

Varazdin Development and Entrepreneurship Agency and University North
in cooperation with
University of Aveiro
Faculty of Management University of Warsaw
Faculty of Law, Economics and Social Sciences Sale - Mohammed V University in Rabat
Polytechnic of Medimurje in Cakovec



Economic and Social Development

68th International Scientific Conference on Economic and Social Development Development

Book of Proceedings

Editors:

Marco Andre da Silva Costa, Abdelhamid Nedzhad, Danijela Lucic



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THE EFFECT OF CORPORATE INCOME TAXATION ON COMPANIES FINANCIAL PERFORMANCE - LISTED COMPANIES ON EUROZONE STOCK MARKETS

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ABSTRACT

The performance evaluation of a company might be based on financial and non-financial factors. However, on top of the main key performance indicators is always profitability. The return on assets and the return on equity are the most used ratios/indicators used to determine financial performance. Therefore, taxation is always a factor that influences the profitability of any business. The tax burden, measured by the tax effect or by the effective tax rate, is an important factor determining the financial performance of companies listed on stock markets. The higher the tax burden (i.e., the lower the tax effect or, the higher the effective tax rate), the lower the profitability and, consequently, the financial performance. Therefore, the differences in the tax law might have an impact on profits taxation. This study aims to analyse the effect of corporate income taxation (tax effect) on return on equity (ROE) of listed companies of eurozone stock markets. The data was collected from listed companies' financial statements in the Eurozone during 2018 (Orbis database). The final sample is based on 750 listed companies from several activity sectors and located in different Eurozone countries. The research results were obtained using the Ordinary Least Square (OLS) regression method. The return on equity average is approximately 12,7%. The tax effect average is approximately 71,4% (i.e., 28,6% in terms of effective tax rate). Therefore, the influence of the tax effect is significant. The results suggest that for the companies listed in the Eurozone stock market, a variation of 1% in the fiscal effect generates a 1,243% variation in the same direction of the ROE. The relationship is positive, as was expected.

Keywords: *DuPont model, regression analysis, ratio analysis, return on equity, tax effect*

1. INTRODUCTION

The performance evaluation of a company might be based on financial and non-financial information. The financial analysis adopts financial data to assess a company's performance and make projections of how the company will perform in the future. It allows recognising changes in financial trends, knowing the performance of a company and understanding its evolution. Profitability is the key when performing financial statement analysis. Profitability is the company's ability to generate profit within a certain period and show how attractive the economics of the business are.

In practice, financial performance and profitability are measures of the results of a company's policies and operations in monetary terms (Sultan, 2014). The return on equity (ROE) and the return on assets (ROA) are the most used indicators/ratios to determine financial performance. Both ratios are based on net income. Therefore, taxation is always a factor that influences the profitability of any business. The tax burden, measured by the effective tax rate (ETR) or by the tax effect (inverse of ETR), is an important factor that determines the financial performance of companies listed on stock markets. The higher the tax burden measured by the ETR, the lower the profitability and, consequently, the financial performance; the higher the tax burden measured by the tax effect (i.e., lower values), the lower the profitability and, thus, the financial performance. This study aims to analyse the tax effect of corporate income taxation on listed companies of eurozone stock markets. For this purpose, we use the DuPont model as a starting point to identify the main factors that have an influence on profitability (return on equity). One of the main factors is the tax burden, measured by the tax effect. Thus, in this study, we analyse the impact of the tax effect on ROE. The data was collected from listed companies' financial statements in the Eurozone during 2018 (Orbis database), and the final sample is based on 750 listed companies from several activity sectors and located in different eurozone countries. The research results were obtained using the Ordinary Least Square (OLS) regression method. The paper is organised as follows: after this introduction, in point two, we present a brief and relevant literature review; in point 3, we describe the research method, explain the data and sample selection, and describe the empirical study; point four, is dedicated to the results discussion; Finally, the main conclusions and the implications of our findings are presented.

2. LITERATURE REVIEW

A company's performance evaluation is an inseparable part of the management role, essential to define the impact of management decisions, the direction of the activity results and the decisions that must be taken to improve the results (Narkunienė & Ulbinaitė, 2018). This evaluation consists of measuring what had been achieved by a company in a certain period to obtain useful information related to flow of fund, the use of fund, effectiveness and efficiency, and it helps the managers make the best decisions. Performance evaluation has been mainly conducted based on financial information by analysing indicators of profitability, liquidity, solvency, and other financial ratios/indicators.

