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The Advantages and Disadvantages of Taxation Strategies Applied on MNEs in the European Union

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Abstract. *In the context of globalization, the advantages and disadvantages of the taxation strategies of multinational companies include the scope of taxes collected at the state budget, as well as foreign direct investment inflows, both having the possibility to influence economic growth directly or indirectly. In this paper, we tested with unifactorial linear model the theory that direct investment inflows have an insignificant impact on economic growth as well as the impact of collected taxes on economic growth. The research was carried out on four member states of the European Union, namely Germany, France, Romania and Bulgaria, and the data collected covered the period 2012-2021. The research results highlighted that a developed country that has a lower tax rate generated more foreign direct investment inflows and less corporate taxes collected at the state budget than a developed country that has a much higher tax rate, but taxes had a larger contribution to GDP growth when we consider only this variable. On the other hand, a developing country with an average tax rate but a larger economy generated more foreign direct investment inflows and more taxes collected at the state budget than a country with a lower rate and a smaller economy.*

Keywords: taxation strategies, corporate tax collected, foreign direct investments, economic growth, multinational companies, European Union.

Introduction

Under the globalization, some companies have developed beyond the perspectives and borders of their countries, becoming so-called multinational companies, a fact that generates a series of advantages such as accessing promising markets and factors of production at a lower cost or higher quality. This practice is targeted by companies to create efficiency, competitiveness and ultimately to generate more profits.

In order to generate these advantages, companies that aim to expand their activity in foreign markets must strategically decide the place, respectively the country they will enter. Within this country, companies will place investments to create a framework for development of the activity. These investments are called foreign direct investments.

For any type of economy, foreign direct investments represent a main external source of funding that ultimately contributes to economic growth. Therefore, in the context of globalization, the countries of the world are developing various policies, either of a fiscal nature or any other nature, in order to become more attractive for companies and to increase the foreign direct investments.

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A well-known fiscal policy practice is the application of a low tax rate for companies, the country thus becoming a so-called tax haven, an attractive place for companies due to the low taxation of the profits.

In this context created within globalization, problems started to appear from both fronts. The first front is represented by the countries of the world where a confrontation regarding taxes has been generated to create attractiveness and the second front is represented by the multinational companies that entered the markets with great potential but perhaps with higher taxes and practiced various tax avoidance strategies including the allocation of profits to tax havens.

Certainly, in this situation a plus attracts a minus from the site. Multinational companies save a part of their profits, tax havens also get a smaller part of the profits, but the country where the companies actually carried out their operational activity loses from the taxes collected at the state budget.

To balance the scales, in recent years the countries of the world have debated multiple strategies for taxing multinational companies in order to reach a global consensus, so that in the summer of 2021 an agreement was negotiated within the Organization for Economic Co-operation and Development and the Group of Twenty. The agreement was later agreed by 137 jurisdictions and it implies a reform of the global tax system based on two pillars.

The two pillars assume the establishment of a global tax rate of 15% and also reallocating a percentage of 25% of the residual profits to the country where the company's goods were consumed. These practices were scheduled to be applied gradually from the beginning of 2023.

Given these current global concerns, we decided to approach this topic and develop this paper to find out what are the advantages and disadvantages of the different taxation strategies of multinational companies in the European Union.

To answer this research question, we will focus on the essence and purpose of the taxation strategy of multinational companies, namely, to generate foreign direct investments, taxes collected at the state budget and finally economic growth, which we will highlight using gross domestic product.

In order to make a distinction between developed and less developed countries, we will choose four countries from the European Union, two from the category of developed and two from least developed, one of the two that practices a strategy of taxation with low rates and the other with higher rates.

From these four countries we will take data regarding the evolution of foreign direct investments, corporate taxes collected at the state budget and the evolution of the gross domestic product.

With the help of these data, we will develop econometric analyzes to determine the relationship between foreign direct investments and the gross domestic product on the one hand and to determine how much the gross domestic product increases if foreign direct investments increase by one unit, in the four countries. Analogously, we will make the same analyzes for the link between the corporate taxes collected at the state budget and the gross domestic product.

The results of the analysis will highlight the connection between the mentioned variables and will guide us to determine what are the advantages and disadvantages of applying some tax strategies with low rates or high rates, both at the level of large countries and small ones as far as the tax strategy generates collected taxes and foreign direct investment with an impact on the gross domestic product.

This research is a part of a larger one in which we aim to determine the impact of the new global tax consensus on the member states of the European Union.

Through this part of the research, our contribution in this field is defined by determining the advantages and disadvantages of taxation strategies from the perspective of foreign direct investment, corporate taxes collected and economic growth for both developed and less developed countries.

We hope that the obtained results will be useful in the situation of debating a strategy for the taxation of multinational companies at country level, when the three variables are considered.

Literature review

The relationship between foreign direct investments and economic growth

Beyond its costs, every country wants economic growth, but its approach often brings contradictory opinions because certain measures that may work for one country will have less significant effects for another. Also, some indicators can influence each other or, in a more dramatic case, certain measures can generate the reverse of the medal.

The same happens when foreign direct investments are highlighted in relation to economic growth and even in the opposite relation. In the specialized literature, there are various contradictory opinions related to the subject, but it is certain that they lead to some areas of influence, for example, in the paper of Blomstrom et al. (1992) it was appreciated that technology would be a factor that generates economic growth and for developing countries, technology transfer is carried out with the help of foreign direct investments. In this sense, foreign direct investments would not contribute directly to economic growth but indirectly through technology transfer, productivity, employment and other activities and all of these represent areas of influence of economic growth.

On the other hand, also in the work of Blomstrom et al. (1992) it was appreciated that economic growth generates foreign direct investments, in this sense economic growth is a factor in companies' decisions regarding expansion in foreign markets.

In a more recent work, by Kosztowniak (2016), the same fact was appreciated, namely the fact that the impact of the gross domestic product on foreign direct investments is greater than its opposite, this case being valid in Poland in the period 1992-2012 but contradictory, in the paper of Murari (2017) it was appreciated that both foreign direct investments and domestic investments have a strong impact on economic growth, the study being carried out on a group of countries from South Asia in the period 1980-2013.

Given these results extracted from the specialized literature, we realize that in certain countries foreign direct investments can have an impact on economic growth, as well as economic growth can have an impact on the attraction of foreign direct investments but, as mentioned Sengupta et al. (2020), in all ways there is an association between FDI and economic growth, but there are economic policies that have a role to play in certain countries that explain the differences.

