Analysis of Correlation Between Gross Domestic Product and Corporate Income Tax in the European Union Countries

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Abstract

The purpose of this paper is to analyze Gross Domestic Product and Corporate Income Tax in European Countries for the period 2004-2013. The main objectives aimed at presenting the theoretical point of view of Gross Domestic Product and Corporate Income Tax, analysis of the indicators in the countries of the European Union compared to Romania. The scientific approach is based on information from national and European literature, the documentation of practice carried out by Eurostat. The expected results are to establish a link between Gross Domestic Product and Corporate Income Tax by the F-test significance of the linear correlation coefficient. In formulating the thesis I opted on combining quantitative research qualitative research in order to obtain the expected results. As a result of the research undertaken, research tools pertaining to the two types of methodsliterature review, statistical study, comparison, descriptive analysis, graphical representation, the case study method, data interpretation.

Keywords: Gross Domestic Product, Corporate Income Tax, Correlation, Evaluation
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Introduction

Work done by an operator is directed towards making a profit. The state, according to its right to set taxes to procure resources, taxing the profit (Țâțu et al, 2009, p.109).

Profit maximization as a firm goal has traditionally been meet with suspicion in the literature on business ethics, being seen as either immoral or amoral. It is argued herein that this practice should be evaluated according to rule-consequentialist ethics, but supplemented with elements that are more of a deontological ethical character. When seen from this point of view, profit maximization may be seen as ethical. This requires, however, that a number of institutional and other requirements are fulfilled (Koch, 2010, p. 270).

Without financing frictions, profit taxes reduce investment by their effect on the user cost of capital. With financing constraints, investment becomes sensitive to cash-flow (Keuschnigg et al, 2013, p. 808).

Literature review

The literature in the field encounters a series of definitions of the notions of corporate income tax that you present below.

A tax first definition is: "a form of compulsory charging and unconditional definitively to the State, part of the income and wealth of individuals and / or legal, to meet the needs of society generally understood" (Risti, 2009, p. 27). Another definition of taxes is "taxes are sampling form part of the income or wealth of a natural or legal person that has binding is carried out in non-refundable and no direct consideration and equal amount from the state" (Vintilă *et al*, 2013, p. 9).

In respect of recorded profit is determined as the difference between revenues (higher) and expenses (less) they carry out economic unit, within a certain period of time - months, quarters, semesters, years - depending on how the is analyzed. Revenue refers to those obtained from sales

of products, execution of works and services and the expenditure relates saddle of achieving revenue (Hada *et al*, 2015, p. 36).

Gheorghe Bistriceanu defines profit as "own economic category of market economy. Gain the advantage obtained by a natural person or legal form of a monetary economic activity, the execution of works or services over its costs. Profit is calculated as the difference between receipts and expenses or the difference between the wholesale price and the cost of the product, work or service + VAT (excise)" (Bistriceanu, 2001, p. 150).

Tax characteristics are: "Tax is a levy cash; Tax is a compulsory levy imposed and collected by the state through its power; Tax is a levy in the State which has financial, as the sums collected are used to support the state's public its financial obligations or its institutions, and its intervention in economic or social purpose; Tax does not involve direct and immediate consideration. In exchange for the tax payer get consideration as indirect use of public services and not a direct consideration, which would mean that the tax would be the price of a service received. Also, there is no equivalence between paid tax to fund public services and their amount received in return. With this feature taxes are different from taxes, where there is a direct counter-serviced report; Has a final tax levies under this head are not repaid any of the contributors cannot claim a direct payment from the state based on taxes paid. This feature distinguishes taxes for public loans interest bearing and repayable; Tax has no destination specified as once collected; they depersonalize their use being made globally for the duties and functions of the state; Sits on income tax, wealth or expenditure, the tax being due only when registering income, possession or transfer of ownership of property or the expenses provided by law; Tax is payable by individuals or legal entities; Tax is paid regular payment frequency being established by law. The role of tax derives from the fact that the creation and perception of the state causes a significant redistribution of GDP. This role is manifested in financial, economic and social manifestations different from country to country and sometimes from one period to another even more important in countries. The most important role of taxes in most countries is financial, the State procure the bulk of financial resources for funding government expenditure to the benefit of taxpayers, while also pursuing neutrality" (Dănuleţiu, 2015, p.102).

Mihaela Onofrei shows that profit the following functions: Synthetic indicator for assessing the efficiency of capital and the conduct of business; Source of cash flow; Leverage the incentives of shareholders and members, to individual owners and employees; Source covering the leveraged; Source of supply to the national public budget; Means of economic management and financial control (Onofrei, 2004, p. 262-263).

