Foreign Direct Investments and the Real Convergence. An Approach for Romania and Bulgaria

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Abstract: This paper outlines the need for an analysis of the extent to which foreign direct investments (FDIs) affects real convergence expressed using the following selected macroeconomic indicators: Gross domestic product (GDP) per capita, the unemployment rate (UR), labour productivity (LP) per person employed and the minimum wage (MW). The purpose of this paper is to analyze the impact of foreign direct investment (FDI) on real convergence in Romania's and Bulgaria's economy during 2004-2014. The main results for both Romania and Bulgaria show that FDI can be considered important sources of growth for real convergence that have contributed to economic growth, increased labour productivity and increased the minimum wage except for the unemployment rate. The results confirmed our expectations because logically, foreign firms bring their own technology, appropriate for the work of the employees, in order for their employees to produce as much as possible and pay salaries relatively higher compared to companies with local capital, but they demand instead higher productivity.

Keywords: employment; European Union; types of convergence; economic growth; statistical methods

JEL Classification: C1; F21; F45; F62; O52

1. Introduction

Foreign direct investments are one of the representative vectors of actual economic progress (Sârbu, 2016, p. 225) and their role tends to become significantly important through their contribution to achieving real convergence. In this context, the purpose of the paper is to analyze the impact of foreign direct investments on real convergence, in the Romanian and Bulgarian economy, for the period 2004-2014. The analysis focuses on Romania and Bulgaria as these economies show a similar nature in terms of economic development and they have joined the European Union

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(EU) the same year, in 2007. Our approach in carrying this study is an attempt to address the problem related to the contribution of FDI to real convergence in Romania and Bulgaria. The expression of personal believes based on personal analyses and the use of statistical methods related to the subject of this paper, is indicative. The paper outlines the need for an analysis of the extent to which FDI affects the real convergence, expressed using the following selected macroeconomic indicators: GDP per capita, the unemployment rate, labour productivity per person employed and the minimum wage. With respect to the real convergence, to be noted that in the economic literature, there are several views on the selection of indicators in order to express the real convergence. For this purpose, indicators such as GDP/capita, labour productivity per employee, unemployment rates, exports per capita, the opening degree towards outside, the stock of human capital, and not least, combinations of these indicators are used. Nevertheless, the diversity of views and the range of variables used to express real convergence make it difficult to carry out meaningful comparisons between the results of different studies in the literature on the subject of real convergence. Regarding the structure of this paper, besides the introductive chapter, the paper contains three sections. Section 2 will examine literature review, Sections 3 is devoted to the methodology of the research and shows the extent to which FDI affects real convergence, while Section 4 presents the results of the research. The paper ends with conclusions.

2. Literature Review

Real convergence is one of the fundamental objectives of Romania's integration in the European Union, reflecting the "interdependence between the uniqueness of the European market and the specific of the national markets", referring to "structures, flows and behaviors related to the production, distribution and consumption of goods and services that by combination should maximize the performance of the European Single Market" (Ghizdeanu, 2015, p. 11). From the analysis made by the economical literature we can distinguish the existence of several types of convergence of the integration process, namely: (1) the real convergence, indicating the proximity of the living standards in terms of income per capita towards the EU average, or mitigating the disparities between countries regarding the level of economic and social development (the growth of GDP and of the income per capita); (2) the nominal convergence, which aims at fulfilling the criteria set by the Maastricht Treaty that member states must meet in order to join the Economic and Monetary Union (EMU) and to adopt the single European currency; (3) Institutional convergence, which refers to the harmonization of the national institutions and the EU institutions, in order to reach the common objectives; (4) the structural or complete convergence (Săvoiu, 2016, p. 153; Iancu, 2007, pp. 86-87). Thus, the macroeconomic convergence criteria are considered as a condition for keeping a sustainable enlargement of the Economic Union (Šmídková, 2001, p. 364). At the same time,

the economic literature develops several indicators, which reflect either the process of reducing the long-term differences between the countries concerned, the dispersion of income per capita across countries or regions, while using in this respect: dispersion, the Gini coefficient, the Theil index, which offers the opportunity to appreciate the "divergence" and in the case of an assembly structured on groups of countries, the beta convergence which assumes that the differences in the income per capita will reduce in time or the absolute beta convergence, the conditional beta convergence or the convergence of time series, the analysis of co integration series, dynamic distribution (Ghosh, 2015; Patache, 2013; Próchniak & Witkowski, 2013; Albu, 2012; Iancu, 2008; Pecican, 2008; Iancu, 2007).

