



Effect of Profitability Indices on the Capital Structure of Listed Companies in Tehran Stock Exchange

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ABSTRACT

The main objective of this research is the index of profitability on the capital structure of listed companies on the Stock Exchange of Tehran. Statistical population consisted of all above companies that 138 companies were selected in time zone of 2011-2014 after screening method (systematic elimination). The research method is descriptive and correlation and study variable is profitability index that was tested by statistical techniques. Research findings indicate that there is a significant inverse relationship between indicators of profitability and capital structure. Also, there is a significant inverse relationship between short-term and long-term profitability and debts.

1 Introduction

In capital markets, corporate credit depends largely on their capital structure and in fact, the basis of production and service delivery depends on how financial resources are secured and used. For this reason, capital structure is raised as the most important factor affecting valuation of companies and their orientation in the capital markets. Most companies provide their funds by various methods, but factors such as company size, profitability, growth opportunity, tangible asset and effective tax rate make them cautious on optimal decisions in this context. However, it is that creating debt and releasing shares are defined as two main sources of corporate finance.

Of course, it should be noted that the use of debt while creating significant fixed costs (related financial costs) causes to increase leverage and thus the risk of company. For this reason, reviewing financing using leverage methods and due to other factors is very important [16-18]. This study investigated the relationship between profitability and capital structure and also it reviewed profitability relationships and short-term and long-term debt. Working capital of a company is a set amount that is invested in current assets. If current debts of current assets of a company are deducted, then net working capital is obtained. Working capital management is to determine the volume and mix of sources and uses of working capital so that the wealth of shareholders increases. Current assets of a company

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are as follows: fund and bank, saleable securities, receivable accounts, available commodities and other current assets. Many current assets are financed by current debts (such as payable accounts, payables documents and short-term loans). At the same time, some companies financed a part of their current assets from long-term borrowings or shareholders' equity. Several factors are involved in the economic and financial proper functioning of one institution. Institutions whether manufacturing or distribution, in industrial, agricultural, and services sectors are needed to observe economic and accounting scientific principles and criteria [19-20].

The enterprise entrance factors or inputs and outputs in a turnover, shall be end so that seeks to lead to increasingly success for the enterprise. An enterprise acquires funds and finally spends these funds, fixed and current assets and fixed and variable costs play a role in its financial operations. Sales volume, final price, dividends, shares transfer, short and long term loans that are received, how to repay them, its cash or non-cash purchases, credit operation that it does, method of instalment sale, checks collection, expected time to collect, the increase or decrease in equity and decrease and increase of fixed and current assets, stock exchange with raw materials, how to buy raw materials, how to pay short-term and long-term loans to employees and meeting all needs of personnel are all involved in the circulation of financial operation of an institution, all above factors and parameters can be reviewed and investigated as working capital management. In above research, we will examine the issue of whether profitability indicators affect the capital structure?

Given the abovementioned, it is tried in this research to respond to the following questions:

Is there a significant relationship between profitability indicators and total company debts?

In this study, we will examine the issue of whether the profitability indicators affect the capital structure?

2 Literature Review

From financial management viewpoint, capital structure is one of the most important issues that have been addressed in the past two decades. Today, rating companies in terms of credit depends largely on their capital structure. The capital structure of each company is an early warning in relation to the company cash bottleneck and it is necessary to pay serious attention to determine the factors affecting on their financing performance in companies strategic planning. On the other hand, main role of success in business is determined by competitive power, and companies are competing to increase their return on investment and strengthen its position in the market and round out their rivals and achieve market power.

The main purpose of capital structure decisions is to form a proper combination of long-term sources of funds in order to minimize the cost of company capital and thereby to maximize company value. This combination is called optimal capital structure.

One of the most complex problems which current financial managers faced is the relationship between the components of capital structure; company needs capital in order to be able to establish and it needs more capital to develop. The required funds are provided from different sources and in different forms but all capital may be placed in two main groups: loan and shares. Basically, the use of financial leverage would lead to increase the expected return on shareholders, but on the other hand, it will lead to increase their risk. Firm's capital structure is firm permanent financing that is shown by long-term debts and equity. Financial structure includes short-term and long-term debts and equity. Thus, capital structure forms a part of financial structure.

The researchers' main concern that causes problem design of this study is the global effect of enter-

prise level factors such as firm size, asset structure, profitability and ownership structure on capital structure.

