The evaluation of the capital structure effect on the performance of companies listed in Tehran Stock Exchange

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ABSTRACT
The purpose of this study is to evaluate the effect of capital structure on firm performance. To estimate the relationship between leverage level and firm performance, the multiple linear regressions was used. Using three accounting criteria based on financial performance (Return on equity (ROE), return on assets (ROA), Tobin's Q ratio) and based on a sample of 100 companies listed in Tehran Stock Exchange for the period 2007-2012, the results show that the firm performance that has been measured by return on assets, return on equity and Tobin's Q ratio has a significant negative correlation with capital structure. In general, there are some evidences that show the firm performance is positively or negatively related to capital structure.

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INTRODUCTION

The theory of capital structure and its relation to the firm value and performance was a complex issue in firm finance and accounting literature before the article of Modigliani and Miller entitled "cost of capital, corporate financing and investment theory" that was published in the Journal of Economic Analysis in America in 1958. Most financial experts believed that financing through loan is cheaper than financing with equity thus the cost of loan capital was low and the firm value increases at the time of borrowing. But when the company’s debt is too much the shareholders and creditors ask for higher efficiency due to the high risk of the company and the cost of capital will increase. Thus, there is a debt ratio - optimal capital cost is minimal. optimal capital with minimal cost between equity and liability. Accordingly, the company’s value depends on the value and type of financial resources and the theory is known as traditional theory. Modigliani and Miller (1990 Nobel Prize winner) completely transformed the traditional theory by presenting the modern finance theory. According to this theory, under the conditions of perfect competition and apart from the effect of taxes, the market value of a company and its capital cost were distributed independent of the ratio of debt, dividends ratio and dividend ratio.

With reference to the research and literature of financial management, it can be seen that the main reason for the failure of companies is the inadequacy of investment and inadequate financing. For example, the owners of these companies may chose a wrong combination of resources (debt versus equity) or acquire resources that have a high liquidity obligations and restrictions for them or may even make the contracts which impose high costs. They may even refer to the suppliers that work with them is problematic, thus the current weakness may lead to bad investments that make it difficult for the company to survive.

Given the importance of capital structure and its effect on the value, profitability and the performance of economic unit, it is important to determine the optimal capital structure. This paper examines the impact of capital structure on the performance of companies listed in Tehran Stock Exchange through the relationship between leverage level and accounting criteria of economic units’ performance.

Review of the related literature:

Capital Structure:
Companies should acquire financial resources in order to invest and provide their needed assets.
"Capital Structure" includes the debt and equity by which the companies finance their long-term assets. In fact, the capital structure is the company’s permanent finance that is shown by long-term debt and shareholders’ equity and financial structure consists of short-term debt and shareholders’ equity, thus the capital structure forms a part of the financial structure. The main objective of capital structure decisions is maximizing the market value of the company through an appropriate mix of long-term sources of funds. This combination that is called the optimal capital structure minimizes the average cost of company’s capital. The selection between debt and equity used in the company should be done by comparing the main features of each type of securities that are affected by internal factors related to the Company’s operations or other external factors. Decisions of finance should be made in such a way to be in line with the investment strategy, not vice versa. Nobody has ever been able to provide a favorable structure for investment. However, to achieve such a model, a lot of research and tests were done and their results are remarkable. The result of these efforts is providing facts, determining or identifying costs and understanding the strengths and weaknesses by which the companies finance. Capital structure and its optimum combination or in other words, the company’s financing from various sources is a subject that was first introduced by Modigliani and Miller in 1958 and since then it has been the basis of many financial research and has sometimes resulted in the introduction of new theories.

2. Research Background:

Ogebe in his study entitled “The effect of capital structure on performance” concluded that there is a significant relationship between leverage and firm performance[1].

Cornigog and mramor concluded that there is a significant relationship between the financial leverage (the ratio of short-term debt to total assets, long-term debt to total assets and total debts to total assets) and firm performance. They used the rate of return on assets and gross profit margin as the measures of performance in their study [2].

Naser and Mazhar in a study showed that there is a significant negative correlation between the capital structure and rate of return on equity (performance criteria) [3].

Pao investigated the relationship between capital structure and firm performance in Taiwanese companies using multiple linear regression and neural network models and showed that there is a significant relationship between the capital structure and gross profit margin as a measure of performance [4].

Li and zhao in their study, examined the capital structure (ratio of short-term debt to total assets) and return on sales, return on assets and gross profit margin the measures of firm performance and came to the conclusion that there is a significant relationship between the capital structure and performance [5].

