The Effect of Industry on the Relation between Capital Structure and Profitability of Tehran Stock Exchange Firms

Zahra Yousefi¹, Shaer Biabani², Mohammad Taleghani³

¹M.A Student of Business Management, Rasht branch, Islamic Azad University, Rasht, Guilan, Iran
²&³Department of Management, Rasht branch, Islamic Azad University, Rasht, Guilan, Iran

ABSTRACT

This paper examines the effect of industry on the relation between capital structure and profitability of Tehran Stock Exchange firms, using a comprehensive sample covering 136 firms in 6 industries over the period 2005-2009. This study is a descriptive one and argues that the relation between firms’ capital structure and profitability among different industries are diverse due to the effect of the specific sort of industry they belong to. The needed data were collected from the financial statements of the sample firms. First, firms’ debt ratio as the capital structure indicator and return on investment (ROI) as the profitability indicator were measured using collected data and then to examine the hypothesis, Pearson correlation coefficient was used. The results revealed that this relation differs among diverse industries and that a particular components of capital structure can lead to either a significant positive or negative relation or even no relation with profitability regarding the influence of industry. Therefore, it is concluded that the kind of industry is the most important influential factor on firms’ capital structure and also determines whether or not there is a significant relation between capital structure and profitability and type of the relation as well.

KEYWORDS: capital structure, profitability, industry, debt ratio, ROI.

1. INTRODUCTION

Nowadays all firms are working in an ever-growing and extremely competitive environment and in order to sustain, they have to compete with several items in both national and international extent and outspreading their business by means of new investments [12]. One of the issues which Tehran Stock Exchange accepted firms face is their financial structure. That how much debt and equity the capital structure should contain in order to be considered as an optimal one and minimize financial cost or the cost of capital and subsequently increase the market value of the firms’ stocks has always been a basic issue [8].

From financial managers’ point of view, it is significant to determine the relation between the cost of capital, capital structure and the firm’s value, due to the effect of capital structure on the firm’s value [3]. Most of the theories in capital structure context maintain the relation between the capital structure and the cost of capital, firm’s risk and its value. The financial managers are determined to use capital structure to decline financial risk and expand their profitability, due to the existence of this relation [4]. Making value and maximizing stockholders’ wealth for a long period of time are the most important objectives of firms. Maximizing firms’ value needs implementing profitable projects which require financing. Choosing among all the ways of financing such as issuing new stocks, issuing bonds or taking out loans affects the optimal capital structure [11]. Among them, financing by means of debt increases fixed costs, financial leverage and consequently the systematic risk. Additionally, paying attention to the cost of capital of different ways of financing leads the firm to either profitability opportunities or financial crisis [14]. For instance, if a firm issues more bonds, its financial breakeven and financial leverage will increase. Moreover, if a firm earns more return then the payable interest, earnings per share will increase, otherwise it will decrease. Therefore, financial managers fully pay attention to the effects of diverse means of financing on the firm’s risk and return and in this way evaluate the effect of different financial structures on stockholders’ wealth [17].

Thus, the following question may exist; how firms should finance in order to have the maximum positive effect on their profit and stockholders’ wealth? Several factors affect financing of a firm including the type of firm’s activity, its assets and the kind of industry. In other words, the kind of industry that a firm is working in and is a member of, has a significant and inevitable influence on the firm’s capital structure. Besides, the relation between capital structure and profitability depends on the type of industry the firm is working in.

*Corresponding Author: Zahra Yousefi, M.A Student of Business Management, Rasht branch, Islamic Azad University, Rasht, Guilan, Iran ZahraYousefi74@yahoo.com
meaning that the kind of industry affects this relation. So financial managers have always been facing this matter that how they should choose their capital structure components considering the kind of industry they are working in, in order to lead the firm to fulfill its final objective which is the maximum profit.

Thus, to solve this issue, investigating the relation between capital structure and profitability considering the effect of the special kind of industry they are working in, on this relation is necessary, so that by applying the results of this study to different industries, the best means to achieve optimal capital structure in every single specific industry and consequently the maximum profit can be recognized.

