Research Journal of Recent Sciences _____ ISSN 2277-2502
Vol. **3(1),** 33-37, January **(2014)** *Res.J.Recent Sci.*

The Study of the Relationship between Product Market Competition and Capital Structure of Companies Which is accepted in Tehran Stock Exchange

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Available online at: www.isca.in, www.isca.me
Received 26th May 2013, revised 30th June 2013, accepted 6th August 2013

Abstract

The aim of this study is to investigate the relationship between product market competition and capital structure of companies which is accepted in Tehran Stock Exchange. The population of study is selected companies listed in Tehran Stock Exchange during the 9-year period from1382 to 1390. Through the populations considered in the Tehran Stock Exchange, a total of 150 companies were selected by simple random sampling method as sample in this study. Capital structure is the independent variable in this study, which it's reagent index according to theoretical considered in this study is intended to debt ratio. The dependent variable in this study is the product market competition which it's index is considered Q2bin, HHI. Also the control variables affecting this study were selected Company size, dividends, interest risk, profitability and non-debt tax savings. The scope of this study includes: a 9-year period from 1382 until the end of 1390 and statistics on these variables are an annual gathering. The results showed that at the corporate level and between the industries, there was no significant correlation between the debt ratio and the earnings volatility (risk-benefit), but four other control variables have a significant relationship with debt ratio.

Keywords: Capital structure, product market competition, Tobin-q, HHI, the debt ratio.

Introduction

The environment which today companies operate in is growing and highly competitive environment. Companies are forced to compete with national and international factors and developing their activities through new investment to survive and they need the financial resources to survive and invest. But the funds and their use should be well defined to so the company can be profitable and this is one of the financial manager's tasks who should determine financing sources and how to use those[1]. In the case of finance companies, two theories have been proposed in financial literature including hierarchical and static equilibrium. Based on the static equilibrium model using the balance between financing benefits via debt (such as tax savings resulting from costs of debt and reduced agency costs via the role of encumbrances) and costs associated with debt(such as bankruptcy costs and agency costs of debt) we can achieve the capital structure by which the value of company maximized. This is the optimal capital structure[2]. This model of the capital structure is moving towards a point which reflects the tax rate, combined assets, business risk, profitability and insolvency regulations, while in the hierarchical model, capital market imperfections are considered and are linking transaction costs and information asymmetries and firm ability to accept new investment with internal resources. This model predicts that there is information asymmetry between external investors and management of a company, about the quality of new projects. According to this model, corporate chose the source of financing based on their adverse selection problem. Since retained earnings has no adverse selection problem is considered as the best source of financing. Since in studying of capital structure of companies is attempting to explain the combination of financial resources needed for investment[3,4], it can be said that the aim of determining the capital structure determination is specify combination of the of each company's financial resources in order to maximize it's shareholder wealth[5]. Because the cost of capital is a function of the optimal capital structure so the company can reduce costs and increases its market value[6]. There are many views about the relationship between capital markets and product markets which is determined the manager must also consider the competition in the product market when making decisions about funding. Industrial and financial economists have recognized increasingly the relationship between product market competition and corporate finance decisions[7]. In an oligopoly product market structure and profitability favorable position, companies implement strategies to maximize production to eliminate monopolies and increase their profitability and to this purpose, they Increase their debt[8]. This theory also applies to the unfavorable economic situation that makes the company to stop its production and reduce profitability[9]. On the other hand, inappropriate capital structure increases risk of financial turmoil and bankruptcy. So we can say that according to the product market and the conditions in it, financial decisions are changing[1]. But most studies show none of the theories and models could not fully explain factors determining the capital structure of companies and do not

provide a decisive answer to this question: why some companies choose to release stock while some others use internal resources and some get loan to finance their activities in various circumstances?[3,9,10,11]. Thus examine various aspects influencing the capital structure of the company can be broader so in this study the relationship between product market competition and capital structure of listed companies in Tehran Stock Exchange is evaluated.