Regarding the term beta convergence generated by the regression analysis of the level of development of countries or regions, it can have three basic forms namely (Iancu, 2007, p. 27): (1) absolute β convergence that occurs when the poorer countries will grow faster than the richer countries; (2) the β group (clubs) convergence, which takes into account the inclusion in the studied panel of those countries/regions that have a certain technological and institutional homogeneity, of economic policy, and (3) the conditional β convergence, which considers the vector of determinant factors of growth as additional variables which define the differences between the economies that require (proxy for) the achievement of a state of equilibrium, by introducing in the regression, equations of variables that keep the balance of economies steady. Regarding the term "club" convergence, Baumol introduced it in 1986, in order to describe behaviors and evolutions of a subset of savings (Baumol, 1986). In what the relationship between FDI and real convergence is concerned, in the specialized literature there are several studies that argue the fact that free movement, without restrictions, of production factors between European countries and regions especially through the integration of the capital market and through foreign direct investments, is an important factor in order to achieve real convergence (Iancu, 2008, p. 28). This scenario can be possible by: containing a consistent investment effort, favored by a high rate of savings and of FDI; increasing the level of qualification and the responsiveness to new human capital; enhancing competitiveness and increasing the social cohesion, recording an overall modernization of the country; and very important, constantly and rapidly growing the total productivity, the factors of production, which, depends on the growth of the labour productivity (Dăianu & Vrânceanu, 2002, p. 289; Dinu & Socol, 2006, p. 14; Neagu, 2009, p. 51). Strat and Popovici (2015) analyzed the evolution of the disparities between the member states of the European Union, separated into two groups, as it follows: the new member states (13 countries that joined the EU since 2004) and the old states in the European Union, states that joined before the last enlargement round. Therein, in order to reach the purpose, the Gini coefficients were used in the research, pursuing to obtain evidence demonstrating that FDI are a determining factor for real and structural convergence in the EU. The results showed that FDI could be considered an amplifier of real convergence only for the new

member states. In addition, real convergence appears to depend crucially on the ability of the countries to harness the international transfer of technology in particular through foreign direct investments (Martín et al., 2001, p. 1).

FDI are an important source concerning the process of real convergence, because FDI influence sources such as income convergence, productivity and structural convergence, by increasing the capital stock of the economy; lead to an increase of the productivity and of the income; contribute to increasing the degree of employment (Marinas, 2006, p. 75). Also, FDI contribute to the economic growth and real convergence through at least two ways: first through the transfer of technology and know-how, the technological process can be stimulated, thereby contributing to an increase in labour productivity; secondly, FDI offer financial resources, contributing to the capital accumulation (Borys et al., 2008, p. 24). One of the features of transition and of the process of real convergence is the accumulation of the production capacity to produce goods of a better quality, especially due to inflows of FDI in the manufacturing sector (Egert, 2007, p. 24). Thus, the flow of FDI plays an important role on the productivity convergence in Central and Eastern Europe, with a strong effect on the productivity convergence both on the country and industry level. But the impact of FDI on productivity depends crucially on the absorption capacity of the recipient economies and industries (Bijsterbosch & Kolasa, 2010). Šmídková, Barrell and Holland presented through a study a model for calculating the real exchange rates for five countries (Czech Republic, Estonia, Hungary, Poland and Slovenia) which were at the time in the pre-accession. Within this study the authors showed that FDI (relative to GDP) are the driving force of economic convergence in the five countries analyzed, highlighting the following aspect: the bigger the stock of FDI, the bigger the economic integration, which in turn tends to promote trade and improve net exports (Šmídková et al., 2002, p. 8). Although the intensification of integration has contributed, in general, to an economic growth, it did not necessarily lead to the reduction of disparities between the less and the most developed states because the mechanisms of the internal market had positive effects only if the conditions for their operation were met, namely: an attractive business environment, foreign direct investments, trusted official institutions, infrastructure, etc. (Tiganasu, Pascariu & Baciu, 2014, p. 175). In such a context, foreign direct investments are one of the main factors in the integration of countries in transition, in the global economy, especially in the European Union (Sohinger, 2005, p. 73).