Corporate Income Taxes: taxpayers, tax rates

In Romania tax is regulated by Law no. 227/2015 regarding the Fiscal Code, as amended and supplemented, Title II - Income taxes.

According to the provisions of the Tax Code in effect, be required to pay corporate tax payers following categories:

a) Romanian legal persons, such as: national companies, national societies, autonomous administrations, agricultural cooperatives, cooperative societies, financial institutions and credit institutions, foundations, associations, organizations and any other entity that has the legal status of legal entity incorporated under Romanian law;

b) foreign legal persons carrying out activities through a permanent/multiple permanent establishments in Romania;

c) foreign legal persons who exercise the place of effective management in Romania;

d) foreign legal persons deriving income from the transfer of real estate located in Romania or any rights on these properties, including rental or lease of goods real property located in Romania, from natural resources located in Romania, and the sale-assignment of shares held in a Romanian legal entity;

e) legal entities with headquarters in Romania, according to established EU law.

In addition to the categories listed above contribute to paying income tax, there are a number of Romanian legal persons exempted so: the State Treasury; public institution, with the exception of the economic activities; Romanian Academy and foundations set up by the Romanian Academy as

sole founding, except for those economic activities; The National Bank of Romania; Deposit Guarantee Fund in the banking system; Investor Compensation Fund; Private pension guarantee fund; Romanian legal entity paying enterprises' income tax etc.

The corporate income tax rate in Romania is 16%. In addition to this flat, we have 5% share applicable taxpayers performing night bars, nightclubs, discos and casinos. Taxpayers who engage in such activities and where the corporation tax payable for those activities is less than 5% of those revenues are obliged to pay tax at the rate of 5% of these revenues recorded.

Tax result is calculated as the difference between revenues and expenses recorded in accordance with applicable accounting rules, net of non-taxable income and tax deductions and deductible expenses plus. The positive tax result taxable profit and the result is negative fiscal tax loss. Tax result is calculated quarterly annual, cumulative from the beginning of the fiscal year. In determining the fiscal result, taxpayers are required to record in the register of registered taxable income tax in a fiscal year and expenses incurred for business purposes, the same fiscal year, including those covered by laws in force.

In the category of *taxable income* includes the dividends received from a Romanian legal entity; dividends received from a foreign entity paying income tax or similar tax profit corporation, located in a third country with which Romania has concluded an agreement for avoidance of double taxation; value of shares amounts of new or increasing the nominal value of the existing equity shares; income from cancellation of recovery, including re-invoicing of expenses for which no deduction was granted, income from the reduction or cancellation of provisions for which no deduction was granted, the income from the reimbursement or cancellation of interest and/or penalties for which no deduction was granted, and income representing cancellation of the reserve recorded as a result of participation in the capital of other legal nature or due to the capital increase legal entity to which hold equity securities; Deferred income tax revenues; revenues stipulated in the agreements and memoranda; compensation received based European Court of Human Rights and others. Among *non-deductible expenses* include corporate tax and expenditure of the taxpayer's own tax due, including those representing differences from previous years; interest/delay penalties, fines, forfeitures and penalties; expenditure on assets such as stocks or depreciable fixed assets discovered as missing or damaged attributable; expenditures made in favor of the shareholders or associates; expenditure on insurance premiums; expenses of sponsorship and/or patronage and expenditure on private exchanges; expenses recorded in the accounts, which are based on a document issued by a taxpayer declared inactive etc. In addition to non-deductible expenses in their entirety, the Tax Code of Romania presents expenses *limited deductibility*, such as entertainment expenses, social expenses, expenses representing meal vouchers and holiday vouchers provided by employers, perishability, losses handling/storage provisioning costs/impairment adjustments and reserves, interest costs and foreign exchange differences, depreciation etc.

In the European Union member countries the Corporate Income Tax Rates recorded different values, as described in the figure below:

Figure no. 1 Top statutory corporate income tax rates in EU countries in 2015

Top statutory corporate income tax rates %
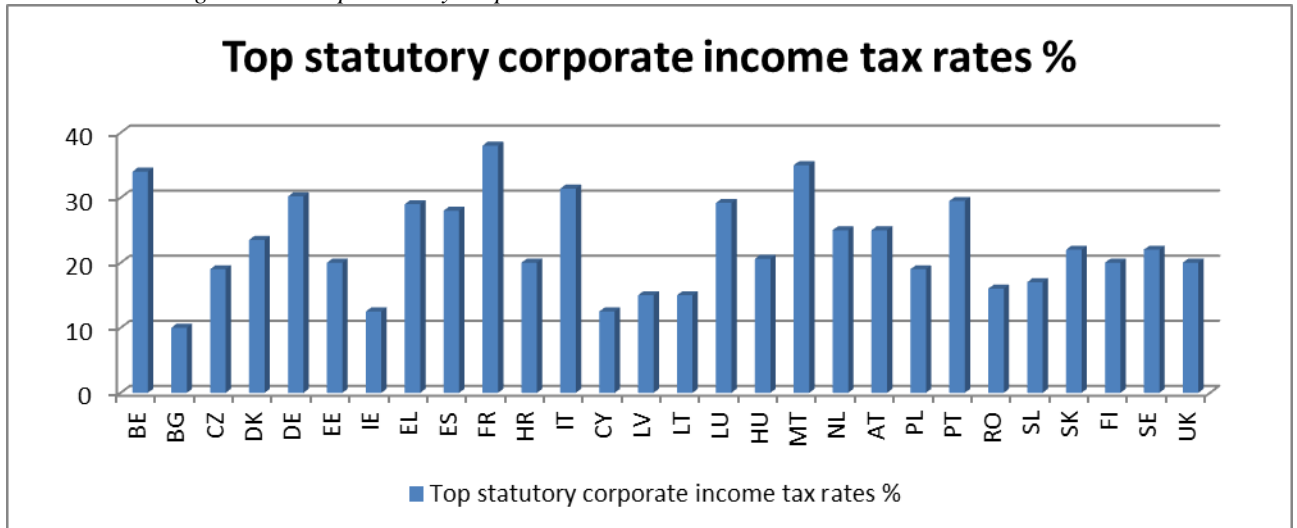
Source: own processing after Eurostat data

From the above chart we can see that the highest level of corporate income tax rates of 38% is registered in France, followed by 35% in Malta, 34% in Belgium. Lowest corporate income tax rates recorded in Cyprus 12.5% and 10% in Bulgaria.

In Romania compared to EU countries the corporate income tax rate remains at a high level (16%) hovering over EU share (28) of 22.8 %.

Analysis of Gross Domestic Product in the European Union

The GDP represents the synthetic expression of the results of the economic activity produced inside the economic environment in a certain time span, irrespective of the contribution of domestic or foreign participants. Gross Domestic Product shows the economic activity in a country (Iuga et al, 2013, p.72).

Related to this indicator, from the figure no. 2, the following can be noticed:

Figure no. 2 The evolution of GDP per capita in 2013 from UE Countries

GDP per capita in PPS 2013
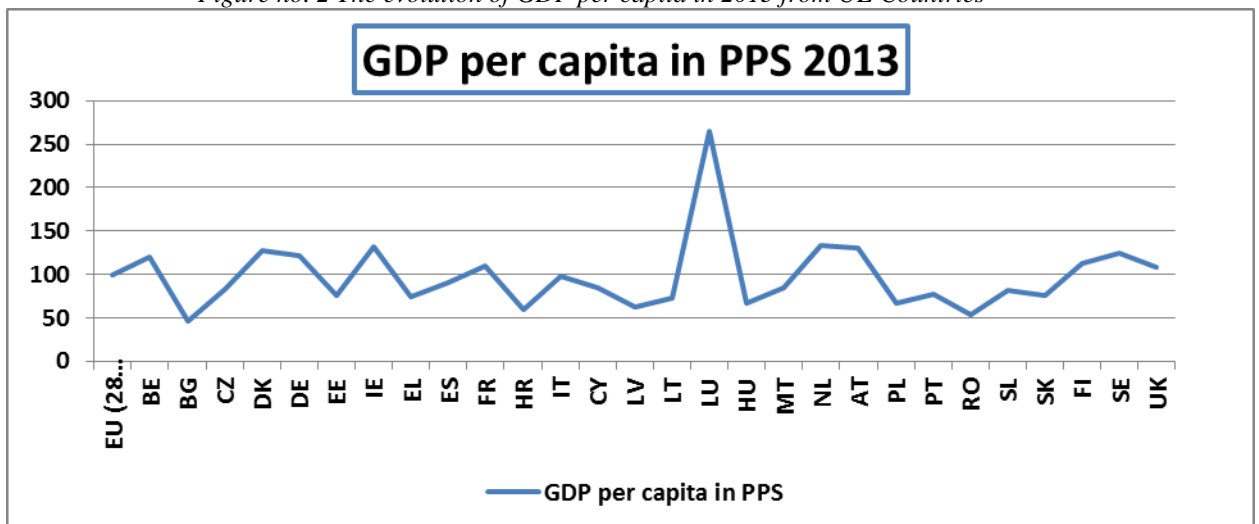
Source: own processing after Eurostat data

The highest values of the GDP per capita in the year 2013 are in Luxembourg (265%), Netherlands (133%) and Ireland (132%) and the lowest in Romania (54%) and Bulgaria (46%). We specify that the value of GDP per capita for each country in the European Union, is shown compared to the EU-28 countries (100%).

