

Impact of Foreign Direct Investment on Tax Revenue: The Case of the European Union

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Abstract

Foreign direct investment (FDI) is an extremely important factor that promotes national competitiveness and economic development through technology transfer, new management skills, foreign trade, corporate productivity, etc. This study aims to analyze the significance of FDI and its impact on tax revenue and competitiveness, focusing on the European Union (EU) economy. An empirical analysis is conducted to determine the relationship between inward and outward FDI and tax revenue by employing data on EU countries between 1999 and 2019. The data were extracted from the United Nations Conference for Trade and Development (UNCTAD) database and the World Development Indicators database (WDI) of the World Bank. To fulfill the objective of this study and to determine the effect of FDI on tax revenue, an econometric model was developed. The research methods include systematic and comparative analysis of scientific literature, panel data analysis, and multiple regression analysis. The regression analysis was based on the least-squares method, and the estimates of the econometric models were calculated by identifying robust heteroscedasticity-consistent standard errors. The study results reveal that the outward FDI has a significant stimulating impact on total tax revenue. In contrast, inward FDI has a dampening effect on tax revenue. The analysis of the lagging effect of FDI on tax revenue in the EU member states revealed a statistically significant lagging impact of the outward FDI made two years before. The estimations indicate that the lagging effect is an incentive. No statistically significant lagging effect of the inward FDI flows on tax revenue was found.

Keywords: foreign direct investment (FDI), tax revenue, competitiveness, gross domestic product (GDP), panel data.

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1 INTRODUCTION

Foreign Direct Investment (FDI) is considered one of the main drivers of economic growth. Therefore, there are several scientific studies on the impact of FDI on national economic

development. Numerous authors (Merajothu, 2020; Bayar & Ozturk, 2018; Magombey & Odhiambo, 2017; Iqbal & Mahmood, 2016; Agrawal & Khan, 2011 and others) agree that FDI plays a multidimensional role within the overall development of any economy: it provides a replacement source for capital, promotes the creation of new jobs, raises the domestic capital, promotes export, and can provide technology up-gradation, skill enhancement, and efficiency effects. FDI is widely considered to have a positive economic impact; however, it can have some negative effects on national economic development.

The theoretical models (including the neo-classical trade theory) focused on the effect of FDI on a host country's general welfare and tax revenue show that FDI can raise national competitiveness and national welfare, mainly through increased tax revenue (Faeth, 2011). Furthermore, the welfare and revenue from FDI can be promoted by introducing an optimal tax on foreign-owned capital. Countries can lose out on tax revenue when incentives are paid to multinational enterprises (MNEs) or when the problems of transfer pricing (including other tax minimization strategies) are encountered (Faeth, 2011). According to Cung (2019), taxes are an essential and indispensable regulatory tool that affects social and economic development.

According to the European Commission (2019) report, more than 35% of the EU's total assets belong to foreign-owned companies, which indicates that the EU's investment regime is one of the most open regimes in the world. At the end of 2017, the share of FDI owned by non-European Union (EU) investors amounted to EUR 6.295 billion and provided 16 million direct jobs to Europeans.

The problem of the research: There is a lack of studies to analyze the effect of inward and outward FDI on tax revenue.

Countries offer tax exemptions and special conditions to foreign companies to make it easier to establish their businesses.

The study on the effect of FDI on tax revenue is intended to contribute to the development of the relevant policies. If the results indicate that FDI positively affects tax revenue, national governments can decide to continue their FDI promotion policies. Conversely, if the results indicate that FDI negatively impacts tax revenue performance, national governments should reconsider their policies to prevent tax revenue degradation owing to FDI; in the latter case, governments should gradually limit FDI by reducing the incentives provided to foreign investors.

The novelty of the study: The study discloses the direction of the impact of inward and outward FDI on tax revenue and enables an evaluation of the strength of this impact in particular groups of countries (the countries were grouped by the level of their gross domestic product (GDP) per capita). The study results can contribute to developing effective investment promotion policies in particular countries or groups of countries.

The remainder of this paper is organized as follows: Section 2 provides the theoretical background of the effects of FDI on economic development, tax revenue, and legal regulation of FDI. Section 3 introduces the research objectives, methodology, and data. Section 4 presents the results and discussion. Section 5 concludes the study.



