The Relationship between Capital Structure Choice and Firm's Profitability: Evidence from Bosnia and Herzegovina

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Abstract

This research is designed to examine the relationship between the capital structure and profitability of non-financial firms in Bosnia and Herzegovina during the period of ten years, from 2003-2012. The goal is to prove the existence of the relationship between the firm's capital structure choice and its profitability. The analysis is extended by including the debt structure and differentiating between the types of debt such as the long-term and the short-term ones. The results of the multivariate canonical correlation analysis provide support to a hypothesis that the capital structure and profitability have statistically significant relationships. Furthermore, the findings provide support that firms develop different patterns of profitability depending on the capital structure choice. We found that an increasing proportion of short-term debt and long-term debt in the overall liability of the firm reduces its profitability.

Introduction

The modality of how firms make their debt-equity choice is one of the most researched issues in corporate finance. Financial leverage, as the extent to which the fixed-income securities (debt and preferred stock) are used in a firm' capital structure, concentrates the firm's business risk on its stakeholder. This concentration of business risk occurs because the debt holders, who receive fixed interest payment, bear none of the business risk (Brigham & Daves, 2010). Nonetheless, many companies use debt to leverage their capital in order to increase profits. The companies increase their financial performance by using debt to finance the companies operation. The increase in companies' operation is expected to increase the net income. Consequently, the equity holder expected that by using more debt, it will increase the return on equity (ROE) (Brigham & Houston, 2007).The positive relation between financial leverage and operating risk has important implications for the firm's required rate of return. Specifically, to the extent that the additional operating risk resulting from debt financing is systematic, the expected rate of return for the firm should be increasing in financial leverage. But the effects of that action vary between companies. Good corporate governance shows the companies' performance on their use of debt to increase their profit (Maher & Anderson, 1999).

But these relationships vary according to the financing sources. Previous research on the relationship between the capital structure and the performance of firms has

produced mixed contradictory results. For example, Alemeida and Campello (2006) argue that there is a negative relationship between profitability and external financing, which includes debt capital. Oppositely, some other school of thought believes that more profitable firms should rely on external funds like debt to finance their investments. The reason is the tax shields advantage which they could derive from debt interest repayment (Graham, 2000). Based on previous empirical studies the main conclusion is that leverage can explain returns but the empirical relationship can be negative, positive, even weak or non-existent.

As compared to the developed markets like Europe, America etc. it is found by the Eldomiaty (2007) that capital markets are less efficient and suffers from higher level of asymmetry in terms of information in emerging and developing markets than capital markets in developed countries. The significance of the relation between the capital structure and firm performance is influenced by the country of origin of the firm (Krishnan & Moyer, 1997).Profitability is not only affected by the use of debt. Other internal (e.g. company size, operating decision) as external factors (industry type, taxes, interests and other macro factors) also affect the profitability of the companies. Results of some studies (Myers, 200; Eldomiaty, 2007; Khan, 2012) showed that the capital structure is not the only way to explain financial decisions.

This Study was designed to examine the relationship between the capital structure and profitability of non-financial firms in the developing market economies like Bosnia and Herzegovina (BiH) during the period of ten years, from 2003-2012. We focused only on non-financial firms since they play a major role in the economic development of this country. The goal is to prove the existence of the relationship between the firm's capital structure choice and its profitability. The analysis is improved by including the debt structure, by differentiating between the types of debt such as long-term and short-term. As stated above, the crucial decision managers of non-financial firms face is the debt-equity choice. Among others, this choice is necessary for the profit determination of the firm. What this means is that firms that are able to make prudent choice between debt and equity would have a competitive advantage in the industry. All things being equal, this will maximize profit levels. Nonetheless, it is essential for us to recognize that this decision can only be wisely taken if and only the firms know how debt policy influences their profitability. To the best of the authors' knowledge this research provides the first attempt to investigate if there is a relationship between the capital structure choice and corporate financial performance in BiH. This research has undoubtedly deepened understanding of BiH firm's profitability. The paper consists of five parts, including the introduction. Part two is dedicated to the research methodology and data, while part three contains the findings. The section five lays out the discussion and limitations of the research. The conclusions and directions for future research are presented in the last section.

