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# THE IMPORTANCE OF A COMPANY'S CAPITAL STRUCTURE IN FINANCIAL RELATIONS: THE DYNAMIC PANEL MODEL

**Abstract**

**Purpose:** The main objective of this research was to determine the impact of capital structure on the profitability of Croatian companies. The second objective was to analyze the consistency of the way in which capital structure is managed with respect to the existing theories of capital structure.

**Methodology:** A survey was conducted on the sample of Croatian companies for the period from 2009 to 2019 using panel model GMM estimation. In order to be included in the sample, all shares listed on the Zagreb Stock Exchange were considered which meet the liquidity criterion and are part of the non-financial sector. Accordingly, the sample consists of 30 shares.

**Results:** The research established a significant relationship between capital structure and profitability, with a negative sign. With these results, Croatian companies are placed alongside other companies from countries that belong to the group of developing countries, and diametrically opposed to the results obtained for the markets of developed countries. Indirectly, the validity of theories of capital structure formation on the Croatian market was tested, and it was proved that the behavior of Croatian companies can best be described by settings of the trade-off theory of capital structure.

**Conclusion:** For Croatian companies, this means that any further use of debt will lead to a decline in profitability. Consequently, this means that domestic companies cannot make significant use of the current situation of low interest rates on loans, and therefore they lag behind in terms of the level of investments made.

**Keywords:** Capital structure, financial relations, panel model GMM estimation, Croatia

## 1. Introduction

The importance of a company's capital structure is a concept that has been at the focus of research for many years by many scientists and practitioners because of its impact on the overall performance of the company. This research will cover capital structure of companies in the Republic of Croatia and try to determine its relationship with profitability indicators. It will also try to provide an answer to the question about a degree of harmonization of the

Croatian capital market and other capital markets of more developed countries of the European Union. With its current position as a country in the process of adopting the euro as its own currency, plenty of research has been devoted to analyzing a degree of harmonization of monetary policies. What has been observed is a lack of research into a degree of harmonization of financial and capital markets.

The term "harmonization of financial and capital markets" means the compatibility of market cycles in Croatia and developed countries of the European Union. Such coherence is important because it depends on whether the EU's economic policy instruments will equally benefit all members of the Union, regardless of the level of development of their financial markets. The importance of financial markets derives from its functions, and in terms of research conducted here, from the function of raising capital outside the banking system. With different combinations of financing sources, a company is able to actively manage its exposure to financial risk, and consequently the cost of financing, which is directly dependent on the level of indebtedness. Looking at a company as an entity with the primary financial goal of maximizing the wealth of its shareholders, the cost of financing is a significant variable in meeting that goal. Apart from the obvious influence which the cost of financing has on the financial result of the company, its significance is even deeper, and it is expressed by the influence on the investment policy of the company. Namely, in the methods for assessing financial profitability of investments, the rate of the total cost of financing (calculated as the weighted average cost of capital) represents the limit for accepting or rejecting investment projects. At a macroeconomic level, this has repercussions on the level of employment, i.e. unemployment of an economy, as well as on the GDP of the economy.

Considering all the above, it is our opinion that, due to its importance, the study of a company's capital structure must be the subject of continuous analysis. Moreover, a further increase in financial flows between the countries of the European Union raises the question of their harmonization. In that sense, the research presented here will indirectly test the existence and validity of various theories about the formation of capital structure. A significant degree of capital market harmonization should be reflected in the similar behavior of companies listed on national stock exchanges, which use different sources of financing. This would mean that on the sample of Croatian companies, we should find evidence of behavior in accordance with the characteristics of the same theories of capital structure formation as is the case in developed countries.

Bearing all this in mind, the main goal of the research conducted here is to determine the impact of capital structure on the level of profitability of the analyzed Croatian companies. A scientific contribution was achieved by using a dynamic panel model that was not previously used either in the analyzed sample or in the analyzed time period in Croatia. The secondary goal of the research is to test the validity of various existing theories on the formation of capital structure in order to determine a degree of harmonization of the financial markets in the EU and Croatia.

Taking into account the goal of the research itself, the article is organized as follows. After this introductory part, there follows a section that presents the main characteristics of the existing theories of capital structure formation. Within all of the theories, elements are presented that have, or do not have, an impact on the formation of the degree of indebtedness, all with the aim of achieving optimal capital structure. The next section provides an overview of previous empirical studies testing capital structure theories, as well as the results obtained in relation to the relationship between capital structure and the profitability of companies. After that, there follows a section in which this relationship is empirically tested on the sample of companies in the Republic of Croatia, and the obtained results are interpreted. The article finishes with a concluding discussion and a list of references.

