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ABSTRACT

of a dissertation for the award of the educational and scientific degree "Doctor" (in Economics) under the doctoral program "Finance, Money Circulation, Credit and Insurance" (Finance) on the topic:

" FOREIGN DIRECT INVESTMENT: ECONOMIC GROWTH AND CONVERGENCE WITHIN THE EUROPEAN UNION"

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Svishtov

2023

The dissertation was discussed and proposed for defense under the Law on the Development of the Academic Staff in the Republic of Bulgaria by the "Finance and Credit" Department of the Academy of Economics "D. A. Tsenov", Svishtov.

The dissertation has a volume of 163 standard pages. Structurally, it consists of an introduction, an exposition in 3 chapters, a conclusion and a list of references - a total of 118 sources. 24 tables and 17 figures are included to support the presented main text. Two studies have been published on the subject of the dissertation. A declaration of authenticity and authenticity is attached.

The defense of the dissertation will be held on **January 22, 2023** at **3:00 p.m.** in the Conference Hall "Rectorate" Academy of Economics DA Tsenov Svishtov and the web-based conference system of the Academy of Economics "D. A. Tsenov "at a meeting of the scientific jury, determined by order of the Rector of the Academy of Economics" D. A. Tsenov ", Svishtov, composed of:

Prof. Andrey Boyanov Zahariev PhD, D. A. Tsenov Academy of Economics
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The defence materials are available at the Doctoral and Academic Development Department.

CONTENT

I. GENERAL CHARACTERISTICS OF THE DISSERTATION

1.1 Relevance of the topic

The processes of the implementation of foreign investment, as a key component of the movement towards globalization or integration of the world economy, are at the centre of the studies of economists, focusing primarily on establishing the impact of foreign direct investment (FDI) on the economic growth of the recipient country. Claims that foreign direct investment plays a direct positive role in the development of national economies are based on extensive theoretical propositions and empirical studies covering various combinations of factors. Committed under good conditions, foreign capital can help reduce the gap between capital requirements and national savings, raise skill levels in the hosting economy, improve market access, and contribute to technology transfer and good governance. Consequently, many researchers conclude that countries that follow outward-oriented development strategies are more likely to achieve higher rates of economic growth, compared to those that are inward – oriented and argue that the enormous effect of FDI on economic growth probably comes from capital accumulation, transfer of new technologies and the availability of adequate knowledge in recipient countries (De Mello, 1997).

Simultaneously, the existence of scientific studies proving the positive impact of FDI on economic growth is contradicted by empirical studies that report a negative relationship or absence of such between the two variables. The reason for such contradictory findings lies in the variety of approaches and the choice of variables. Researches focuses either on the overall effect or on particular determinants of FDI, such as technology, employment, degree of economic freedom, trade and other areas of the

economy. As a result, the nature of the causal relationship between FDI and economic growth remains unclear.

The attractiveness of a country for foreign capital investment is determined by many factors, **that altogether** form the investment climate. In the economic literature, there is no single model that reveals the motives and reasons for investing outside national borders. Usually, the decision to invest in another country is formed on the basis of an established high degree of correspondence between the criteria defined by the investors and the real socio-economic development of the recipient country.

This scientific research is focused on the problems related to the assessment of the degree of influence and scope of FDI's impact on economic growth in Bulgaria, based on main macroeconomic indicators. The motives for implementing European integration policies through macroeconomic policy convergence and greater capital mobility on the part of the EU will undoubtedly lead to convergence in income growth rates. Of foreign capital is one of the main prerequisites for accelerating the process of economic and social convergence between the countries within the Union.

The research is based on the following information and empirical base: legislative and regulatory legal acts, theoretical and analytical studies, statistical data and analytical materials of the Ministry of Finance (MoF), the Bulgarian National Bank (BNB), the National Statistical Institute (NSI), the International monetary fund (IMF), the World Bank (WB), the Statistical Office of the European Union (Eurostat), the Organization for Economic Cooperation and Development (OECD) and other international organizations.

1.2. Object and subject of the research

The object of the research is the FDI flow in Bulgaria and the EU member states from Central and Eastern Europe.

The subject of the research is a focused assessment of the intensity of foreign direct investments in Bulgaria and their influence on the degree and speed of convergence within the European Union.

1.3. Research thesis

The **scientific thesis** defended in the present study is formulated as follows: *improving the investment climate and taking measures to optimize the conditions for increasing the inflow of foreign capital are a prerequisite for economic growth and accelerating the process of real convergence of Bulgaria within the European Union.*

1.4. Purpose of the dissertation

The aim of the dissertation **is** to establish the direction of impact of FDI intensity on economic growth and the degree of convergence of Bulgaria and the member states of Central and Eastern Europe within the European Union.

1.5. Research tasks

To achieve the main goal of the research the following tasks are set:

1. Clarifying the specificity, form of manifestation and types of foreign direct investment.

2. Revealing the degree and direction of impact of FDI on the economic growth of the recipient country. On the basis of studied theoretical propositions and empirical studies to summarize the effects of foreign investment flows on the socio-economic development of the host country.

3. Identification of the economic and non-economic determinants of attractiveness of foreign direct investments.

4. Analysis of the intensity of net foreign investments, the absolute size and structure of the main components of FDI and structural transformations of investment flows in Bulgaria.

5. On the basis of a comparative analysis, to analyse the existing dependencies between economic growth (measured by basic macroeconomic indicators) and the inflow of foreign capital in Bulgaria and in the CEE countries.

6. To construct an econometric model for assessing the degree of convergence in terms of income and FDI flows in the CEE member countries.

7. To assess the degree of impact of FDI flows on the real convergence of CEE member countries on the basis of macroeconomic indicators significant for economic growth.

1.6. Methodology and scope of the research

The theoretical basis of the research is composed of fundamental monographic works of local and foreign economists, scientific publications, materials from scientific conferences on problems of economic theory and practice.

The research methodology is based on the studying of the problem through the principles of the system approach. Methods of logical, comparative and statistical analysis, synthesis and economic modelling were used to solve the tasks. The empirical information was processed using

Microsoft Excel and the statistical package IBM SPSS Statistics. The final results are illustrated using figures, tables and graphs.

1.7. The structure of the research.

INTRODUCTION

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1.1.1. Nature and substantive characteristics of foreign direct investment

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2.2.4. Structure and rate of change of foreign and national investments in fixed assets in Bulgaria (2010 - 2021)

2.3. **Structural transformations of investment flows in Bulgaria for the period 2010-2021.**

1.8. Applicability of the research results

The carried out critical analysis of theoretical statements regarding the impact of FDI on the economic growth of the host country and the derived results of empirical studies are a good prerequisite for establishing the country's capacity to attract foreign investments and for taking measures to improve the investment environment in Bulgaria.

The established disproportions of structural transformations of local and foreign investment flows in Bulgaria necessitates optimization of measures to direct foreign investments to priority, for our country, industries providing high added value based on high-tech productions.