2. THEORETICAL BACKGROUND

2.1 Role of FDI in economic growth

The theoretical Harrold–Domar growth model posits that economic growth can be achieved through an investment acquired from saving at a linear movement. Following this theory, economic growth is expected to increase as saving increases. Later, the theory was improved by Solow who defined economic growth (Y) as a function of capital (K) and workforce (L) (Solow, 1956). According to this theory, economic growth can be achieved through capital accumulation, which is expected to increase owing to saving-based investment and decrease due to depreciation and population growth. Since the level of investment is still determined by the level of saving, a low saving rate will lead to less intensive economic growth. In this case, FDI is expected to directly fill the gap between domestic savings and the demand for the actual investment to achieve an expected economic growth rate (Pratomo, 2020).

FDI reflects the level of a country's competitiveness in international markets and indicates the economic partnerships with other countries. According to Privara & Kiner (2020), globalization is one of the most significant processes shaping the world in the past decades, with developing relationships and growing interdependence among global economies, cultures, and political systems that substantially influence international affairs, primarily driven by the trade of goods and services, technology and investment flows, and people and information. In the current rapidly changing global environment, quick response and adaptation to market conditions are considered the crucial determinants of entrepreneurial success, which leads to higher competitiveness and profitability of business firms (Blažkova & Dvouletý, 2018).

According to Dobrovič et al. (2019), investing in product and process innovation as well as in employees' skills, motivation, and customer satisfaction (Belas et al., 2014) are very important because they help to compete in the market. Thus, FDI is one of the crucial elements of a country's economic integration into the global market. Miyagawa & Ohno (2009), however, argue that the positive impact of FDI on national economies can only be observed in the short run. According to Saksonova (2014), a decline in investment activity "can create a negative feedback loop, lowering industrial production and increasing unemployment rate, which leads to a decline in disposable incomes and therefore private consumption as well as government revenues." Rajnoha et al. (2018) identify that foreign-owned firms can optimize their profits by following the principles of transfer pricing and could further optimize their tax liability by transferring a part of their profit to a country that has a favorable tax environment. Thus, foreign-owned firms artificially reduce their business performance.

Banks, which had to increase capital investment following the new banking regulation, play an important role in this process (Belas et al., 2012).

Developing countries regard FDI as a panacea for tackling the problems of low investment, foreign exchange shortages, tax revenue gaps, and others. Therefore, they tend to provide various incentives, primarily tax incentives, to attract FDI. According to Ginevičius & Šimelytė (2011), tax deductions are a key factor in attracting FDI. Additionally, Putuntica & Bonaci (2013) reveal that tax incentives promote investment decisions.

In general, there are several theoretical and empirical arguments supporting the significance of FDI, but not many of them confirm the impact on tax revenue.

2.2 What is the effect of FDI on tax revenue?

The positive and indirect effect of FDI on tax revenue occurs if tax revenue is increasing due to a larger scale of economies owing to horizontal spillover effects. The impact of FDI on tax revenue depends on competition and technology spillovers from multinational companies (MNCs); both of the factors mentioned above stimulate productivity (Nguyen et al., 2014). A productivity spillover might occur when output is increasing due to the technology transfer from an MNC to a domestic company. Moreover, the competition encourages domestic companies to adopt technology or knowledge, thereby raising their productivity and efficiency (Demena & Bergeijk, 2019).

Balikcioglu et al. (2016) investigated the impact of FDI inflows on corporate tax payments at various technology levels in Turkey between 2004 and 2012 and found that FDI inflows raised corporate tax payments; the impact was found to be the greatest in high-tech companies. Odabas (2016) examined the causal relationship between tax revenues and FDI revenues in seven EU transition economies between 1996 and 2012. They discovered a one-sided causal relationship running from FDI revenue to tax revenue.

Bayar & Ozturk (2018) investigated the short- and long-term tax revenue, FDI inflows, and growth synergies in 33 Organization of Economic Co-operation and Development (OECD) countries between 1995 and 2014. The results of their research revealed that both FDI inflows and economic growth did not have any significant impact on total tax revenue. However, FDI inflows positively impacted total tax revenue in Sweden, Israel, Iceland, the United Kingdom, and the United States, whereas FDI inflows negatively impacted total tax revenue in Italy, France, Austria, and Poland.

Basheer et al. (2019) found that tax revenue is affected by several national financial and economic factors, cash surplus deficit, and FDI net inflow—the key factor that significantly affects tax revenue. Camara (2019) examined the relationship between FDI and tax mobilization at the regional level, and their results suggested that FDI inflows have a positive impact on government tax revenue. Binha (2021) found that FDI has a highly significant positive impact on tax revenue growth in Zimbabwe. The positive effect of FDI on tax revenue suggests that FDI might have generated some positive technology spillovers that improved the productivity of domestic firms, thereby positively contributing to the tax revenue collected by the Zimbabwean government.