2. LITERATURE REVIEW

2.1 Capital structure

Capital structure is defined as follows: “dividing firm’s financial resources into debt and equity”. In precise words, capital structure means how to use financial resources in different investment opportunities [24]. In general, firm’s capital structure contains two parts, first the needed capital and second the composition of financial resources. Loans and stocks are considered as two primary parts of capital structure.

With regard to financial resources, firms have diverse returns and risks in capital markets. Therefore, the decision concerning capital structure has an effective role on a firm’s efficiency and credit in financial houses’ attitude [25]. This decision is extremely momentous due to the needs to maximize returns to various organizational constituencies, and also due to the impact such a decision has on the firm’s ability to deal with its competitive environment. In general, a firm can choose its own capital structure components among many alternative resources. It can issue a large amount of debt or a little debt. It can arrange lease financing, use warrants, issue convertible bonds, sign forward contracts or trade bond swaps. It can issue dozens of distinct securities in countless combinations; however it attempts to find the particular combination which maximizes its overall market value [1].

Financial managers usually follow a special order in financing and it means that they first prefer internal resources to the external ones [6]. According to this, most of them first evaluate the firm’s debt capacity and after particular considerations, take out loans or other debts equal to the declared deal. The basic downside of increasing debt is the firm’s insolvency to pay off its liabilities in maturity. Thus these fixed payments must be paid off regardless of the firm’s profitability. Any kind of business failure leads to bankruptcy or legal actions against firm. Moreover, preserving firm’s financial solidarity and competitive position has a specific significance. Firm should provide the money needed for strategic investments, paying stocks dividend, research and development costs and so forth available. The inability to obtain the needed money threatens its financial health. To determine debt capacity, the financial manager should consider the balance between cash inflows and outflows. In order to do this, the cash flow which can be used to pay off the liabilities, should be recognized.

The purpose of choosing capital structure is determining financial components in order to maximize stockholders’ wealth. Although the given theoretical framework in financial management is a reliable source, there is no doubt that there will be some problems when they are put into action, because stockholders’ wealth is affected by many factors such as capital structure.

There is a close relation between firm’s capital structure and its cost of capital. In fact, capital structure is a composition of firm’s usable long term liquid resources and any changes in it change the cost of capital. The main purpose in capital structure decisions is making a suitable composition of long term liquid resources in order to minimize the cost of capital and subsequently maximize the market value [19].

The cost of capital is defined as follows:

“The minimum rate of return which firm should obtain so that the stockholders’ expected rate of return is achieved”.

Considering a relation between cost of capital and maximizing stockholders’ wealth, the cost of capital can be defined as follows:

“The minimum rate of return which firm should gain so that its value does not change or at least be preserved”.

In this definition the rate of breakeven is discussed. If the firm does not earn equal to the cost of capital, its stocks’ value will decrease. Contrary to this situation, if the rate of return is more than its cost of capital, firm’s market value will increase. Specific cost of capital changes due to different capital structures. The money paid to stockholders as stock dividend, is generated from earning after tax. If a firm issues bonds, the payable interest related to those bonds will be paid from earning before interest and tax. Any increase in interest declines the expected final dividend. If a firm carries on this way and continues taking out loans, more amounts of earning before interest and tax will be paid to bondholders as interest. Finally stockholders understand that if the real amount of earning before interest and tax is less than the expected amount of it, they might get no earning.
therefore noting the increased stock risk, they will increase their expected rate of return. This will increase the specific cost of capital.

The suggested results of this discussion are as follows:
1. Any changes in capital structure affect the firm’s value and its cost of capital.
2. The capital structure with the minimum cost of capital which is similar to the one with the maximum firm’s value is introduced as the optimal capital structure.

These two results have some important usage:

- If a manager reduces the firm’s cost of capital, will observe increase in its value.
- Since a firm can change its own capital structure and consequently control its cost of capital to some extent, has the authority to indirectly (by changing capital structure components) affect its market value.
- Since an optimal capital structure maximizes firm’s value, stockholders’ wealth will increase as well, thus the objective of minimizing the cost of capital does not differ from the objective of maximizing stockholders’ wealth [17].