2.1. Profitability and return on equity

Profitability is one of the main objectives of all companies, to allow its survival and growth in the current competitive market economy and indicates whether the company has good prospects in the future; thus, each company intends to improve profitability. Several studies analyse the profitability of companies in different countries and industries using financial indicators such as return on total assets (ROA), financial return and invested capital (ROIC), where the elements considered express working capital. Still, other studies evaluate the performance considering profit before interests and taxes (EBIT), economic value added (EVA), return on equity (ROE) and operating profit margin (Popa & Ciobanu, 2014). The relationship between profitability and internal and external factors was also very studied (Xianyu, 2011; Chaddad & Mondelli, 2013), but, in some cases, the results were inconclusive (Al-Jafari & Samman, 2015). In this way, Popa and Ciobanu (2014) quantified the performance of the Romanian SMEs companies using ROE and ROIC. They adopted the OLS model to analyse whether some factors can influence the profitability and the results were significant for most of them. Hence, ROE is one of the major indicators adopted in the financial analysis of the companies that measure the ability of shareholders' equity to generate a financial return. It is calculated by dividing net income by shareholders' equity and analysing the profitability on the equity investor's perspective on its net profits (net profit after tax and interest expenses) relatively to

the book value of equity investments. It is relevant for investors, knowing about the creation of additional value (Eiteman, Stonehill, & Moffet, 2002) and for entrepreneurs and managers, helping them in the decision-making process (Burja, 2011; Chandrapala & Guneratne, 2012; Chandrapala & Knapkova, 2013; Charles et al., 2018). Investors and entrepreneurs can assess if their investment is profitable or not, analysing the global efficiency rate (Popa & Ciobanu, 2014).

2.2. Tax burden and profitability

One important factor that influences the profitability of any business is taxation, particularly income taxation. Clausing (2007) studied variation among OECD countries in the size of corporate income tax revenues relative to GDP over 1979-2002 and observed a parabolic relationship between tax rates and revenues, implying a revenue-maximising corporate income tax rate of 33% for the whole sample. The author also concluded that this revenue-maximising rate decrease as economies are smaller and more integrated with the world economy. In another cross-country study, Devereux, Lockwood and Redoano (2008) analysed 21 OECD countries between 1982 and 1999 and found evidence that countries compete over the statutory tax rate to attract mobile profit. Overesch (2005) studied the effective tax burden of companies in EU member states in 2005 and observed remarkable differences between countries. He concludes that, from the point of view of each country, cutting the statutory profit tax rate seems to be a favourable strategy because it improves the position in the international tax competition on both real investments and mobile taxable profits. Alyeksyeyev et al. (2018) analysed the income tax rates in different countries and concluded that companies' taxation negatively affects the companies; the most effective optimisation of the tax burden can only be achieved with comprehensive carrying out on the local and macro-economic measures of influence. Also, at the macroeconomic level, other studies observed a negative relation between the level of companies' taxation and the economic activity (Koester & Kormendi, 1989) and the GDP growth (Plosser, 1992). Baker (2018) studied the influence of the corporate tax rate in the less developed countries, using data of 14 countries over the period between 1980 and 2006. The analysis showed that although the corporate tax rate has decreased, corporate tax revenues have been increasing. The corporate tax rate is increasing in the personal tax rate. Constantin (2012) studied the influence of financial indicators, such as the assets' structure, the degree of indebtedness, the company size and the rates of return on the ETR, using data of 90 Romania companies for the year 2012. He concluded that financial profitability indirectly influences the effective income tax rate and negatively links the ETR and leverage. An interesting approach to income tax is the influence on financial performance. Ngobo and Stefani (2001) validated that financial performance is correlated to the activity sector, diversity and heterogeneity of economic entities using a model that includes ROA, ROI, and q Tobin indicators. Stefanescu et al. (2018) analysed the possible influence of income tax over a company's performance in a sample of 20 companies listed on the Bucharest Stock Exchange for the period 2013-2015. They demonstrated that ETR influences a company's financial performance negatively. They found the ETR negatively affects both dependent variables (ROE and net profit's margin rate). An increase of tax rate by 1% determines a decrease of ROE in 0.3135 percentage points, and when the effective tax rate increases by 1%, the net profit's margin rate decreases by 0.2868 percentage points. In the sector service, Fang et al. (2019) investigated the impact of the tax burden and regulations on the development of this sector and concluded a significant and negative effect. However, the effect varies by economic development level, economic cycle, and industry categories. Xianyu (2011) adopted a multiple regression model with a sample data from 2000 to 2009 of listed companies in China. He found that the tax burden on the macro and micro-operating performance significantly negatively impacted these companies. Different studies analysed the effect of corporate income tax on financial performance and the results