2.3 Regulations of FDI and tax law

The EU is one of the most open areas for investment. Since 2009, the EU has pursued a policy of FDI on behalf of all the EU member states. Currently, the EU possesses the largest trade network, with 41 trade agreements covering 72 countries. The Regulation (EU) 2019/452 established a framework for the screening of FDI into the EU (the Framework Regulation) and discussed the importance of this new legislation with foreign investors.

The Framework Regulation focuses on the EU concerns regarding the increasing number of

EU companies acquired by non-EU investors, particularly Chinese companies. Most of these acquisitions involved the EU companies operating in strategic and sensitive sectors.

Recently, more companies have started trading in international markets. Concurrently, the internationalization of advanced economies has turned into FDI. This growth in the trade of goods and services, with the gradual liberalization of international economic relations, has aroused great interest in the dynamics of trade and investment. When analyzing the significance of FDI in terms of tax law, it should be noted that both scientific studies (Abela et al., 2009; Blouin et al., 2014) and taxation practice justify that FDI, and in particular striving to attract it, directly determines consolidation of the relevant tax law provisions.

Scientific studies focused on tax and accounting regulations reveal that to attract FDI, financial accounting regulations should remain independent of tax law; that is, tax regulations should not be implicated in accounting regulations. Previous scientific studies confirm that harmonization of the legal framework for financial accounting with the one for corporate income tax negatively impacts financial statements, thereby hindering the international movement of capital as well as accumulation of investment in a state, which, in turn, reduces budget tax revenue (Abela et al., 2009; Blouin et al., 2014). A particularly relevant challenge is that corporate tax laws often mislead investors when compiling financial statements and distort the distribution of mobile capital in states (significance for regulation of financial accounting).

A special document on tax law issued by the OECD, which also comprises an analysis of the tax regulations in the EU member states, confirms that FDI in the EU can be promoted, namely, through appropriate tax regulation (OECD, 2012). The document focuses on establishing such tax regulations that would not promote fund borrowing but investment in equity and FDI attraction. According to Blouin et al., (2014) and Dukic (2011), in tax law, it is crucial to understand that, in principle, relatively higher corporate debt financing should reveal that corporations are simply seeking tax benefits (since interest costs reduce taxable profits as opposed to dividends). Concerning the practical implementation of tax legislation, it should be noted that the EU tax legislation usually comprises regulations that aim to create a favorable tax base for FDI. The EU tax legislation includes the Council Directive 90/435/EEC of July 23, 1990, on the common system of taxation applicable in the case of parent companies and subsidiaries of different member states (as amended and supplemented). The directive mentioned above stipulates that the dividends paid by an EU company to a foreign entity that holds a certain number (e.g., 10%) of voting shares (parts, stocks) for not shorter than a particular term (e.g., 12 uninterrupted months), including the moment of the dividend distribution, are exempted from withholding tax unless the foreign entity receiving the dividends is registered or otherwise organized in target territories. Additionally, the relevant provisions of the corporate tax law in the EU member states provide for very favorable incentives aimed at attracting FDI. For instance, capital gains on the transfer to another entity or natural person of the shares in an entity, which is registered or otherwise organized in a state of the European Economic Area or in a state with which a double taxation agreement is concluded and which is subject to corporate income or any other substitute tax, in case a transferring entity has held more than a certain number (e.g., 10%) of voting shares for not shorter than a particular term (e.g., 10 uninterrupted years), are commonly exempted from withholding tax. Furthermore, tax incentives apply to companies engaged in

research, experimental development, and investment projects. These examples are provided to substantiate the direct impact of FDI on tax regulation.

3. RESEARCH OBJECTIVE, METHODOLOGY AND DATA

This study aims to analyze the significance of FDI and its impact on tax revenue and competitiveness, focusing on the EU economy. The aim was detailed into three objectives: 1) to assess the impact of FDI on tax revenue concerning scientific and law literature; 2) to conduct a comparative analysis of the volumes of FDI and tax revenue in the EU member states, and 3) to empirically evaluate the impact of FDI on tax revenue in the EU countries by employing the method of multiple regression analysis.

The timeframe of 21 years was selected to provide a sufficient number of observations for a statistically sound conclusion. The research was based on the data representing 28 EU member states.

To fulfill the research aim and determine the effect of FDI on tax revenue, the econometric model was developed. The variables in the model were calculated based on the data extracted from the United Nations Conference for Trade and Development (UNCTAD) database and the World Development Indicators database (WDI) of the World Bank.