Methodology

For the purpose of this study we have chosen to measure the capital structure by the debt-to-capital ratio. It measures the percentage of a company's capital (debt plus equity) represented by debt. Depending on two different definitions of debt, leverage was measured by two variables (Welch, 2011):

➢ the financial-debt-to-capital ratio (financial leverage) that does not consider non-financial liabilities as debt (PSC1)

➢ the total-liabilities-to assets ratio (balance sheet leverage) that treats financial and non-financial liabilities alike (PSC3).
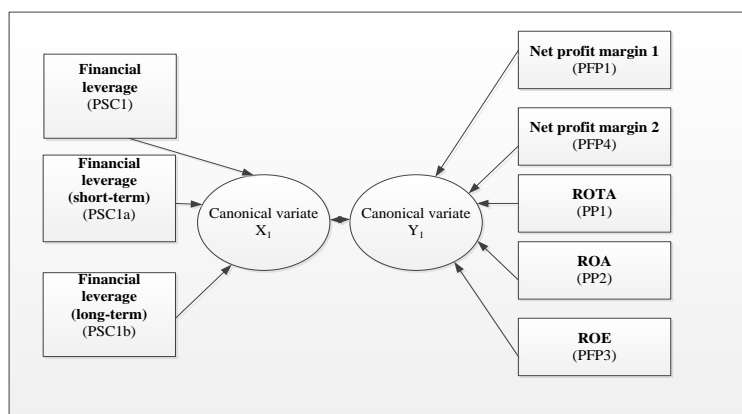
The relationship between capital structure decisions and the profitability position of the company is assessed by applying the *canonical correlation analysis* in order to determine if a significant linear relationship exists between two constructs (capital structure and profitability), each represented by the set of variables that measure similar constructs, and if a relationship exists, how the two sets relate to each other.

The capital structure variables are labelled as *SET 1* and are represented by two debt-to-capital ratios which are further divided by debt structure into short and long-term component. The profitability variables are labelled as *SET 2* and are represented by five ratios: Net profit margin (sales), Net profit margin (total revenue), ROTA (return-on-total assets), ROA (return-on-assets), ROE (return on equity) (Annex 1).Both canonical models test the relationship between leverage and profitability, but, first model test capital structure without regards to non-financial liabilities and the second model with regards to total liabilities, including financial as non-financial.

Results

The data are collected for period of 10 years (from 2003 to 2012) using the AFIP (Agency for the Financial, IT and Intermediary Services) dataset that maintains a comprehensive financial database of all companies operating in the FBiH. The canonical correlations are calculated for each year and for overall data collection. Total number of observation is 140.766 coming from 14 industries.

Figure 1. Canonical Model - First Capital Structure Model

Source: Authors' calculation

Overall *first* canonical correlation explains about 8.5% of relationships between profitability and first capital structure model while and second capital structure model explains 48.34% of the relationships that is much higher. Both canonical correlations are statistically significant, however, for the first capital structure model it is practically irrelevant and probably product of high number of observations. First canonical correlation between profitability and the first capital structure model explains between 5% and 15% in the period of 2003 and 2012, if analysed separately. Data mostly shows a trend in increase in canonical correlation value over the years with 14% being explained in 2012. The first canonical correlation between profitability and the second capital structure model shows higher correlations than with the first capital structure model and total explained variance varying from 45% to 55% over the years with 46% explained in 2012. At the level of all companies observed over the years all canonical correlations are statistically significant.

