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## **THE IMPACT OF FINANCIAL LEVERAGE ON FIRM GROWTH: EMPIRICAL EVIDENCE FROM BOSNIA & HERZEGOVINA**

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### **Abstract**

Referring to the permanent need for investigation of the corporate finance principles effects on firm growth performance, we present the research of financial leverage effects on firms' growth in Bosnia and Herzegovina. For that purpose, we collect a sample of 18,007 firms from B&H. The sample includes all firms being active in the period 2008-2016, classified in twelve industries, three size levels and situated in two entities (Federacija BiH and Republika Srpska). Along with the impact investigation, we tend to confront the findings with theoretical expectations and suggest certain incentives policy development if appropriate. We apply Stata 15 throughout the empirical research analysis. The findings of the paper call for comprehensive and decisive response in order to turn potentials of external operations and investments financing into true development supporting tool, instead of being temporary solution to cover loss of assets and imbalanced assets to debt structure as the main findings reveal.

**Keywords:** Financial Structure, Financial Leverage, Firm Growth, Bosnia & Herzegovina

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### **1. Introduction**

Commercial loans as source of externally provided firms' funding play major role in the financial systems dominated by banks, such as the case of Bosnia and Herzegovina. BH banking market began to develop in 2002, upon the accomplishment of banking sector privatization. Ever since, banks increasingly support the lending of B&H economy. During the period from 2003 to 2016, the growth rate of corporate loans in B&H have fluctuated with the maximum of 26.2% annual growth rate being reached in 2008.

According to data of the Central Bank of B&H, total household deposits in commercial banks at the end of 2017 reached the highest level (above 5.5 billion EUR) thus far despite lowest interest rates recorded, with residents' saving accounts of 57.6 percent of total deposits. Furthermore, terms structure includes more than half of the total deposited amount, the fact providing many opportunities for investments.

By recognizing the overall potential and considering the impact of the financial leverage on profitability and firm growth, we find it worthwhile to examine the influence of the financial

leverage on the firms' growth in the very specific circumstances featured by the post-transitional, post-crisis, emerging economy such as the Bosnian. The clear-cut theoretical expectations on one hand and various research findings in the field of financial principles effects on the firms' growth on the other hand, encourage and inspire perpetual survey efforts. The aim of these research findings tends to shed light on the proper economic growth policies. To the best of our knowledge, the financial leverage has not been studied profoundly in relation to the firms' growth impact policies in B&H. Therefore, we believe the paper might carry certain added value in supporting the development of such a comprehensive firms' growth underpinning framework. For this purpose, we use the data of almost entire population of firms acting in the period between 2008 and 2016 in B&H.

Accordingly, the main purpose of this paper is to assess the potential and impact of leverage on firm growth in such unique circumstances and to provide framework for effective growth stimulus incentives. The remainder of this paper is organized as follows: The next section provides review of the related papers focusing capital structure impact on firm performance. Section 3 contains sample structure description, regression variables overview and econometric estimation model. The results and main notes on the obtained relation essence are given in Section 4. Finally, concluding remarks and recommendations for further researches are presented in Section 5.

We believe that finding to be presented may contribute to the extensive evidence and knowledge related to the corporate finance principles effects in different circumstances. We also believe in further research efforts motivated by the strong evidence of the opposite or poor leverage policy effects on firms' sales or profitability performance.

## **2. Theoretical Background and Literature Review**

Everlasting desire and need to maximize returns of the firms' operations imply focus on major processes whereas capital structure decisions deserve distinct attention. The relationship between capital structure and profitability cannot be ignored since the improvement of the profitability remains as the constant challenge. Profitability is not only a firm growth generator but also the precondition of survival in the long term. Clearly, as the interest payment on debt is tax deductible, the addition of debt in the capital structure will, *ceteris paribus*, improve the profitability of the firm. Although the financial leverage provides tax benefits to the firms, it simultaneously increases default risk for the lending institutions such as banks, credit unions, and other private lenders.

Financial leverage is recognized as one of the notable determinants affecting profitability. At the firm's level, management uses three levels to effect return on equity (ROE): (1) the earnings squeezed out of each money unit of sales, or the profit margin, i.e. Net income/Sales, (2) the sales generated from each money unit of assets employed, or the asset turnover, i.e. Sales/Assets and (3) the amount of equity used to finance assets, or the financial leverage (Higgins, 2009). Financial leverage is a device to increase owner's expected return at the cost of greater risk. Technically, financial leverage involves the substitution of fixed-cost debt financing for owners' equity, and thereby increases fixed interest expenses. Financial leverage is thus the proverbial two edged sword, increasing owners' risk as well as return. Accordingly, part of the growth management challenge is to identify an appropriate degree of financial leverage for firms.