The statistical indicators in the econometric model were treated as a separate variable. The conclusions were drawn considering the statistical significance of the variables and the value of their coefficients (positive and negative). The panel data provided information on different periods and entities, which allowed us to evaluate the impact of the relevant factors on tax revenue in all the EU member states over the entire period under consideration. Thus, the results of the regression analysis reflected the situation in all the EU countries. The regression analysis was based on the least-squares method. The data in the model were differentiated to evaluate the annual fluctuations in all variables, and the logarithms were employed to transform all the dependencies into linear models. The data analysis was conducted by using the GRETL econometric package. The multiple regression models were developed with tax revenue (Taxrev) as the dependent variable (Table 1).

Tab. 1 - Description of the variables employed to analyze the impact of FDI on tax revenue.

Source: own research

Variable notation	Indicator method	
Taxrev	Tax revenue/population	Dependent variable
FDIinw	Inward FDI/Population	Independent variables
FDIout	Outward FDI/Population	
Wage	Average Wage per Employee	Control variables
GDP	GDP per capita	
CPI	Corruption Perception Index	
Agri	Agriculture Sector Share to Total GDP	



Manuf	Manufacturing Sector Share to GDP	Control variables
Service	Service Sector Share to GDP	
Empl	Number of Persons Employed /Population	
ExpGDP	Trade Openness as Measured by Share of Export to GDP	
ImpGDP	Trade Openness as Measured by Share of Import to GDP	
Infl	Inflation	

Based on the detailed analysis of the relevant empirical literature and theoretical foundations, this study postulates the following hypothesis:

H1: Inward FDI has a significant positive effect on tax revenue.

H2: Outward FDI has a significant positive effect on tax revenue.

The relationship among the variables is expressed in Equation (1)

$$\Delta Taxrev_{i,t} = \alpha + \beta_1 \Delta lnFDI_{in_{i,t}} + \beta_2 \Delta lnFDI_{out_{i,t}} + c_k \Delta C_{k,i,t} + \theta_t + \Delta \varepsilon_{i,t} \quad (1)$$

The levels of reliability are as follows: if $p > 0.05$, the model is statistically unreliable; if $p < 0.05$, the model is statistically reliable.

H1 is confirmed if $\beta_1 > 0$.

H2 is confirmed if $\beta_2 > 0$.

4. RESULTS AND DISCUSSION

4.1 Analysis of the relationship between FDI and tax revenue

The data on FDI are categorized as inward and outward FDI data. Previous empirical studies primarily focus on either FDI flows or accumulated FDI but based on the literature analysis. This research concentrates on accumulated FDI depicted in Figure 1.

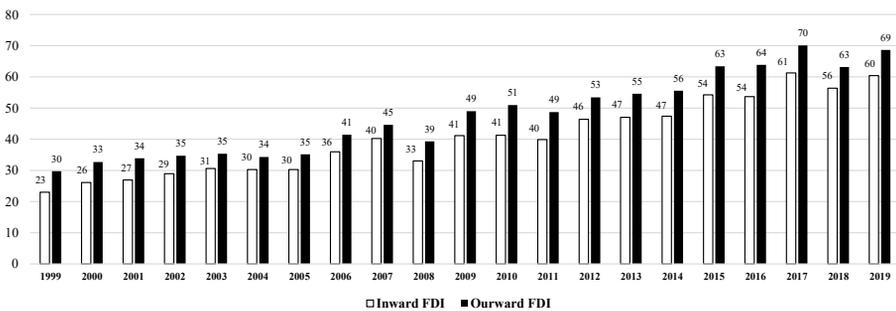


Fig. 1 – Average inward and outward FDI in the EU over the 1999-2019 period, % of GDP. Source: own research

From the above Fig. 1, it is evident that the average inward and outward FDI as a percentage of GDP in the EU fluctuated unevenly; nevertheless, there is a clear upward trend. An increase in the inward FDI accumulated within the EU between 1999 and 2019 was as high as 160.9%, and an increase in the outward FDI was as high as 130%. Hence, it can be stated that the average inward FDI accumulated within the EU grew faster than the outward FDI, which proves that the EU member states are competitive in attracting FDI. In addition, the results suggest that the amounts of the inward FDI accumulated within the EU are smaller than the amounts of the outward FDI. The difference between the inward and outward FDI accumulated within the EU in 2019 amounts to 9 percentage points measured as FDI ratio to GDP. However, the parallel growth of both inward and outward FDI indicates that the EU member states not only promote FDI attraction intensively but also invest heavily in foreign countries.