differ according to the country and the industry. A negative relationship between corporate income tax and financial performance/profitability was revealed in Ghana (Gatsi et al., 2013), Tunisia (Assidi et al., 2016) and Romania (Pitulice et al., 2016). In listed consumer goods companies in Nigeria, from 2006-2016, Junaidu and Hauwa (2018) found an insignificant negative relationship between corporate tax and financial performance using the ROA as a measure. Otwani et al. (2017) studied listed companies in Kenya and obtained different results. They found a positive relationship between corporate income tax and the financial performance of these companies. Vržina and Dimitrijeviæ (2020) studied a particular sector – the agricultural companies in Vojvodina – and their results revealed that nearly 69% of observations have a current effective tax rate and cash effective tax rate of 0%. These results indicate that agriculture is an industry with an exceptionally low corporate income tax burden. Abiahu et al. (2020) examined the effect of corporate tax on the sustainable financial performance of 10 manufacturing listed companies in Nigeria in 2013-2017. The results revealed that corporate tax payment has no significant effect on the ROE. Still, it has a positive and significant effect on the debt-to-equity ratio.

2.3. The DuPont Model

The DuPont model was created in the early 1900s, but it is still a model valid for assessing profitability (Sheela & Karthikeyan, 2012). The model was first introduced by F. Donaldson Brown in the General Motors Corp. when he was given the task of cleaning up the finances in this giant company. The DuPont model is credited to Brown as he attempted to find a mathematical relationship between two commonly computed ratios, namely net profit margin and total asset turnover. The original DuPont model was firstly used in the internal efficiency report, which was the product of two often-computed ratios, net profit margin (a measure of profitability) and total asset turnover (a measure of efficiency). With ROA being affected by a profitability measure and an efficiency measure, the DuPont model became a widely used tool of financial analysis (Liesz, 2002). The formula of the original DuPont model is illustrated below in equation 1 (Liesz, 2002; Soares and Galdi, 2011; Mubin et al., 2014).

$$ROA = \frac{\text{net income}}{\text{sales}} \times \frac{\text{sales}}{\text{asset turnover}} = \frac{\text{net income}}{\text{asset turnover}} \quad [1]$$

Later, in the 1970s, emphasis on financial analysis shifted from ROA to ROE, and the DuPont model was modified to include the ratio of total assets to equity (Little et al., 2011). To obtain deep information about the factors that have an influence on ROE, the DuPont model states that ROE depends on three factors: "net profit margin", "assets turnover", and "leverage" (Ferreira et al., 2019). A new modification was introduced by Hawawini and Viallet (1999) to add two more factors, consisting of a total of five ratios combined to form the ROE. The equation suggested by the previous authors has been stated as follows (equation 2):

$$ROE = \frac{\text{net income}}{EBT} \times \frac{EBT}{EBIT} \times \frac{EBIT}{\text{revenue}} \times \frac{\text{revenue}}{\text{total assets}} \times \frac{\text{total assets}}{\text{shareholder's equity}} \quad [2]$$

In this formula, EBIT is the earnings before interest and taxes, EBT is the earnings before taxes, and the ROE is equal to (*tax burden* × *interest burden* × *EBIT* × *EBIt margin* × *total assets turnover* × *leverage*). The tax burden (perspective of tax effect) measures the effect of taxes on ROE, the interest burden measures the interest burden on ROE, the EBIT margin measures the operating profitability on ROE, the assets turnover measures how effectively the entity uses the assets to generate revenue, and the financial leverage measures the relationship between the equity and total assets (Ferreira et al., 2019).

During this long period, three distinct versions of the DuPont model were created and used to help discover the underlying drivers of profitability and return over time (Little et al., 2011). The last modified version of this model is more complete. It includes the following five factors: tax burden effect, interest burden effect, earnings before interest and taxes (EBIT) margin, assets turnover and financial leverage.