The impact of corporate tax rate on foreign direct investment

Consulting the specialized literature, from previous reports we have already found that economic growth also has an impact on the attraction of foreign direct investments, certainly, a market that becomes bigger becomes more promising for multinational companies, but still taking into account certain criteria such as the mode of access to the market. However, it remains to be seen what impact the corporate tax rate has on the attraction of multinational companies and foreign direct investments, especially given that they have at their disposal various ways to avoid taxation.

We approach as the first reference the paper of Banovic et al. (2020), as this represented a panel analysis of the European Union states in the period 1998-2017 and was composed separately

for the old and new states. Elaborating the analysis, it was concluded that the strategy of taxing multinational companies had a significant impact on foreign direct investments, but nevertheless it did not have the impact that a primary factor had, namely the gross domestic product.

Still starting from the taxation strategy, in the paper of Kersan-Skabic (2015) it was appreciated that the factors that determined the attraction of FDI in the Southeast European Countries are the population, the growth rate, the gross domestic product per capita and wages. The corporate tax rates had an impact, but not as significant as the other mentioned variables.

However, in the paper of Ghinamo et al. (2010) a research was developed on a large number of countries from 1983-2003 to test the impact of economic and political volatility on tax rates, from which it emerged that economic volatility has a negative impact on corporate tax rates but the political one it has no impact to consider. Therefore, economic volatility has an impact on tax rates, but this impact also takes into account foreign direct investment flows.

The relationship between corporate tax collected and economic growth

According to the work of Arvin et al. (2021) taxes collected, institutional quality and government spending are important factors of long-term economic growth. These statements were concluded following the elaboration of a study on different categories of countries in the period 2005-2019.

But in the context of establishing a company taxation strategy, there are some findings that must be considered. As a reference for these we will propose the paper of Clausing (2007) elaborated on the OECD member states in the period 1979-2002, paradoxically, it was concluded that when the taxes of the companies increase, there are decreases in the tax revenues to the state budget, mentioning some ways in which companies respond to taxation. One of the methods involves reducing the company's activity in response to the fiscal change, which generates a loss for the respective country. Also, companies can reduce their activity in locations with high taxes in parallel with increasing activity in locations with low taxes or without interrupting its activity and investments in the country that increased the taxes, the company can allocate the profits in another country with the help of transfer prices, but it can also find accounting solutions to reduce its tax burden or another way.

On the other hand, according to the paper of Gechert et al. (2022) the reduction of tax rates may not have a favorable effect on growth, especially over a short period of time, but considering the change in the rate and the tax base by using an effective average tax rate could have results, but certainly, the behavior of the other budget components must also be considered.

Methodology

In this paper we aim to find out the advantages and disadvantages of taxation strategies applied on multinational companies in the European Union. In this sense, we chose four countries from the European Union, two of them being from the category of developed countries, respectively Germany and France, and the other two from the category of developing countries, respectively Romania and Bulgaria.

We made these choices because Germany over time practiced a tax strategy with low rates of 15%, compared to France which practiced higher rates in the range of 27.5 - 33.33%. Also, Romania practiced taxation strategies with rates of 16%, compared to Bulgaria which practiced rates of 10% and in this way, we can obtain results regarding the advantages and disadvantages of taxation strategies for both developed and developing countries, but also for the practice of a tax strategy with lower rates and with high rates.

To obtain these results, we proposed to focus our attention on the essence of a multinational companies' taxation strategy, that of generating FDI, taxes collected and economic growth.

Therefore, we propose a quantitative analysis using the unifactorial linear regression model that we will apply in relation to foreign direct investments and gross domestic product, in order to test the relationship between them and to find out by how many units the gross domestic product increases when foreign direct investments increase by one unit. In this way, if there is a strong connection between the variables, we could find out if foreign direct investments attracted by lower or higher tax rates generate economic growth.

On the other hand, we will also apply the model in relation to the corporate tax collected at the state budget and the gross domestic product, to determine the relationship between them and how much the gross domestic product increases when the tax collected increases by one unit. In this way we can conclude if a country with a lower or higher tax rate generates more economic growth through the tax collected.

Accordingly, we will note here the equation of the linear regression model:

$$Y = a + bx + u \quad (1)$$

Y assumes the real values of the dependent variable, respectively of the gross domestic product; *x* assumes the real values of the independent variables, for one of the analyzes it will be foreign direct investments and for the second the collected tax; *a* and *b* represent parameters of the model; and *u* assumes the residual variable that signifies the influence of other factors on *Y*.

To elaborate the analysis, we will have to find out if the econometric model is linear. To test the linearity of the model we will make the correlogram of the variables *y* and *x*. To find out the influence of the variable *x* on the variable *y*, we will follow the estimate of the parameter *b*, only if the estimators calculated by the least squares method are of maximum veracity.

The parameter *b* is estimated by the following formula:

$$\hat{b} = \frac{n \cdot \sum y_t x_t - \sum x_t \cdot \sum y_t}{n \cdot \sum x_t^2 - \sum x_t \cdot \sum x_t} \quad (2)$$

In the formula (2), *n* implies the number of observations. The analysis we propose has 10 observations because the data collected covers a period of 10 years, namely 2012-2021.

The analysis will be developed in eViews.

Results and discussions

The following table includes data regarding the evolution of the corporate taxation rate, the corporate tax collected at the state budget, the evolution of foreign direct investments and the gross domestic product in Germany, France, Romania and Bulgaria in the period 2012-2021.

Table 1. The evolution of the corporate taxation rate, the corporate tax collected at the state budget, foreign direct investments inflows and the gross domestic product in Germany, France, Romania and Bulgaria in the period 2012-2021

Country	Ind	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Germany	CTR (%)	15	15	15	15	15	15	15	15	15	15
	CTC (mil. euro)	18,532	21,107	21,622	21,551	29,223	31,563	36,035	34,117	25,841	44,301
	FDI (mil. euro)	51,063	50,604	14,637	56,287	58,306	97,035	141,349	63,908	127,915	63,694
	GDP (mil. euro)	2,745,310	2,811,350	2,927,430	3,026,180	3,134,748	3,267,160	3,365,450	3,473,268	3,485,430	3,681,750
France	CTR (%)	33.33	33.33	33.33	33.33	33.33	33.33	33.33	31	31	27.5
	CTC	47,559	49,536	49,529	49,674	49,725	57,920	55,125	59,277	55,205	61,158