II. MAIN CONTENT OF THE DISSERTATION

Introduction

The introduction justifies the research topic and outlines the theoretical and practical framework of the research area. The main elements of the scientific research are defined: object, subject and the research thesis of the dissertation, the main purpose of the research is formulated, as well as the research tasks, the methodology and the information security.

CHAPTER I. IMPACT OF FOREIGN DIRECT INVESTMENT ON ECONOMIC GROWTH

In the first chapter, issues concerning the specifics and forms of manifestation of FDI are discussed. The definitions existing in the scientific literature have been analysed and summarized, forming the main characteristics, which are as follows:

First, in general, FDI is a course of action in which residents or companies from one source country (also called the "home country") acquire ownership of assets for the purpose of controlling the production, distribution, and other activities of a company in another host country (also called "foreign country").

Second, FDI includes both the initial acquisition of property abroad by the investor and all subsequent transactions between the investor and enterprise in which the foreign investor holds a management interest of 10 percent or more of the voting shares.

Third, from an economic point of view, FDI is a mechanism for transferring resources, including financial capital, technology and human resources, across national borders, while remaining under the control of the parent company.

Fourth, the definitions of FDI given by the International Monetary Fund (IMF., 2011) and the World Investment Report of the United Nations Conference on Trade and Development which defines (UNCTAD., 2012) use "long-term" and "enduring interest ' to distinguish between FDI and portfolio investments, which are characterized by a lack of long-term commitment of the foreign investor and involve a high turnover of securities.

Fifth, in contemporary literature the most widely accepted definition of FDI is known as the "IMF/OECD reference definition" and states: "FDI is an international venture in which an investor resident in the local economy acquires long-term 'influence' in the management of a subsidiary firm in the host economy' (OECD., 2008).

Sixth, the definition of foreign direct investment has different meanings depending on whether it is reviewed from the perspective of the foreign investor or the host country. According to Moosa (2002), "both perspectives have something in common: a) there is control through significant shareholding; and b) there is a transfer of some of the company's assets, production or sales to the host country' (Moosa, 2002).

The main four leading motives for making investments in a foreign country for the investor are: ***markets; assets; natural resources and the search for efficiency*** (Dunning, 2008, Second edition.).

The theoretical statements, built on the basis of empirical studies, regarding the degree and direction of ***impact of FDI on the economic growth*** of the receiving countries are examined. A number of publications claim with a high degree of confidence that FDI generates growth. The reasoning is that growth can encourage FDI inflows in cases where investors are looking for new consumer markets or when growth leads to greater economies of scale and hence to increased cost efficiency.

Most authors, analysing the positive and negative effects of foreign direct investment (FDI), emphasize on the possibilities of "ensuring" an

increasing growth rate of the host economy. However, the results of the conducted empirical studies are ambiguous and inconclusive and do not provide a clear answer to the question: "Does Foreign Direct Investment (FDI) Contribute to Economic Growth?"

The ambiguous findings of the researchers are divided into four groups: *conditionally positive*, *inconclusive positive, neutral and negative impact of FDI on economic growth*.

From the analysed scientific publications, it is clear that there is a lack of consensus regarding the effects of FDI on the economic growth of host countries. The reasons for the mixed findings on whether the impact of foreign flows positively or negatively on growth, in our view, are as follows:

First, the generalizing conclusions of the authors based on their empirical research, are based on the application of econometric models that are different in nature, scope and specificity. A fact that does not allow "unification" of the conclusions;

Second, the variables used in econometric models are different in scope and number and interact differently, depending on the research objectives;

Third, the factors influencing the inflow of FDI in different countries vary greatly, depending on the degree of socio-economic development, geographical location, investment climate, etc.

Fourth, FDI affects growth through different channels, depending on the characteristics of the environment – level of development and appropriate policies (UNCTAD, 2002).

The defining mechanisms established in world practice with a positive impact on the development of national economies have been identified. According to OECD (2002), there are several channels through which FDI can affect the economic growth of the host country: transfer of new technologies and know-how; increasing the quality of human capital;

integration into the global economy; increased competition in the host country and development and restructuring of firms (OECD, 2002). We should also add the influence of the inflow of foreign capital on domestic investments and market structure to the mentioned impact mechanisms.

Based on the review of the scientific literature, regarding the identification of the economic and non-economic determinants of FDI attractiveness, the following general conclusions were drawn:

First, one of the reasons for the found multidirectional influence of the variables included in the empirical models is that heterogeneous strategies are applied to capture the impact of FDI and factors with different degrees of investment sensitivity are included.

Second, the possibilities of identifying generally valid economic and non-economic determinants of FDI attractiveness are also limited due to the fact that the results of the impact of a certain factor (or variable) are directly dependent on the specificity of the sample and the subject of research, as a result of which estimates for its influence are not unidirectional.

Third, the most commonly applied economic determinants of FDI are those included by UNCTAD (United Nations Conference on Trade and Development) when calculating the Index of potential for inward FDI: GDP per capita, Real GDP growth, Exports as a percentage of GDP (UNCTAD, 2002). Factors such as: *market capacity, degree of openness of the economy, inflation, taxation, exchange rate stability and the level of liquidity are also used as mandatory and significant variables in the research.*

Fourth, the inclusion of a variety of variables to assess the impact of non-economic determinants on the attractiveness of FDI and the ambiguous results, regarding the degree of their influence, do not allow the derivation of universally valid factors. The relevance of the variables used in the empirical models, reflecting the influence of institutional-political factors,

has not been conclusively proven, despite the fact that they are one of the most frequently used. The influence of political risk, corruption levels and corporate tax rates has been established with a relative degree of certainty. Regardless of the applied methodology, two non-economic determinants have a significant positive influence: ***the number of the population and the level of education.***

CHAPTER II. COMPARATIVE ANALYSIS OF FDI INFLOW IN BULGARIA FOR THE PERIOD 2010-2021

The emphasis in the **second chapter** is on the investment environment and the policies for attracting foreign investments in Bulgaria. One of the main prerequisites for attracting and creating a favourable environment for foreign investments in the country is the existence of a legal regime, guaranteeing compliance with the principle of non-discrimination and ensuring transparency of capital flows. Optimizing the country's institutional framework and striving to increase the inflow of FDI are identified as key priorities in the strategic document "Vision, goals and priorities of the National Development Program BULGARIA 2030" (MC, 2020 г.).