The analysis of the correlation between GDP per capita and rate of corporate income tax as % of GDP, conducted with the help of the f-test of significance of the linear correlation coefficient

We wish to establish a correlation between GDP per capita and Rate of Corporate Income Tax as % of GDP in European Union countries in the period 2004-2013 with the help of the F-test of significance of the linear correlation coefficient. In our case: X – GDP per capita, and Y – Rate of Corporate Income Tax as % of GDP is the influenced factor. In order to estimate the coefficients of the simple linear econometric model we must determine the defining parameters:

Table no. 1 Correlation matrix

X \ Y	50	150	250	TOTAL
12,5	0	1	0	0
7,5	5	4	8	17
2,5	146	115	1	262
TOTAL	151	119	9	279

Source: processing of data collected from Eurostat

Based on the above formula and on the correlation matrix we obtained the following values

M(X)	M(Y)	M(X*Y)	$\text{cov}(X,Y)$	σ_X^2
99,10	2,8	298,83	21,35	3144,36

The stages of the F-test:
1. Formulating the hypothesis:

$H_0 : R_{01} = 0 \Rightarrow$ the linear model is not adequate

$H_1 : R_{01} \neq 0 \Rightarrow$ the linear model is adequate

2. Based on the data collected on the sample volume of *279* with respect to the variables *X* and *Y*, the linear correlation coefficient estimator is obtained $\hat{R}_{01}$.

Where:

$$\hat{R}_{01} = \sqrt{1 - \frac{\det M}{m_{00} m_{11}}} = \frac{\text{cov}(x,y)}{\sigma_x \sigma_y} \qquad M = \begin{pmatrix} m_{00} & m_{01} \\ m_{10} & m_{11} \end{pmatrix} \qquad \sigma_X^2 = \frac{\sum_{i=1}^{R}(x_i - \overline{x})^2 N_i}{\sum_{i=1}^{R} N_i} \equiv m_{01}$$

σ_X^2	σ_Y^2	$\widehat{\det M}$	$\hat{R}_{01}$
3144,36	1,43	4218,95	0,24

$$\sigma_Y^2 = \frac{\sum_{i=1}^{R}(y_i - \overline{Y})^2 N_i}{\sum_{i=1}^{R} N_i} = m_{00}$$

$$\widehat{\det M} = m_{00} * m_{11} - m_{10} * m_{01} \qquad m_{10} = m_{01} = \text{cov}(X,Y) = M(X \cdot Y) - M(X) \cdot M(Y) \equiv 21,35$$

Since we will say that at a sample level, the linear model is adequate to the data.
3. The statistic *F-test* is based on a random variable,

$$F = \frac{R_{01}^2 \cdot (n-2)}{(1 - R_{01}^2)},$$ which follows Fisher's law of probability, with $v_1 = 1$ and

$v_2 = n - 2 = 279 - 2 = 277,$ degrees of freedom.

Based on a risk or a materiality value, $\alpha = 5\%$, we determine from Fisher's table, corresponding to

$v_1 = 1$ and $v_2 = 279 - 2 = 277$ degrees of freedom, a tabular value $F_{\alpha,1,n-2} =$ the hypothesis will be accepted at [0; 3.84].

5. Based on the data obtained on the sample, we calculate a particular value of the variable:

$$F_{calc} = \frac{\hat{R}_{01}^2 \cdot (n-2)}{(1 - \hat{R}_{01}^2)} = 17$$

Because *Fcalc* doesn't belong to the distribution [0; 3.84], we reject the null hypothesis and accept the alternative hypothesis, therefore, $R_{01} \neq 0$, so we can conclude that *F test explains quite well the correlation between GDP per capita and Rate of Corporate Income Tax as % of GDP* for a materiality value of 5%.

Conclusions

From the analysis of GDP per capita in the countries of the European Union in 2013, we see that only industrialized countries have a value above the EU limit (28) of this indicator, namely: Luxembourg, Denmark, Germany, Ireland, Austria and Netherlands. The level of this indicator in Romania are below the EU (28), namely 53% to 100%.

Regarding the corporate income tax rates we notice that the highest values are in: France, Malta, Belgium. The value in Romania at the corporate income tax rates is 16% over the value recorded by the EU (28) of 22.8%.

Calculating the GDP per capita and Corporate Income Tax as % of GDP showed that there is a correlation between this two indicators but not very strong. GDP may be influence by another factors such as: investments, legislation, purchasing power of population, infrastructure etc.

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