Country	Ind	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
	(mil. euro)										
	FDI (mil. euro)	25,692	23,713	4,299	38,692	29,714	31,702	65,700	47,778	12,939	74,776
	GDP (mil. euro)	2,088,804	2,117189	2,149,765	2,198,432	2,234,129	2,297,242	2,363,306	2,437,635	2,310,469	2,500,870
Romania	CTR (%)	16	16	16	16	16	16	16	16	16	16
	CTC (mil. euro)	2,231	2,477	2,623	3,083	3,255	2,976	3,136	3,249	3,144	3,815
	FDI (mil. euro)	2,368	2,901	2,920	3,895	5,645	5,275	6,223	6,568	3,153	9,964
	GDP (mil. euro)	139,320	142,929	150,522	160,288	167,494	186,399	206,072	224,179	220,487	241,268
Bulgaria	CTR (%)	10	10	10	10	10	10	10	10	10	10
	CTC (mil. euro)	687	759	817	987	1,054	1,172	1,226	1,377	1,282	1,989
	FDI (mil. euro)	1,390	1,497	826	2,002	1,346	1,781	1,535	1,982	3,156	1,798
	GDP (mil. euro)	42,257	42,050	43,026	45,812	48,773	52,531	56,225	61,559	61,639	71,077

Source: European Commission, TEDB - Taxes in Europe database, [Accessed 08 March 2023]; Eurostat, GDP and main components, [Accessed 08 March 2023]; Eurostat, Tax revenue statistics [Accessed 08 March 2023]; The World Bank, World Development Indicators [Accessed 08 March 2023].

In Table 1, the CTR indicator shows corporate tax rates taken from the *European Commission database*, respectively *TEDB - Taxes in Europe*, the CTC indicator shows corporate tax collected at the state budget in millions of euros, taken from the *Eurostat database*, respectively *Tax revenue statistics*, the FDI indicator shows foreign direct investment inflows in millions of euros taken from *The World Bank database*, respectively *World Development Indicators* and the GDP indicator shows the gross domestic product in millions of euros taken from the *Eurostat database*, respectively *GDP and main components*.

In the case of corporate tax collected at the state budget, the data taken from the *Eurostat database* were expressed in national currency, and in the case of Romania and Bulgaria, which are not yet part of the Eurozone, we divided the values by the average exchange rate of the national currency reported to the euro currency of each year. The data on the average exchange rate were taken from the website of the *European Central Bank*, respectively *Euro foreign exchange reference rates*.

If we calculate the total corporate taxes collected at the state budget during the period, we get 62.833 mld. euro in Germany, 108.717 mld. euro in France, 6.056 mld. euro in Romania and 2.676 mld. euro in Bulgaria. And as far as foreign direct investment inflows are concerned, we get 114.757 mld. euro in Germany, 100.468 mld. euro in France, 12.332 mld. euro in Romania and 3.188 mld. euro in Bulgaria.

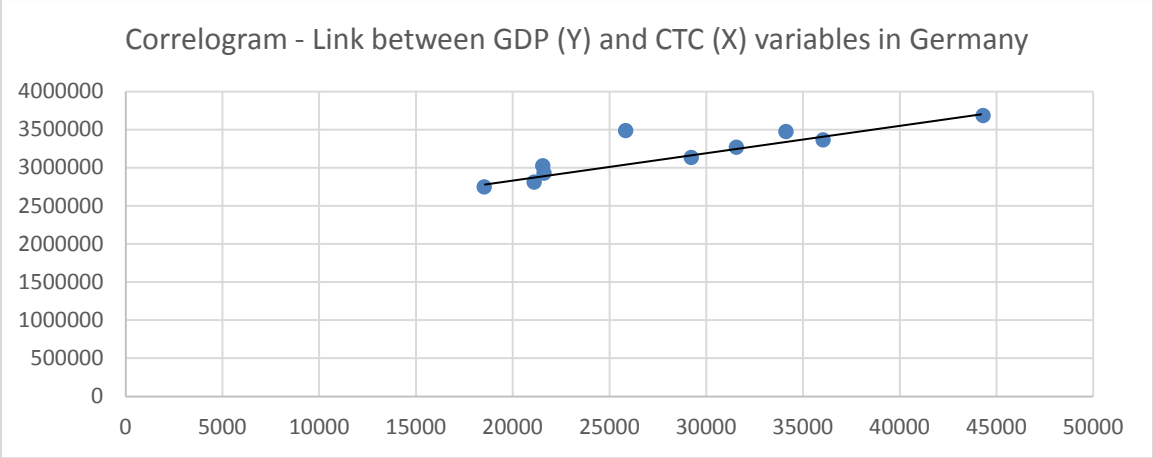


Figure 1. Link between GDP (Y) and CTC (X) variables in Germany

Source: Authors' own data processing in Excel, based on the data from Table 1.

According to the correlogram in Figure 1, the two variables can be approximated with a straight line, which suggests the linearity of the model.

Dependent Variable: GDP
Method: Least Squares
Date: 04/01/23 Time: 1404
Sample: 2012 2021
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2239691.	192161.8	11.65524	0.0000
CTC	33.53798	6.528443	5.137211	0.0009

R-squared	0.767381	Mean dependent var	3191808.
Adjusted R-squared	0.738303	S.D. dependent var	313758.4
S.E. of regression	160507.3	Akaike info criterion	26.98692
Sum squared resid	2.06E+11	Schwarz criterion	27.04744
Log likelihood	-132.9346	Hannan-Quinn criter.	26.92054
F-statistic	26.39093	Durbin-Watson stat	1.651773
Prob(F-statistic)	0.000888		

Figure 2. Estimation of the impact of CTC (X) on GDP (Y) in Germany

Source: Authors' own data processing in eViews, based on the data from Table 1.

According to Figure 2, with an acceptable plausibility of the estimators, but still taking into account the fact that we are trying to explain the dependent variable with only one independent variable, for our analysis it is enough to know that when CTC increases by one unit, the GDP indicator increases with 33.53798 units in Germany (according to the estimator of parameter b).