Since the very occurrence of the seminal paper addressing the irrelevance of capital structure on firm value (Modigliani and Miller, 1958), different circumstances in which firms operate inspire permanent debate on this issue. Immense evidence of various research outcomes is thus far available, proving motives for constant investigation efforts of the related field.

Therefore, the results of previous researches of this field due to various specific influences are not unambiguous. There is a substantial evidence of positive, neutral and negative effects depending on the industrial, environmental and regional context. In order to avoid large literature review of the research field, we provide concise but focused overview of the findings related to countries under certain transitional processes.

The impact of a financial leverage on the company's performance depends to a large extent on the dynamics of industry. Simerly and Li (2000) discovered positive relation of the

leverage to growth performance in stable environments (lower dynamism) while the relation is negative in dynamic environments. In attempts to extend knowledge of financial leverage, firm growth and financial strength, some authors (Bei and Wijewardana, 2012; Makris, 2014; Gill *et al.* 2011) identify a positive rather than negative relationship between financial leverage and firm growth.

When considering the impact of the capital structure on the firms' growth, it is worth mentioning that Antoni and Chinaemerem (2012) examined the impact of capital structure on the financial performance of Nigerian firms over a period of 7 years, i.e. from 2004. to 2010 and revealed that the capital structure represented by the debt ratio has a significant negative impact on the firms' financial performance, which is in line with the conclusions of the other researchers such as Soumadi and Hayajneh (2012), Uchenna and Uremadu (2009), Syed Jawad Hussain *et al.* (2015), Vithessonthi and Tongurai (2015), and Daryantoa Wiwiek *et al.* (2018).

On the other hand, the results of a similar study by Ebaid- El-Said (2009) in Egypt as one of the transition economies have indicated that capital structure decisions have a weak influence on the firms' financial performance while hypothesis about the positive impact of capital structure on firm performance could not be rejected by Salehi and Moradi (2015), Fosu (2013), Ramli *et al.* (2019). Actually, the study reveals weak-to-no influence of capital structure choice on financial performances being examined in 64 sampled firms. Capital structure is considered as a portion of short-term, long-term and total debt over total assets, while financial performance is measured by return on assets, return on equity and gross margin (gross profit to sales).

Using a sample of 63 Romanian firms listed on the Bucharest Stock Exchange over the period 2001-2011, Anton (2016) investigated the impact of leverage on firm growth. By using first log-difference of sales, assets and number of employees as dependent variables, and traditional leverage measure as Rajan and Zingales (1995) suggested, i.e. ratio of total debts to total assets, accompanied by several control variable, Anton (2016) identified the positive relation between leverage and firm growth.

Salehi and Moradi (2015) investigated the effect of capital structure and product market competition on the financial performance of the companies listed in Tehran's Stock Exchange. The independent variable in this study is the financial leverage ratio, and the dependent variable is the assets return ratio. Competition in the product market - share of the company's sales in the entire industry is used as a moderating variable to determine the relationship between dependent and independent variables. Firm growth is also included as a control variable through changes in consecutive annual sales. The results exhibit better financial performance indicators when a high amount of financial leverage ratio is applied. It is recommended that shareholders and creditors pay attention to the company's performance as well as debt and financial leverage ratios. Also, a company's higher share of sales in industry can lead to better use of debts in order to increase profitability.

Soumadi and Hayajneh (2012) created a model for estimating the impact of capital structure on corporate performance for the public Jordanian firms listed in Amman stock market. For performance variables Soumadi and Hayajneh (2012) used return on equity and tobin q. Financial leverage (as ratio of total liabilities and total assets) was used as an independent variable. Model also includes few control variables: tangible assets (measured by dividing net fixed assets to total assets), firm size (natural logarithm of total assets) and firm growth (difference rate in the book value of total assets). The study found out no significant difference of the financial leverage impact between high financial leverage firms and low financial leverage firms on their performance. The study also showed no difference between the financial leverage of high growth firms and low growth firms on the performance.