3. METHODOLOGY

The main goal of this research work is to analyse the relationship between the tax effect and the Return on Equity (ROE) of companies located in Eurozone countries. As previously mentioned, ROE is one of the most important ratios/indicators used to determine financial performance. According to the DuPont model, the tax burden, measured by the tax effect or the effective tax rate, influences ROE. Thus, this variable is an important factor determining the financial performance of companies listed on the stock market. For achieving such a goal, financial information from the ORBIS/AMADEUS database was used to conduct the research. The data collected is based on the financial statements of listed companies in the Eurozone in the economic period of 2018. During the data processing arose the need to remove some observations contained in the initial database. Namely, those concerning: (i) companies whose net profit for the period was shown to be higher than the profit before tax, a situation that possibly reflects the accounting treatment of deferred taxes established in financial accounting standards; (ii) companies with "tax effect" and "financial charges" ratios higher than one, for the reason previously mentioned, where there is a significant positive effect on results before tax; (iii) companies whose variables are not defined or do not present a value. For obtaining viable and coherent analysis results, it is worth mentioning that the database does not present unrelated data, data falling into the criteria abovementioned, or non-existent data. In these cases, observations were eliminated so that there would be no bias in the results. After data processing, a final sample consisting of 750 companies was obtained. Regarding their absolute and relative distribution by country, the following should be highlighted. France (22.8%), Germany (21.6%) and Italy (15,9%) are the economies where most companies in the sample are located (60.3% of all companies in the sample). For each remaining Eurozone country, the number of companies considered in the sample ranges from 5,9% in Spain, Belgium, or the Netherlands and 0.5% in Latvia or Slovakia. In Portugal are located 2.7% of the total sample companies. In the sense of the proposed analysis, to study the relationship between the Return on Equity and the tax effect will be applied the linear regression methodology, known as the Ordinary Least Squares (OLS) method. The method is intuitively applicable and mathematically simple. Its name comes from its purpose. With the use of the OLS method, the objective is to adjust a set of estimated values to the real values of the variable under study, minimising the sum of squares of the residuals (differences between estimated and actual values). The estimation is performed through a linear regression to identify and quantify which variables explain (the explanatory or independent variables) another variable, which is the object of study (dependent or explained variable) (Gujarati, 2003). In the specific case of this study, by applying the OLS method, the aim is to understand if the tax effect influences the Return on Equity and, if it influences, quantify the influence of changes on the tax burden on the Return to Equity. The model to estimate is given by the following equation (equation 3):

$$ROE_i = \alpha + \beta_i Tax Effect_i + \varepsilon \quad [3]$$

Where ROE is the dependent variable, Tax Effect is the explanatory variable, α is the model constant, β_i is the estimated coefficient and ε the error term. Note, $i = 1, 2, \dots, n$ represent the observations in the model since the database is cross-sectional. An additional mathematical transformation is done.

The variables will be present in a logarithmic form. The conversion allows the estimated coefficient to be read as a percentage. On the other hand, it will enable the range of values used in the regression to be reduced. The accuracy of the model fit may be evaluated using a set of indicators and tests. The coefficient of determination (R^2) indicates the percentage in which the variations in the explained variable are explained by variations occurring in the explanatory variable. A larger value indicates a better accuracy of fit, i.e., a better model. The Student's t-test allows verifying that the estimated coefficient is statistically significant and should be considered as correctly predicting changes in the explained variable. It should be noted that the OLS method is one of the traditional methods of inferential analysis most used in economic research (Wooldridge, 2012). In the specific case of applying the DuPont model, several articles have been published in recent years that use this method, which validates and justifies its use in this study (Warrad & Nassar, 2017; Gaweda & Sajnog, 2020).

4. RESULTS AND DISCUSSION

For preparing the inferential analysis and make the data under study known, a descriptive analysis of the data and Pearson's linear correlation analysis are first performed. The statistical distribution of data is presented in Table 1. The distribution presents the main indicators of centrality (mean) and variability of the distribution (standard deviation and the minimum and maximum distribution values). In addition, the number of observations for each variable and the respective unit of measurement is presented. It should be noted that, for a more simplified analysis of the data obtained, the values of the return on equity and the tax effect ratios are multiplied by 100 to show values in percentage.