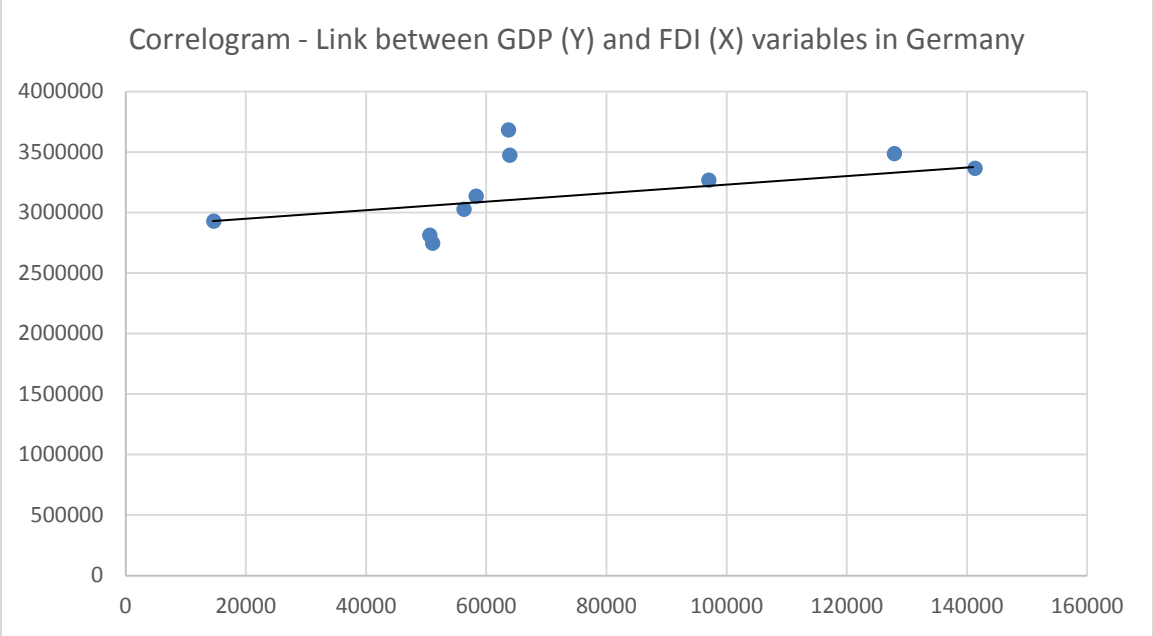


Figure 3. Link between GDP (Y) and FDI (X) variables in Germany

Source: Authors' own data processing in Excel, based on the data from Table 1.

According to the correlogram in Figure 3, there is a relationship between FDI and GDP that can be appreciated with a straight line in Germany, but the relationship is not as strong as that between CTC and GDP.

Dependent Variable: GDP
Method: Least Squares
Date: 04/01/23 Time: 14:14
Sample: 2012 2021
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2865016.	195026.0	14.69043	0.0000
FDI	4.508727	2.403356	1.876013	0.0975

R-squared	0.305521	Mean dependent var	3191808.
Adjusted R-squared	0.218711	S.D. dependent var	313758.4
S.E. of regression	277332.8	Akaike info criterion	28.08068
Sum squared resid	6.15E+11	Schwarz criterion	28.14120
Log likelihood	-138.4034	Hannan-Quinn criter.	28.01429
F-statistic	3.519426	Durbin-Watson stat	1.029212
Prob(F-statistic)	0.097501		

Figure 4. Estimation of the impact of FDI (X) on GDP (Y) in Germany

Source: Authors' own data processing in eViews, based on the data from Table 1.

According to the data in Figure 4, the plausibility of the estimators in the case of FDI and GDP in Germany is not as significant as that of the CTC and GDP indicators. The results of the parameter b estimator indicate that when FDI increases by one unit, GDP increases by 4.508727 units.

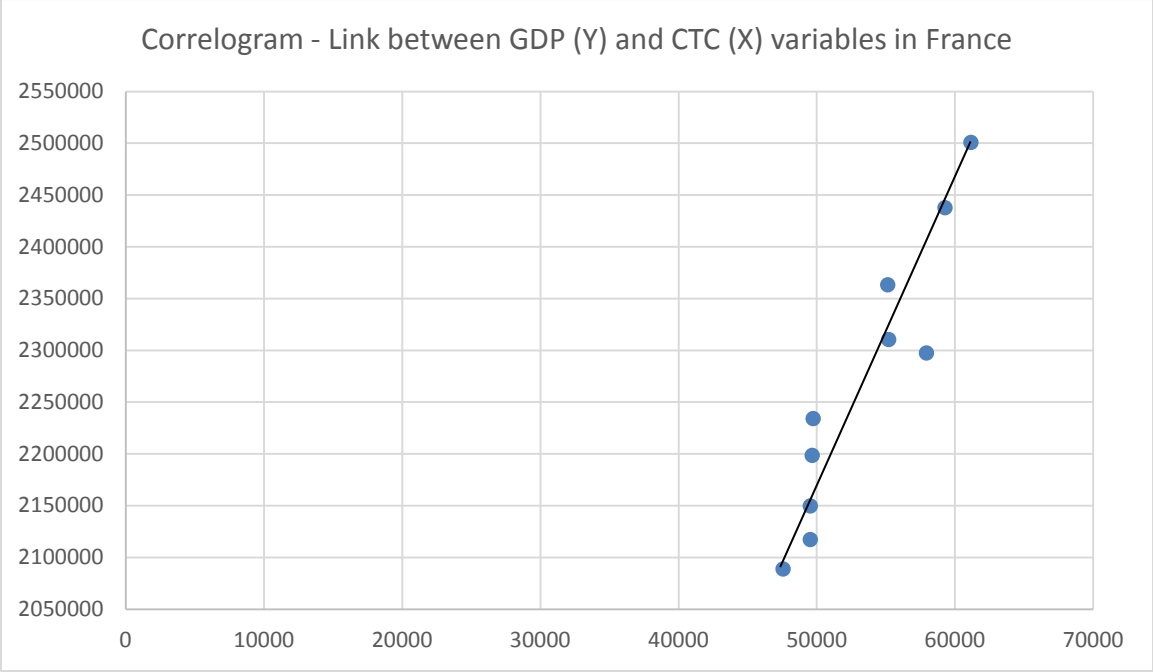


Figure 5. Link between GDP (Y) and CTC (X) variables in France

Source: Authors' own data processing in Excel, based on the data from Table 1.

According to the correlogram in Figure 5, there is a connection between the GDP and CTC variables in France that can be appreciated with a straight line, fact that denotes the linearity of the model.

Dependent Variable: GDP
Method: Least Squares
Date: 04/01/23 Time: 14:20
Sample: 2012 2021
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	850759.0	182552.3	4.660358	0.0016
CTC	26.53832	3.401424	7.802120	0.0001

R-squared	0.883844	Mean dependent var	2269784.
Adjusted R-squared	0.869325	S.D. dependent var	137249.3
S.E. of regression	49614.26	Akaike info criterion	24.63880
Sum squared resid	1.97E+10	Schwarz criterion	24.69932
Log likelihood	-121.1940	Hannan-Quinn criter.	24.57241
F-statistic	60.87308	Durbin-Watson stat	2.591817
Prob(F-statistic)	0.000052		

Figure 6. Estimation of the impact of CTC (X) on GDP (Y) in France

Source: Authors' own data processing in eViews, based on the data from Table 1.