According to the European Commission report (2019), more than 35% of the EU's total assets belong to foreign-owned companies, which shows that the EU is open to FDI. In 2019, the largest amounts of the inward FDI as a percentage of GDP were recorded in Cyprus—1816.54%, followed by Malta with 1406.9%, Ireland with 289.89%, the Netherlands with 193.25%, Luxembourg with 183.5%, and Belgium with 106.95%. In the other EU member states, this indicator did not exceed the 100% threshold, and the lowest rates were recorded in Greece, Italy, and Germany with 19.18%, 22.35%, and 24.96%, respectively. The results suggest that the countries mentioned above accumulated a relatively high percentage of FDI owing to the lack of the EU's control over their investment in particular countries and economies. Regarding the European Commission (2019), the FDI control in the EU member states started in 2018. The control is aimed at managing the penetration of FDI into the industries of national importance, thereby protecting the EU economies from potential negative effects. The statistical data suggest that the total ratio of the inward FDI to GDP decreased by 5 percentage points in 2018, which could be determined by the EU investment control policies.

The EU's "newcomers" generated the largest shares of FDI as a percentage of GDP, whereas the shares generated by the old member states were the smallest. This can be explained by the convergence within the EU when the states that most recently accessed the Union attracted the largest amounts of investment. Another reason may be that the return on investment in the EU's "newcomers" is higher owing to cheaper jobs, domestic investment promotion policies, and the establishment of free economic zones. In 2019, the largest amounts of the outward FDI were also recorded in Cyprus—1807.18%, Malta—418.84%, Luxembourg—310.34%, the Netherlands—283.32%, Ireland—280.8%, and Belgium—124.07%. This result may be because FDI in these EU member states is considered highly favorable, and investors earn investment returns. Most of the remaining EU member states, however, accumulated no more than 100% of the outward FDI as a percentage of GDP in 2019. The lowest rates of outward FDI were recorded in Romania—0.56%, Croatia—1.85%, Bulgaria—4.21%, Poland—4.24%, Latvia—5.14%, Lithuania—8.66%, and Greece—9.44%. The remaining countries exceeded the 10% threshold. The countries mentioned above accessed the EU later and therefore have the smallest amounts of the outward FDI. The results can further be explained by the fact that the countries that accessed the EU later were historically dependent on another country. Consequently, the economies of the



countries that regained their independence only at the end of the last century are still growing and catching up with the old members of the EU.

After the general analysis of the dynamics of the inward and outward FDI within the EU, we will focus on the volumes in the inward and outward FDI in individual EU member states. The volumes of the inward and outward FDI per capita in thousands EUR (the 1999–2019 average) are depicted in Figure 2.

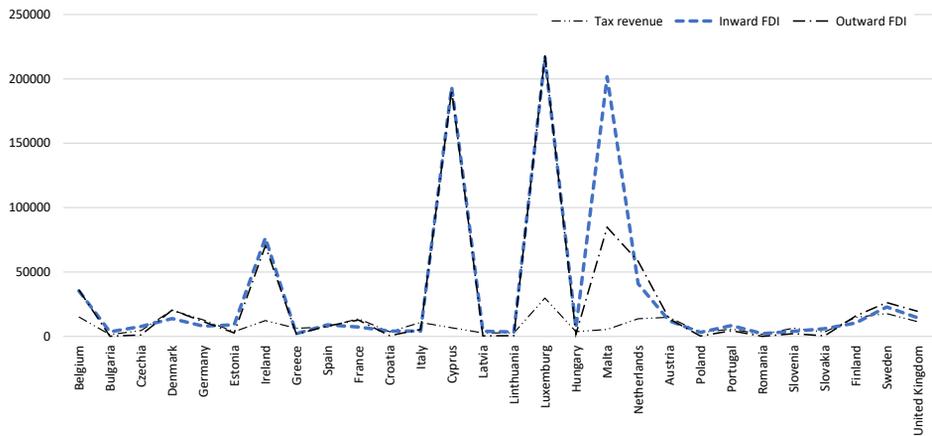


Fig. 2 – Tax revenue, inward FDI and outward FDI per capita in the EU member states (the 1999–2019 average, thousands EUR). Source: own research

Figure 2 indicates that the average inward FDI per capita between 1999 and 2019 was highest in Malta, Cyprus, Luxembourg, and Ireland. In addition, these countries are the largest investors abroad. They are characterized by a large gap between FDI and tax revenue. Luxembourg is a small country that is unique in its financial sector; it is also a low-tax country with several financial companies that operate globally but are established in Luxembourg for tax benefits.