Figure 2. Canonical Model - Second Capital Structure Model
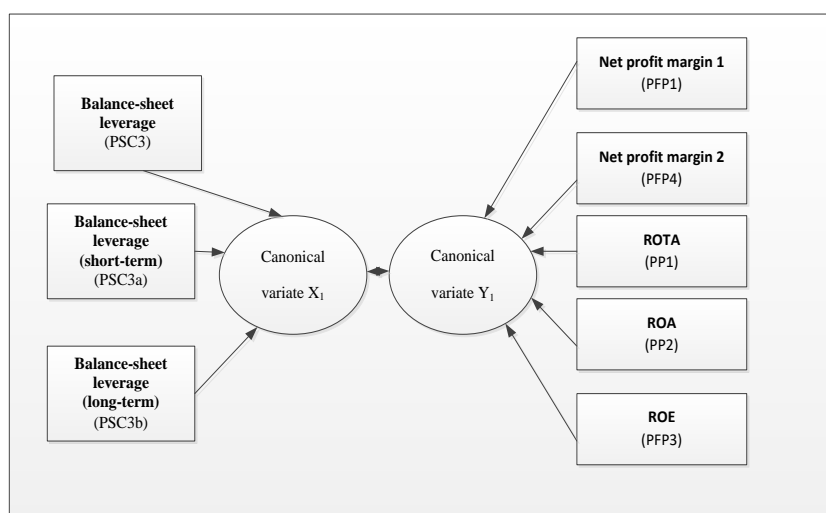
Source: Authors' calculation

The correlation within the capital structure variables shows that there are high correlations between total and short-term debt in both models (0.74 to 0.84 in Model I; 0.85 to 0.91 in Model II), while the correlations between total and long-term debt (0.46 to 0.65) is medium in size in Model I and very low in Model II (0.06 to 0.22).

Correlations between the short-term and long-term debt (0.02 to 0.17) are low in both models, however in Model II these correlations are somewhat higher and reflect negative relationships (-0.15 to -0.28). Over the years, there has been an average flat rate in the increase of correlations between the total and short-term debt in both models, the correlations between total and long-term debt are increasing over the years in both models, while the correlations between the short-term and long-term debt increase in Model I and decrease in Model II.

As both Models contain the same sets of performance variables, the correlations matrix is the same for both Models. The correlations between ROTA, ROA, Net profit margin (Sales) and ROE are moderately high (0.62 to 0.99) with the increase trend over the observed years. Correlations among ROA, Net profit margin (Sales), ROE and Net profit margin (revenue) are very high and indicate possible multicollinearity problems (above 0.90).Correlations between the capital structure and profitability variables are small and in Model I do not exceed 0.1 while in Model II do not exceed 0.23. The data shows a good convergent and discriminative validity.

Discussion

Three canonical variates are extracted in both examined models. All three canonical variates are statistically significant in Model II, while in Model I first two canonical variates are statistically significant over the years, but third canonical variate is statistically significant during the half of the observed period, without clear tendency. Canonical correlations between first canonical variates are higher in Model II (0.58 to 0.74) in comparison with Model I (0.22 to 0.38), indicating that Model II provides better description of company profitability based on capital structure.

Even though three canonical variates are statistically significant in the explanation of relationships between profitability and leverage, only the first canonical variate explains usable size of variance of both profitability and leverage. Therefore, the second and third canonical variates in both models will not be analysed in details. Relationships with canonical variate are consistent over the years.

Canonical cross loadings between the capital structure variables and canonical variates of profitability indicate a low relationship within Model I (loadings between 0.01 and 0.34) while in Model II, canonical loadings are consistently high over the years and vary from 0.66 to 0.73 for total debt and 0.58 to 0.64 for short-term debt. Long-term debts do not have high loadings with canonical variate 1 of company's profitability. All relationships are negative, indicating that a higher canonical variate results in profitability of companies with a lower total and short-term debt.

The *first* canonical variate of company's Profitability has general low loadings with profitability proxies in Model I (0.00 to 0.91), and somewhat higher loadings within the Model II (0.01 to 0.22). Over the years, there is a general trend of increasing relationships between the first canonical variate and profitability indicators in Model II, while in Model I the trend is flat. In both models the higher results in First canonical variate have companies with low ROE (contributing the most to the total score of canonical variate) and the higher remaining profitability indicators (for some years some indicators have loading lower than 0.1, but in most of years it is over 0.2).