## 2. The relationship between capital structure and financial performance of the company

Determining the relationship between capital structure, or different levels of debt utilization, and financial performance of the company is the subject of numerous studies. Ever since the historical work of Modigliani and Miller (1958) opposing their thinking about the irrelevance of capital structure to its traditional understanding, capital structure has been the subject of research by many scholars and practitioners seeking to adapt capital structure of their companies in search of an optimal structure. In doing so, optimal capital structure can be

defined as the one that will result in the lowest weighted average cost of capital, and thus the maximum value of such company.

The search for optimal capital structure has resulted in a number of theories that, each in its own way, seek to define how to achieve such optimal structure. All known capital structure theories can illustratively be divided into two groups:

- traditional, rational theories; and
- modern, behavioral theories.

The first group includes theories that approach the problem of determining capital structure from a quantitative aspect, trying to determine optimal capital structure through various calculations. Apart from the fact that in most cases they start from the assumption of a perfect market, they also start from the assumption of rational behavior of investors. This group of theories includes the traditional theory, the Modigliani-Miller theory and the trade-off theory of capital structure.

The traditional theory starts from the hypothesis that there is a direct interdependence of capital structure and the value of a company according to the level of financial risk to which the firm is exposed (Durand, 1952). The higher the share of debt in the sources of finance, the higher the financial risk of the company, and thus the lower the perceived value of the company. That is expressed by a decrease in the market price of shares, i.e. by an increase in the required rate of return of investors on securities issued by a company. A significant feature of the theory is the speed with which owners and creditors react to changes in the financial risk of the company. Namely, for creditors, the coefficient of reaction to financial risk is significantly higher than the coefficient of reaction of owners. As a consequence of such relationships, the theory implies that an increase in the degree of indebtedness will reduce the total cost of financing to a certain limit (due to cheaper debt financing) after which they begin to grow. The very point at which total costs are lowest is the required optimal capital structure (Asaf, 2004, p. 32).

The basic Modigliani-Miller theory of the capital structure irrelevance sets as its initial hypothesis the claim that capital structure has no influence on the market value of the company (Modigliani & Miller, 1958). Namely, in conditions of a perfect market, equity and debt securities are perfect substitutes, and the value of a company does not depend on their ratio but on the realized profit and the degree of risk exposure expressed through the financing cost rate (McMenamin, 2000, p. 456). Unlike this first version of the theory, further work by Modigliani and Miller focuses on getting their model closer to reality, including taxes that had not been considered until then (Modigliani & Miller, 1963). Taking into account taxes, capital structure is no longer an irrelevant item; on the contrary, it becomes very significant. However, a still limited view on the significance of capital structure results in the conclusion that the use of debt as a source of finance creates a tax shelter, while neglecting the degree of financial risk. In this regard, Modigliani and Miller concluded that optimal capital structure consists entirely of debt because in that case the value of the tax shelter would also be maximal. With such capital structure, the total cost of financing would be the lowest, and consequently the value of the company would be maximal.

The trade-off theory of capital structure solves the problem of the Modigliani-Miller theory with taxes included by confronting the tax shelter with the cost of financial troubles (Kraus & Litzenberger, 1973; Kim, 1978) and the agency cost (Jensen & Meckling, 1976; Myers, 1977), which reduce the company value while increasing the level of debt. Taking into account the investors' income tax (Miller, 1977), as well as other forms of tax savings besides debt (DeAngelo & Masulis, 1980), the trade-off theory makes such relationship more complex, but more realistic.

The second group of theories on the formation of capital structure consists of those theories that take into consideration some of the elements of behavioral finance, i.e. psychological elements. In this way, these theories deviate from the assumptions of a perfect market, but also from the assumption of investor's rationality, which in many ways makes them closer to reality. At the same time, the quantitative approach to capital structure is not the focus of these theories either. This group includes the signaling theory and the pecking-order theory.

The signaling theory of capital structure rejects the assumption of a perfect market for information symmetry in an attempt to explain capital structure in terms of equity and debt securities issues as a "signal" by which a company indicates expectations of future financial results (Ross, 1977; Leland & Pyle, 1977). In this sense, the issue of debt securities

is interpreted as a positive signal of the expected future financial result from which it will be possible to settle the interest liability on the securities issued. In contrast, the issue of equity securities on the market will be interpreted as a negative signal of the current overvaluation of the company's shares and the questionable achievement of a positive financial result in the future. Considering this interpretation of signals, it follows that the determination of optimal capital structure is secondary. The method of capital structure formation, and thus the degree of indebtedness, depends primarily on the available investment projects and their profitability.