4.2 Empirical evaluation of the impact of FDI on tax revenue

In this section, we evaluate the impact of FDI on the tax revenue by employing the multiple regression model. As indicated in the research methodology, the model also includes the additional control variables that can affect a country’s tax revenue: the number of the employed per 1,000 population, share of the manufacturing sector in the structure of the national economy, value added by the agricultural sector, value added by the service sector, level of openness of the economy reflecting the share of export and import in GDP, average wages, corruption perception index, inflation, and the number of employees.

The research comprises 28 EU member states between 1999 and 2019; the number of observations is 439. The values of the coefficients in the model are reported in Table 2.

Tab. 2 – Results representing the impact of FDI on tax revenue in the EU. Source: own research

	Modification 1	Modification 2	Modification 3	Modification 4
const	0.007672	0.007891	0.004882	0.007881
	(0.006985)	(0.006991)	(0.006574)	(0.006664)
ld_ FDIOUTSTOCK	0.01406*	0.01411*	0.01314*	0.01361**
	(0.007417)	(0.007390)	(0.006424)	(0.005586)
ld_FDIINSTOCK	-0.03628**	-0.03605**	-0.03275**	-0.03724**
	(0.01631)	(0.01649)	(0.01507)	(0.01797)
ld_GDP	0.6593***	0.6592***	0.6929***	0.6396***
	(0.05267)	(0.05270)	(0.04393)	(0.06129)
ld_Empl	0.06324	0.06243	0.07845	0.1264
	(0.1070)	(0.1080)	(0.1162)	(0.1233)
ld_ExpGDP	-0.07654**	-0.07813**	-0.08771**	-0.1498***
	(0.03647)	(0.03675)	(0.03715)	(0.04494)
ld_ImpGDP	0.04853	0.04942	0.07182	0.08918
	(0.05277)	(0.05256)	(0.06285)	(0.06371)
ld_Wage	0.2248***	0.2257***	0.2079***	0.2464***
	(0.04223)	(0.04286)	(0.03590)	(0.04676)
ld_CPI	0.007753	0.008268	-0.01178	-0.006284
	(0.02682)	(0.02716)	(0.03008)	(0.03171)
ld_AGRI	-0.004895		0.002287	0.004475
	(0.01312)		(0.01165)	(0.01347)
ld_SERVICE	-0.3676**	-0.3605**		-0.03920
	(0.1483)	(0.1383)		(0.1302)
ld_MANUF	-0.1830***	-0.1808***	-0.1099***	
	(0.05478)	(0.05274)	(0.02984)	
Infl	-8.142e-05	-7.802e-05	0.0002933	0.0006618
	(0.0009891)	(0.0009949)	(0.001075)	(0.001132)
n	439	439	439	441
Adj. R ²	0.8535	0.8538	0.8474	0.8403
lnL	1038	1038	1028	1023
F-statistic	5.875	6.0807	5.78795	5.48265
Prob>F	<0.000	<0.000	<0.000	<0.000

* – significance level of 90%. ** – significance level of 95%. *** – significance level of 99%. Source: compiled by the authors

The variables in the model were differentiated and logarithmized, barring the inflation rate—it reflects the percentage change in prices, and therefore logarithmizing and differentiating this

indicator is meaningless. To check the robustness of the model, the model was modified by changing the variables that reveal sectoral differences across the countries. The first modification included the variables that indicate the shares of the agricultural sector, manufacturing, and services in GDP. The second modification eliminated the variable representing the share of GDP generated by the agricultural sector. The third modification measured only the share of GDP generated by the agricultural and manufacturing sectors. The fourth modification eliminated the variable representing the share of GDP generated by the manufacturing sector. The modifications did not significantly impact the model results.

The model was empirically verified by employing the Pooled Ordinary Least Squares method, which revealed that multicollinearity was not present in the model ($VIF < 10$); the model and its modifications were statistically significant, a significance level of 0.000 indicated goodness of fit; the White test demonstrated that the errors of all modifications in the first model were heteroskedastic (White test $p < 0.05$). Therefore, the model and its modifications were verified by applying the least squares method; the estimates of the econometric models were calculated by using stabilized residual error regression (HAC). A Durbin–Watson value of 1.798 indicated no autocorrelation in the model; however, owing to the 21-year data used in the model, an additional Wooldridge test was performed. This test confirmed that there was no autocorrelation in the model (p -value was equal to 0.57). The results of the analysis show that the impact of either the inward or outward FDI on the EU tax revenue is statistically significant. However, it may manifest in different directions. A 1% increase in the value of inward foreign direct investment (FDIINSTOCK) reduces the EU's tax revenue by 0.03%, whereas a 1% increase in the value of outgoing FDI (FDIOUTSTOCK) increases the EU's tax revenue by 0.013%.

