is lower than in other liabilities. And a significant negative relation-term debt with profitability index means Companies that use of long-term debt, for financing will encounter by reducing profitability. In the event that normally expected, long-term debt increasing because of their tax advantages, lead to increased profitability. One of the main reasons for this is that on the Iranian companies, often, long-term loans due to the need for bail and the high banking fees, Impose large costs on firm.

On the other hand, since the company usually precedes of long-term loans into long-term investment projects, they are not able to pay and face with heavy non-payment fines by bank, which increases the cost of long-term loans. Another reason for this, can be high risk when long-term loans in contrast to short-term debt, noted that this causes the interest expense on loans and reduces the profitability. By analyzing the relationship between capital structure and profitability; we can conclude that Companies in Tehran Stock Exchange are under the static or stable theory of capital structure.

**BASED ON THESE RESULTS, THE FOLLOWING RECOMMENDATIONS ARE SUGGESTED**

1-Further research should be investigated about the influence of other factors that affect profitability, not just the capital structure.

2-before raising long-term debt, the company must assess the benefits and costs of debt and how to estimate the impact on profitability.

**REFERENCES**