3. Research Methodology

In order to achieve the purpose of this paper, there was used data sources from the databases of Eurostat, the National Bank of Romania, the Bulgarian National Bank, for the variables: FDI stock, GDP/capita (Mill. PPS/capita), unemployment rate, the

labour productivity per person employed and the minimum wage, for the period 2004 -2014, annual series. There was used this period of time for the analysis due to the availability of statistical information.

To express real convergence, there is selected the following indicators: GDP/capita, the unemployment rate, the labour productivity per person employed and the minimum wage.

By analyzing the impact of FDI on indicators such as GDP per capita, the unemployment rate, labour productivity per person employed and the minimum wage, the purpose is to verify whether the FDI has an impact on real convergence, expressed through the indicators mentioned above.

Given that at present there are many approaches and methodologies used to calculate real convergence, in this section there is intended to achieve a modest application of statistical methods, respectively, the correlation analysis and the regression analysis in order to assess the influence of FDI in Romania and Bulgaria.

Although in the economic literature there are various calculation methodologies of real convergence, the selection of the calculation methodology is determined by the available statistical data and by the purpose of the analysis.

Thus, in order to study the impact of FDI on real convergence, there is estimated a simple regression model of the FDI (independent variable) and each of the indicators of real convergence (dependent variable).

The regression model has the following form:

$Y_t = \beta_0 + \beta_1 * FDIstocks_t + \varepsilon_t'$,

where:

β_0 - constant (originally ordered);

β_1 - regression coefficient (slope);

FDIstocks = foreign direct investment stocks;

Y = convergence indicators (GDP per capita, the unemployment rate, labour productivity per person employed and the minimum wage);

t = 2004, 2005, … , 2014.

In this research, we formulated the following assumptions:

Hypothesis 1: FDI stocks have a significant influence on real convergence in Romania;

Hypothesis 2: FDI stocks have a significant influence on real convergence in Bulgaria.