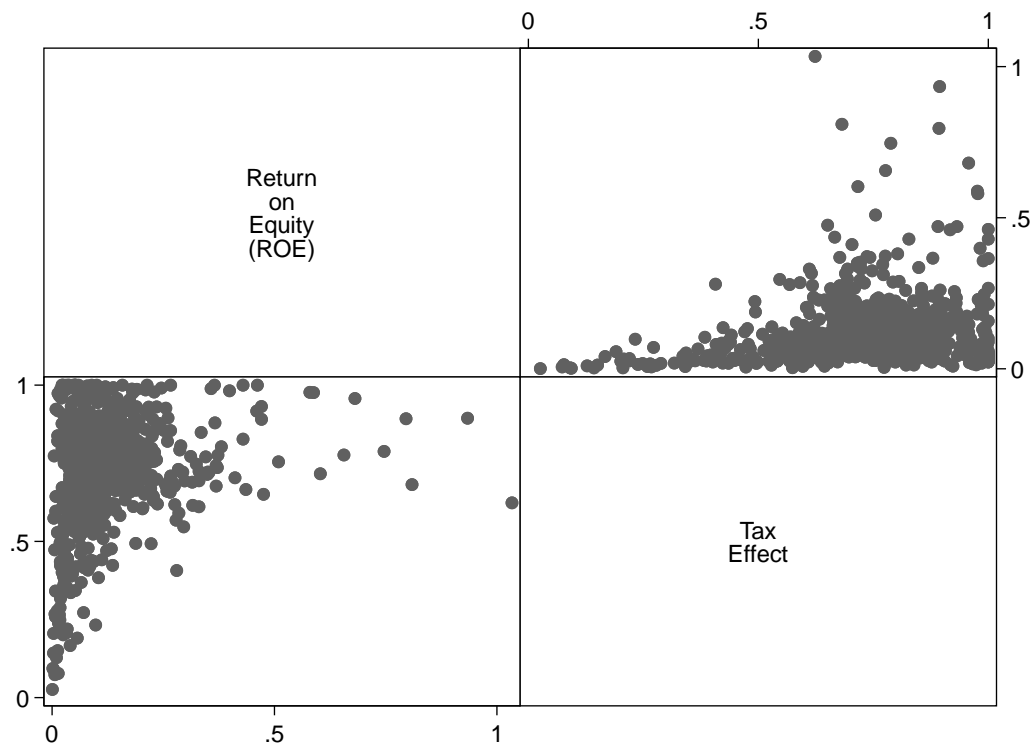
Table 1: Statistical distribution

	Nº	Unit of measurement	Mínimum (%)	Maximum (%)	Mean (%)	Standard Deviation (%)
Return on Equity	750	Rácio	0.1	103.4	12.7	11.3
Tax Effect	750	Rácio	2.6	100.0	71.4	17.1

(Source: Author's elaboration)

On the Eurozone listed companies, the Return on Equity varies between 0.1% and 103.4%, with an average value of 12.7%. The Return on Equity indicates the percentage of profit for each euro invested, so for each euro invested, the companies under study receive an average profit of 12.70% (i.e., 0,127€). The standard deviation is 11.30%, which shows the values are widely dispersed from the average value. The tax effect variable varies between a minimum value of 2.6% and a maximum value of 100%. The tax effect variable is calculated by the difference between 1 and the effective tax return, i.e., tax effect = 1 – effective tax rate (tax/profit before tax). Therefore, the relationship between the variables is inverse since the higher the tax effect value, the lower the tax burden, and vice versa. Companies with a zero value of tax effect present the maximum tax burden of this variable (income before tax = income tax). A minimum value of 2.6% tax effect indicates the existence of firms for which the effective tax rate effect reaches approximately 97.4%. The average value of the variable, 71.4%, indicates that the average effective tax rate for the sample is 28.6%. The standard deviation has a value of 17.3%, which reveals a perception that each company deviates, on average, either positively or negatively, from the average value by 17.3%. The distribution of the ROE (above) and the tax effect (below), ranging from 0 to 1, for each one of the 750 companies listed in the Eurozone stock market can also be observed in Figure 1.

Figure 1: Distribution of the observation by variable on a 0 to 1 scale.