The pecking-order theory has its starting point in the results of a practical study on capital structure management, where certain patterns of company management behavior in obtaining the preferred sources of funding are identified (Myers, 1984; Myers & Majluf, 1984). Such a hierarchy of preferred sources of funding is made in accordance with the psychological characteristic of a man who will always prefer to "follow the line of least resistance". In accordance with this deviation from the assumption of rational investor behavior, company management will primarily use retained earnings as a source of finance. If they are not sufficient to finance all investment opportunities, the use of debt financing instruments will be approached, while the use of equity securities is the least desirable source of finance because it requires most effort, time and additional costs for the company. As a result of all the above, capital structure is only a reflection of past preferences in choosing the sources of finance and investment options available to the company, while determining optimal capital structure is secondary.

## 3. Empirical research review

As expected, there is a difference in the results of research conducted in developed capital markets compared to those obtained from emerging markets. Thus, for example, Graham and Harvey (2001) present the results of a comprehensive study conducted in 1999 of US companies from the Fortune 500 list. They found some support for the pecking-order and the trade-off theory of capital structure, but little evidence that companies are concerned about asset substitution, asymmetric information, transaction costs, free cash flows, or personal taxes. Similar results are obtained by Gill et al. (2011) who analyzed US companies for the period 2005-2007. Rajan and Zingales (1995) and Bancel and Mittoo (2004) did the same on a sample of G7 and sixteen developed European economies, respectively, and found evidence consistent with the results obtained for the USA, i.e. they confirmed the results in support of the pecking-order and the trade-off theory. La Porta et al. (1997) and La Porta et al. (1998) compared determinants of capital structure, financing methods and dividend policy in 49 countries within the legal and institutional environment. Highlighting the results of their research related to the issues explored in this article, it can be concluded that those countries that have a more developed legal environment have a stronger capital market.

Examining the connection between capital structure and the profitability of companies in the UK, contradictory but, to some extent, complementary results can be singled out. Namely, analyzing a sample of 30 companies from the FTSE-100 index of the London Stock Exchange for the period 2005-2014, Nasimi (2016) found evidence to confirm the prevailing behavior of British companies according to the assumptions of the trade-off theory. Thus a positive significant relationship was found between the degree of indebtedness and profitability measured by the ROE indicator, and at the same time, a negative significant relationship was found between profitability measured by ROA and ROIC indicators. Exploring the same issues for SMEs in the UK market for the period 1998-2008, Abeywardhana (2015) found that the link between capital structure and profitability is significantly negative. This would mean that SMEs do not take advantage of financial leverage because of the fear of losing control.

Similar results were obtained for France, Greece, Italy and Portugal by Psillaki and Daskalakis (2009), who researched SME companies in the period from 1997 to 2002. They also established a negative relationship between capital structure and the profitability of the company, and a positive relationship between the size of the company and capital structure.

These differences in the obtained results could also be attributed to the fact that these research studies were conducted on the examples of companies from the SME sector. However, Herciu and Ogrean (2017) conducted a comprehensive survey of the world's 100 most profitable companies in 2016 according to the Global Fortune 500 list. Through the analysis of the relationship between capital structure and the profitability of the companies measured by the ROE indicator for 59 non-financial and

big companies from that list, they came to conflicting conclusions about the relationship of these variables depending on the industry to which the specific company belongs. Namely, both low and high levels of the debt-to-equity ratio can result in high levels of ROE, which indicates the problem of determining optimal capital structure. This situation suggests that determining optimal capital structure is a task at the level of each individual company and that it is difficult to explicitly determine whether any of the existing theories of capital structure holds true. This is in agreement with the well-known fact that the market value of company securities is no longer correlated with financial performance of the issuing company, but that those securities almost have "their own life". At its core, this separation of the "securities life" from the "issuing company's life" is a characteristic of contemporary behavioral theories of capital structure.

Investigating the empirical research results for emerging markets, which are the closest to the behavior of developed markets is India, in the period from 1995 to 2008, the formation of a company's capital structure was confirmed to be in accordance with the pecking-order and the trade-off theory (Chakraborty, 2010). Furthermore, exploring the recent period from 2008 to 2017, Pal Singh and Bagga (2019) found a significant positive relationship between capital structure and profitability indicators of Indian companies. Bauer (2004) obtained the same result in terms of confirming theories of capital structure by analyzing data for companies in the Czech Republic for the period from 2000 to 2001.