The industry in which a firm is working has a significant influence on capital structure. According to other researches’ results, the kind of industry is one of the most influential factors on financial structure and affects it severely in a way that firm’s financial structure differs in different industries [6]. Based on this, Tehran Stock Exchange firms have a similar financial structure in one specific industry. In other words, the kind of industry affects the capital structure components and makes it identical in any particular industry [3].

2.2 Profit

Profit is one of the most transitive concepts in the complicated trade world and there might not be a particular acceptable definition for it. Among all diverse profit definitions which have been put forward, we suggest this one as one of the most comprehensive ones [23]:

“Profit derives from any changes in equity or a firm’s net assets during a financial period. In precise words, profit is the result of all the changes in equity during a financial period, except for the changes caused by stockholders’ investments and distributing earnings among them.”

Porheydari (1995) examined the relation between financial leverage and four factors including the kind of industry, firm size, its profitability and mortgage assets of Tehran Stock Exchange accepted firms and found that financial leverage had a negative relation with profitability, a positive relation with firm size and no significant relation with industry and mortgage assets [18]. Salimi (2007), investigating the relation between industry and firm size with capital structure of TSE manufacturing firms for the years 1993 and 2002 found that TSE firms financial structure are not identical in different industries while they do not differ considerably in one industry [3]. Mahmoudi (2007) examined the effect of six factors including industry, size, lifetime, total investments to total assets ratio, total debts to total assets ratio and advertisement costs on profitability of 60 TSE accepted firms. The results revealed that if profitability is defined as adjusted ROA, factors such as size, total investments to total assets and total debts to total assets affect it, but if profitability is defined as ROI, industry and size affect it [20]. Ghayouri Moghadam (2009) using DEA to identify the optimal capital structure of 314 TSE accepted firms in 11 industries found that there is a significant relation between financial leverage with profitability in 11 industries, with size in 6 industries and with non-current assets in 3 industries [24]. Schwartz (1967) examining the capital structure in different industries found that firms belong to one industry have identical capital structure while in different industries, diverse structures were observed [22]. Mandelker (1984) investigating the profitability determinants and the relation between financial and operational leverage found that firm size is absolutely related to its profitability and financial and operational leverage depend on capital structure decisions [9]. Schmalensee (1985) by choosing firms with more than 500 million $ assets found that the kind of industry has an important effect on firms’ profitability [21]. Kester (1986) investigating American firms’ capital structure compared them to that of Japanese. The results revealed that if debt is calculated based on market value, there is no difference in using debt between American and Japanese firms to be justified by industry. It was also observed that firms’ debt ratio in one industry is parallel during the time [7]. Megahan (1997) by choosing firms with more than 10 million $ sale found that the kind of industry has a significant effect on firms’ profitability [10]. Muradoglu (2001) investigating the relation between capital structure and return of 787 London Stock Exchange firms for the years 1980 and 2008 found that return decreases in the firms which finance by means of debt. However, when the average of debt in the industry increases, return increases as well [13]. Abor (2005) examining the relation between capital structure and profitability of Ghana Stock Exchange firms for the years 1998 and 2002 found a positive relation between short term debt ratio and ROE and a negative relation between long term debt ratio and ROE[1]. Carpentier (2006) investigated the effect of capital structure long term changes on firms’ value of 234 French firms for the years 1987 and 1996. The results showed that there is no relation between the changes of debt ratio and those of firms’
value [5]. Acquaah (2007) investigating the relation between firms’ special financing resources and their profitability considering the effect of industry on this relation, found that special financing resources increases the firms’ performance based on both book value and market value[2]. Olavarrieta (2007) proved that the innovations of market condition are effective on profitability while industry has no considerable effect on it [15].