The business environment in Bulgaria is of particular importance for attracting foreign capital. At the end of 2022, the general indicator of the business climate in Bulgaria rises by 22% compared to 2021 and by 72.17% compared to 2010 (See Fig. 1). Having reached the highest level of 27.1% for the analysed period, as a result of the crisis caused by the Covid-19

pandemic, investors' expectations regarding the potential for business development fell to a record low of 4.0%.
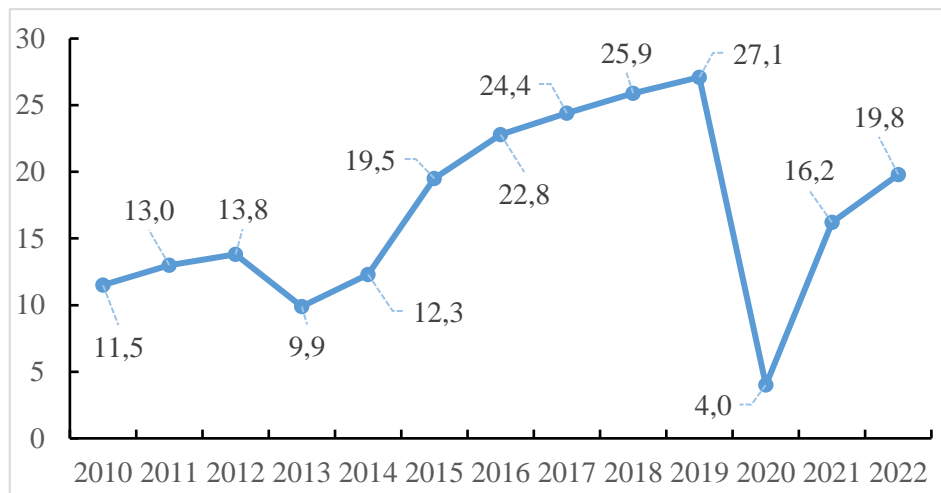
Fig. 1. General indicator of the business climate in Bulgaria for the period 2010-2022 (%)[1]

The general assessment of the dynamics and rate of change of FDI flows in Bulgaria for the period 2010-2021 covers: net foreign investments in Bulgaria; the relative share of FDI in GDP; the direct investment positions of foreign capital in the EU (EU-28) and Bulgaria; the main components of FDI and the amount of foreign and national investments in fixed assets in Bulgaria.

The sectoral structure of FDI and domestic investments in fixed assets is characterized. Based on the values of the coefficients for absolute structural changes and integral indicators for structural differences, an *assessment of the structural changes and differences between FDI and domestic investments in fixed assets* in Bulgaria for the period 2010-2021 was made.

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[1] *Note:* Since May 2002, the overall business climate indicator is calculated as a weighted average of the four sectoral business climate indicators - in industry, construction, retail trade and the service sector.

The flow of FDI in non-financial enterprises in Bulgaria during the analysed period (2010 - 2021) is characterized by relatively significant dynamic changes, that result from the impact of a number of economic factors, administrative and structural changes that occurred both in the country - source of investments, and in the host economy.

The information regarding the growth rate of FDI and domestic investments in non-financial sector enterprises as of 31.12 of the respective year, compared to the growth rate of GDP in Bulgaria for the period 2010-2021, leads to the following conclusions:

First, for the analysed period, the average annual growth rate of FDI was 2.8 points, with an average annual growth rate of 5.58% of GDP and 1.4% of domestic investments.

Second, the rate of growth of invested foreign capital in the national economy moves within "broad" limits. In 2014, the most significant decrease in foreign investments in fixed assets was reported: -7.53%, which equals to 898.98 million euros. A decrease in the inflow of FDI in the amount of EUR 240.07 million was also found in 2011 (-2.12%), which can be explained by the "delayed" influence of the last financial crisis on the investment activity of foreign investors in Bulgaria. In 2020 (compared to 2019), FDI increased by 6.09% or, in absolute terms, by 788.84 million euros, as an "echo" of the global trends of increasing investment activity after the induced "slowdown" of the economy from the Covid-19 pandemic.

Third, sensitive disproportions are found between the growth rates of FDI and those of domestic investments, for example: in 2011, with a negative growth of FDI by -2.12%, domestic investments grew by 10.01%, and GDP - by 8.34% ; 2013 – with a growth of 6.33% of FDI, domestic investments had a negative growth of -5.47%, a circumstance that is also reflected in the growth rate of GDP, which has a negative value (-0.49%); 2014 – with the most significant decrease in FDI inflow reported for the

analyzed period of -7.53%, domestic investments in durable tangible investments increased by 11.35%; 2016 - with FDI growth of 1.49%, domestic investments had a relatively significant negative growth of -17.34%; 2021 - the inflow of foreign capital increased by 4.84%, while at the same time domestic investments reported a decrease of -0.41% at a GDP growth rate of 15.31%.

When comparing the values of the average annual growth of FDI and domestic investments, disproportions are found, which could be perceived *as an assessment of the preferences of foreign and local investors* towards certain sectors of the Bulgarian economy.

Preferred by both types of investors are industries from the O-Q group: "Government; education; human health and social work'. With a negative growth of FDI in industries "Creation and distribution of information and creative products; telecommunications', 'Construction' and 'Real estate operations', inward investment has a positive average annual growth.

The established differences between the growth rates of FDI and domestic investments require a deepening of the research to establish the structural differences of the inflow of FDI in Bulgaria and the realized domestic investments.

The comparison between the established values of the linear coefficient for foreign and domestic investments in fixed assets lead to the following conclusions:

First, significant structural differences for both types of investments were found in group **B-E** (industry - excluding construction), respectively 6.70% for foreign investments and 3.49% for national investments. In industries **G-I** (trade, transport, hospitality and catering), inward investments demonstrate significant structural differences, with a coefficient value of 3.06%, with insignificant structural changes of FDI.

Second, FDI in fixed assets is without sensitive deviations in the sectoral structure (with coefficient values close to 0) except for the M-N group industries (government; education; human health care and social work) with a coefficient value of 1.77%.

Third, according to the values of the calculated linear coefficients of the sector cross-section, national investments in fixed assets, compared to FDI, have more significant structural differences.

The results of the calculated coefficients of absolute structural differences by industry (with applied dependences of the normalized quadratic coefficient) impose the following conclusions:

First, with the exception of branches of group **A** (agriculture, forestry and fisheries), where the values of the index for foreign investments show significant structural differences (11.31%), and domestic ones with insignificant changes (0.29%) and branches of **F** (construction) in which foreign investments have minor structural changes (1.15%), and the coefficient for national investments has a value higher than 2% in the rest of the industries, the trends in both types are identical.

Second, in three groups of industries – **B-E** (industry (excluding construction), **G-I** (trade, transport, hotels and restaurants) and **M-N** (government; education; human health and social work), investment flows in fixed assets are with similar values, accounting for significant structural changes. For foreign investments, the coefficient for industries of group **B-E** is 4.54% and for domestic - 4.62%, for industries of group **G-I** are 5.52% for foreign and 5.76% for domestic and for industries of groups **M-N** – 5.44% for foreign and 5.11% – for national.

Third, for the analysed period, relatively high structural differences are reported for industries from groups **J** (creation and dissemination of information and creative products; telecommunications) and L (real estate operations), with an index value of 2%.