The adjusted coefficient of determination enables establishing a significant relationship between the dependent variable and the set of independent variables. The value of this indicator explains that 84.0% of the EU's tax revenue depends on the fluctuations in the independent variables included in the model. The research results suggest that a higher value of the outgoing foreign investment has an incentive effect on tax revenue in the EU member states. This can be explained by the fact that FDI promotes exports, thereby indirectly affecting employment in an investing country (i.e., creating and maintaining jobs) and corporate profits. For instance, China has significantly increased its FDI in European countries to boost exports of low-cost goods from China (Knoerich, 2012). Another explanation for the relationship identified in this study is the return of profits to an investing country. Investing in other countries with a cheap labor force raises corporate profits through wage cost savings (Knoerich, 2017).

The analysis of the impact of FDI on tax revenue revealed a disincentive effect, which might be due to the impact of fluctuations in this factor on the changes in tax revenue that were evaluated in the same year. In the first year, most countries offer tax incentives for foreign investment, which means that MNCs pay lower taxes than domestic businesses facing additional competition.

The model developed during the research shows that GDP has a stronger statistically significant stimulating effect on tax revenue than FDI. With a 1% increase in GDP, tax revenue will increase by 0.66%. According to Lobanova et al. (2018), an increase in GDP per capita could arise from the interrelation between domestic and foreign companies owing to technology spillovers.

To evaluate the lagging effect of FDI on tax revenue, the model was adjusted by additionally assessing the effect of FDI on tax revenue with a one-to-three-year lag. The coefficient of determination equal to 0.85, estimated for the models reflecting the lagging effects, indicates that 85% of the changes in tax revenue can be explained by the factors included in these models.

Tab. 3 – Results representing the lagging effect of FDI on tax revenue in the EU. Source: own research

	Modification 1	Modification 2	Modification 3
const	0.005398 (0.003543)	0.006212* (0.003273)	0.004050 (0.003611)
ld_FDIOUTSTOCK	0.01375* (0.007197)	0.01306* (0.006984)	0.01283* (0.006968)
ld_FDIOUTSTOCK_1	0.001344 (0.006151)	0.004603 (0.006264)	0.006068 (0.006653)
ld_FDIOUTSTOCK_2	0.01269** (0.005330)	0.009539*** (0.003384)	
ld_FDIOUTSTOCK_3	0.004531 (0.006876)		
ld_FDIINSTOCK	-0.05030*** (0.01805)	-0.04362** (0.01619)	-0.03795** (0.01607)
ld_FDIINSTOCK_1	-0.006213 (0.009587)	-0.003838 (0.008545)	0.002023 (0.008960)
ld_FDIINSTOCK_2	0.00000259 (0.007650)	0.0009864 (0.007324)	
ld_FDIINSTOCK_3	0.003510 (0.008261)		
ld_GDP	0.6677*** (0.05888)	0.6744*** (0.05682)	0.6631*** (0.05333)
ld_Empl	0.05914 (0.1079)	0.06493 (0.1110)	0.05582 (0.1117)
ld_Wage	0.2075*** (0.04238)	0.2128*** (0.03934)	0.2202*** (0.03779)
ld_CPI	0.01382 (0.02966)	0.007676 (0.02776)	0.006770 (0.02661)
ld_AGRI	-0.006627 (0.01297)	-0.007158 (0.01277)	-0.003231 (0.01289)
ld_SERVICE	-0.3900** (0.1509)	-0.3751** (0.1491)	-0.3739** (0.1465)
ld_MANUF	-0.1926***	-0.1921***	-0.1866***



ld_MANUF	(0.05419)	(0.05439)	(0.05609)
ld_ExpGDP	-0.07123*	-0.06593*	-0.07394**
	(0.03845)	(0.03543)	(0.03517)
ld_ImpGDP	0.06987	0.06117	0.05046
	(0.05242)	(0.04638)	(0.04868)
n	414	435	437
Adj. R ²	0.8531	0.8542	0.8537
lnL	976.7	1027	1032
F-statistic	5.15982	5.30025	5.53837
Prob>F	<0.000	<0.000	<0.000

* – significance level of 90%. ** – significance level of 95%. *** – significance level of 99%. Source: compiled by the authors