Ibrahim investigated the relationship between the ratio of short-term debt to total assets, long-term debt to total assets and total liabilities to total assets the measures of capital structure with the criteria of economic units’ performance (return on assets, return on salary equity and gross profit margin). His research showed that there is a poor significant relationship between the capital structure and firm performance under normal conditions [6].

Fosberg and ghosh in a study on the New York Stock Exchange showed that there is a significant negative correlation between the capital structure and rate of return on assets as a measure of financial performance [7].

Tian and zeitun investigated the relationship between capital structure and performance and came to the conclusion that there is a significant negative correlation between the ratio of short-term debt to total assets and the ratio of long-term debt to total assets and the ratio of total debts to the total assets and return on assets [8].

Sajjadi and colleagues in a study showed that the there is a significant negative correlation between the ratio of short-term debt to total assets and the ratio of total assets to the total assets with the rate of return on assets. In other words, under normal circumstances, choosing the capital structure has little impact or no impact on the performance of companies listed in the Stock Exchange[9].

Kurdistani, Najafi and Emrani examined the determinants of capital structure companies listed in Tehran Stock Exchange. The study of 93 companies during 1999 to 2006 suggests that profitability is one of the factors affecting capital structure (debt ratio) and there is a negative correlation between these two variables in accordance with the theory of hierarchy [10].

Kimiagari and Eynali studied the factors affecting capital structure. The sample consisted of 78 companies listed in Tehran Stock Exchange for the period 2001 to 2006 and the results showed that profitability is one of the factors affecting the capital structure and has a negative and significant relationship with it.

BagherZadeh explained the pattern of capital structure of companies listed in Tehran Stock Exchange. The study of 158 manufacturing companies in the period 1998 to 2002 suggest that the pattern of investment firms’ capital structure is subjected to the variables such as the amount of fixed assets, the company's size and its profitability [11].

Namazi and Shirzad [12] in their study examined the relationship between capital structure and profitability of companies listed in Tehran Stock Exchange. The sample consisted of 108 companies from various industries and the information related to the average ratio of debt to assets and return on assets ratio were collected and tested during the 5-year period. The correlation coefficient was used to test the hypotheses.
The obtained results suggested that there is a positive relationship between the capital structure and profitability of companies, but this relationship is statistically weak [13].

Sajjadi, Dastgir, Farazmand and Mahmoodi studied the effect of six factors of industry type, size, age, capital to assets ratio, debt to assets ratio, and advertising costs on the profitability of companies listed in Tehran Stock Exchange. Profitability has been defined as three measures of return on assets, return on assets and return on capital. The findings suggest that the variables such as size, the ratio of capital to asset, debt to assets ratio affect the profitability but the industry type, age, and advertising costs are ineffective on the profitability. If the measure of profitability is considered as return on capital, the industry type and company’s size will be effective on the profitability of the company. But age, capital to assets ratio, debt to assets ratio, and advertising costs are ineffective on the profitability [9].

Mohammadi in his study examined the impact of capital management on the profitability of companies listed in Tehran stock exchange. In this study, the ratio of gross profit to total assets was used as the measure of profitability and the variables of receivables period, inventory turnover period, and the cash conversion period were used as the measures of working capital management and the variables of company’s size, sales growth, the ratio of financial assets to total assets and financial liabilities to total assets ratio were used as control variables. The result of this research was that there is a significant inverse relationship between the ratios of profitability with the collection of receivables, inventory turnover period, the bank creditors and cash conversion cycle.

Arbabian and Safari Graily examined the impact of capital structure on the profitability of companies listed in Tehran stock exchange. The results showed that there is a positive relationship between the ratio of short-term debt to total assets and profitability, as well as the ratio of debt to assets and profitability. But there is a negative relationship between the long-term debt to equity ratio and profitability [13].

Yahya Zadeh Far, Shams and Larimi found a significant relationship between EVA and return on equity and the value added of companies’ market. But they did not find any significant relationship between the rate of return on assets and earnings per share and market value [14].

Research Objectives:
Idealistic objectives:
- Determining the optimal capital structure for stock exchange companies.

The main objective:
- Determining the effect of capital structure on return on assets and the return on equity of shareholders of stock exchange companies.