4. Results and Discussion

The link between the stock of FDI and the variables expressing real convergence in Romania is graphed using the correlogram (the point cloud chart type, Chart 1). It can be observed, based on the correlogram, that there is a direct and strong link between the FDI and the following indicators: GDP/capita, labour productivity and the minimum wage. Instead, there is a reversed and weak link between FDI and the unemployment rate.
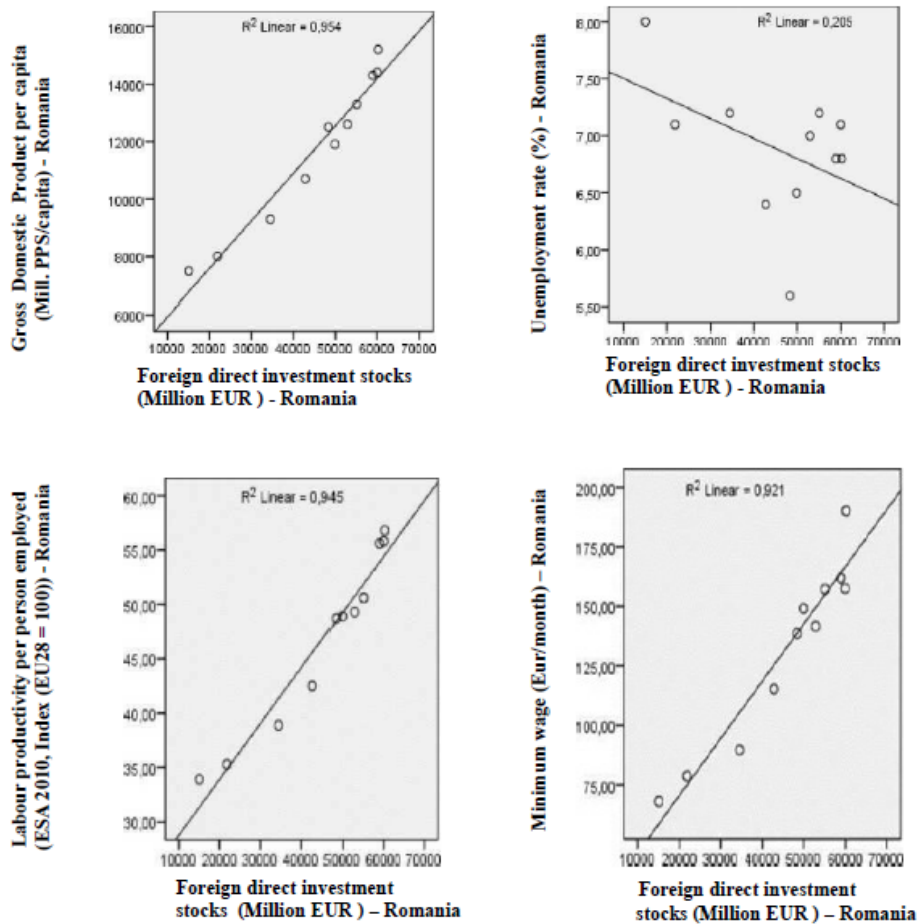

Figure 1. The link between FDI and real convergence in Romania, during 2004-2014

Source: Authors' representation

The results of the correlation analysis allow us to evaluate the meaning and the intensity of the relationship between the FDI stocks and the convergence indicators. The values of the bivariate Pearson correlation coefficients are positive and close to the value of 1, in the event of the link between the FDI and the following indicators: GDP/capita, labour productivity and the minimum wage. Therefore, there is a direct and close connection between FDI and the three indicators of convergence. The correlation between the analyzed variables is significant in the conditions of an assumed risk of 0.1%. However, between the FDI and the unemployment rate there is a reversed and weak link (the value of the Pearson correlation coefficient is -0.452). The relatively modest volume of FDI in the Romanian economy, which cannot yet generate significant effects on the unemployment rate, could explain this result. In addition, the background of the global economic crisis triggered in 2008, which caused in Romania as well as in Bulgaria, a powerful process of dismissals, with drastic effects on the variable unemployment rate can also explain the result. Furthermore, the correlation between these two variables is not significant statistically speaking (the Sig. significance level of the Student test applied in order to test the correlation coefficient is higher than 5%).

Table 1. The Pearson correlation coefficient between FDI and the real convergence indicators in Romania

Correlations

		FDI stocks (Mill. EUR)	GDP/capita (Mill. PPS/capita)	Unemployment rate (%)	Labour productivity per person employed (ESA 2010, Index (EU28 = 100))	Minimum wage (EUR/month)
FDI stocks (Mill. EUR)	Pearson Correlation	1	,977**	-,452	,972**	,960**
	Sig. (2-tailed)		,000	,162	,000	,000
	N	11	11	11	11	11
GDP/capita (Mill. /capita)	Pearson Correlation	,977**	1	-,394	,995**	,980**
	Sig. (2-tailed)	,000		,230	,000	,000
	N	11	11	11	11	11
Unemployment rate (%)	Pearson Correlation	-,452	-,394	1	-,382	-,414

	Sig. (2-tailed)	,162	,230		,247	,206
	N	11	11	11	11	11
Labour productivity per person employed (ESA 2010, Index (EU28 = 100))	Pearson Correlation	,972**	,995**	-,382	1	,977**
	Sig. (2-tailed)	,000	,000	,247		,000
	N	11	11	11	11	11
Minimum wage (EUR/month)	Pearson Correlation	,960**	,980**	-,414	,977**	1
	Sig. (2-tailed)	,000	,000	,206	,000	
	N	11	11	11	11	11

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Authors' calculation

The regression coefficients between the FDI stocks and the indicators of real convergence in the Romanian economy are obtained by estimating the four models of regression. There was also estimated the determination ratio for each model and the models were validated as a whole but also as individual factors. We presented the estimates of the coefficients of the regression models and of the coefficient determination (R-squared) synthetically in the following table.