Other research studies conducted in developing countries demonstrate more or less similar results. Thus, for example, Habimana (2014) conducted research on a large number of companies from Africa, the Middle East, Asia, Eastern Europe, Russia and China, and found evidence in favor of the trade-off theory and a significant negative relationship between capital structure and company profitability. A negative relationship between the capital structure and profitability indicators was also proven in a survey of companies in Romania for the period 2003-2010 (Vătavu, 2015), in Turkey for the period 2005-2012 (Nassar, 2016), in Ghana for the period 1998-2002 (Abor, 2005), in Macedonia for the period 2002-2011 (Ferati & Ejupi, 2012), in Croatia for the period 2009-2018 (Učkar, 2020), to name but a few.

## 4. Methodology, data and results

Since the main objective of this research is to determine the impact of capital structure on the profitability of Croatian companies, two dynamic panel data models using the GMM (Generalized Method of Moments) technique are estimated. Dynamic panel models have several advantages in relation to static panel models since they tend to be more properly specified and because the dynamics are placed in the estimated part of the model and not within the error term that invalidates fixed or random effects estimation. As confirmed by the experiment, Brañas-Garza, Bucheli and García-Muñoz (2011) showed that the use of dynamic panel data models in the context of experiments allows us to unravel new relationships between experimental variables and highlighting new paths in behavior. In addition, in relation to other methods such as OLS, fixed effects or generalized effects methods, the dynamic panel GMM specification avoids the endogeneity problem arising from a causal relationship between independent and dependent variables using instrumental variables generated by lagged variables (Trad et al., 2017). Furthermore, it allows the estimation of consistent parameters even when time series are short. This method was initially proposed by Arellano and Bond (1991) and further developed by Arellano and Bover (1995) and Blundell and Bond (1998). The initial estimator is usually called the difference GMM, whereby the system GMM estimator was developed.

The linear dynamic panel model can be presented as (Wooldridge (2002), Baltagi (2005) and IHS Global Inc. (2019)):

$$Y_{it} = \sum_{j=1}^{p} \rho_j Y_{it-j} + X_{it}'\beta + \delta_i + \varepsilon_{it}, \quad i = 1, 2,\ldots, M; t = 1, 2,\ldots, T \quad (1)$$

where $Y_{it}$ is a dependent variable of $i$ (individuals) in $t$ (period of time), $\rho_j$ are $j$-th order autocorrelation coefficients, where , $Y_{it-j}$ are lags of a dependent variable, where , $X_{it}$ is a vector of regressors of $i$ (individuals) in $t$ (period of time), $\beta$ is a vector of coefficients, $\delta_i$ is the individual effect (individual heterogeneity) and $\varepsilon_{it}$ are the error terms.

By first-differencing equation (1), the individual effect can be eliminated producing the following equation which can be estimated by using GMM techniques:

$$\Delta Y_{it} = \sum_{j=1}^{p} \rho_j \Delta Y_{it-j} + \Delta X_{it}'\beta + \Delta\varepsilon_{it} \quad , \qquad (2)$$

where Δ denotes a difference operator.

GMM estimation of (2) may include a different number of instruments for each period along with the period-specific instruments corresponding to different numbers of lagged dependent and predetermined variables available at a given period.

If $\boldsymbol{\varepsilon}_{it}$ are not autocorrelated, the optimal GMM weighting matrix for the differenced specification estimated by White period covariance and used in the Arellano-Bond two-step estimator can be shown as:

$$H = (M^{-1} \sum_{i=1}^{M} Z_i' \Delta\varepsilon_i \Delta\varepsilon_i' Z_i)^{-1} \quad , \qquad (3)$$

where $H$ is a weighting matrix, $Z_i$ contains a mixture of strictly exogenous and predetermined instruments, Δ denotes difference operator and $\boldsymbol{\varepsilon}_{it}$ are the error terms.

Before estimating the models, the first step in this research involves the determination of a representative sample of shares from the Zagreb Stock Exchange (2020) database in the period from 2009 to 2019. The shares are selected on the basis of the share liquidity criterion, where shares of the financial sector (banks and insurance companies) whose financial structure is formed in accordance with some other principles are excluded from the representative sample. All shares listed on the Zagreb Stock Exchange were considered for the sample, which meet the liquidity criterion, i.e. they were traded at least once a week during the analyzed period. The final sample for both models consists of unbalanced (since data for some years are missing) 330 annual observations of selected company level data. The selected company shares are presented in Table 1.