Knowledge and awareness of capital structure companies is very important, on one hand, for shareholders and investors and, on the other hand, information about the capital structure is used by creditors. Many financing decisions of companies depend on market share value.

Capital structure of a company is comprised of short-term debts, long-term debts and shareholder's equity by which company assets are provided and it includes items in balance sheet left side. He introduced capital structure as the total claim on company assets. He finds capital structure including public issued securities, private investments, bank debt, commercial debt, lease agreements, tax liabilities, pension debts, deferred bonuses for management and employees, deposits of performance guarantee, commodity guarantees and other possible debts that is usually measured through ratios such as debt to total assets ratio, shareholders' equity to total assets ratio, and debt-to-shareholders' equity ratio.

Profitability indicators impact on firms' capital structure is due to short-term debts and long terms.

For domestic and foreign research in line with this study, the following can be mentioned:

Khani et al. [18] examined the relationship between cash conversion cycle and company profitability. The overall analysis shows that there is a significant positive relationship between cash conversion cycle and company profitability. There is a significant relationship between collection period of receivables accounts and inventory conversion days with profitability. And there is no significant relationship between deferral days of payable accounts and profitability. Michael et al [22], in an article, examined the relationship between leverage effect and liquidity on earnings management and income. The results of their study suggest a positive relationship between liquidity and earnings management.

Khajoooye and Hosseini [19] discussed decision making about financial leverage of companies. In this study, 1620 Australian companies were divided into two mining and non-mining sectors over a period of 13 years - from 2000 to 2012. Results of this article show that there is a significant difference in selecting leverage among mining and non-mining companies. Based on evidences, mining companies are more sensitive toward tangible assets and profitability. Because no significant relationship between profitability and tangible assets in these companies with non-mining companies. The overall results showed that type of industry is important in decision making related to organizational leverage. Hosseini Montazeri [7] examined the relationship between economic criteria and the cash conversion cycle of Stock Exchange listed companies in Tehran. His research in the form of four hypotheses investigated the effect of companies (working capital management) cash conversion cycle on companies' profitability.

It suggests that there is a significant relationship between cash conversion cycle and its components including the period of receivables collection, inventory turnover period and payment period of creditors with shareholders' equity, gross margin, earnings per share ratio and operating cash flows and corporate executives can increase, at an optimal level, their company profitability by reducing the period of receivables collection and inventory turnover period.

Ansari et al. [8] examined the effect of free cash flow and capital structure on various criteria of evaluating performance in medicine products and material industry companies listed in Tehran's Stock Exchange. Data analysis showed that the relationship between debt leverage and Q Tobin's index and shareholders' equity return rate is positive and significant and it is negative and significant for assets return rate. Also, the relationship between free cash flow and assets return rate is negative and signifi-

cant and it is positive and significant for shareholder's equity. But it does not have a significant relationship with Q Tobin's index. Saghafy [14] examined the relationship between working capital management and profitability of listed companies in Tehran's Stock Exchange.

The results of their research indicate that there is no non-linear relationship between working capital management and profitability. This implies that there is no optimal level of working capital in which level of profitability is the maximum. Also, results of this study in relation to three industries of car and parts manufacturing, chemical products and non-metallic mineral products, show that there is non-linear relationship between working capital management and profitability only in chemical products industry.

Thus, regarding literature review, the aim of this study is as follows:

1. Reviewing that the profitability indicators impact on firms' capital structure is due to short-term long term debts. With secondary objectives:
2. Guiding managers to determine the optimal financial leverage through the creation of short-term or long-term debts.
3. Encouraging and prompting investors to buy companies stocks without debt or with debt in the capital market.

3 The Proposed Methodology

The hypothesis of this study is as follows:

There is a significant relationship between profitability indicators and capital structure by creating an entire corporate debt (short and long term). Statistical population of this study consisted of all companies listed on Tehran Stock Exchange that were active in time domain of 2010-14. The number of listed companies in Tehran Stock Exchange was 671 companies in 2014. Number of samples after screening (systematic removal) was 138 companies that were selected by random classification.

In main hypothesis, dependent variable is considered capital structure that is shown by LEV [12-15].