Table 2. The coefficients for the regression model between FDI and the real convergence indicators, in Romania

The dependent variable	The constant (b_0)	The regression coefficient (b_1)	The coefficient of determination (R^2)
GDP/capita (Mill.PPS/capita)	4295,808***	0,165***	0,954
Unemployment rate (%)	7,678***	-1,753E-5	0,205
Labour productivity per person employed (ESA 2010, Index (EU28 = 100))	23,638***	0,001***	0,945
Minimum wage (EUR/month)	22,538*	0,002***	0,921

*** - Sig. < 1%, ** - Sig. < 5%, * - Sig.< 10%

Source: Authors' calculation

The coefficient of determination (R^2) indicates the variation percentage of the dependable variable explained by the FDI stock.

It is observed that the FDI explains over 90% of the variation of the real convergence indicators except the unemployment rate.

The results in the ANOVA table (Table 3, Table 4, Table 5, and Table 6) present the decomposition elements of the total variation, of the dependable variable on variation sources, the value and the significance level of the Fisher test.

For the regression models between the FDI stocks and the indicators GDP/capita, labour productivity and the minimum wage, the Fisher test is statistically significant because the level of significance Sig. is inferior to the assumed risk of 0.1%.

With a 99.9% probability there can be affirmed that the link between FDI and the convergence indicators is statistically significant (except for the variable unemployment rate). We can allow therefore a linear relationship between the studied variables.

Table 3. The ANOVAs results for the regression model between the variables FDI and GDP/capita in Romania

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	65216100,295	1	65216100,295	187,343	,000[b]
	Residual	3132990,614	9	348110,068		
	Total	68349090,909	10			

a. Dependent Variable: Gross domestic product per capita (Mill. PPS/capita) - Romania
b. Predictors: (Constant), Foreign direct investment stocks (Million EUR) - Romania

Source: Authors' calculation.

Table 4. The ANOVAs results for the regression model between the variables FDI and the unemployment rate in Romania

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,736	1	,736	2,315	,162[b]
	Residual	2,861	9	,318		
	Total	3,596	10			

a. Dependent Variable: Unemployment rate (%) - Romania
b. Predictors: (Constant), Foreign direct investment stocks (Million EUR) - Romania

Source: Authors' calculation

Table 5. The ANOVAs results for the regression model between the variables FDI and the labour productivity per each person employed in Romania

ANOVAᵃ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	630,140	1	630,140	155,953	,000ᵇ
	Residual	36,365	9	4,041		
	Total	666,505	10			

a. Dependent Variable: Labour productivity per person employed (ESA 2010, Index (EU28 = 100)) – Romania

b. Predictors: (Constant), Foreign direct investment stocks (Million EUR) - Romania

Source: Authors' calculation

Table 6. The ANOVAs results for the regression model between the variables FDI and the minimum wage in Romania

ANOVAᵃ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13812,501	1	13812,501	105,533	,000ᵇ
	Residual	1177,946	9	130,883		
	Total	14990,447	10			

a. Dependent Variable: Minimum wage (EUR/month) - Romania

b. Predictors: (Constant), Foreign direct investment stocks (Million EUR) - Romania

Source: Authors' calculation

The coefficient tables for the regression model between FDI and the convergence indicators present the estimated values of the regression coefficients, the standard errors and the significance level of the Student test. The estimates of the regression coefficients are presented in Table 7, Table 8, Table 9 and Table 10.