Fourth, for industries of groups *O-Q* (professional activities and scientific research; administrative and auxiliary activities) and *R-U* (culture, sports and entertainment, repair of household goods, other activities and unclassified) both types of investment flows are without significant structural changes, with coefficient values close to **zero**.

The values of the calculated average annual indices of structural changes according to the specified dependences of Gatev, Salai and Ryabtsev show that both types of investment flows in fixed assets have significant structural differences by year (See Table 1).

Table 1

Average annual integral coefficients of structural differences of FDI in fixed assets and domestic investment by years (2010 - 2021)

Categories	*Gatev' Coefficient*	*Salai' Index*	*Ryabtsev' Index*
FDI	0.1008	0.0868	0.0958
Domestic investment	0.1064	0.0851	0.0836

Source: Author's calculations

The established disproportions could be perceived as an assessment of the preferences of foreign and local investors towards certain branches of the Bulgarian economy, formed by the specifics of the business environment in Bulgaria for the analysed period.

CHAPTER III. FOREIGN DIRECT INVESTMENT AND CONVERGENCE WITHIN THE EUROPEAN UNION

The **third chapter** is dedicated to clarifying the issue of whether and to what extent FDI flows influence the ongoing processes of socio-economic convergence of the CEE member states and, in particular, Bulgaria. The

essence of the models for economic convergence and the prerequisites for real convergence of the member states within the European Union, which can be considered as the main goal for less developed countries to join the regional economic integration scheme, are derived. This is also the case with the countries from Central and Eastern Europe (CEE), which entered the European Union after 2004.

Convergence is a recurring theme in the process of European economic integration. The aspiration of the countries to join the EU is mainly due to the prospect of catching up with the standards of living in the community. The European Union, as the most complex integration structure and with the highest degree of integration, provokes the interest of researchers on the evolution of economic convergence. The issue is also relevant due to the fact that the processes of "convergence" are an important aspect of the development of both the community and the relatively slower developing countries - members of the Union. The existing relatively significant differences in the socio-economic development of the member countries is a serious challenge to the mechanisms for managing cooperation and the implementation of the convergence process.

The concept of real economic convergence can be viewed in two directions: firstly, establishing a tendency towards equalization of income levels and development, which can be called growth or convergence of the level of incomes and, secondly, a tendency towards conformity of business cycles, defined as cyclical convergence (Matkowski, 2007).

In a number of scientific studies, the relationship between FDI and real convergence within the EU is sought, and based on the results of empirical studies, the presence and degree of influence of foreign money flows on the ongoing processes of convergence between the countries in the community are proven.

The main conclusion of the analysed scientific studies, regarding the relationship between FDI and the real economic convergence of the member states within the EU, can be summarized as follows: ***the integration of less developed countries into the EU makes them more attractive for foreign capital initially within the existing economic clusters and then gradually extended to the peripheral territories along with the expansion of infrastructure.***

In the search for indications of ongoing processes of real convergence of the EU member states from CEE, a comparative analysis was carried out to assess the degree of economic growth of the countries of Central and Eastern Europe (CEE) and trends in changes in FDI flows based on information on the size of real GDP, estimated at 2020 market prices, of GDP per capita based on purchasing power parity (PPP) and of PPP flows for the period 2010 – 2021. This study covers 10 of 11 of the CEE countries: Bulgaria (BGR), Czech Republic (CZE), Estonia (EST), Croatia (HRV), Latvia (LVA), Lithuania (LTU), Poland (POL), Romania (ROM), Slovenia (SVN) and Slovakia (SVK). The analyses were carried out on the basis of information from Eurostat and the World Bank. Due to lack of information in the Eurostat database for some analysed years, Hungary is excluded from the analysis. The trends in the direction of change of the indicators for assessing real economic convergence and convergence depending on FDI flows are commensurate with those of the European Union (27).

The results of the performed comparative analysis regarding the dynamics of incomes and FDI inflows in CEE and EU27 member states allow the following generalizations:

First, with an average annual real GDP growth rate (at 2020 market prices) of the EU27 of 2.58%, the CEE countries included in the sample grew at nearly twice the rate, reaching a value of 4.83% per annum in unweighted basis.

Second, the reported average annual growth rate of GDP per capita (PPP) for the EU 27 of 1.06% (based on chain-linked volumes at market prices in euros) against values of 3.03% for the CEE member states may is be perceived as an indication of ongoing processes of convergence of the real incomes of the CEE countries within the Union.

Third, despite the demonstrated higher average annual growth rates of real GDP (at 2020 market prices) and GDP per capita (PPP), CEE countries have the lowest levels of real GDP per capita for 2021, with the lowest values for Latvia, Croatia, Romania and Bulgaria.

Fourth, a directly proportional relationship between the average annual growth rates of FDI and the average annual growth rate of GDP per capita (PPP) was established - the countries with the highest growth in FDI flows (Latvia and Lithuania) also have the highest levels of average annual growth of GDP per capita (PPP).

Fifth, with an average annual growth rate of FDI in the EU27 of 4.12%, for the analysed period Bulgaria reported an average annual growth of only 3.29%.

To test the assumption *that CEE countries develop at faster rates of economic growth and absorb a relatively higher flow of foreign capital*, the tools developed by Barro and Sala-i-Martin for β-convergence (Barro, 1997) are applied. The direct relationship between initial levels of income (usually expressed as real GDP per capita in PPP) in a given sample of countries and their growth rates over a given period is evidence of the presence of β-convergence.

Real income β-convergence and FDI inflow convergence for CEE EU member states are estimated by cross-sectional regression. The dependent variables in the model reflect the standard deviation of the natural logarithm of GDP per capita by PPP and the standard deviation of the natural logarithm

of FDI in the period 2010 – 2021. Independent variables are the initial levels of GDP per capita by PPP and the volumes of inflow FDI.
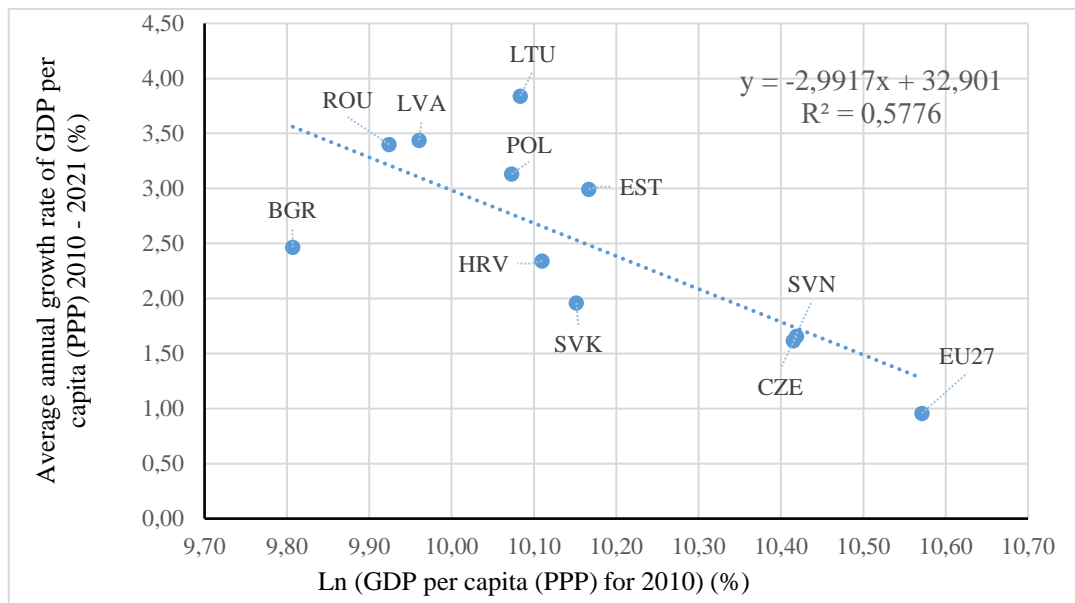
The applied cross-sectional regression is based on the following formula:

$$\frac{1}{T} \ln \left[\frac{y_{it}}{y_{i0}}\right] = \alpha_0 + \alpha_1 ln(y_{i0}) + \varepsilon_1$$

where, y_{it}= GDP per capita by PPP (FDI inflow) of country i in t; y_{i0}= GDP per capita by PPP and FDI inflow from economy i in 2010; T = time period; α = constant; ε = error term

The rationale behind this procedure is the assumption that ***all sampled economies converge to the same steady state.*** The negative slope of the curve (-2.9917) proves the presence of ongoing convergence processes (See. Fig. 1).

At the same time, it is necessary to note that income convergence between less developed countries, even within an integrated economic area such as the EU, is by no means an automatic process. Income differences between EU countries, and CEE in particular, may not necessarily decrease in the future. Divergent tendencies may appear under the influence of economic shocks, such as the crisis caused by the Covid – 19 pandemics, for example, which may hinder the process of convergence between Member States within the Union.

$$y = -2{,}9917x + 32{,}901$$
$$R^2 = 0{,}5776$$

Fig. 1. Growth of GDP per capita (PPP) for the period 2010-2021 and the initial level of GDP (2010) of CEE and EU countries (27)

By means of a correlograms, the correlation dependence between the value of ln FDI in the initial year of the analysed period and the average annual growth rate of FDI to the CEE member states within the EU was derived (see Fig. 2). The assumption is that the inflow of foreign capital to the economies included in the sample approaches the average levels of inflow within the European Union. One of the proofs of the presence of ongoing processes of convergence on FDI flows is the negative slope of the curve (-0.5206).
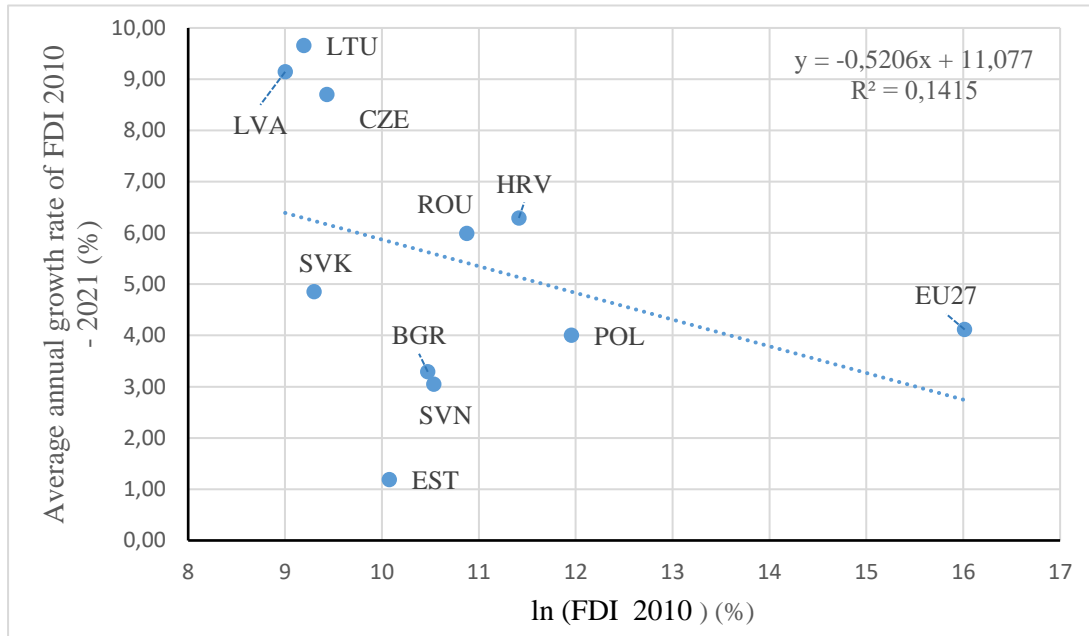
Source: Own calculations based on Eurostat data

Fig. 2. Growth of FDI flows for the period 2010-2021.

and the initial level of FDI (2010) of CEE and EU countries (27)

The intensity of the relationship between the average annual rate of change of the FDI flow and the initial values of the indicator was assessed by means of the two-dimensional Pearson correlation coefficients, which are positive and fall in the interval 0.25 – 0.49 – i.e. the interdependence between the parameters is moderately positive. The correlation between the analysed variables is significant at the assumed risk of 0.05%.

The established relationship between the absolute initial values of the inflow of FDI to the CEE countries and the average annual growth rate of foreign capital, in each of them, allows us to distinguish three groups of countries with specific features:

With the lowest absolute values of FDI inflows, but with the highest average annual growth rates compared to the countries in the 2010 sample, are Latvia, Lithuania and Estonia. Starting from the lowest levels of foreign capital inflow Latvia (8108.00 million euros) and Lithuania (9838.00 million euros) they have the highest growth rates for the analysed period -

9.65% (LTU) and 9.14% (LVA) respectively). With an initial value of EUR 12,496 million for 2010, Estonia achieved an average annual increase in foreign capital inflows of 8.70%.

With relatively high levels of FDI inflow but with lower average annual growth rates for the analysed period are: Romania - with initial values of FDI of 52866 million euros, the average annual growth rate for the period is 5.99% and the Czech Republic with an average annual growth of 6.29% and with relatively high levels of absolute values of FDI of 90527 million euros for the initial year of the analysed period.

With an average annual growth rate of FDI flows close to that of the EU (27) of 4.12%. **Poland** started with the highest absolute values of FDI in the initial period of EUR 155,581 million and with an average annual growth rate of 4.00%. This group can also include **Slovenia**, which, however, unlike Poland, has one of the lowest levels of FDI in 2010, but achieved growth of 4.85% for the analysed period.