History of Research: A study in 1388 examined the effects of capital structure and it's changes on the production was done by Setayeshand Jamalianpor[12]. Examining data from 341 firms in the period of 1378 to 1387 they found that there is a significant relationship between all components of the capital structure except the registered capital and the level of company's ability to achieve projected production. In 1384, a study examining the relationship between capital structure and profitability of listed companies in Tehran Stock Exchange was done by Namazi and Shirzadeh[13]. The main objective of the paper was examining the impact of capital structure on profitability of listed companies in different industries in Tehran Stock Exchange. A total of 108 companies from various industries were selected. The results of this study indicate that: Generally, there is a positive relationship between capital structure and firm profitability but, this relationship is statistically poor, the relationship between capital structure and profitability depends on the industry, and optimal capital structure can be determined in various industries and the relationship between capital structure and profitability of the various industries depends on the definition of profitability. In 1380, a study examining the relationship between capital structure and short-term or long-term financing methods through debt and efficiency of the companies listed in stock exchange was done by Ahmadi[14]. A total of 50 companies from 13 industries were selected then using simple regression and correlation coefficient reached the conclusion that has not been found any definitive conclusion about the existence of a significant relationship between capital structure and the efficiency ratio but it seems that this relationship is not completely be ruled out. Céspedes and colleagues in a research examined the relationship between capital structure and ownership in seven Latin American countries and concluded that there is a positive relationship between lever and ownership concentration. The results also indicate a positive relationship between lever and growth variable and a Negative relationship between lever, profitability and larger firms have more tangible assets[15]. Al-najjar and Taylor[16] concluded that in Jordanian firms, profitability, firm size, growth rate, market value to book value ratio, asset structure and liquidity are the determinants of capital structure, these factors were similar to the determinants of capital structure in the developed markets. Myers[17] and Fernandes[18], on the existence of optimal capital structure, and Miller[19], Damon and Senbet[20] and Havakimiyan[21] on the capital structure have done research and have introduced optimized combination. One important finding of this study was the positive and significant relationship between wage efficiency of equities and debts means the increase of the debt ratio, increases the wage efficiency of equities.

Table-1
Conceptual model

$Y = F(x_1, x_2, x_3, x_4, x_5, x_6)$	**Variables**	**Relationship**
The dependent variable of debt ratio	Dependent variable	Y
Index HHI	The first independent variable	X1
profitability	The second independent variable	X2
Firm size	The third independent variable	X3
Tax saving	The fourth independent variable	X4
Dividends	The fifth independent variable	X5
Interest risk control variable	Control variable	X6

Material and Methods

Research approaches used in this study is a type of descriptive research (Non experimental) because the independent variable is not manipulated by the researcher also it is applicable. Since in order to investigate possible casual relationships, the old and historical data are used and collected and analyzed also casual relationship are examined after the occurrence, so research project is the type of post event (causal - comparative) projects. Population: The target population is the collection of people, things and ... Have at least one common industry[2]. The target population of this study is the selected companies listed in Tehran Stock Exchange during the period of 9 years from 1382 until the end of 1390 which have the following characteristics: i. The end of their fiscal year is 29/12 and have not had a change in their financial year; ii. It should be one of manufacturing companies in the stock exchange and it's activity is not stopped; iii. Standard information filtering should be performed.

The sample consists of a set of symptoms that are selected from a larger portion, group or community. So, this set is reagent of qualities and characteristics of that larger portion or group or community[22]. Sampling is a process in which a number of units of a total (communities) are chosen in such a way that they are indexes of the larger society of which they are chosen[9]. To determine the sample size of this research first the random pilot sample size of 10 companies has been selected then in those companies S^2 (variance) was calculated for dependent variable and putted in the following formula to calculate the number of samples.

$$n = \frac{NZ^2pq}{Nd^2+Z^2pq} = 150$$

Random sampling method is a way to select all or part of population so that all of instances have the same probability of being selected[23]. Sampling method used in this study is random sampling.

Results and Discussion

Inference method of this study is a descriptive method, so this study used the main parameters such as mean and median, the indexes of scattering, such as standard deviation, expected, skewness and kurtosis also, to analyze the relationship between variables the multivariate linear regression, correlation and analysis of variance (Sig) tests was used. In table 2 variables of this research have been proposed to describe.

According to the population of this survey which is the selected companies listed in Tehran Stock Exchange during the period of 6 years from 1385 to the end of 1390, and according to the criteria, for determining the sample size of the study, first the Random sample of pilot of 10 participants were selected then in those companies we calculate S^2 (variance) for dependent variable and finally, given the above conditions, the sample size of companies came to the 150 firms. The coefficients of skewness and Kurtosis are used to determine symmetry of distribution. According to the coefficient obtained which is lower than 1.96 for all variables, symmetric distribution assumption can be accepted and use mean as reagent of the central tendency and the std. deviation as the reagent of scattering. Also can be seen that kurtosis coefficient of all parameters is higher than 1.96, so we can say that all variables are normally distributed.

According to the proposed hypothesis, test research hypotheses are summarized in table 4.

According to the test statistic values and significant levels are shown in table 4, it can be concluded that the multivariate regression model was not meaningful (but this model can be significant in the s 0.1 level).

