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THE EFFECT OF INDUSTRY AND FIRM'S OWNERSHIP ON CAPITAL STRUCTURE OF FIRMS IN BOSNIA AND HERZEGOVINA

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Abstract

This paper examines the effect of industry and firm ownership on capital structure of firms in Bosnia and Herzegovina. Since most of the studies for developed and other transition economies explore the effect of different determinants on capital structure through firms' leverage, that approach was used in this study too. Data on firms listed in two stock exchanges were obtained for the period of 2011-2015. Effects of industry and ownership on firm's leverage were tested through the use of ANOVA and t-test. The results indicate differences in significance of industry and firm's ownership for the firms listed in Sarajevo and Banja Luka Stock Exchange. For firms listed in BLSE industry effects have proven to be statistically significant where manufacturing firms have higher leverage while firms in water supply, electricity, gas supply industry have lower leverage. The results also show that privately owned firms will have higher leverage compared to state owned firms.

Keywords: Capital Structure, Leverage, Industry Effect, Ownership Effect

1. Introduction

Capital structure is often defined as a mix of firm's long term financing represented by debt, preferred and common stock equity (Van Horne and Wachowicz, 2008). There are, however, opinions that all debt of firm, not just long term one, should be taken into consideration when examining how the firm is financed.

Almost sixty years ago Modigliani and Miller (1958) stated that capital structure is irrelevant under perfect markets assumptions. Ever since then different authors have tried to explore market imperfections to show under which circumstances the capital structure matters. Many different theories on capital structures have emerged and according to those different studies have tried to answer which of those theories are applicable. Unfortunately there is no definite answer even today.

Large portion of the studies in this field explored possible determinants of firms' capital structure especially for developed economies but there are much less similar studies on transition economies. In most of those studies effects of different firm-specific and country-specific factors on capital structure are explored through their influence on firm's leverage.

The objective of this paper is to explore the capital structure of firms through establishing the size of leverage of firms in transition economy such as Bosnia and Herzegovina and to see if the industry in which firm operates has an effect on capital structure of firms. Since Bosnia and Herzegovina has a lot of firms in which majority of them state-owned and still not

privatized, this paper will also try to conclude whether the factor of ownership plays a role in the size of firms' leverage.

2. Literature Review

Possible effects of industry on firm's leverage were discussed in some of the studies for the firms in developed economies. Bradley *et al.* (1984) showed that firms in more regulated industries such as telephone, electric utility, gas utilities etc. had higher leverage. Titman and Wessels (1988) linked the effect of industry to liquidation value of the firm. According to them, firms that produced products that required availability of specialized servicing and spare parts had lower debt ratios. That was explained by the fact that those firms would have higher liquidation costs. Harris and Raviv (1991) analyzed relevant theories and studies of capital structure and concluded that firms that belonged to paper industry, textile, mill products, steel industry and airlines had the highest leverage. The lowest leverages were found in firms in pharmaceuticals, instruments, electronics and food industry. The results indicated that firms that belonged to industries that had more tangible assets were more leveraged. Hall *et al.* (2000) in the study of UK unquoted SMEs had shown that determinants of capital structure varied across industries.

Miao (2005) demonstrated that heterogeneity of technology was important in determining firm's chances for survival as well as the level of leverage. The study showed that firms with higher technological growth, industries with risky technology, industries with higher potential bankruptcy costs and industry with higher fixed or entrance costs had relatively lower leverage. So, type of industry will affect the size of firms' leverage. Koralun-Bereznicka (2013) investigated relative importance of industry specific factors and size specific factors and their impact on corporate capital structure. By using firm data of nine EU countries, Koralun-Bereznicka (2013) concluded that leverage ratios of firms depended more on industry in which a firm operated than size of the firm.

Ownership effects in relevant studies for developed economies were not discussed from the aspect of whether a firm is privately or state owned. Nguyen and Ramachandran (2006) shown that state owned SMEs in Vietnam had higher leverage compared to private SMEs. They explained it by the fact that state owned SMEs had advantage in obtaining credit from the banks. Some studies for the firms in transition economies had examined the effect of industry on firms' capital structure. Penavin and Sarlija (2010) studied capital structure changes of Croatian firms for the period of 2001-2007 and concluded that firms in commercial business had the highest indebtedness and the lowest one could be found for the firms in the service industry. Arsov and Naumoski (2016) studied capital structure of four former Yugoslavia countries with emphasis on identifying relevant determinants of capital structure in those countries. Their study, among other things, investigated if the influence of some corporate structure determinants varies among industries. The results shown that the effect of tangibility and profitability was negative and significant for all firms no matter what industry they belonged to. However, size of the firm had proven to be important and in negative relation to the leverage for manufacturing firms and risk had negative effect on firms in services industry.