With relatively high levels of FDI inflow, but with the lowest values of average annual growth rate are: **Bulgaria** - 35348 million euro FDI for 2010 and average annual growth of 3.29%; **Slovakia** – EUR 37,665 million in the initial period and 3.05% average annual growth in the inflow of foreign capital into the country and **Croatia** – with an FDI amount at the beginning of the period of EUR 23,764 million and with the lowest (compared to the countries in the sample) from 1.19%.

The results of the applied regression model for measuring the β-convergence in terms of income and in terms of FDI income in the CEE countries and the EU27 model "lead" to the following conclusions:

First, the inferred dependencies from the cross-sectional regression model, with a dependent variable the average annual rate of GDP per capita (PPP) between 2010 and 2021, confirm the assumption that all sampled economies converge to one steady state. The negative value of the regression

coefficient of the dependent coefficient ($\alpha\_1 = -1.4814$) is evidence of the existence of real convergence in terms of income between the CEE countries within the EU.

Second, the rate of income convergence is 24.44%, which implies a "catch-up" to the average levels in the EU by the CEE countries within 3 years.

Third, the established correlation dependence between the value of ln FDI in the initial year of the analysed period and the average annual growth rate to the CEE countries confirms the validity of the assumption that *the inflow of foreign capital to the economies included in the sample approaches the average* inflow levels within the European Union with an *average positive interdependence* between the parameters.

Fourth, the negative value of α_1 (-0.0681) suggests an inverse relationship between the variables and proves the existence of ongoing processes of equalizing the growth rates of FDI flows. The rate of β - convergence is 14.16% and implies a "catch-up" to the average levels in the EU by the CEE countries within 5 years.

"Measuring" the degree of influence of FDI flows on the real convergence of four of the CEE member states (Bulgaria, Romania, Latvia and Lithuania) was carried out by applying the techniques of correlation and regression analysis. For each of the countries included in the sample, the impact of FDI flows on three macroeconomic indicators was assessed: GDP per capita (*GDP per capita*), GDP per employed person (constant PPP $ for 2017), (*GDP per employed*) and labour productivity per employed (Index, 2015=100) (*LP*).

The methodology applied to achieve the objective is "predetermined" by the available information and is reduced to a moderate application of statistical methods, such as correlation and regression analysis. The *aim is*

to check whether and to what extent FDI has an impact on the real convergence expressed by the indicators mentioned above.

The impact of FDI on real convergence is estimated on the basis of a regression model of FDI (independent variable) and indicators of real convergence (dependent variable) as follows:

$$Yt = \alpha_0 + \alpha_1 \cdot FDI_t + \varepsilon_t,$$

where, α_0 – constant; α_1 - regression coefficient; FDI_t - net FDI flows; $Y_t =$ convergence indicators (GDP per capita, GDP per employed, LP, AASE); t = 2010, 2011, ..., 2021.

The relationship between the volume of FDI and the variables expressing the real convergence in Bulgaria is depicted with the help of correlograms (point cloud diagram type) (See Fig. 3).
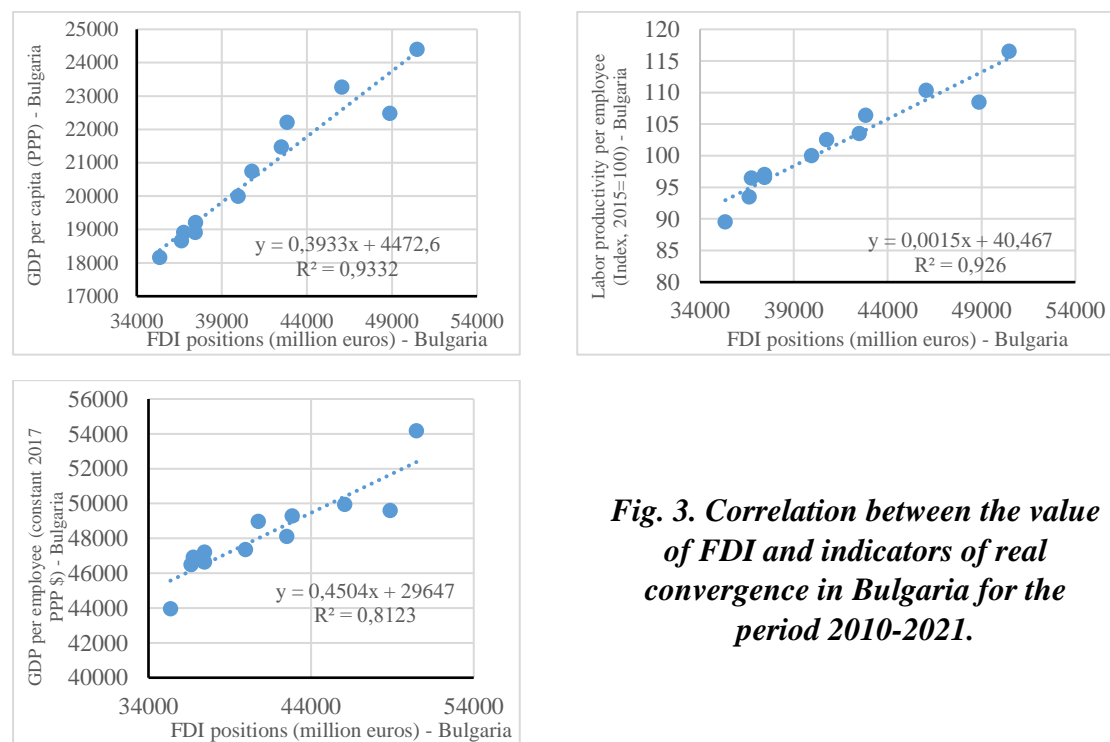

Fig. 3. Correlation between the value of FDI and indicators of real convergence in Bulgaria for the period 2010-2021.

The slope of the curves for assessing the correlation dependence between the inflow of FDI on the model parameters are respectively 0.3933 points for GDP per capita (PPP), 0.4504 for GDP per employed person and 0.0015 for labour productivity of an employed person of a direct and relatively strong relationship between the studied indicators and the inflow of foreign capital.

The regression equations for Bulgaria have the following form:

$$GDP\ per\ capita\ = 4472.65 + 0.3933 \cdot FDI + \varepsilon$$

$$GDP\ per\ employed = 29647.23 + 0.4505 \cdot FDI + \varepsilon$$

$$LP = 40.47 + 0.0015 \cdot FDI + \varepsilon$$

Based on the indicated dependencies in the regression equations, it can be predicted that if the flow of FDI in Bulgaria increases by one million euros, then: GDP per capita (PPP) will increase by 0.3933 million EUR PPP/inhabitant, GDP of employed person will increase by 0.4505 million euros, and labour productivity per employed person by 1.5%.

For Romania, the correlations between FDI inflows and the analysed variables affecting real convergence are depicted by means of correlograms in Fig. 4.

The established correlation dependences are a signal of a strong correlation between the indicators of real convergence and the independent variable. The sample correlation coefficient R is statistically significant (at confidence level α = 0.05).