Specific objectives:
- Determining the effect of debt to equity ratio of stock exchange companies’ shareholders.
- Determining the effect of debt to equity ratio of stock exchange companies’ assets
- Determining the effect of debt to Tobin’s q of stock exchange companies
- Determining the effect of debt to equity ratio of shareholders on the return on equity of exchange companies’ shareholders.
- Determining the effect of debt to equity ratio of shareholders on the return on assets of stock exchange companies
- Determining the effect of debt to equity ratio of shareholders on the return on assets of stock exchange companies

Research Questions:
- Is there a significant relationship between debt ratio and return on equity of shareholders?
- Is there a significant relationship between debt ratio and return on assets?
- Is there a significant relationship between debt ratio and Tobin’s Q ratio?
- Is there a significant relationship between debt to equity ratio of shareholders and the he return on assets of shareholders?
- Is there a significant relationship between debt to equity ratio of shareholders and return on assets?
- Is there a significant relationship between debt to equity ratio of shareholders and Tobin’s Q ratio?

Research hypotheses

To achieve the objectives, the following hypotheses are raised:
- Is there a significant relationship between debt ratio and return on equity of shareholders?
- Is there a significant relationship between debt ratio and return on assets?
- Is there a significant relationship between debt ratio and Tobin's Q ratio?
Is there a significant relationship between debt to equity ratio of shareholders and the return on assets of shareholders?
Is there a significant relationship between debt to equity ratio of shareholders and return on assets?
Is there a significant relationship between debt to equity ratio of shareholders and Tobin’s Q ratio?

4. Method:
This study is an applied research in terms of purpose, a positive research in terms of theory and is an inductive research in terms of reasoning. This study is also quasi-experimental in the field of financial accounting research.

The statistical population and data collection method
The statistical population
The statistical population of this study includes the companies listed in Tehran Stock Exchange which worked from 2007 until the end of 2012 in the Tehran Stock Exchange.

The statistical sample:
In this study, the statistical sample was selected by systematic elimination method (targeted). The statistical sample of this study consists of those firms listed in Tehran Stock Exchange that meet the following conditions:

The firms which are not banks, financial, investment, holding and leasing institutions because of the nature of their activities, the relationship of the components investigated in this study are different for such institutions and cannot be generalized to others.

The firms should have been listed in the Stock Exchange by the end of 1385 and should have not been excluded during the years 2007 to 2012.
To observe the comparability, the financial year should be ended to 29 March each year.
The firms should not have a change in fiscal year since 2007 to 2012.
The financial statements and firms’ information should be available.
Accordingly, and after applying the above limitations, 100 companies have had the above criteria from 2007 to 2012.

Data collection method:
In this study, the information was collected in two ways:
The part of developing theoretical basis was performed through the library method namely studying books, articles and dissertations. Another part that is related to the variables was performed through the field method namely the website of the Stock Exchange Organization.

Research Models:

\[
\text{ROE}_{it} = \alpha_0 + \beta_1 \text{TDTA}_{it} + \beta_2 \text{Size}_{it} + \epsilon_{it}
\]

\[
\text{ROA}_{it} = \alpha_0 + \beta_1 \text{TDTA}_{it} + \beta_2 \text{Size}_{it} + \epsilon_{it}
\]

\[
\text{Tobin q}_{it} = \alpha_0 + \beta_1 \text{TDTA}_{it} + \beta_2 \text{Size}_{it} + \epsilon_{it}
\]

\[
\text{ROE}_{it} = \alpha_0 + \beta_1 \text{TDE} + \beta_2 \text{Size}_{it} + \epsilon_{it}
\]

\[
\text{ROA}_{it} = \alpha_0 + \beta_1 \text{TDE} + \beta_2 \text{Size}_{it} + \epsilon_{it}
\]

\[
\text{Tobin q}_{it} = \alpha_0 + \beta_1 \text{TDE} + \beta_2 \text{Size}_{it} + \epsilon_{it}
\]

In these models, respectively:
Dependent variable:
Return on equity for shareholders of company I in year t/ (ROEit)

This ratio reflects the company's management in the efficient use of investors’ money and shows the management power in increasing the value of the company. In fact, the return on equity is a status in which the manager carefully controls all aspects of the activity in order to make better use of the resources available to the institution. One of the main tasks of management is the evaluation and promotion of the company's return on equity. In this study, the following equation is used to calculate the return on equity.

\[
\text{ROE} = \frac{NI}{E}
\]
In which, ROE is the return on equity, NI is the net income (It has been used before tax due to comparability of net profit) and E is the equity of shareholders.