Financial leverage = total debt. total asset

Above ratio reflects the importance and role of current and long-term liabilities in securing and collecting company total assets. Whatever this ratio is higher it reflects company tendency in providing its financial resources from outside. This large ratio indicates that this company is risky from creditors and banks perspectives; those which lend to the company. It should be noted that the dependent variable of company debts in the main hypothesis is obtained by dividing company total debts by total assets. The dependent variable of short-term debts in the first sub-hypothesis is obtained by dividing short-term debts by total company assets.

The dependent variable of long-term debts in the second sub-hypothesis is obtained by dividing company long-term debts by total company assets.

3.1 The Models Used in this Research

In this study, independent variable is the profitability index and it is measured using the following formula [8-11].

Model related to main hypothesis is as follows:

$$EEV_{it} = \beta_0 + \beta_1 RROA_{it} + \beta_2 ZZZ_{it} + \beta_3 TANG_{it} + \beta_4 GROTT_{Hit} + \beta_5 RRT_{it} + \varepsilon$$

Where:

LEV: capital structure (total company liabilities ratio)

PROA: return on assets (profitability index)

SIZE: company size

TANG: fixed assets

GROWTH: growth opportunity.

ERT: Effective tax rate

Model related to first sub-hypothesis is as follows:

$$\text{LEVST}_{it} = \beta_0 + \beta_1 \text{PROA}_{it} + \beta_2 \text{Size}_{it} + \beta_3 \text{TANG}_{it} + \beta_4 \text{GROWTH}_{it} + \beta_5 \text{ERT}_{it} + \varepsilon$$

Where:

LEVST: capital structure (company short term debts ratio)

PROA: return on assets (profitability index)

SIZE: company size

TANG: fixed assets

GROWTH: growth opportunity.

ERT: Effective tax rate

Model related to the second sub-hypothesis is as follows:

$$\text{LEVLT}_{it} = \beta_0 + \beta_1 \text{PROA}_{it} + \beta_2 \text{Size}_{it} + \beta_3 \text{TANG}_{it} + \beta_4 \text{GROWTH}_{it} + \beta_5 \text{ERT}_{it} + \varepsilon$$

Where:

LEVLT: capital structure (company long term debts ratio)

PROA: return on assets (profitability index)

SIZE: company size

TANG: fixed assets

GROWTH: growth opportunity.

ERT: Effective tax rate

Table 1: Dependent Variables Descriptive Statistics after Normalization

Variables	Average	Middle	Max.	Min.	Criteria Deviation	Skewness	Strain
LEV (total company debt)	-0.001	0.02	2.61	-2.43	1.02	-0.02	2.68
LEVST (short-term debt)	0.006	-0.0008	3.41	-2.74	1.00	0.01	2.88
LEVLT (long-term debt)	0.01	0.03	2.47	-2.25	0.96	-0.04	8.73
PROA (profitability index)	0.13	0.12	0.63	-0.26	0.12	0.66	4.26
SIZE (size of the company)	13.96	13.47	19.01	10.23	1.46	0.78	4.00
TANG (ratio of fixed assets)	0.24	0.20	0.86	0.00	0.18	1.08	3.79
GROWTH (growth opportunities)	1.59	1.37	7.67	0.21	0.81	2.92	16.87
ERT (effective tax rate)	0.11	0.12	1.18	0.00	0.11	2.91	25.87

Also, the descriptive statistics related to the research dependent variables is normalized by Minitab software and its results are shown in Table 1.

3.2 Analysis of Data

As it can be seen in Table 1, ROA variable median is 0.12 that shows half of the data is less than this amount and half are greater than this amount. Scattering parameters, in general, are a criterion for determining data distribution from each other or it is their distribution toward the mean. The standard deviation is the most important scattering parameter.

This parameter value for variable ROA is 0.12. The asymmetry of frequency curve is called skewness. If the coefficient of skewness is zero, the population is totally symmetric and if the coefficient is positive, it is skewed to the right, and if it is negative, it is skewed to the left.