According to figure 6, the plausibility of the estimators in the case of CTC and GDP in France is confirmed and also according to the estimator of parameter b when CTC increases by one unit, the GDP indicator increases by 26.53832 units.

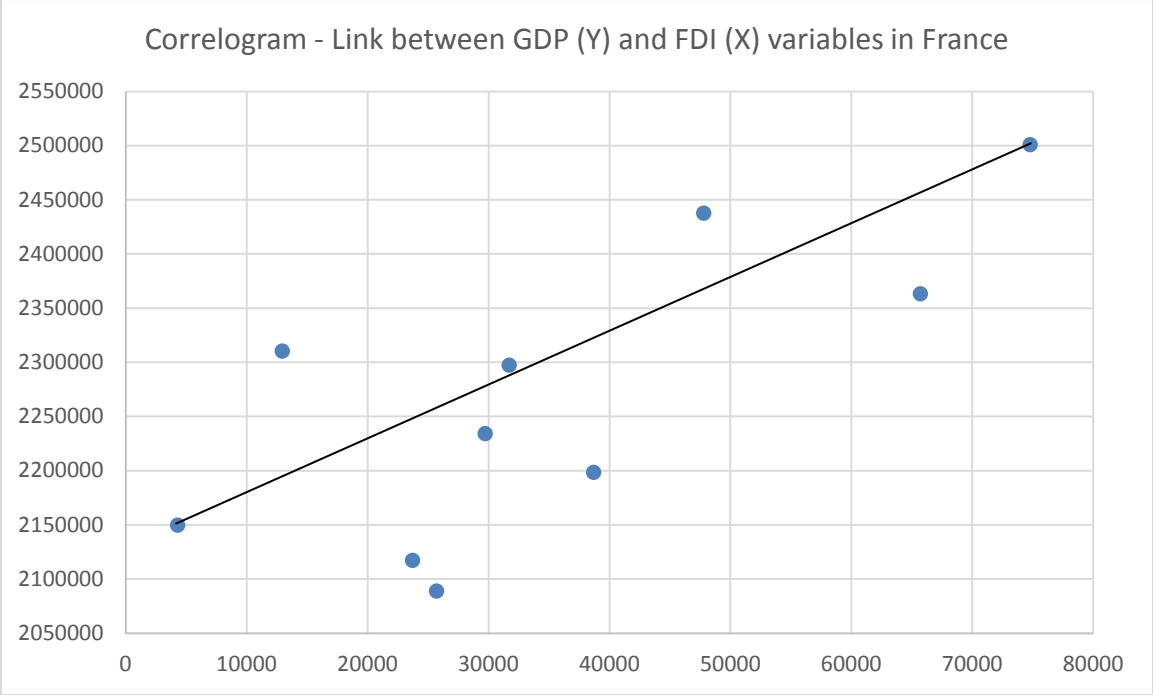


Figure 7. Link between GDP (Y) and FDI (X) variables in France

Source: Authors' own data processing in Excel, based on the data from Table 1.

The correlogram in Figure 7 shows an oscillating evolution of the points, which indicates that there is not a strong connection between FDI and GDP in France.

Dependent Variable: GDP
Method: Least Squares
Date: 04/01/23 Time: 14:23
Sample: 2012 2021
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2105809.	60712.65	34.68485	0.0000
FDI	4.618946	1.473193	3.135330	0.0139

R-squared	0.551325	Mean dependent var	2269784.
Adjusted R-squared	0.495241	S.D. dependent var	137249.3
S.E. of regression	97510.63	Akaike info criterion	25.99017
Sum squared resid	7.61E+10	Schwarz criterion	26.05068
Log likelihood	-127.9508	Hannan-Quinn criter.	25.92378
F-statistic	9.830296	Durbin-Watson stat	1.058595
Prob(F-statistic)	0.013903		

Figure 8. Estimation of the impact of FDI (X) on GDP (Y) in France

Source: Authors' own data processing in eViews, based on the data from Table 1.

According to Figure 8, the plausibility of the estimators in the relationship between GDP and FDI is not as significant as in the case of GDP and CTC, not even in France. Regarding the estimation of parameter b, when FDI increases by one unit, GDP increases by 4.618946 units.

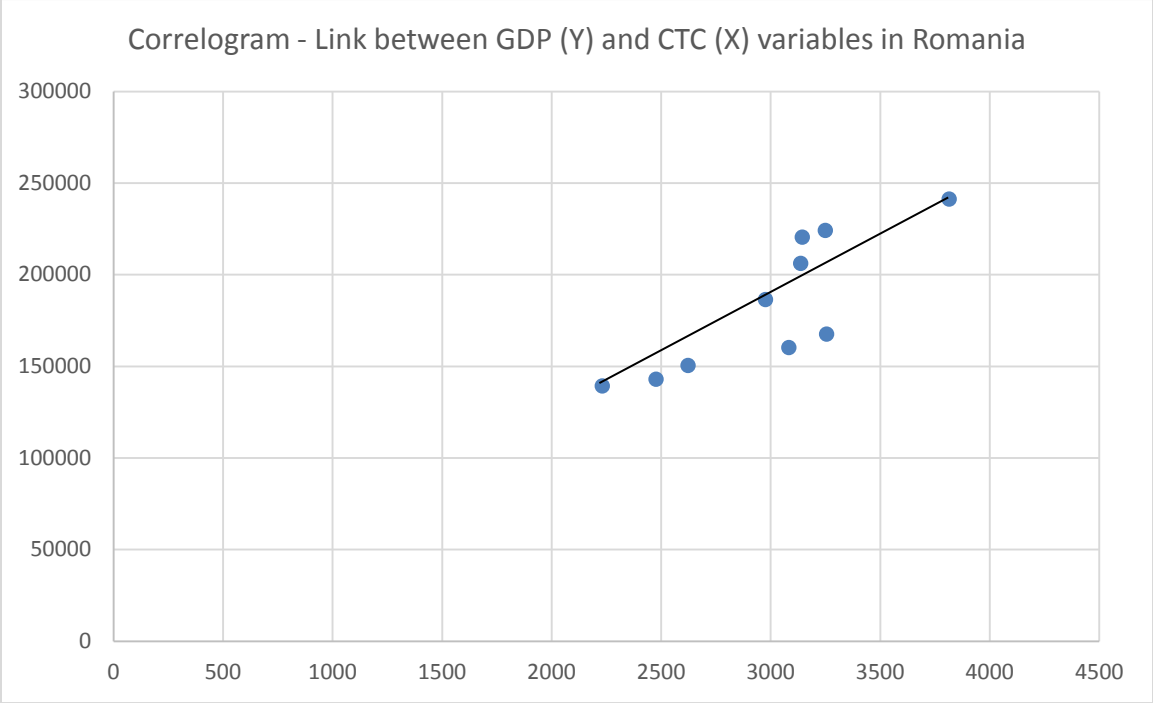


Figure 9. Link between GDP (Y) and CTC (X) variables in Romania

Source: Authors' own data processing in Excel, based on the data from Table 1.