***Table 1 Companies included in the sample***

| *Ticker* | *Company* | *Ticker* | *Company* |
|---|---|---|---|
| ADPL | AD Plastik d.d. | LRH | Liburnia Riviera hoteli d.d. |
| ADRS | Adris grupa d.d. | LRHC | FTB turizam d.d. |
| ARNT | Arenaturist d.d. | MAIS | Maistra d.d. |
| ATGR | Atlantic grupa d.d. | MDKA | Medika d.d. |
| ATLN | Excelsa nekretnine d.d. | OPTE | OT – Optima telekom d.d. |
| ATPL | Atlantska plovidba d.d. | PLAG | Plava laguna d.d. |
| DDJH | Đuro Đaković holding d.d. | PODR | Podravka d.d. |
| DLKV | Dalekovod d.d. | PTKM | Petrokemija d.d. |
| ERNT | Ericsson Nikola Tesla d.d. | RIVP | Valamar riviera d.d. |
| HT | Hrvatski Telekom d.d. | THNK | Tehnika d.d. |
| IGH | Institut IGH d.d. | TPNG | Tankerska next generation d.d. |
| INA | INA – Industrija nafte d.d. | ULPL | Uljanik Plovidba d.d. |
| INGR | Ingra d.d. | VART | Varteks d.d. |
| KOEI | Končar-elektroindustrija d.d. | VIRO | Viro tvornica šećera d.d. |
| KRAS | Kraš d.d. | VLEN | Brodogradilište Viktor Lenac d.d. |

*Source: Zagreb Stock Exchange (2020)*

Further analysis implies financial ratio calculation from the company's audited and consolidated financial statements. The calculation of financial ratios is presented in Table 2. The return on assets (ROA) and the return on equity (ROE) are related to a company's profitability, while the debt ratio, the financing ratio and the long-term balance are related to a company's capital structure. These variables were selected in accordance with comparable research analyzed in the review of previous empirical research.

***Table 2 Financial ratio calculation***

| | |
|---|---|
| Return on assets (ROA) | (net profit – preferred dividends) / total assets |
| Return on equity (ROE) | (net profit – preferred dividends) / equity |
| Debt ratio (LEV) | (total liabilities – capital and reserves) / total assets |
| Financing ratio (FIN) | (total liabilities – capital and reserves) / equity |
| Long-term balance (LTB) | long-term assets / (long-term liabilities + capital and reserves) |

*Source: Žager et al. (2009, p. 251)*

Based on equation (2), the first panel model fits the return on assets (ROA) to the debt ratio (LEV), the financing ratio (FIN) and the long-term balance (LTB), while the second model fits the return on equity (ROE) to the debt ratio (LEV), the financing ratio (FIN) and the long-term balance (LTB). Both models include two lags of the dependent variable (ROA or ROE) as explanatory variables, the debt ratio, the financing ratio and the long-term balance as regressors altogether with period dummy variables. A transformation, i.e. the first difference of each variable in the regression, is applied to remove the cross-section fixed effects, while period dummy variables are included as untransformed. With regard to the dependent variable (ROA or ROE), the Arellano-Bond type dynamic panel (predetermined) instruments include all valid lags, and a list of other instruments in the transformed equation consists of the debt ratio, the financing ratio and the long-term balance. The Arellano-Bond 2-step estimator is computed by using the 2-step method. Finally, the GMM weighting matrix uses the White period weights, and the coefficient covariance method is based on the ordinary estimates.

Descriptive statistics are presented in Table 3.

***Table 3 Descriptive statistics***

| | *ROA* | *ROE* | *LEV* | *FIN* | *LTB* |
|---|---|---|---|---|---|
| Mean | -0.001514 | 0.066903 | 0.571753 | 5.805058 | 1.035833 |
| Median | 0.017043 | 0.053702 | 0.513396 | 2.030556 | 0.981992 |
| Maximum | 0.223626 | 8.526554 | 2.108646 | 67.83492 | 15.99315 |
| Minimum | -0.491436 | -5.658025 | 0.057816 | 0.099532 | -7.958199 |
| Std. Dev. | 0.090792 | 1.034672 | 0.305018 | 10.38968 | 1.243522 |
| Observations | 317 | 317 | 317 | 317 | 317 |

*Source: Authors' calculations*

It can be seen that the mean value of ROA was negative during the observed period. On the other hand, the lowest value of standard deviation, as a classical measure of risk, was achieved by ROA. To avoid potential problems with multicollinearity between variables, the correlation coefficients are estimated and presented in Table 4.