Coefficient of skewness in the variables of LEVLT, and LEV is negative, indicating skewness to the left and tendency to larger amounts. In this study, variance dissimilarity test was conducted whose results are presented in the following table:

Table 2: Variance Dissimilarity Test Outcome

Test method	Degrees of freedom	Value	Significance
Bartlett	3	30.13	0.00
Loon	(3.686)	13.27	0.00
Bro- Forsyth	(3.686)	9.99	0.00

H0: error terms have similar variance (there is no variance dissimilarity)

H1: error terms do not have similar variance (there is variance dissimilarity)

Table 3: The Output of Multiple Correlation Coefficient Tests

	LEV	PROA	SIZE	TANG	GROWTH	ERT
LEV (capital structure) Statistics t	1.00					
Possibility	-					
PROA (profitability index) Statistics t	-0.58	1.00				
Possibility	-18.91	-				
SIZE (company size) Statistics t	0.13	0.03	1.00			
Possibility	3.62	0.79	-			
	0.00	0.42	-			
TANG (ratio of fixed assets) Statistics t	-0.01	-0.03	0.02	1.00		
Possibility	-0.48	-1.03	0.75	-		
	0.62	0.30	0.44	-		
GROWTH (growth opportunity) Statistics t	-0.29	0.52	-0.09	-0.02	1.00	
Possibility	-7.96	16.04	-2.51	-0.68	-	
	0.00	0.00	0.01	0.49	-	
ERT (effective tax rate)	-0.10	0.10	-0.07	05	0.03	1.00
Statistics t	-2.83	2.85	-1.85	1.46	1.01	-
Possibility	0.00	0.00	0.06	0.14	0.31	-

According to Table 2, as the possibilities is less than 0.05, in this study, we are faced with variance dissimilarity, therefore, H0 is rejected and H1 is accepted, that EGLS estimators are used to resolve this dissimilarity. In this study, linearity is also tested that appears as a result of technical or linear relationship between independent variables. In this research, linearity is reviewed by multiple correlation coefficient tests whose results are presented in Table 3.

According to Table 3, it can be seen that we face no linearity in conducting this study.

In order to ensure that research results are correct and ensuring that relationships in regression are not fabricated and that variables are significant, reliability test and unit root calculation of study variables were done in the model of EGLS whose results are shown in Table 4.

Table 4: Reliability Test

Test Method								
Levin, Lin and Chu			Eim, sons and Shein		Fisher, Dickey, Fuller		Fisher - Phillips-Perron	
variable	Statistics	Possibility	Statistics	Possibility	Statistics	Possibility	Statistics	Possibility
LEV (total company debt)	-20.82	0.00	-4.98	0.00	340.56	0.00	418.54	0.00
LEVST (Short-term debt)	-26.41	0.00	-5.75	0.00	356.27	0.00	434.49	0.00
LEVL (long-term debt)	-1213.55	0.00	-94.99	0.00	313.45	0.00	399.68	0.00
PROA (profitability index)	-14.43	0.00	-2.48	0.00	-	-	-	-
SIZE (size of the company)	-15.70	0.00	-	-	-	-	-	-
TANG (ratio of fixed assets)	-12.57	0.00	-1.98	0.00	0.00	0.00	385.71	0.00
GROWTH (growth opportunity)	-15.23	0.00	-3.26	0.00	-	-	337.84	0.00
ERT (effective tax rate)	705.31	0.00	-78.68	0.00	361.38	0.00	436.09	0.00

H0: there is no single root (they are not viable)

H1: There is a single root (they are viable)

According to the table above because Sig is zero that is less than 0.05, so the H0 is rejected and H1 is accepted that shows the reliability (static) of data. According to the results, null hypothesis is not accepted that says variables have single root. To test the research hypotheses, at first, the time-fixed effects model is estimated, then Chow test is used to observe whether the intercepts are statistically difference or not.

Table 5: Chow Test

Fixed effects test Model			
$LEV_{it} = \alpha_0 + \beta_1 PROA_{it} + \beta_2 SIZE_{it} + \beta_3 TANG_{it} + \beta_4 GROWTH_{it} + \beta_5 ERT_{it} + \epsilon$			
The effect of test	Statistics	Degrees of freedom	P-Value significance
Cross – Section F	17.33	(547,137)	0.00
Cross – Section Chi - Square	1156.17	137	0.00

H0: data model is an integrated one.

H 1: data model is the panel one.

Table 6: Hausman Test Table

Random effects Model			
LEV it = $\beta_0 + \beta_1$ PROA it + β_2 Size it + β_3 TANG it + β_4 GROWTH it + β_5 ERT it + ε			
The effect of test	Statistics	Degrees of freedom	P-Value Significance
Cross – Section Random	29.40	5	0.00

According to Table 5, because Sig is zero and its significance level is less than 0.05, so H0 is rejected and H1 is accepted. In this hypothesis, according to P-Values, null hypothesis based on equality of width of sources is accepted. Therefore, in this hypothesis, the panel model is chosen as the preferred model. Due to P-Value that is less than 0.05, fixed effects model is chosen as the preferred model. Finally, research test result is mentioned in Table 7.