(Source: Author's elaboration)

In the following table (Table 2), in addition to the values obtained in Pearson's correlation between the pair of variables, considering both the original values and the logarithmic values, the level of statistical significance of the correlation is presented.

Table 2: Pearson correlation between variables

	Original values		Logarithmic values	
	Return on Equity	Tax effect	Return on Equity	Tax effect
Return on Equity	1	1	1	0,487**
Tax Effect	0,245***	0,245***	0,487**	1

Note: *** indicates statistical significance at 1% level of significance, ** indicates statistical significance at 5% level of significance.

(Source: Author's elaboration)

From the observation of the correlation matrix presented above, it is possible to conclude the ROE shows a statistically positive relationship with the tax effect (the higher the tax effect value, the greater the return on equity). The relationship is a moderate one (Mâroco, 2011) and smaller for the original values than for the logarithmic values. After performing the descriptive and correlation analysis of the study sample, it was found that the values are not evenly distributed. It can be deduced that the observations are heterogeneous. Considering the pattern of the variables under study, the OLS is sensible to heterogeneity, and the estimated results of the OLS method may be subject to biases. In order to minimise and limit this problem, the logarithms corresponding to each of the variables analysed were calculated. The logarithm of the data of the study variables has several advantages such as: (i) a greater homogeneity of the values; (ii) a greater levelling of the value of the observations, so that variations are not reflected; and (iii) an analysis of results in terms of growth. From the literature review and the descriptive analysis above made, it is expected a positive influence on the tax effect on the Return on Equity.

The OLS method will allow calculating the importance of the influence. Table 3 presents the OLS estimation results – it is possible to observe the estimated coefficients, standard deviation, and individual statistical significance. Moreover, is presented the coefficient of determination.

Table 3: OLS estimation results

Variables	Estimation Results		
	Estimated coefficient	Standard deviation	Statistical significance
Constant	-1,915	0.042	***
Tax effect	1.243	0.815	***
Observations (number)	750		
R2	0,237		

*Note: *** indicates sstatistical significance at 1% level of significance
(Source: Author's elaboration)*

From the observation of the above table, the tax effect is not alone a very powerful explanatory variable for the ROE. Indeed, the changes in the Return on Equity depend on a more significant number of explanatory variables. However, the coefficient of determination indicates the changes in the tax effect explain almost 24% of the changes observed in the companies' ROE. The results suggest that for the companies listed in the Eurozone stock market, a variation of 1% in the fiscal effect generates a 1.243% variation in the same direction of the ROE. The relationship is positive, as was expected. The results are in line with other studies previously mentioned. Regarding the negative impact of taxation in ROE that significantly influence profitability, see, for example, Alyeksyeyev et al. (2018), Stefanescu et al. (2018). A similar trend (negative relationship between corporate income tax and financial performance/profitability) was found by Gatsi et al. (2013) in Ghana or by Assidi et al. (2016) in Tunisia and Pitulice et al. (2016) in Romania. Nonetheless, we need to consider if the tax variable used is the tax effect or effective tax rate when comparing the results.

5. CONCLUSION

Several factors might have an influence on the financial performance of a company. The main goal of this study is to analyse the tax burden of corporate income taxation on listed companies of Eurozone stock markets. For this purpose, we use the DuPont model as a starting point to identify the main factors that have an influence on profitability (return on equity). One of the main factors is the tax burden, measured by the tax effect in the DuPont model. The others are the interest burden, the EBIT margin, the total assets turnover, and the leverage. Considering the sample based on 750 companies listed in the Eurozone stock markets (the data was collected from the financial statements for 2018 and was available on the ORBIS Database) was found the following evidence:

- 1) on average, the return on equity for the global sample was 12.4%;
- 2) on average, the tax effect for the global sample was 71.4% - in other words, the average of the effective tax rate was 28.6%;
- 3) the results suggest that for the companies listed in the Eurozone stock market, a variation of 1% in the fiscal effect generates a 1.243% variation in the same direction of the ROE. The relationship is positive, as was expected.

Therefore, the tax effect plays an important role to explain the return on equity and the performance of financial listed companies in the Eurozone stock market. Consequently, the tax effect factor is a relevant variable that influences Eurozone companies' competitiveness and an essential element to be considered for decision-making concerning tax planning and foreign investments. Future research based on a country-by-country analysis will also be relevant to determine the differences in the tax effect behaviour inside the Eurozone countries.

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