**Return on assets for company I in year t; (ROAi_t):**
One of the most important tests of the management ability on gaining the resources provided is the rate of return on total assets. In this study, the following equation is used to calculate the return on assets.

\[
ROAi_t = \frac{NI_t}{TA_t}
\]

In which, ROA is the Return on Assets, NI is the net income (It has been used before tax due to comparability of net profit) and TA is the total assets.

Tobin's Q ratio has been proposed as an important technique for the assessment of managers’ operations. The proportion is a statistics that can be used as the representative of the company value for investment.

In the present study, according to the studies by Namazi and Zeraatgari (2009), Moradi and Pourhassan (2010) and due to the high degree of correlation and approximate equality of estimates of different versions of Tobin's Q on the one hand and the difficulty of calculating the replacement value of assets and liabilities in Iran stock market on the other hand, the simple Tobin's Q ratio is used as follows:

\[
Q_i = \frac{(MVP_{i,t} \times NOS_{i,t}) + TDB_{i,t}}{TAB_{i,t}}
\]

In which, MVP is the market value per share, NOS is the number of shares available to the shareholder, TDB is the book value of total liabilities of the company, and TAB is the book value of the total assets of the company.

**Independent variables:**
Debt ratio for company I in year t; (TDTAi_t)
Debt ratio implicates the extent to which a company has financed through borrowing. In other words, the debt ratio represents the amount of fixed costs such as the fixed interest of loans in companies. The debt ratio is calculated as follows:

\[
TDTAi_t = \frac{TD}{TA}
\]

In which, TDTA is the debt ratio, TD is the total debts and TA is the total assets.

Tobin’s Q ratio for company I in year t; (Tobin qit)
Tobin's Q ratio is one of the measures of calculating the company's financial leverage. This ratio shows that the percentage of equity and debt used by the company. Debt-to-equity ratio of shareholders is one of the measures of calculating the company's financial leverage.

\[
TDE_it = \frac{TD}{E}
\]

In which, TDE is the debt to equity ratio of shareholders, TD is the total debts and E is the equity of shareholders.

**Control variable:**
The size of company for company I in year t (Sizeit)
Eit: error (of disruption)
The results of hypotheses tests

5. **Finding:**

<table>
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<th>Table 1: The analysis of the hypothesis 1, 2, 3.</th>
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<td>Intercept</td>
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<td>Debt ratio</td>
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<td>Company Size</td>
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<td>Adjusted R2</td>
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<td>F-statistic</td>
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<td>sig (F-statistic)</td>
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<td>Durbin-Watson</td>
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<th>Table 2: The analysis of the hypothesis 4, 5, 6.</th>
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<td>Coefficient</td>
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<td>Size</td>
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<tr>
<td>Adjusted R2</td>
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The analysis of the first hypothesis: there is a significant relationship between the ratio of debt and equity returns of shareholders.

In the study of the model significance, since the significant level (sig) of F-statistic is smaller than 0.05 the overall significance of models is confirmed at 95% confidence level. Determining factor of model also suggests that 68/9% of changes in equity returns of shareholders are explained by the variables entered to the model. Moreover, since the value of Durbin-Watson is a number between 1/5 and 2/5 (1/714), thus the independence of the rest of the model is confirmed.

The significant level (sig) of t-statistics related to debt ratio is less than 0/05 (0.000) and its coefficient is negative (-0/487), thus there is a negative and significant relationship between the ratio of debt and equity returns of shareholders. Thus, the first hypothesis is confirmed at 95% confidence level.

In relation to the control variable, it can be said that due to the obtained results the company size has a significant positive correlation with equity returns of shareholders.

The analysis of the second hypothesis: there is a significant relationship between the ratio of debt and return on assets.

In the study of the model significance, since the significant level (sig) of F-statistic is smaller than 0.05 the overall significance of models is confirmed at 95% confidence level. Determining factor of model also suggests that 50/3% of changes in return on assets are explained by the variables entered to the model. Moreover, since the value of Durbin-Watson is a number between 1/5 and 2/5 (1/714), thus the independence of the rest of the model is confirmed.

The significant level (sig) of t-statistics related to debt ratio is less than 0/05 (0.000) and its coefficient is negative (-0/258), thus there is a negative and significant relationship between the ratio of debt and return on assets. Thus, the second hypothesis is confirmed at 95% confidence level.

In relation to the control variable, it can be said that due to the obtained results the company size has a significant positive correlation with return on assets.