3.3 The Analysis of Hypotheses

Table 7: Research Hypothesis Test

Model:				
LEV it = $\beta_0 + \beta_1$ PROA it + β_2 Size it + β_3 TANG it + β_4 GROWTH it + β_5 ERT it + ε				
Method: extended least squares				
Variable	Variable coefficient	SD	Statistics t	P-Value significance
C (fixed amount)	0.39	0.33	1.20	0.22
PROA (profitability index)	-3.35	0.14	-22.56	0.00
SIZE (size of the company)	0.02	0.02	1.01	0.30
TANG (ratio of fixed assets)	-0.81	0.16	-4.83	0.00
GROWTH (growth opportunity)	0.01	0.01	0.83	0.40
ERT (effective tax rate)	-0.73	0.10	-6.94	0.00
134.25 Statistics F		0.76 Adjusted determined coefficient		
0.00 Statistic F probability		1.81 Durbin-Watson statistics		

As it can be seen, test results are fixed based on effects model selection. However, fixed effects model should be tested against random effects model. To do this, Hausman test is used. For doing Hausman test, first we need to estimate random effects model. Hausman test is set for reviewing the presence of random effects as follows:

H0: there is no correlation between descriptive variables and individual effects – random effects model

H1: there is correlation between descriptive variables and individual effects – fixed effects model

Table 8: Research Hypothesis Test

Model:				
LVVt = $\beta_0 + \beta_1$ PAAAt + β_2 AANGi + β_3 TTTt + ε				
Method: extended least squares				
Variable	Variable coefficient	SD	Statistics t	P-Value significance
C (fixed amount)	0.74	0.05	14.27	0.00
PROA (profitability index)	-3.30	0.14	-23.43	0.00
TANG (ratio of fixed assets)	-0.86	0.16	-5.30	0.00
ERT (effective tax rate)	-0.74	0.10	-7.05	0.00
136.15 Statistics F		0.76 Adjusted determined coefficient		
0.00 Statistic F probability		1.81 Durbin-Watson statistics		

Hausman test results related to the research hypothesis are mentioned in Table 6. The results of research hypothesis, stating that as the significant level of independent variable of profitability index is less than 0.05, it can be said that there is an inverse significant relationship between profitability index and capital structure by creating company total debts. Also the result of the best fit of research hypothesis is in Table 8. The results of the research hypothesis, stating that due to the significant level of independent variable of profitability index is smaller than 0.05.

Linear model obtained in this hypothesis is as follows:

$$LEV_{it} = 0.74 - 3.30Pro_{it} - 0.86TANG_{it} - 0.74RRRRR_{it}$$

By analysing linear model above, it can be said that one percent increase in profitability index will reduce 3.30 in debt to asset ratio. By one percent increase in fixed asset ratio; asset to debt ratio decrease 0.86 and with one percent increase in the effective tax rate, asset to debt ratio decrease 0.74. Due to fit model R2 it can be claimed that totally variables used in the model can explain 76% of dependent variable of company total debts changes. Durbin-Watson amount of 1.81 show no correlation between errors.

4 Conclusion

One of the main tasks of managers in companies is to determine finance resources combination or in other words capital structure. Due to analysing research hypotheses that increasing profitability indices will lead to reducing capital structure, it can be said that totally result found in this research is matched with hierarchy theory that indicate there is a negative significant between profitability and capital structure [1-3]. And based on static balance theory, negative relationship between profitability index and capital structure could be justified through bankruptcy cost, thus by reducing company profitability, its bankruptcy expected cost will increase that it causes to reduce in capital structure [4-7].

Table 9: Hypothesis Test Results

Theories	Findings
There is significant relationship between profitability index and total company debts.	Inverse significant
There is significant relationship between profitability index and company short term debts.	Inverse significant
There is significant relationship between profitability index and company long term debts.	Inverse significant

In future research, following topics could be addressed:

If possible it is recommended that in future studies, shareholders combination method, effect of advanced technologies by production of goods and company services, the discussion of types of risk that this needs its own method. It is also suggested that doing this research in different industries listed in the Tehran Stock Exchange will bring different guidelines about situation and difference of company capital structure.

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