According to the correlogram in Figure 9, there is a relationship that can be appreciated with a straight line regarding the two variables in Romania, namely GDP and CTC.

Dependent Variable: GDP
Method: Least Squares
Date: 04/01/23 Time: 14:30
Sample: 2012 2021
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-22794.94	47265.36	-0.482276	0.6425
CTC	68.92218	15.60168	4.417612	0.0022

R-squared	0.709253	Mean dependent var	183895.8
Adjusted R-squared	0.672909	S.D. dependent var	37053.58
S.E. of regression	21191.63	Akaike info criterion	22.93746
Sum squared resid	3.59E+09	Schwarz criterion	22.99797
Log likelihood	-112.6873	Hannan-Quinn criter.	22.87107
F-statistic	19.51530	Durbin-Watson stat	0.830473
Prob(F-statistic)	0.002234		

Figure 10. Estimation of the impact of CTC (X) on GDP (Y) in Romania

Source: Authors' own data processing in eViews, based on the data from Table 1.

According to figure 10, with an acceptable plausibility of the estimators, the estimation of the b parameter shows that when CTC increases by one unit, the GDP indicator increases by 68.92218 units.

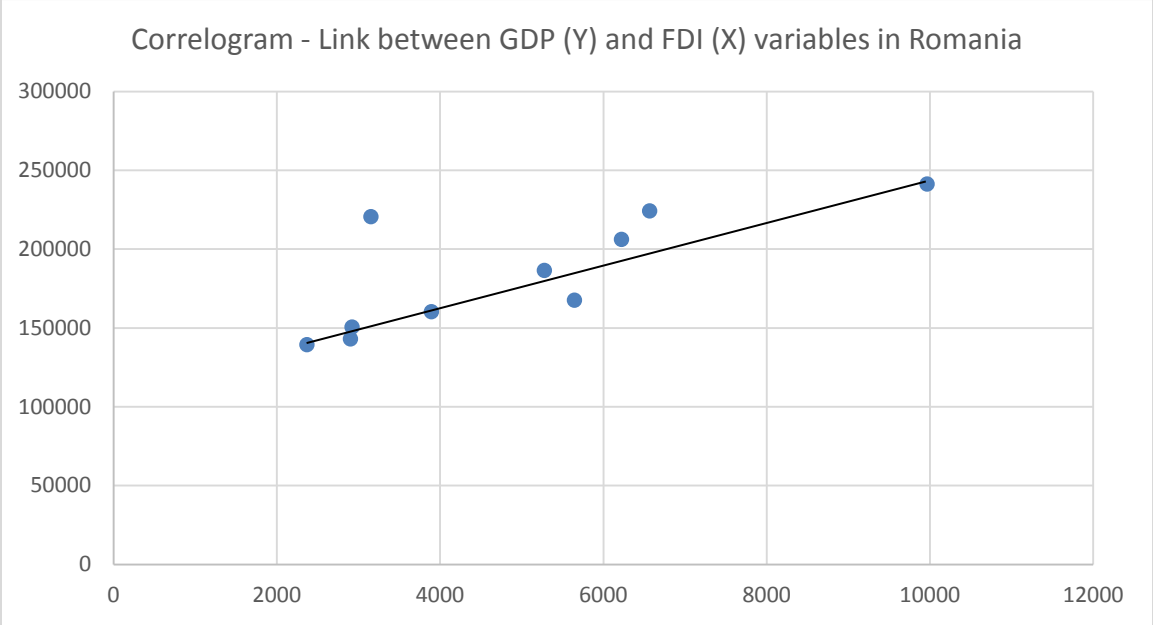


Figure 11. Link between GDP (Y) and FDI (X) variables in Romania
Source: Authors' own data processing in Excel, based on the data from Table 1.

The correlogram in Figure 11 shows that in Romania there is a connection between FDI and GDP compared to the other two more developed countries, respectively Germany and France.

Dependent Variable: GDP
Method: Least Squares
Date: 04/01/23 Time: 14:33
Sample: 2012 2021
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	124676.0	19389.65	6.430029	0.0002
FDI	12.10742	3.609919	3.353931	0.0100

R-squared	0.584391	Mean dependent var	183895.8
Adjusted R-squared	0.532440	S.D. dependent var	37053.58
S.E. of regression	25336.64	Akaike info criterion	23.29475
Sum squared resid	5.14E+09	Schwarz criterion	23.35526
Log likelihood	-114.4737	Hannan-Quinn criter.	23.22836
F-statistic	11.24885	Durbin-Watson stat	1.225307
Prob(F-statistic)	0.010022		

Figure 12. Estimation of the impact of FDI (X) on GDP (Y) in Romania
Source: Authors' own data processing in eViews, based on the data from Table 1.

According to Figure 12, the plausibility of the estimators is not as significant in the case of the GDP and FDI relationship as it is in the case of GDP and CTC, but it is more significant compared to the two developed countries within the analysis, namely Germany and France. The estimation of parameter b shows the fact that when FDI increases by one unit, GDP increases by 12.10742 units.