The regression equations for Romania have the following form:

$$GDP\ per\ capita\ = 8634.40 + 0.2328 \cdot FDI + \varepsilon$$

$$GDP\ per\ employed = 19659.42 + 0.5469 \cdot FDI + \varepsilon$$
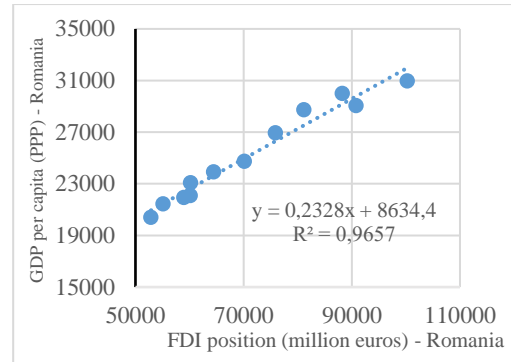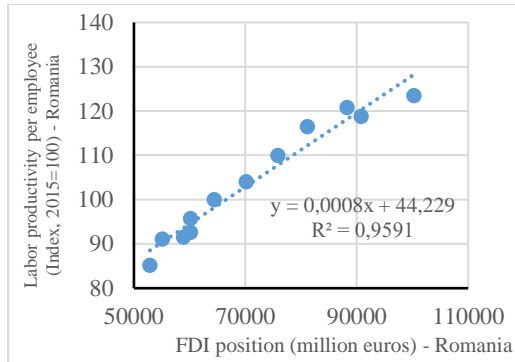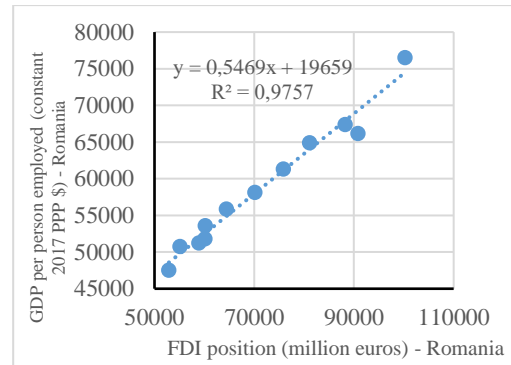
$$LP = 44.23 + 0.0008 \cdot FDI + \varepsilon$$

Fig. *4. Correlation between the value of FDI and real convergence indicators in Romania for the period 2010-2021.*

From the thus obtained dependencies in the regression equations, it can be expected that if the flow of FDI in **Romania** increases by one million euros, then: GDP per capita (PPP) will increase by 0.2328 million EUR PPP/inhabitant, GDP per employed person will increase by 0.5469 million euros, and labor productivity per employee by 0.08%.

With the help of correlograms expressing the real convergence in Lithuania, the relationship between the volume of FDI and the variables included in the regression model is depicted (See Fig. 5).

The slope of the FDI inflow curves on GDP per capita (PPP) of 0.8162 points, on GDP per employed person of 1.0799 and on labor productivity per employed person of 0.0016 proves the existence of a direct and strong relationship between the studied indicators and the inflow of foreign capital in Lithuania
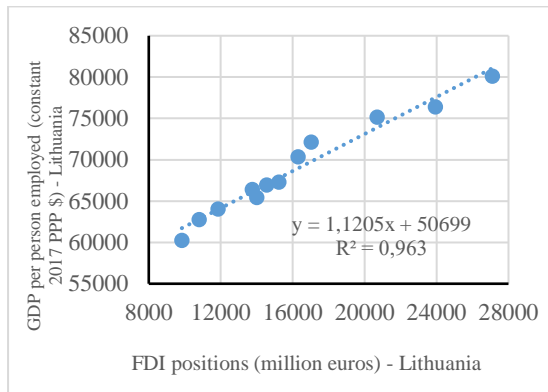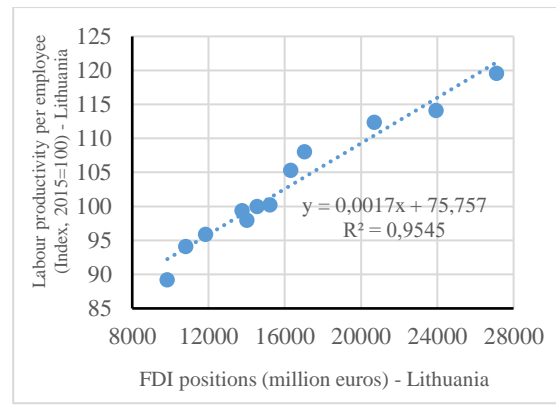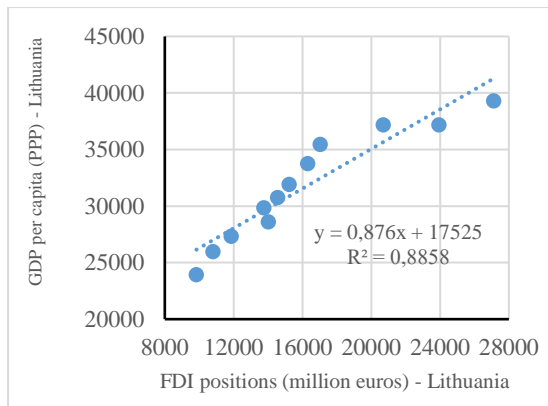
Fig. 5. Correlation dependence between the value of FDI and indicators of real convergence in Lithuania for the period 2010-2021.

The regression equations for Lithuania have the following form:

$$GDP\ per\ capita\ = 18732.77 + 0.8162 \cdot FDI + \varepsilon$$

$$GDP\ per\ employed = 51518.77 + 1.0799 \cdot FDI + \varepsilon$$

$$LP = 77.42 + 0.0016 \cdot FDI + \varepsilon$$

On the basis of the specified dependencies in the regression equations, it can be predicted that if the flow of FDI in Lithuania increases by one million euros, then: GDP per capita (PPP) will increase by 0.8162 million EUR PPP/inhabitant; GDP per employed person will increase by 1.0799 million euros, and labor productivity per employed person by 1.6%.