3. Data and Methodology

Financial data on firms in Bosnia and Herzegovina were collected from the financial statements of the firms that are listed in official stock exchanges. Bosnia and Herzegovina has two stock exchanges - Sarajevo Stock Exchange (SASE) and Banja Luka Stock Exchange (BLSE). Firms listed in SASE are firms registered in one of the entities, Federation of Bosnia and Herzegovina, and firms listed in BLSE are firms registered in other entity Republic of Srpska. Both entities have their own laws on registration and doing business of companies. Federation is the larger entity that also has more population and higher GDP. All the analysis will be done separately for the firms listed in those two stock exchanges.

Firms taken into sample from SASE are firms from the free market, sub-segment 1 that contains most liquid shares and those firms also fulfill their obligations in regards to disclosing

financial reports to the public. Only non-financial companies were taken into the sample so the final sample consists of 23 companies that still represent 76% of all firms listed in the sub-segment.

For BLSE firms taken into sample are firms whose shares are in Official market – Shares, non-financial firms were taken into consideration so the final sample consists of 29 firms (90%) of all the firms. Data necessary for the analysis were taken from the financial statements of the firms chosen for the sample. The period analyzed is from 2011-2015.The next step was to calculate the leverage. Relevant literature shows different measures of leverage depending on its definition and purpose of the research. One of the most used are the ratio of total debt to equity, debt to assets or long term debt to total capitalization of the firms. In most of the studies, that explored capital structure of firms, in developed economies ratio of total debt to total assets was used.

For the comparability of results with those in developed economies and some studies in transition economies that ratio was also used in this study. The total debt in this case, taking into consideration information in financial statement of the firms and their financing patterns, consists of both short-term and long-term debt and some short-term liabilities that prevail in the financing of observed firms. All firms were classified according to the *Classification of the activities in Bosnia and Herzegovina* (applied to the territory of whole Bosnia and Herzegovina). Leverage size for the firms in specific industries was calculated as well as the percentage of the firms belonging to a certain industry in the sample.

In order to test for the influence of industry on firms' capital structure ANOVA was used. That test enables us to compare the means of three or more unrelated samples. In the test an estimate of the between-groups variance is compared to the estimate of the within-groups variance by dividing the former by the latter. If the test shows higher F ratio value that means that hypothesis of no link between groups might be rejected. However ANOVA can only help in concluding existence of significant difference between one or more of the groups. It does not inform us on where the difference lies. To determine this, post hoc tests need to be applied and in this paper Scheffe test will be used. It is considered to be the most conservative post hoc test in the sense that it is least likely to find the differences between groups (Bryman and Cramer, 2005).

Since Bosnia and Herzegovina is a transition economy that is still in the process of privatization it is interesting to see if ownership (whether the firms is in majority state or privately owned) has an effect on firms' leverage. In order to test thatt-test was used. That test is used to determine if the means of two unrelated samples differ. So all the firms in both samples were classified according to whether they are in majority owned by state or privately owned in order to conduct a t-test. All tests were conducted through SPSS version 21.0

4. Results

The data on the size of leverage for the firms listed in SASE and BLSE are presented in the Table 1.

Table 1. Leverage values for the period 2011-2015for the firms listed in SASE and BLSE

	Leverage (Mean)	
Year	**SASE**	**BLSE**
2011	16.49%	20.21%
2012	21.14%	21.35%
2013	24.62%	19.11%
2014	21.97%	19.83%
2015	22.14%	19.07%

Leverage of firms listed in SASE has increased in the period from 2011-2013, experienced decrease in 2014 and continued to grow. On the other hand, leverage of firms

listed in BLSE has grown for two years, decreased in 2013 and then in the next two years first grew and then decreased again. Overall, it is lower than the leverage of firms in SASE for the last three years.

Information on the value of the leverage across different industries is presented in Table 2.