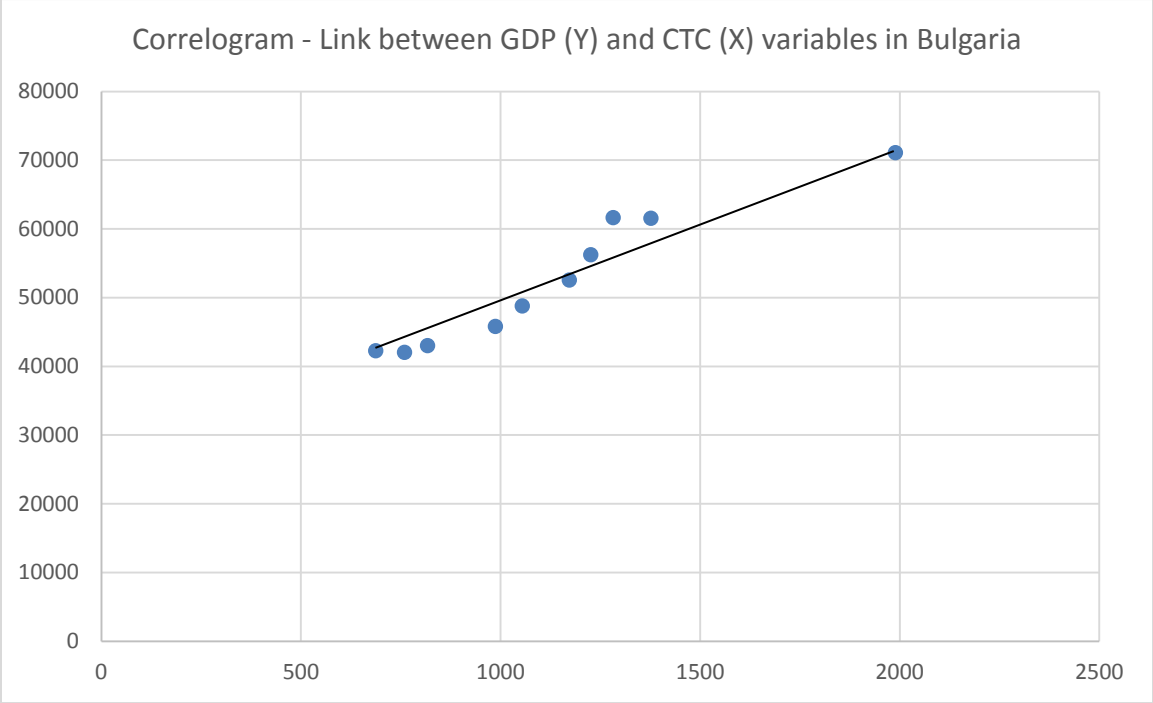


Figure 13. Link between GDP (Y) and CTC (X) variables in Bulgaria
Source: Authors' own data processing in Excel, based on the data from Table 1.

According to the correlogram in Figure 13, the relationship between GDP and CTC in the case of Bulgaria can be appreciated with a straight line, which indicates that the model is linear.

Dependent Variable: GDP
Method: Least Squares
Date: 04/01/23 Time: 14:38
Sample: 2012 2021
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	23862.36	3000.594	7.952545	0.0000
CTC	25.22691	2.520435	10.00895	0.0000

R-squared	0.926049	Mean dependent var	52494.90
Adjusted R-squared	0.916805	S.D. dependent var	9927.885
S.E. of regression	2863.560	Akaike info criterion	18.93438
Sum squared resid	65599793	Schwarz criterion	18.99489
Log likelihood	-92.67188	Hannan-Quinn criter.	18.86799
F-statistic	100.1791	Durbin-Watson stat	1.421135
Prob(F-statistic)	0.000008		

Figure 14. Estimation of the impact of CTC (X) on GDP (Y) in Bulgaria
Source: Authors' own data processing in eViews, based on the data from Table 1.

According to Figure 14, the estimators calculated by the least square method are plausible and regarding the estimation of b parameter, when CTC increases by one unit, GDP increases by 25.22691 units.

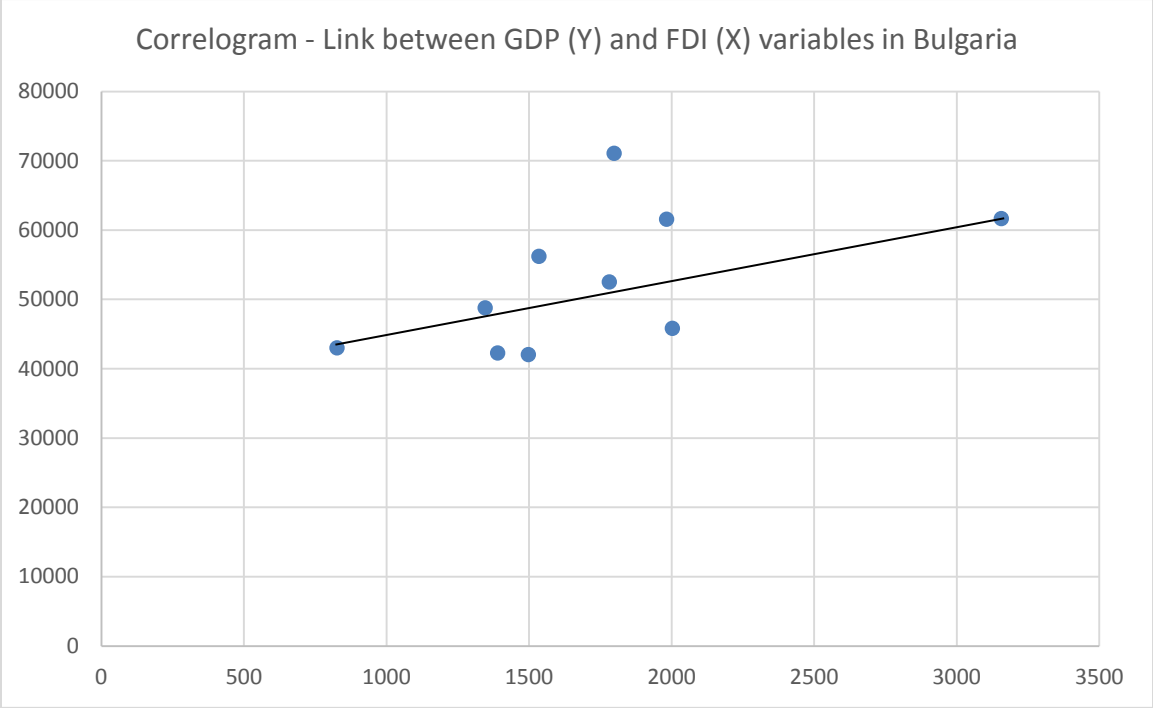


Figure 15. Link between GDP (Y) and FDI (X) variables in Bulgaria
Source: Authors' own data processing in Excel, based on the data from Table 1.

The correlogram in Figure 15 shows an oscillating distribution of points indicating that there is no significant connection between FDI and GDP in Bulgaria.