High *second* canonical variate is in companies with lower ROTA, higher ROA and higher ROE. A high third canonical variate is in companies with low results on all five Profitability indicators. Interpretation of the second and the third canonical variates are consistent over the years and canonical variates of profitability in Model II have similar interpretation as in Model I. Canonical cross loadings between profitability proxies and canonical variates of company capital structure indicate a low relationship within both tested Models. Cross loadings are somewhat higher in Model II (0.01 to 0.22) in comparison with Model I (0.01 to 0.09).

The first canonical variate of capital structure explains a high proportion of variance of the capital structure proxies in both models (0.31 to 0.44 with the trend of increase over the years).While the first canonical variate of company's profitability explains low proportion of the capital structure variance Model II (0.03 to 0.07) and Model I (0.002 to 0.007). Variance of profitability is not consistently explained even by the own or by the capacity structure canonical variates. During some years the explained variance grows. However, the growth is not consistent in time (contributed by third canonical variate only).

This Study has several limitations. There is a criticism that the firm-level financial data collected by the government agency tend to be inaccurate as a result of firms underreporting and misreporting their true financial position to government authorities to avoid excessive taxation and government interference. But, in BiH datasets collected by the government are the only available source of firms' financial data. In terms of assessing the link between the profitability and the leverage, the key limitation is that we neglected other factors that can affect profitability. Isolation and observation of interdependence of only two variables, although in theory possible, is rather simplified view of the practice. Especially if one of these variables is profitability, which is influenced, besides the capital structure, by a number of factors, both internal and external, such as the firm size, age, growth, risk, tax rate and factors specific to the sector of economic activity and macroeconomic environment of the country.

Conclusion

The results of the multivariate canonical correlation analysis provide support to the hypotheses that the capital structure and profitability have statistically significant relationships. Furthermore, the findings provide support that firms develop different patterns of profitability depending on the capital structure. Finding of the research

indicate that there are three statistically significant structures of relationships (combinations of relationships) between profitability and the capital structure.

The following relationships between profitability and the capital structure are found: the companies with a lower total debt and short term debt are more likely to have a lower ROE while retaining other's profitability indicators on a higher level. This can be also be interpreted vice versa and is applicable to both models. In Model I, the companies with a lower total debt, the short term debt and long term debt are more likely to have a lower ROTA, higher ROA and ROE, while in Model II, the companies with a lower long term debt and higher values of short term debt are more likely to have lower ROTA, higher ROA and ROE. In Model I, the companies with a lower total and short term debt, but higher long term debt are more likely to have lower results on all five profitability indicators, while in Model II the companies with higher total, short and long term debt are more likely to have lower results on all five profitability indicators. Interpretations are consistent over the years.

Even though three canonical variates are statistically significant in the explanation of relationships between profitability and leverage, only the first canonical variate explains the practically usable size of variance of both profitability and leverage. Obviously, the canonical correlations between the first canonical variates are higher in Model II in comparison with Model I, indicating that Model II provides better description of company profitability based on capital structure. Both canonical correlations are statistically significant, however, for the first capital structure Model it is practically irrelevant and probably product of a high number of observations. Therefore, we take into consideration only the interpretation of the Model II that indicates the companies should preferably decrease their short term debt financing as it lowers firm's financial performance. Analysis of relationships between canonical variates of the capital structure and profitability also revealed that a much better relationship is explained if observing the canonical variates in comparison with correlations between the capital structure and profitability proxies.

Although, we concluded that there is a significant relationship between the capital structure and the financial performance, the conducted canonical analysis and the methodology (correlation study) does not ensure causality interpretation. Further research might be extended to determine the direction and intensity of that relationship. Another recommendation for future research would be to include a larger number of variables that affect profitability in order to accurately and precisely detect the interdependence between financial leverage and profitability.

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