Table 2. Leverage (mean) for the firms in different industries

Industry	Leverage (SASE) (%)	% of the total sample	Leverage (BLSE) (%)	% of the total sample
Mining	27.54	4.35	35.7	3.44
Manufacturing	19.33	34.78	29.07	34.48
Utilities (*Electricity, gas etc.*)	9.8	8.70	12.15	34.48
Water supply	-	-	8.06	6.9
Construction	36.21	4.35	-	-
Wholesale and retail trade	24.53	26.09	6.52	3.44
Transportation	39.94	4.35	30.48	3.44
Information and communication	19.8	13.04	17.03	6.9
Real estate	24.7	4.35	-	-
Support service activities	-	-	31.21	3.44
Health and Social services	-	-	11.06	3.44

Source: Authors calculations based on data from financial statements of the firms

There are some differences in the value of leverage across firms in different industries but in order to test if those differences are significant i.e. if an industry has significant effect on firms' leverage ANOVA testing was conducted. Since there are cases of very low number of firms representing some industries only firms that belong to industries that participate with at least 5% in the total sample were taken into consideration.

In case of firms listed in SASE relevant industries for ANOVA testing are: Manufacturing, Utilities, Trading and Information and communication. Results of ANOVA are presented in Table 3.

Table 3. ANOVA results for firms listed in SASE

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.162	3	0.054	0.748	0.527
Within Groups	5.781	80	0.072		
Total	5.943	83			

Source: Authors calculations based on data from financial statement of the firms

The results show that there is no statistically significant difference among firms in different industries in terms of the size of their leverage. So, industry does not play significant role in the size of the leverage of firms listed in SASE so there is no need to conduct Scheffe test in this case.

In case of firms listed in BLSE relevant industries for ANOVA testing are: Manufacturing, Utilities, Water Supply and Information and Communication.

Table 4. ANOVA results for firms listed in BLSE

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.864	3	0.288	11.848	0.000
Within Groups	2.820	116	0.024		
Total	3.684	119			

Source: Authors calculations based on data from financial statement of the firms

The results show that there is statistically significant difference among firms in different industries in terms of the size of their leverage. To see for what industries the effects are significant Scheffe test was conducted. The results are in Table 5.

Table 5. Scheffe test results for firms listed in BLSE

(I) Industry	(J) Industry	Mean Difference (I-J)	Std. Error	Sig.
Manufacturing	Utilities	0.17*	0.03	0.00
	Water supply	0.21*	0.05	0.00
	Information and communication	0.12	0.05	0.18
Utilities	Manufacturing	-0.17*	0.03	0.00
	Water supply	0.04	0.05	0.90
	Information and communication	-0.05	0.05	0.84
Water supply	Manufacturing	-0.21*	0.05	0.00
	Utilities	-0.04	0.05	0.90
	Information and communication	-0.09	0.07	0.65
Information and communication	Manufacturing	-0.12	0.05	0.18
	Utilities	0.05	0.05	0.84
	Water supply	0.09	0.07	0.65

Note: * significance at 5%

Source: Authors calculations based on data from financial statement of the firms

According to this test there is statistically significant difference in the size of the leverage between firms that belong to industry of Manufacturing to firms in industries of Utilities and Water supply. Manufacturing firms on average have leverage of 29.07% and it is higher compared to firms in other two industries. So firms in utilities and water supply will have less debt which is interesting if we take into consideration the fact that those firms in Bosnia and Hercegovina are in majority state owned.

To test the possible effect of whether a firm is majority state or privately owned on the size of its leverage a t-test was conducted. Results of the test are in Tables 6 and 7.

Table 6. T-test results for the effect of ownership for firms listed in SASE
Independent Samples Test

		t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Leverage	Equal variances assumed	1.18	98	0.24	0.07	0.06
	Equal variances not assumed	1.59	91.7	0.12	0.07	0.04

Source: Authors calculations based on data from financial statement of the firms

Table 7. T-test results for the effect of ownership for firms listed in BLSE
Independent Samples Test

		t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Leverage	Equal variances assumed	5.01	143	0.00	0.13	0.03
	Equal variances not assumed	5.11	108.5	0.00	0.13	0.03

Source: Authors calculations based on data from financial statement of the firms

In the case of firms listed in SASE we can conclude that there is no significant difference between the firms in terms of their ownership and the size of leverage.

The results for the firms listed in BLSE are different. There is significant difference among the firms in leverage size depending on them being privately or state owned. The more detailed inspection of data shows that on average privately owned firms have leverage of 26.17% and state owned much less 13.21%.