Dependent Variable: GDP
Method: Least Squares
Date: 04/01/23 Time: 14:40
Sample: 2012 2021
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	37021.31	8775.166	4.218873	0.0029
FDI	8.937556	4.806975	1.859289	0.1000

R-squared	0.301734	Mean dependent var	52494.90
Adjusted R-squared	0.214451	S.D. dependent var	9927.885
S.E. of regression	8799.204	Akaike info criterion	21.17957
Sum squared resid	6.19E+08	Schwarz criterion	21.24008
Log likelihood	-103.8978	Hannan-Quinn criter.	21.11318
F-statistic	3.456956	Durbin-Watson stat	1.288256
Prob(F-statistic)	0.100040		

Figure 16. Estimation of the impact of FDI (X) on GDP (Y) in Bulgaria
Source: Authors' own data processing in eViews, based on the data from Table 1.

According to Figure 16, the estimated values calculated by the least square method are not of the highest plausibility in the case of the GDP and FDI relationship in Bulgaria. According to the estimate of b parameter, when FDI increases by one unit, GDP increases by 8.937556 units.

Conclusion

The results of the research confirmed the theories from the specialized literature that stated that there is a link between the evolution of foreign direct investments and the gross domestic product, but it is not a significant one. This fact applies both to the two developed countries Germany and France, as well as to the two developing countries Romania and Bulgaria, in the period 2012-2021. On the other hand, both in the case of Germany and France, as well as Romania and Bulgaria, there was a significant connection between the taxes collected at the state budget and the gross domestic product.

Regarding the developed countries, calculating the total foreign direct investment inflows during the period, the results showed that Germany, a country that practiced a lower tax rate of 15%, generated approximately 14.22% more inflows of foreign direct investments compared to France, which practiced higher rates, located in the range of 27.5 - 33.33%.

In the context of the corporate taxes collected, France collected 73% more than Germany, but according to estimates from the least square method in Germany one unit of collected taxes generated 33.53798 units of GDP and in France it generated 26.53832.

Therefore, a developed country that has a lower tax rate generated more inflows of foreign direct investment and less taxes collected, but taxes had a greater contribution to the growth of GDP, when we consider only this variable.

Regarding developing countries, in the case of smaller differences between the rates, the results showed that Romania, a country that practiced a higher tax rate of 16% compared to Bulgaria that practiced a rate of 10%, generated with 286.83% more inflows of foreign direct investments and in terms of corporate taxes collected, it recorded 125.93% more. Also, in Romania a unit of collected tax generated 68.92218 units of GDP and in Bulgaria it generated 25.22691 units. However, these results must also be seen from the perspective of the fact that Romania's economy is larger than Bulgaria's.

In this case, a developing country with an average tax rate but with a higher economy than a country with a lower rate and with a smaller economy generated more foreign direct investment inflows and more taxes collected at the state budget. Thus, we confirm the theory according to which decisions regarding foreign direct investments have more in mind the size of the economy than the level of corporate tax rate.

The current paper is part of a larger research through which we want to determine the impact that the new global consensus on taxation will have on the member states of the European Union.

The current research also has limitations, which derive from the fact that we are trying to explain the gross domestic product component through a single variable with the help of the unifactorial linear model, but also from the fact that some analyzes did not confirm the verisimilitude of the estimators.

However, with the help of the results we were able to confirm the fact that the theories mentioned in the specialized literature also apply to the member states of the European Union and these results will help us start a research to determine the evolution of these relationships between variables in the context of the new tax changes that will take place.

References

Arvin, M.B., Pradhan, R.P., & Nair, M.S., (2021). Are there links between institutional quality, government expenditure, tax revenue and economic growth? Evidence from low-income and lower middle-income countries. *Economic Analysis and Policy*, 70, 468-489. https://doi.org/10.1016/j.eap.2021.03.011

Banovic, I, Blazic, H, & Drezgic, S., (2020). The Impact of the Corporate Income Tax on the FDI Flows in the EU Member Countries. *ZBORNIK VELEUCILISTA U RIJECI-JOURNAL OF THE POLYTECHNICS OF RIJEKA,* 8(1), 41-58. https://doi.org/10.31784/zvr.8.1.3

Blomstrom, M., Lipsey, R.E., & Zejan M., (1992). What explains developing countries growth? *NBER Working Papers 4132,* 10-14.

Clausing, K.A., (2007). Corporate tax revenues in OECD countries. *International Tax and Public Finance*, 14(2), 115-133. https://doi.org/10.1007/s10797-006-7983-2

Gechert, S., & Heimberger, P., (2022). Do corporate tax cuts boost economic growth?. *European Economic Review,* 147. https://doi.org/10.1016/j.euroecorev.2022.104157

Ghinamo, M., Panteghini, P.M., & Revelli, F., (2010). FDI determination and corporate tax competition in a volatile world. *International Tax and Public Finance*, 17(5), 532-555. https://doi.org/10.1007/s10797-009-9127-y

European Commission, TEDB - Taxes in Europe database, [online] Available at:< https://ec.europa.eu/taxation_customs/tedb/taxSearch.html> [Accessed 08 March 2023].

Eurostat, GDP and main components, [online] Available at:< https://ec.europa.eu/ eurostat/databrowser/view/NAMA_10_GDP/default/table?lang=en&category=na10.nama 10.nama_10_ma> [Accessed 08 March 2023].

Eurostat, Tax revenue statistics, [online] Available at:< https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Tax_revenue_statistics> [Accessed 08 March 2023].

Kersan-Skabic, I., (2015). The Importance of Corporate Taxation for FDI Attractiveness of Southeast European Countries. *PANOECONOMICUS*, 62(1), 105-122. https://doi.org/10.2298/PAN1501105K

Kosztowniak, A., (2016). Verification of the relationship between FDI and GDP in Poland. *Acta Oeconomica Periodical of the Hungarian Academy of Sciences,* 66(2), 307-332. https://doi.org/10.1556/032.2016.66.2.6

Murari, K., (2017). Financial Development–Economic Growth Nexus: Evidence from South Asian Middle-income Countries, *Global Business Review*, 18(4), 924–935. https://doi.org/10.1177/0972150917692245

Sengupta, P., & Puri, R., (2020). Exploration of Relationship between FDI and GDP: A Comparison between India and Its Neighbouring Countries. *Global Business Review*, 21(2), 473–489. https://doi.org/10.1177/0972150918760026

The World Bank, World Development Indicators, [online] Available at:< https://databank.worldbank.org/source/world-development-indicators> [Accessed 08 March 2023].