Interesting and closely related findings are furthermore provided by Abor (2005). The focus was the relation between capital structure and profitability in case of listed firms on the Ghana Stock Exchange (GSE) during a five-year period. By investigating the impact of leverage ratios at three levels (short term debt to liabilities, long term debt to liabilities and total debt to liabilities) on profitability (EBIT/Equity), Abor (2005) identified significantly positive relation between the given capital structure ratio of short term debt to ROE and opposite relation of long term debt capital structure ratio to ROE. Total debt capital ratio to profitability also shows positive relation.

And finally, in addition to extensive literature overview of heterogeneous research results, Hamouri *et al.* (2018) portray positive correlation between leverage and growth of sales and employment but irrelevant relation of leverage to growth of assets in case of Jordanian firms listed at Amman stock exchange. This study has revealed positive correlation between growth of sales and firms' size as well as growth of employment and firms' size. Firm growth was measured by log-differences for three determinants: asset growth, employment growth, sales growth. Financial leverage was measured by the ratio of total liabilities and total assets. The model also included several control variables as follows: firm size (logarithms of total assets), firm age (logarithms linked to firm age), industry sector, return on assets and current ratio.

This brief overview of the researches presents more than a sufficient basis for consistent research of financial leverage as a potential for firm growth in various industries and specific time and environment. In relation to the main interest of the previous researches as well as our primary interest, we introduce the following research hypothesis: Financial leverage is positively associated with firm growth. The text to follow should be considered as further contribution attempt to this research field and corresponding hypothesis testing.

### **3. Methodology of the Empirical Research**

#### **3.1. Sample Size and Structure**

This research was carried out by using data for a total of 18,007 firms in Bosnia and Herzegovina which were operating continuously in the period 2008-2016 (strongly balanced panel set). Data from the financial statements in both entities in Bosnia and Herzegovina are provided by the Financial Information Agency (for Federacija Bosna i Hercegovina) and the LRC BIS - Business Intelligence System (for Republika Srpska). The total number of observations is 130,835. Data are structured as a panel, providing 9-year time-series.

**Table 1. Number of firms by size and entity**

	Small	Medium	Large	Total
FBiH	10,120	1,395	602	12,117
RS	4,622	1,021	247	5,890
Total	14,742	2,416	849	18,007

Table 1 presents the size structure of the firms included in the sample as well as their entity origin. 14,742 firms or 81.87 % are small, 2,416 firms or 13.42% are middle while the rest or 849 (4.71%) are large firms. The frequency distribution of the sample in relation to the industries is given in Table 2.

**Table 2. Number, percentage and cumulative % of firms by industries**

Activity (ACT)	Industry	Frequency	%	Cumulative %
1	Wood	441	2.45	2.45
2	Energy	79	0.44	2.89
3	Construction	708	3.93	6.82
4	Metal	146	0.81	7.63
5	Other production	2,128	11.82	19.70
6	Agriculture	882	4.90	24.60
7	Mining	88	0.49	25.08
8	Retail	2,766	15.36	40.45
9	Wholesale	3,063	17.01	57.46
10	Transport	842	4.68	62.13
11	Services	6,819	37.87	100.00
12	Other	45	0.25	7.88
	Total	18,007	100	

### 3.2. Variables Description

Referring to the measures of variables in previous researches, we have selected the following:

- Firm growth: sales volume (log values) and ROA (ratio of net-result to firms' assets)
- Financial leverage: indebtedness ratio (total debt over total assets)
- Control variables: firms' size (small, medium and large), industry (1-12 as listed in the Table 2), dummy variables for profit/loss firms (1 if profitable, 0 otherwise), timespan of the global financial crisis (2008-2010 labeled as 1, 0 otherwise);
- Interactions: financial leverage to firms' size, financial leverage to industry
- Instrumental variable: lagged dependent variable (order 1)
- Table 3 provides summary of the main variables descriptive statistics.