***Table 4 Correlation coefficients***

| | *ROA* | *ROE* | *LEV* | *FIN* | *LTB* |
|---|---|---|---|---|---|
| *ROA* | 1 | | | | |
| *ROE* | 0.60 | 1 | | | |
| *LEV* | -0.54 | -0.41 | 1 | | |
| *FIN* | -0.09 | 0.25 | 0.35 | 1 | |
| *LTB* | -0.11 | -0.06 | 0.01 | -0.08 | 1 |

*Source: Authors' calculations*

The results in Table 4 show that the absolute value of correlation coefficients between independent variables are below 0.7, indicating the absence of multicollinearity (Kervin, 1992). The results of the first model are presented in Table 5.

***Table 5 Dependent variable: ROA***

| *Dependent variable: ROA* | | | | |
|---|---|---|---|---|
| ***Variable*** | ***Coefficient*** | ***Std. Error*** | ***t-Statistic*** | ***Prob.*** |
| ROA(-1) | 0.074722 | 0.029414 | 2.540354 | 0.0118 |
| ROA(-2) | -0.230539 | 0.015899 | -14.50000 | 0.0000 |
| LEV | -0.370855 | 0.069160 | -5.362247 | 0.0000 |
| FIN | 0.004173 | 0.001682 | 2.481042 | 0.0139 |
| LTB | -0.001710 | 0.001590 | -1.075295 | 0.2835 |
| @LEV(@ISPERIOD("2012")) | -0.008279 | 0.007730 | -1.071042 | 0.2854 |
| @LEV(@ISPERIOD("2013")) | 0.025479 | 0.004889 | 5.211575 | 0.0000 |
| @LEV(@ISPERIOD("2014")) | -0.018174 | 0.004103 | -4.429056 | 0.0000 |
| @LEV(@ISPERIOD("2015")) | 0.025751 | 0.004631 | 5.561082 | 0.0000 |
| @LEV(@ISPERIOD("2016")) | -0.001017 | 0.004762 | -0.213619 | 0.8310 |
| @LEV(@ISPERIOD("2017")) | -0.009084 | 0.009200 | -0.987358 | 0.3246 |
| @LEV(@ISPERIOD("2018")) | -0.008570 | 0.007278 | -1.177529 | 0.2403 |
| @LEV(@ISPERIOD("2019")) | 0.035462 | 0.008794 | 4.032495 | 0.0001 |
| *Specification of effects* | | | | |
| Cross-section fixed (first differences) | | | | |
| Period fixed (dummy variables) | | | | |
| Root MSE | 0.088013 | Mean dependent var. | | 0.000465 |
| S.D. dependent var. | 0.100132 | S.E. of regression | | 0.090647 |
| Sum squared resid. | 1.758410 | J-statistic | | 20.36183 |
| Instrument rank | 30 | Prob(J-statistic) | | 0.256142 |
| *Arellano-Bond serial correlation test* | | | | |
| *Test order* | *m-Statistic* | *rho* | *SE(rho)* | *Prob.* |
| AR(1) | -2.505651 | -0.678269 | 0.270696 | 0.0122 |
| AR(2) | -0.491483 | -0.053597 | 0.109052 | 0.6231 |

*Source: Authors' calculations*

The GMM estimator requires first-order serial correlation, but no second-order autocorrelation. The Arellano-Bond serial correlation test indicates that the model passes the test of first- and second-order serial correlation in the disturbances. *J*-statistic and the accompanying *p*-value indicate that over-identifying restrictions are valid. Overall tests suggest that the model is consistent, without heteroscedasticity or autocorrelation problems. An insight into *t*-statistics and accompanying *p*-values indicates that all variables are statistically significant, with the exception of the long-term balance. The debt ratio affects ROA negatively, meaning that a rise in the debt ratio decreases a company's profitability. On the other hand, although the coefficient is small, the financing ratio affects ROA positively, meaning that a rise in the financing ratio increases a company's profitability. Although not shown, the Wald test for joint significance of period dummy variables confirms their significance ($p$=0.0000).

The results of the second model are presented in Table 6.