The presence of prerequisites for real convergence of Latvia as a result of the influence of FDI flows on the analyzed variables is illustrated by correlograms (See Fig. 6).
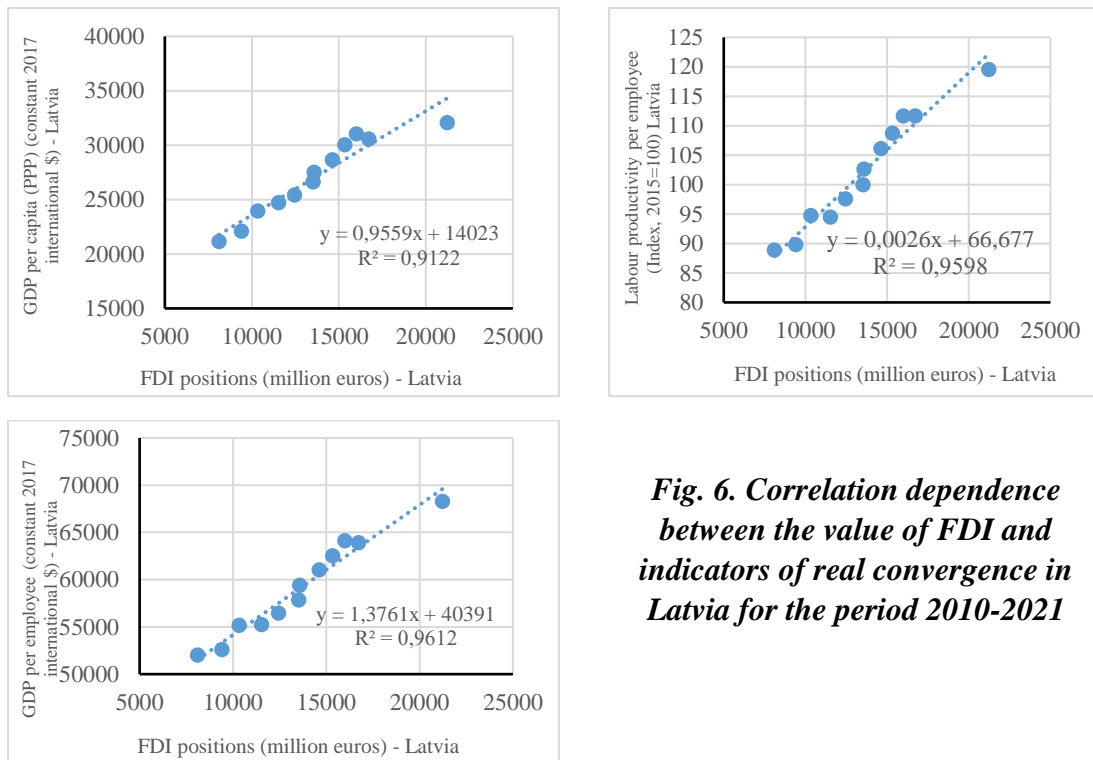
Fig. 6. Correlation dependence between the value of FDI and indicators of real convergence in Latvia for the period 2010-2021

The regression equations are of the form:

$$GDP\ per\ capita\ = 14023.44 + 0.9559 \cdot FDI + \varepsilon$$

$$GDP\ per\ employed = 40391.31 + 1.3761 \cdot FDI + \varepsilon$$

$$LP = 66.68 + 0.0026 \cdot FDI + \varepsilon$$

Thus, if the flow of FDI in Lithuania increases by one million euros, then: GDP per capita (PPP) will increase by 0.9559 million EUR PPP/inhabitant; GDP per employed person will increase by 1.3761 million euros, and labor productivity per employed person by 2.6%.

The results of the applied regression equations to establish the impact of FDI flows on the real convergence of Bulgaria, Romania, Lithuania and Latvia FDI and the indicators of real convergence **is statistically significant**. From this fact, it follows that there *is a direct causal relationship* between foreign investment flows and the main

macroeconomic variables included in the model for the studied EU member countries.

At the same time, it would not be fully justified to claim the presence of a single and universally positive impact of FDI flows on the economic growth and real convergence of a host country. The indicated conclusions concern only the studied CEE countries and are valid for the analyzed period for the macroeconomic indicators included as variables in the study of the real β-convergence. Therefore, there is no guarantee that by changing the number and type of macroeconomic variables and the time scope, FDI flows will have a positive and/or stronger impact on the ongoing processes of real convergence, and hence on the economic growth of the member countries of CEE (included in the sample).

In the conclusion, the results of the scientific research are summarized and the main trends of the influence of FDI on economic growth and the degree of convergence of Bulgaria within the European Union are shown.

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III. Guidelines for future research on the topic of the dissertation

The relevance of the current scientific research, focused on assessing the degree of influence and scope of FDI's impact on economic growth in Bulgaria, predetermines the need to deepen the scientific research in the following directions:

1. Identification of attractiveness factors specific to Bulgaria in order to increase the inflow of FDI as a basic prerequisite for implementing an adequate investment policy.

2. Optimizing the methodology for establishing the structural differences in the inflow of FDI in Bulgaria and the realized internal investments in order to outline the trends and derive recommendations for overcoming the established disparities and creating the prerequisites for redirecting FDI to high-tech industries.

3. Expanding the range of macroeconomic indicators for measuring the impact of FDI on economic growth and convergence rates of Bulgaria within the European Union.

IV. Information about the scientific and scientific-applied contributions in the dissertation

1. The specificity, the form of manifestation and the types of foreign direct investments are clarified.

2. The extent and direction of the impact of FDI on the economic growth of the recipient country is revealed, and on the basis of studied theoretical statements and empirical studies, the effects of foreign investment flows on the socio-economic development of the host country are summarized.

3. The determining economic and non-economic determinants of attractiveness of foreign direct investments are identified.

4. The intensity of net foreign investments, the absolute size and structure of the main components of FDI and the structural transformations of investment flows in Bulgaria were analysed.

5. On the basis of a comparative analysis, the existing dependencies between economic growth (measured by means of basic macroeconomic indicators) and the inflow of foreign capital in Bulgaria and in the CEE countries have been analysed.

6. An econometric model was constructed to assess the degree of convergence in terms of income and FDI flows in CEE member countries.

7. On the basis of macroeconomic indicators significant for economic growth, the degree of impact of FDI flows on the real convergence of CEE member states was "measured".

V. LIST OF PH.D. STUDENTS 'PUBLICATIONS

1. Structural transformations of Direct Foreign and Domestic Investment flows in Bulgaria (2010 – 2020). Annual almanac "Scientific research of doctoral students"., Issue XIV – 2021, Book 17.

2. Foreign Direct Investment: Economic Growth and Determinants of Attractiveness: A Literature Review. Doctoral Research Annual Almanac. Issue XIV – 2022, Book 18.

VI. Information for compliance with the national requirements under the Regulations for application of the Law for the development of the academic staff in the Republic of Bulgaria

National number of points requirement: 30

Number of studies indexed in NACID: 2 pc.
Number of points from articles indexed in NACID: 30.00

Total points: 30.00

DECLARATION OF ORIGINALITY AND ASSURANCE
of dissertation work

From **Anna Dimitrova Petkova**

In connection with the procedure for obtaining the educational and scientific degree "Doctor" in the scientific specialty "Finance, Money Circulation, Credit and Insurance (Finance)", I declare that:

1.   The results and contributions to the dissertation on "Foreign Direct Investment: Economic Growth and Convergence within the European Union" are original and are not borrowed from research and publications in which the author has no participation.

2. The information presented by the author in the form of copies of documents and publications, personally compiled reports, etc. corresponds to the objective truth.

3. The results obtained, described and / or published by other authors are duly and in detail cited in the bibliography.

Signature of applicant

DATE 21.11.2023
Svishtov