**Table 3. Descriptive statistics of the main variables**

Variable	Obs	Mean	Std. Dev	Min	Max
LogINC	153,625	12.5969	2.2017	-4.6052	22.7419
INDBT	164,269	0.5912	0.3212	0	1
PROF	153,625	0.3102	0.4768	-30.49	0.9255
ENT	164,269	0.6729	0.4692	0	1
LRG	164,269	0.0471	0.2119	0	1
MID	164,269	0.1341	0.3408	0	1
SMLL	164,269	0.8187	0.3853	0	1

### 3.3. Econometric Model

Functional form of the model to be estimated has been specified as:

Growth variable = Leverage + Instrumental variable + Control variables + Interactions + Residuals

Applying the abovementioned variables, we derive the estimation models as follows:

Sales Income – Indebtedness regression (log – ratio):

$$LogINC = \beta_0 + \beta_1 * d.LogINC + \beta_2 * INDBT + \beta_3 * PROF + \beta_4 * ENT + \sum_{i=1}^{11} \beta * ACTdummy_i + \beta_5 * LRG + \beta_6 * MID + \beta_7 * FNCRS + \beta * INTVAR + ai + Uit \quad (1)$$

ROA – Indebtedness regression (ratio – ratio):

$$ROA = \beta_0 + \beta_1 * d.ROA + \beta_2 * INDBT + \beta_3 * PROF + \beta_4 * ENT + \sum_{i=1}^{11} \beta * ACTdummy_i + \beta_5 * LRG + \beta_6 * MID + \beta_7 * FNCRS + \beta * INTVAR + ai + Uit \quad (2)$$

## 4. Analysis and Results

### 4.1. Leverage – Sales Performance

#### 4.1.1. Model Estimation, Results and Quality

In the process of model estimation, we use Stata 15 software. As the Hausman test suggests (Prob chi2 = 0.1349), we apply the random affects model. The outcome of the regression reveals the following relations:

**Table 4. Random effects model regression output**

Variable	Coef.	Variable	Coef
LogINC D1	0.4818*** (0.0026)	IINDBTen	0.0019*** (0.0004)
INDBT	-0.4088*** (0.0306)	IINDBTppi	0.0007* (0.0003)
ENT	0.3199*** (0.0220)	IINDBTtnv	-0.0004* (0.0002)
Energydummy2	0.8487* (0.4875)	IINDBTtr	-0.0005** (0.0002)
Miningdummy8	0.6066* (0.3249)	IINDBTmid	-0.0012*** (0.0002)
Retaildummy9	0.9569*** (0.3712)	ILRGgr	0.4289** (0.2067)
Wholesaledummy10	0.3403** (0.1533)	IMIDen	-1.9959*** (0.6270)
Transportdummy11	0.5149*** (0.1311)	IMIDppi	-0.6134** (0.2577)
LRG	3.6475*** (0.1039)	IMIDrud	-0.8737** (0.4343)
MID	2.0897*** (0.0497)	IMIDtnm	-0.9565*** (0.2572)

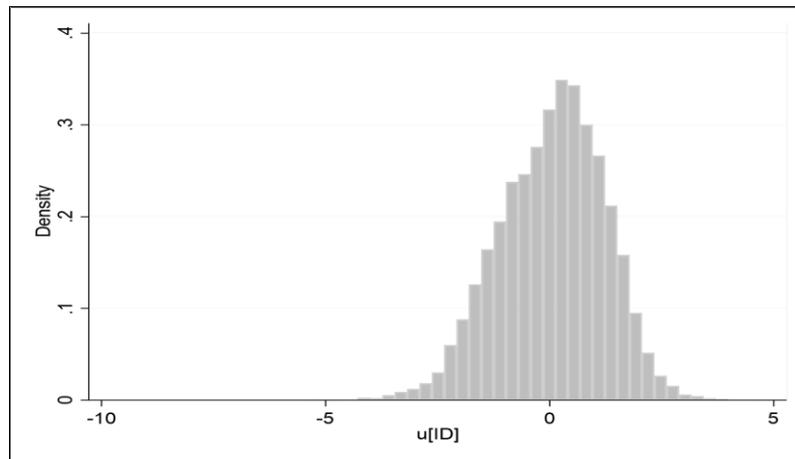
**Note:** standard errors are in parentheses. \*, \*\* and \*\*\* represent 10%, 5% and 1% significance level respectively.

Table 4 provides important findings. At first, influence of the leverage on firms' growth is quite large and negative (-.4088) with strong evidence of its significance ( $p=0.000$ ). Entity origin and firms' size alike do exhibit statistical significance with minor essential effect on the growth. Several interactions of the industry and size (Energetics, Mining, Retail, Wholesale and Transport) as well as industry and leverage (Energetics, Agriculture, Wholesale, Transport) generate modest influence on the respective slope coefficients.