The analysis of the third hypothesis: there is a significant relationship between the ratio of debt and Tobin's q ratio.

In the study of the model significance, since the significant level (sig) of F-statistic is smaller than 0.05 the overall significance of models is confirmed at 95% confidence level. Determining factor of model also suggests that 39/1% of changes in Tobin's q ratio are explained by the variables entered to the model. Moreover, since the value of Durbin-Watson is a number between 1/5 and 2/5 (1/90), thus the independence of the rest of the model is confirmed.

The significant level (sig) of t-statistics related to debt ratio is less than 0/05 (0.000) and its coefficient is negative (-0/348), thus there is a negative and significant relationship between the ratio of debt and Tobin's q ratio. Thus, the third hypothesis is confirmed at 95% confidence level.

In relation to the control variable, it can be said that due to the obtained results the company size has a significant positive correlation with Tobin's q.

The analysis of the fourth hypothesis: there is a significant relationship between Debt-to-equity ratio of shareholders and return on equity.

In the study of the model significance, since the significant level (sig) of F-statistic is smaller than 0.05 the overall significance of models is confirmed at 95% confidence level. Determining factor of model also suggests that 48/5% of changes in return on equity are explained by the variables entered to the model. Moreover, since the value of Durbin-Watson is a number between 1/5 and 2/5 (1/711), thus the independence of the rest of the model is confirmed.

The significant level (sig) of t-statistics related to debt ratio is less than 0/05 (0.000) and its coefficient is negative (-0/030), thus there is a negative and significant relationship between Debt-to-equity ratio of shareholders and return on equity. Thus, the fourth hypothesis is confirmed at 95% confidence level.

In relation to the control variable, it can be said that due to the obtained results the company size has a significant positive correlation with return on equity of shareholders.

The analysis of the fifth hypothesis: there is a significant relationship between Debt-to-equity ratio of shareholders and Return on Assets.

In the study of the model significance, since the significant level (sig) of F-statistic is smaller than 0.05 the overall significance of models is confirmed at 95% confidence level. Determining factor of model also suggests that 48/7% of changes in Return on Assets are explained by the variables entered to the model. Moreover, since the value of Durbin-Watson is a number between 1/5 and 2/5 (1/682), thus the independence of the rest of the model is confirmed.
The significant level (sig) of t-statistics related to debt ratio is less than 0.05 (0.013) and its coefficient is negative (-0.012), thus there is a negative and significant relationship between Debt-to-equity ratio of shareholders and Return on Assets. Thus, the fifth hypothesis is confirmed at 95% confidence level.

In relation to the control variable, it can be said that due to the obtained results the company size has a significant positive correlation with Return on Assets.

The analysis of the sixth hypothesis: there is a significant relationship between Debt-to-equity ratio of shareholders and Tobin's q ratio.

In the study of the model significance, since the significant level (sig) of F-statistic is smaller than 0.05 the overall significance of models is confirmed at 95% confidence level. Determining factor of model also suggests that 53% of changes in Tobin's q ratio are explained by the variables entered to the model. Moreover, since the value of Durbin-Watson is a number between 1/5 and 2/5 (2/07), thus the independence of the rest of the model is confirmed.

The significant level (sig) of t-statistics related to debt ratio is less than 0.05 (0.000) and its coefficient is negative (-0.007), thus there is a negative and significant relationship between Debt-to-equity ratio of shareholders and Tobin's q ratio. Thus, the sixth hypothesis is confirmed at 95% confidence level.

In relation to the control variable, it can be said that due to the obtained results the company size has a significant positive correlation with Return on Assets.

Conclusion:

The results of testing the hypotheses showed that there is a significant negative correlation between the capital structure measured by (debt ratio, debt to equity ratio) and the performance measured by (return on equity, return on assets and Tobin's q ratio). These results are not consistent with the studies of Gahremanan, Gosh et al., Hadok and James, Frank and Gayal, Berger and D. Petit that showed that there is a positive relationship between capital structure and performance. But the results are consistent with the studies of Rajan and Zingales, Tian and Zeyten, Abar that found a negative relationship between capital structure and performance [8].

Suggestions for Future Research:

It is suggested to study the determinants of capital structure of listed companies in Tehran Stock Exchange such as business risk, growth and so on and compare the results to the results of the similar studies in other developing and developed countries.

It is suggested to study the common effect of capital structure and ownership structure on firm performance.

It is suggested to classify the debts to current and long-term debts separately in the model.

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