The results indicated that multicollinearity was not present in the model evaluating the lagging effect of FDI on tax revenue ($VIF < 10$); the model and its modifications were statistically significant, a significance level of 0.000 indicated goodness of fit; the White test showed that the errors of all modifications in the first model were heteroskedastic (White test $p < 0.05$). Therefore, the model and its modifications were verified by applying the least squares method; the estimates of the econometric models were calculated through stabilized residual error regression (HAC). A Durbin–Watson value of 1.8 indicated no autocorrelation in the model; however, an additional Wooldridge test was performed. This test confirmed that there was no autocorrelation in the model ($p > 0.05$). The analysis of the lagging effect of FDI on tax revenue in the EU member states revealed a statistically significant lagging impact of the outward FDI made two years before. The estimations suggested that the lagging effect was an incentive. Furthermore, the estimations indicated that a 1% increase in the outward FDI determines a 0.01% increase in tax revenue after two years. No statistically significant lagging effect of the inward FDI flows on tax revenue was found. The modeling results indicated that the inward and outward FDI had a statistically significant impact on tax revenue, though the direction of the effect was reversed.

5. CONCLUSION

The analysis of scientific literature indicates that an increase in FDI can lead to either an increase or a decrease in tax revenue. Moreover, FDI may contribute to the development of the financial sector by indirectly raising national competitiveness and tax revenue.

Studies assessing the impact of outward FDI on home countries' economies indicate a potential impact on tax revenues owing to the impact on export volumes and employment; however, studies that quantify these effects are lacking. This necessitates this type of research.

Based on the coefficients of the regression model and their significance level, it can be concluded that the impact of both inward and outward FDI has a statistically significant effect on tax revenue in the EU member states. However, the effect can manifest in different directions. The first hypothesis is not confirmed because a 1% increase in the inward FDI (FDIINSTOCK) leads to a 0.03% decrease in tax revenue. These results correspond to Varol Iyidogan & Dalgıç's (2015)

and Bellak & Leibrecht's (2009) conclusions, which propose a negative relationship between FDI and taxes. This can be explained by the fact that FDI can produce tax revenue losses through the existence of tax incentives, such as free economic zones, where goods are generally exempted from duties and taxes, and corporate taxes are low or zero (Zee et al., 2002; Fuest & Riedel 2009). These incentives reduce the tax base and distort the allocation of resources for the benefit of foreign companies at the expense of domestic ones. Moreover, a substantial share of tax revenue can be lost owing to profit shifting (Cobham & Jansky, 2018; Jansky & Polansky, 2018; Crivelli et al., 2016; Fuest et al., 2011). Meanwhile, since a 1% increase in the outward FDI (FDIOUTSTOCK) leads to a 0.013% increase in tax revenue, the second hypothesis is confirmed. This result may be due to several reasons. First, the impact of the fluctuations in this factor on the changes in tax revenue was evaluated in the same year. In the first year, most countries offer tax incentives for foreign investment, which means that MNCs pay lower taxes than domestic businesses facing additional competition.

To evaluate the lagging effect of FDI on tax revenue, the model was adjusted by additionally assessing the impact of FDI on tax revenue with a one-to-three-year lag. The analysis of the lagging effect of FDI on tax revenues in the EU member states revealed a statistically significant lagging impact of the outward FDI made two years before. The estimations showed that the lagging effect was an incentive. Additionally, the estimations indicated that a 1% increase in the outward FDI determines a 0.01% increase in tax revenue after two years. No statistically significant lagging effect of the inward FDI flows on tax revenue was found. The modeling results indicated that the inward and outward FDI had a statistically significant impact on tax revenue, though the direction of the effect was reversed.

This study shows that tax evasion should be considered in promoting FDI through tax incentives. A monitoring and evaluation system needs to be established to increase tax revenue. The results suggest it is essential to combine these policies with non-tax measures, such as subsidies to foreign investors or institutional environment improvement, to attract FDI without loss in tax revenue. Further, this study highlights the importance of engaging in prudent and deliberate economic policies that enhance the outward FDI as an effective tool to improve economic performance, create employment, and sustain economic growth. Based on the study results, countries are recommended to develop their outward FDI-promoting tax policies. Since the inward FDI negatively impacts tax revenue performance, governments seeking national competitiveness to attract FDI should be careful with offering tax incentives. They need to develop appropriate policies to prevent tax revenue degradation caused by FDI; thus, the governments should consider gradually limiting FDI by diminishing the incentives provided to foreign investors.

The limitation of this research lies in excluding other variables which can impact tax revenue, for example, tax incentives and the market size. Therefore, future research should consider these other factors. Future research on the impact of FDI on tax revenue could also focus on the effects of FDI on different types of taxes, such as personal and corporate income tax.

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