The regression estimation provides firm evidence of the significant impact of leverage on the sales performance. However, the direction of the relation is quite opposite to the expectations and we shall highlight the probable causes later on. Among the control variables, entity origin and size exhibit related impact on the sales level, while difference in profitability, industry specifics and financial crisis mostly appear to be non-significant control variables.

Interactions are also in general insignificant with minor exceptions. Instrumental lagged sales performance variable, as expected, plays an important role in the structure, though we apply it to preserve model quality. Referring to the model quality, we apply several remedies and check the panel set quality to protect results of being biased or violated.

At first, lagged dependent variable is incorporated into the model to prevent omitted variable bias. Yet, homoscedasticity assumption is satisfied by use of robust standard error procedure. Furthermore, normality assumption of the residuals distribution has been checked and Figure 1 reveals quite normal distribution what satisfies set of conditions for the utmost model quality.



**Figure 1. Distribution of the residuals**

As the residuals exhibit normal distribution with zero expected value, this entails strict ergogeneity of the model, no serial correlation and proper structure of the time-series without co-integration effect. Therefore, we may confirm the best possible model estimation.

#### **4.1.2. Discussion and Practical Essence of Findings**

The relation of the leverage to logarithmic sales value with the coefficient of -0.4088 and accompanying p-value of 0.000 deserve special attention. Following the theoretical foundations, the significant and positive relation between leverage and growth performance at the firms level is expected. On the contrary, the results presented provide firm evidence to reject our hypothesis. Significant but negative relation, yet with the sample of almost entire firms' population, sheds light on generally inadequate leverage use. Instead of being the tool for better growth performance, leverage serves as a tool to cover bad performance effects.

This finding assumes set of measures to tackle the improper approach toward leverage potentials at firms' as well as at the macro level. It looks interesting to identify the insignificant effect of the leverage regardless the firms' profitability but significant effect of the entity origin and firms' size. However, it is beyond the scope of this paper to consider side effects of control variables to growth performance though these implications are of considerable interest.

Poor effect of the industry specifics on the growth performance entails general approach to this issue rather than special industry policies. To conclude, interactions though significant at the group level, provide no strong evidence of the influence with minor exceptions.

#### **4.2. ROA-Leverage**

The leverage to ROA regression output implies rather insignificant explanatory power (within variation 0.1438, between variation 0.0163 and overall variation 0.1163). If lagged ROA performance is taken out of the regression, it falls down to negligible 0.02 overall variation. We find no further sense to provide deep insight into individual relations as we may generally conclude that leverage exhibits no significant effect on ROA performance.

#### **5. Conclusions and Recommendations**

In this paper we examined the relation of leverage and sales performance. The sales income measured in logarithmic term represents growth performance while leverage is perceived as one of the corporate finance principles. In order to provide reliable research outcome we considered large sample size of 18,007 firms in Bosnia and Herzegovina. Yet comprehensive regression model has been applied in order to capture all relevant effects and preserve model unbiasedness and validity.

We consider the findings of this paper relevant and valid for several reasons. At first, clear negative relation between leverage and sales performance call for active role at all influential levels. 10% increase of the indebtedness ratio (total liabilities over total assets) generates 4% fall of sales income. Significant but opposite effect of leverage on firms' growth reveals obvious improper use of debts. Effective leverage policy implies better firms' performance not the opposite. Consequently, findings of this paper inspire deep concerns. The main concern of the findings for shareholders and managers is how to effectively apply leverage since improper use of leverage considerably increases operational risk. Higher ratio of indebtedness, ceteris paribus, implies solvency issues and restrained approach of the banks. Constrained external finance furthermore implies lower competitiveness. The effects of the improper leverage policy undermine other growth potentials of firms as well.

Financial market players may also use this findings as an additional caution. Namely, providing external funding to firms with no clear implication on the growth may increase default risk. Finally, decision makers at the policy level might recognize the opportunity to introduce comprehensive stimulus measures for firms that properly use leverage.

In addition to these finding, we examined the impact of the leverage on return on assets. Return on assets has been selected as a second growth performance in this research. Negligible impact of the leverage on ROA identified by the regression output remains challenge that call for further research efforts. We also recommend further researches to provide deeper insight into causes of such a negative relation between leverage and sales performance. Furthermore, we suggest more comprehensive coverage of the variables as well as review of the relation for start-ups. In addition, we propose approaches with entity origin and firms size focus. Finally, we believe that sample size used as well as the methodology applied inspire further research efforts for country and environment specific focuses of the corporate finance principles effects on firms performance.

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