3. Tested Variables
This survey aims at examining the relation between capital structure and profitability and to do this, employs two popular variables as follows [16]:

3.1 Overall leverage (total debt divided by total assets): this ratio measures all the money obtained by means of debt. It is considered as capital structure indicator and is calculated as follows:
Overall leverage = Total debt / Total assets

3.2 Return on investment: this ratio measures the amount of profit earned by investing 1 Rial. It is considered as profitability indicator and is calculated as follows:
Return on investment = Earning after tax / Total assets

4. DATA AND METHODOLOGY

4.1 Data
The data used in the present study refer to a sample of manufacturing firms listed on Tehran Stock Exchange for the period 2005-2009. Insurance companies, banks and investment companies were excluded due to their line of business. Also, in order to avoid potential distortion effects by new listings, the firms that are included in our sample were listed in Tehran Exchange before 2005 and none of them was delisted from it during the period under examination. Also the financial year of the chosen firms ended in March 13th during those 5 years and in order to make the relation statistically significant, only the industries with 10 or more active firms were chosen. This resulted to a final sample of 136 manufacturing firms which are illustrated in table1 as follows:

<table>
<thead>
<tr>
<th>industry</th>
<th>The number of firms in each industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sorts of food and drink products</td>
<td>16</td>
</tr>
<tr>
<td>Automobile and manufacturing pieces</td>
<td>27</td>
</tr>
<tr>
<td>Other non metallic mineral products</td>
<td>31</td>
</tr>
<tr>
<td>Basic metals</td>
<td>16</td>
</tr>
<tr>
<td>Machinery and equipment</td>
<td>10</td>
</tr>
<tr>
<td>Material and chemical products</td>
<td>36</td>
</tr>
<tr>
<td>The number of industries: 6</td>
<td>Total number of firms: 136</td>
</tr>
</tbody>
</table>

All financial data including total debts, total assets and earning after tax were extracted from the published financial statements of the firms under examination during 2005-2009 and in order to do it, Tadbirpardaz software and also statistical archive available at TSE website are used.

4.2 Methodology
In this study the following hypothesis was tested:
“There is a significant relation between firms’ capital structure and profitability, considering the effect of the specific kind of industry the firm is working in, on this relation”.
The gathered data were analyzed by SPSS software and in order to test the hypothesis, Pearson correlation coefficient was applied and for both variables Correlation was significant at 0.05 levels. Statistical hypotheses were as follows:

\[
\begin{align*}
H_0 &: r = 0 \\
H_1 &: r \neq 0
\end{align*}
\]
If \(H_0\) is rejected it is inferred that there is a significant relation between capital structure and profitability in the industries which affect this relation; and if \(H_0\) is not rejected it is implied that there is not a significant relation between capital structure and profitability.
5. EMPIRICAL FINDINGS AND DISCUSSION

The results of testing the hypothesis by segregating the industries and the years under study are illustrated in table2 as follows:

Table2. The results of testing hypothesis

<table>
<thead>
<tr>
<th>industry</th>
<th>year</th>
<th>coefficent</th>
<th>sig</th>
<th>relation</th>
<th>H0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sorts of food and drink products</td>
<td>84</td>
<td>-0.470</td>
<td>0.066</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>85</td>
<td>-0.534</td>
<td>0.033</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>86</td>
<td>-0.703</td>
<td>0.002</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>87</td>
<td>-0.620</td>
<td>0.010</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>88</td>
<td>-0.596</td>
<td>0.015</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td>Automobile and manufacturing pieces</td>
<td>84</td>
<td>-0.323</td>
<td>0.005</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>85</td>
<td>-0.844</td>
<td>0.000</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>86</td>
<td>-0.824</td>
<td>0.000</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>87</td>
<td>-0.754</td>
<td>0.000</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>88</td>
<td>-0.810</td>
<td>0.000</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td>Other non metallic mineral products</td>
<td>84</td>
<td>0.035</td>
<td>0.825</td>
<td>positive</td>
<td>not rejected</td>
</tr>
<tr>
<td></td>
<td>85</td>
<td>-0.663</td>
<td>0.000</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>86</td>
<td>-0.635</td>
<td>0.003</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>87</td>
<td>-0.509</td>
<td>0.000</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>88</td>
<td>-0.683</td>
<td>0.000</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td>Basic metals</td>
<td>84</td>
<td>0.177</td>
<td>0.511</td>
<td>positive</td>
<td>not rejected</td>
</tr>
<tr>
<td></td>
<td>85</td>
<td>-0.782</td>
<td>0.000</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>86</td>
<td>-0.830</td>
<td>0.000</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>87</td>
<td>-0.796</td>
<td>0.001</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>88</td>
<td>-0.844</td>
<td>0.000</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td>Machinery and equipment</td>
<td>84</td>
<td>-0.817</td>
<td>0.004</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>85</td>
<td>-0.966</td>
<td>0.001</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>86</td>
<td>-0.861</td>
<td>0.002</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>87</td>
<td>-0.854</td>
<td>0.003</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>88</td>
<td>-0.804</td>
<td>0.000</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td>Material and chemical products</td>
<td>84</td>
<td>-0.333</td>
<td>0.047</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>85</td>
<td>-0.558</td>
<td>0.000</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>86</td>
<td>-0.670</td>
<td>0.000</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>87</td>
<td>-0.770</td>
<td>0.002</td>
<td>negative</td>
<td>rejected</td>
</tr>
<tr>
<td></td>
<td>88</td>
<td>-0.776</td>
<td>0.000</td>
<td>negative</td>
<td>rejected</td>
</tr>
</tbody>
</table>

As it is observed, there is a significant relation between capital structure and profitability in 3 industries including automobile and manufacturing pieces, machinery and equipment and material and chemical products which means H0 hypothesis is rejected in 5% error level, so it can be stated that H1 hypothesis is confirmed in 95% confidence level. While this relation is not confirmed statistically in other 3 industries including sorts of food and drink products, other non metallic mineral products and basic metals, which means H0 hypothesis is not rejected in 5% error level, so it can be stated that H1 hypothesis is not confirmed in 95% confidence level.

The most important point revealed in results derived from the effect of industry on this relation. Among 3 industries with a proved relation, in other non metallic mineral products for instance, after investigating its firms financial statements in order to find the reason of changing the positive relation between capital structure and profitability in 2005 to a negative one in 2006, it was observed that most firms in that industry, noting a positive relation (which means any increase in debt increases profit), increased their use of debt. Although they used tax benefits of more debts, not considering that the relation between capital structure and profitability was not statistically significant due to the effect of that industry on it, the increase in cost of capital caused by increased debts, decreased a considerable amount of their profit which changed the positive relation in 2005 to a negative one in 2006. However, the effect of other factors such as economical, political and … ones on this transition can not be ignored. The same situation was perceived in the firms working in basic metals as well.
6. Conclusion

In the present study, we attempted to examine the effect of industry on the relation between capital structure and profitability of Tehran Stock Exchange firms using financial data from firms listed in TSE continuously during the 2005-2009 periods. For this reason, we applied Pearson correlation coefficient. The results using the financial variables revealed that there is such a relation in some of the industries among those under examination. In those industries for which this relation proved to exist, it was either positive or negative.

In general, a positive relation suggests that financing by means of debt expands the profitability of the firms, since a primary part of Iranian firms financial structure include short term debts which are cheaper financial resources in comparison with the long term ones. Other causes can be tax benefits of debt and its low cost, compared to other financing ways. While a negative relation suggests that financing by means of debt decreases firm’s profitability due to paying interests, stocks dividend and so forth.

In order to examine the effect of industry on the relation between capital structure and profitability, financial statements of the firms belong to industries in which this relation was proved to exist, were investigated and it was recognized that a positive relation (which suggests more profit by using more debts) increases profit if and only if the relation is statistically significant due to the effect of industry. Contrary to this situation, if the relation is not statistically significant, a positive relation not only does not increase profitability, but also would lead the firm to financial crisis.

Therefore, a similar component of capital structure in different industries can result in an either positive or negative relation or even no relation between capital structure and profitability due to the effect of the specific kind of industry on it.

REFERENCES