5. Conclusion

This paper explored the effects that industry and ownership of a firm might have on capital structure of firms in a transition economy, such as Bosnia and Herzegovina. Since most of the studies for developed economies, but also transition ones, explored the effect of different determinants on capital structure through their effects on firm's leverage, that approach was used in this paper too.

The effect of industry on firm's leverage was tested through ANOVA and the results were different for the firms listed in Sarajevo Stock exchange (SASE) and Banja Luka Stock Exchange (BLSE). Industry does not have effect on leverage of firms listed in SASE. The results for firms listed in BLSE indicate that there are significant differences between firms in manufacturing industry compared to electric, gas and water supply companies. Manufacturing firms have higher leverage that is in line with the results of the studies conducted in developed economies and in some transition economies. However, utilities companies have lower leverage which is in contrast to previous studies in developed economies that have shown that more regulated industries have higher leverage.

Whether a firm is in majority state or privately owned does not play a significant role in determining the size of leverage of the firms listed in SASE but has a significant effect for the firms in BLSE. The results show that privately owned firms will have higher leverage compared to state owned firms. A study for one transition economy has shown results opposite to this one.

This paper is a small contribution to the exploration of the capital structure for the firms in transition economies. The results for BLSE and SASE are different and need to be explored in more details.

For the future research macroeconomic determinants should be tested to see if they caused some differences among these firms but also other factors that could explain the size of leverage of firms inBosnia and Herzegovina should be tested.

References

Arsov, S. andNaumoski, A., 2016.Determinante strukture kapitala: empirijska studija kompanija iz odabranih post-tranzicijskih ekonomija[Determinants of capital structure: An empirical study of companies from selected post-transition economies]. *Zbornik radova Ekonomskog fakulteta Rijeka[Proceedings of Rijeka Faculty of Economics],* 34(1), pp.119-146.

Bradley, M., Jarrell, G. A., and Kim, E. H., 1984. On the existence of an optimal capital structure: Theory and evidence.*The Journal of Finance*, 39(39, pp.857-880.

Bryman, A. and Cramer D., 2005. *Quantitative data analysis with SPSS 12 and 13, a guide for social scientists*. London: Routledge.

Hall, G., Hutchinson, P., and Michaelas, N., 2000. Industry effects on the determinants of unquoted SMEs capital structure.*International Journal of the Economics of Business*, 7(3), pp.297-312. http://dx.doi.org/10.1080/13571510050197203

Harris, M. and Raviv, A., 1991. The theory of capital structure.*The Journal of Finance*, 46(1), pp. 297-355. http://dx.doi.org/10.1111/j.1540-6261.1991.tb03753.x

Koralun-Bereznicka, J.,2013. The relative importance of industry and size effect in corporate capital structure – empirical evidence from the EU countries.*Eurasian Journal of Economics and Finance*, 1(2), pp.1-27

Miao, J., 2005. Optimal capital structure and industry dynamics. *The Journal of Finance*, LX(6), pp. 2621-2659. http://dx.doi.org/10.1111/j.1540-6261.2005.00812.x

Modigliani F. and Miller M. H.,1958. The cost of capital, corporation finance and the theory of Investment.*The American Economic Review*, 48(3), pp.261-297.

Nguyen, T. D. K. and Ramachandran, N. 2006. Capital structure in small and medium-sized enterprises: The case of Vietnam.*ASEAN Economic Bulletin*, 23(2), pp.192-211.http://dx.doi.org/10.1355/AE23-2D

Penavin, S. and Šarlija, N., 2010. Pojave u kretanju strukture kapitala hrvatskih poduzeća u predrecesijskom razdoblju (2002. - 2007) [Occurrences in capital structure flow of Croatiancompanies in the pre-recession period (2002–2007)].*Ekonomski vjesnik [Econviews – Review of Contemporary Business, Entrepreneurship and Economic Issues],*No.22, pp.317-332.

Titman S. and Wessels, R., 1988. The determinants of capital structure choice.*The Journal of Finance*, 43(1), pp. 1-19. http://dx.doi.org/10.1111/j.1540-6261.1988.tb02585.x

Van Horne, J. C. and Wachowicz Jr., J. M., 2008. *Fundamentals of financial management*.UK: Prentice Hall, Pearson Education Limited.