Table-2
Describing the research variables

		Debt Ratio	Tobin-q	Firm size	Dividends	Interest Risk	Profitability	Non-debt Tax savings
N	**Valid**	**150**	**150**	**150**	**150**	**150**	**150**	**150**
	Missing	**1**	**0**	**0**	**1**	**21**	**20**	**22**
Mean		0.8404	1.7293	12.3816	863.5126	0.0242	0.00006	0.1018
Std. deviations		0.42069	2.0303	1.61773	9323.835	0.0710	0.00063	0.20928
Variance		0.177	4.122	2.617	2.673	0.602	0.001	0.044
Skewness		0.614	0.014	0.127	0.051	0.602	0.320	0.633
Kurtosis		3.402	3.557	2.930	3.440	3.217	2.487	2.927
Min		0.18	-1.49	8.16	-25030.6	-0.059	-.00449	0.00000
Max		3.53	11.61	18.18	99209.82	0.26	0.00370	0.7824

Testing the research hypotheses

Table-3
Summary of the research hypotheses

No.	Hypothesis
1	There is a relationship between earnings variability and debt ratio.
2	There is a relationship between the interest payout ratio and debt ratio.
3	There is a relationship between profitability and debt ratio.
4	There is a relationship between firm size and debt ratio.
5	There is a relationship between non-debt tax savingsand debt ratio.

Table-4
Analyze results of the regression model's variance

Changes source	Sum of squares	Degrees of freedom	Mean of squares	The test statistic	Significant level
Regression	1.264	6	0.211	2.017	0.067
Missing	14.932	143	0.104		
Total	16.196	149			

According to the table 5 it can be said that significant coefficient of saving and Tobin-q variables and also intercept which it's significant level is less than 0.05, is accepted and the regression model is obtained as follows:

$$Y_1 = e^{\sin Y} = 1.541 + 0.031X_1 + 0.00004X_6$$

Table-5
Test results of the regression coefficients

Variable	Coefficient	Significant level
Intercept	1.541	0.000
Tobin-q	0.031	0.02
Size	0.028	0.21
Dividends	-0.00002	0.459
Interest risk	0.063	0.821
Profitability	0.00004	0.526
Saving	0.00004	0.015

Tobin-q coefficient in the obtained model is 0.031, so we can say that (If other variables did not change) with a unit increase in the amount of Tobin-q, the dependent variable (Y_1) increases by 0.031 units (Increased due to the positive coefficient) so, main response variable, this means Y, according to the following equation is increased by 0.52.

$$Y = \sin^{-1}(\ln Y_1) = \sin^{-1}(\ln 0.031) = 0.58$$

The suitability of the model which has chosen Herfindhal-Hirshman index as a criterion for evaluation of product market competition is summarized in table 6:

According to Values of the test statistic and significant level it can be concluded that the multivariate regression model is significant. According to table 7, it can be said that the coefficient of savings and Hirshman variables and the intercept, which is less than the significance level of 0.05 could be significant and the regression model is obtained as follows:

$$Y_1 = e^{\sin Y} = 1.559 + 0.557X_1 + 0.00003X_6.$$

According to the significant level shown in the table above, we can say that any of the variable size, dividends, interest risk and profitability has no relationship with the dependent variable.

Conclusion

One of the essential issues of corporate finance is to determine the optimal capital structure. The capital structure has important applications in making decisions on the financing of current operations and investment projects of firm. Due to the low risk debt securities, the expected return is less than expected return of shareholders and creditors so according to the importance of determining the optimal capital structure and product market competition in the current circumstances this study investigated the relationship between product market competition and capital structure of listed companies in Tehran Stock Exchange. To conclude the hypotheses considered in this study can be said that the first sub-hypothesis which explains the variability, it was accepted according to significance testing of regression coefficients; the second sub-hypothesis that Noted that the ratio of interest payments was not accepted because the significance level of that was more than the level of test so this hypothesis was rejected; the third sub-hypothesis that is concerned about the profitability, were not accepted because the significance level of that was more than the level of test so this hypothesis was rejected; the fourth sub-hypothesis argues about the size of the firm, this assumption is also rejected because it's significant level is higher than the desired level. The fifth sub-hypothesis refers to non-debt tax savings; this hypothesis refers to the depreciation against the asset. This hypothesis has been accepted because the level of significance was less than desired level. According to the results of this study recommend to the managers of Companies surveyed that use this results in order to create their optimal capital structure and also, according to the results of other similar studies, it is clear that the size of the company should be considered as the most essential parameter influencing adjustment and financing decisions. Therefore, corporate managers and funding agencies to develop and evaluate these issues with a more comprehensive, more up to date and to consider.

Table-6
Analyze results of the regression model

Changes source	Sum of squares	Degrees of freedom	Mean of squares	The test statistic	Significant level
Regression	1.633	6	0.0272	2.672	0.017
Missing	14.563	143	0.0102		
Total	16.196	149			

Table-7
Test results of the regression coefficients

Variable	Coefficient	Significance level
Intercept	1.559	0.000
Herfindhal – Hirshman	0.557	0.003
Size	0.018	0.403
Dividends	0.000001	0.712
Interestrisk	-0.085	0.754
Profitability	-0.00005	0.352

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