***Table 6 Dependent variable: ROE***

| *Dependent variable: ROE* | | | | |
|---|---|---|---|---|
| ***Variable*** | ***Coefficient*** | ***Std. Error*** | ***t-Statistic*** | ***Prob.*** |
| ROE(-1) | -0.121058 | 0.019010 | -6.368152 | 0.0000 |
| ROE(-2) | -0.204528 | 0.016014 | -12.77172 | 0.0000 |
| LEV | -0.806365 | 0.416270 | -1.937119 | 0.0540 |
| FIN | -0.028021 | 0.006605 | -4.242505 | 0.0000 |
| LTB | -0.019765 | 0.014391 | -1.373389 | 0.1711 |
| @LEV(@ISPERIOD("2012")) | -0.131594 | 0.019609 | -6.710732 | 0.0000 |
| @LEV(@ISPERIOD("2013")) | 0.191942 | 0.037140 | 5.168119 | 0.0000 |
| @LEV(@ISPERIOD("2014")) | -0.074977 | 0.051093 | -1.467471 | 0.1437 |
| @LEV(@ISPERIOD("2015")) | 0.266419 | 0.060215 | 4.424499 | 0.0000 |
| @LEV(@ISPERIOD("2016")) | -0.189431 | 0.023169 | -8.176046 | 0.0000 |
| @LEV(@ISPERIOD("2017")) | -0.051468 | 0.036789 | -1.398998 | 0.1633 |
| @LEV(@ISPERIOD("2018")) | 0.035843 | 0.023730 | 1.510455 | 0.1324 |
| @LEV(@ISPERIOD("2019")) | 0.144807 | 0.053218 | 2.721039 | 0.0070 |
| *Specification of effects* | | | | |
| Cross-section fixed (first differences) | | | | |
| Period fixed (dummy variables) | | | | |
| Root MSE | 0.913287 | Mean dependent var. | | 0.034740 |
| S.D. dependent var. | 1.075710 | S.E. of regression | | 0.940618 |
| Sum squared resid. | 189.3393 | J-statistic | | 15.40432 |
| Instrument rank | 30 | Prob(J-statistic) | | 0.566384 |
| *Arellano-Bond serial correlation test* | | | | |
| *Test order* | *m-Statistic* | *rho* | *SE(rho)* | *Prob.* |
| AR(1) | -2.578739 | -78.505055 | 30.443199 | 0.0099 |
| AR(2) | -0.732641 | -12.330606 | 16.830348 | 0.4638 |

*Source: Authors' calculations*

As before, the Arellano-Bond serial correlation test indicates that the model passes both tests for serial correlation. *J*-statistic and the accompanying *p*-value indicate that over-identifying restrictions are valid. Overall tests suggest that the model is consistent, without heteroscedasticity or autocorrelation problems. As with the previous model, an insight into *t*-statistics and accompanying *p*-values indicates that all variables are statistically significant, with the exception of the long-term balance. All variables negatively affect ROE, meaning that a rise in each variable decreases a company's profitability. Although not presented, the Wald test for joint significance of period dummy variables reveals their significance ($p = 0.0000$).

## 5. Interpretation of the obtained results

The results obtained in both models are consistent with the results of related research conducted in emerging markets. Namely, in all analyzed research studies there is a significant relationship between capital structure and profitability indicators. In this study, this is shown in Table 5 and Table 6, where the coefficients associated with variables representing capital structure (i.e. LEV, FIN or LTB) almost always take on a significant negative sign regard-

less of whether ROA or ROE is taken as a profitability indicator. According to the results obtained here, there is a diametric difference in relation to the markets of developed countries, where such a relationship has mostly a positive sign.

Further analysis of the obtained results can be directed toward determining the conformity of the formation and management of the sources of funding in accordance with the assumptions of the existing theories of capital structure. However, it should be noted that the research was not primarily focused on proving the existing theories. Nevertheless, from the obtained results one can indirectly draw a conclusion which of the existing theories have not been proven. These are the theories that in their basic considerations start from the hypothesis that there is no relationship between the sources of finance (capital structure) and the value of a company. Here, a logical assumption is made that the value of a company is affected by the achieved profitability.

Since the research proved the relationship between capital structure and a company's profitability, and thus its value, it can be concluded that in the Croatian capital market no evidence was found in favor of Modigliani-Miller's theory of capital structure irrelevance (a tax-free version), the signaling theory and the pecking-order theory. It is not possible to confirm the validity of Modigliani-Miller's theory with taxes included, since then optimal capital structure would be one that is fully financed by debt (due to the maximum tax shelter). As the mean value of the total debt level (LEV) for sample companies is still at an acceptable and normal level of 57%, and any further increase in the debt level leads to a further decrease in corporate profitability, and to the rejection of this theory of capital structure as well.

The described movement of the degree of indebtedness, as well as the description of implications of a further increase in the level of debt, can be best illustrated in accordance with the settings of the trade-off theory. According to this theory, optimal capital structure is achieved at a certain level of debt at which the total cost of financing is minimal, meaning that the value of the company is maximal. Such optimal structure is at some degree of debt that is greater than 50%, as suggested by the traditional approach to capital structure, but still lower than 100%, as suggested by Modigliani-Miller's theory of capital structure irrelevance with taxes included.

Considering all the facts established so far regarding the relationship between a company's capital structure and profitability, it can be concluded that the Croatian capital market belongs to the group of emerging markets. Namely, the obtained results confirm the same negative relationship between the level of debt and profitability of the company, as well as the most probable determination of capital structure in accordance with the settings of the trade-off theory. Both elements are supported by numerous examples of previous research studies on emerging markets. Such results differ from those obtained for developed markets. The difference is not so much important in terms of a valid theory of capital structure, as it is in the relationship between capital structure and profitability which is positive in developed countries.

What does such difference mean in the context of the harmonization of financial relations for capital markets in EU countries? The monetary policy of the European Central Bank, and in general of other central banks in developed countries, is moving in the direction of cheap money and low interest rates. Such a situation is in favor of further borrowing by companies that see cheap loans as an opportunity to increase investments. In accordance with the positive relationship between the level of indebtedness and profitability for developed countries, such an increase in debt leads to an increase in a company's profitability and market value of its shares, and at the macrolevel to GDP growth, unemployment reduction and economic growth in general. So, we can see that there is a significant degree of alignment of monetary policy and capital markets of developed countries, which certainly contributes to meeting the basic economic goals of these countries.

The situation in emerging markets is diametrically opposed. Because the relationship between debt utilization and corporate profitability is negative, companies operating in developing countries do not benefit from the current low interest rates. Any further increase in the level of debt leads to a decrease in profitability, and the rest of the causal relationship is reversed from the previously described. Thus, it can be concluded that there is a significant differential factor between the capital markets of developing countries and the developed capital markets of the "original" countries of the European Union.

## 6. Conclusion

As the main goal of the research conducted here was to determine the relationship between a company's capital structure and profitability. The secondary goal was to determine the consistency of the way in which capital structure is managed with respect to the existing theories of capital structure. The conducted research established a significant relationship between capital structure and profitability of companies in the Republic of Croatia, with a negative sign. This result is in line with the results of other research studies conducted in emerging markets, but diametrically opposed to the results obtained for the markets of developed countries, where such a relationship has a positive sign.

Regarding the secondary goal, the research indirectly found that in forming and managing the level of indebtedness, Croatian companies do not follow the principles of the traditional approach to capital structure, the Modigliani-Miller theory, the signaling theory, and the pecking-order theory. What has been established, however, is that the behavior of Croatian companies in terms of capital structure management, can best be explained by the settings of the trade-off theory. According to this conclusion, this research is comparable to similar surveys of companies in countries that belong to the group of developing countries. In contrast, in developed countries, mostly the pecking-order theory and the already mentioned trade-off theory have been proven.

Such results are expected, and they once again show a weak degree of harmonization of financial markets of developed and developing countries. In the context of the countries that make up the EU, this is a problem for the introduction of a common economic policy. This research identified different corporate behavior with regard to the financing of investment opportunities in the current situation of low interest rates. Although different intentions have been identified in groups of countries, this problem certainly deserves a more detailed attention, so future research could be directed toward this area.

This primarily refers to the need for further research on the impact that the European Union's economic policy adopted at the global level may have on companies in Croatia, considering the results of this research. Namely, the diametrically opposite effects that the currently low interest rate has on the decline in profitability of Croatian companies, i.e. the increase in profitability of companies from developed EU countries, pose a serious obstacle to further unification of EU countries in terms of forming a common economic policy.

Finally, this study has some limitations. The Croatian capital market is still underdeveloped with a small number of listed companies and available financial instruments that ultimately affect market liquidity, create large fluctuations in stock prices and lead to yield instabilities. All this is reflected in the company's financial performance indicators. In addition, the estimated period is relatively short. Despite the shortcomings, this analysis can serve as a good starting point for future research regarding the importance of capital structure in financial relations of Croatian companies.

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