The regression equations have the following form:

$GDPt = 4295.808 + 0.165* FDIstocks_t + et$'; $URt = 7.678 -1.753*10-5* FDIstocks_t + et$';

$LPt = 23.638 + 0.001* FDIstocks_t + et$'; $MWt = 22.538+ 0.002* FDIstocks_t + et$'

The effect of FDI on the convergence indicators is measured through the regression coefficients (slope): If the FDI stock increases by one Million Euros, then the variable GDP/capita increases, on average, by 0.165 Million PPS/inhabitant; If the FDI stock increases by one Million Euros, then the variable labour productivity increases, on average, by 0.001%. If the FDI stock increases by one Million Euros, then the variable minimum wage increases, on average, by 0.002 Euro. The effect of the FDI stock on the unemployment rate is not statistically significant.

Table 7. The regression coefficients for the regression model between the variables FDI and the GDP/capita in Romania

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	4295,808	575,765		7,461	,000
	Foreign direct investment stocks (Million EUR) - Romania	,165	,012	,977	13,687	,000

a. Dependent Variable: Gross domestic product per capita (Mill. PPS/capita) - Romania

Source: Authors' calculation

Table 8. The regression coefficients for the regression model between the variables FDI and the unemployment rate in Romania

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7,678	,550		13,955	,000
	Foreign direct investment stocks (Million EUR) - Romania	-1,753E-5	,000	-,452	-1,521	,162

a. Dependent Variable: Unemployment rate (%) - Romania

Source: Authors' calculation

Table 9. The regression coefficients for the regression model between the variables FDI and the labour productivity in Romania

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	23,638	1,962		12,051	,000
	Foreign direct investment stocks (Million EUR) - Romania	,001	,000	,972	12,488	,000

a. Dependent Variable: Labour productivity per person employed (ESA 2010, Index (EU28 = 100)) - Romania

Source: Authors' calculation

Table 10. The regression coefficients for the regression model between the variables FDI and the minimum wage in Romania

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	22,538	11,164		2,019	,074
Foreign direct investment stocks (Million EUR) - Romania	,002	,000	,960	10,273	,000

a. Dependent Variable: Minimum wage (EUR/month) - Romania

Source: Authors' calculation

Testing the significance of the effect of the FDI stocks on the convergence indicators is in fact testing the significance of the regression slope. The statistical assumptions are the following: H0: $\beta 1 = 0$ (slope is not statistically significant); H1: $\beta 1 = 0$ (slope is statistically significant).The verification of the H0 hypothesis is performed using the t test (Student) for the regression parameter $\beta 1$.

The used t test is: $t = b_1/S_{\beta 1}$, where:b – estimation of the regression parameter $\beta 1$; $S_{\beta 1}$ – estimation of the standard deviation of the estimator $\beta 1$.

For the three models analyzed, the regression coefficient is statistically significant, the level of significance of the Student test is lower than the assumed risk (Sig. <0.1%). With a probability of 99%, the slope of the regression line is statistically significant. Therefore, the H0 hypothesis must be rejected, as in Romania the FDI stock has a significant impact on real convergence.

Regarding the impact of the FDI stocks on real convergence in Bulgaria, with the help of the correlogram, it can be observed that there is a direct and substantial connection between the FDI and the following indicators: GDP/capita, labour productivity and the minimum wage.

Compared to Romania, in Bulgaria there is a direct link between the FDI and the unemployment rate (for Romania the connection is reversed). However, similarly, the relationship between these two variables is weak, even very weak in Bulgaria.

The relatively modest volume of FDI in the Bulgarian economy, which cannot yet generate significant effects on the unemployment rate, could explain this result. In addition, in Bulgaria, the result can be explained against the background of the economic crisis triggered in 2008, which caused a significant decrease of the foreign direct investments in the Bulgarian economy, which generated a powerful process of dismissals.

Concurrently, the unemployment rate helps us realize the consequences of the crisis on the economic activity in a country or region. Also, the increase in unemployment amongst the population has a negative impact on the quality of life at the individual level or over the region to which it belongs, context in which it is necessary to create a climate of trust in Bulgaria and Romania, as a measure for recovering foreign investments.
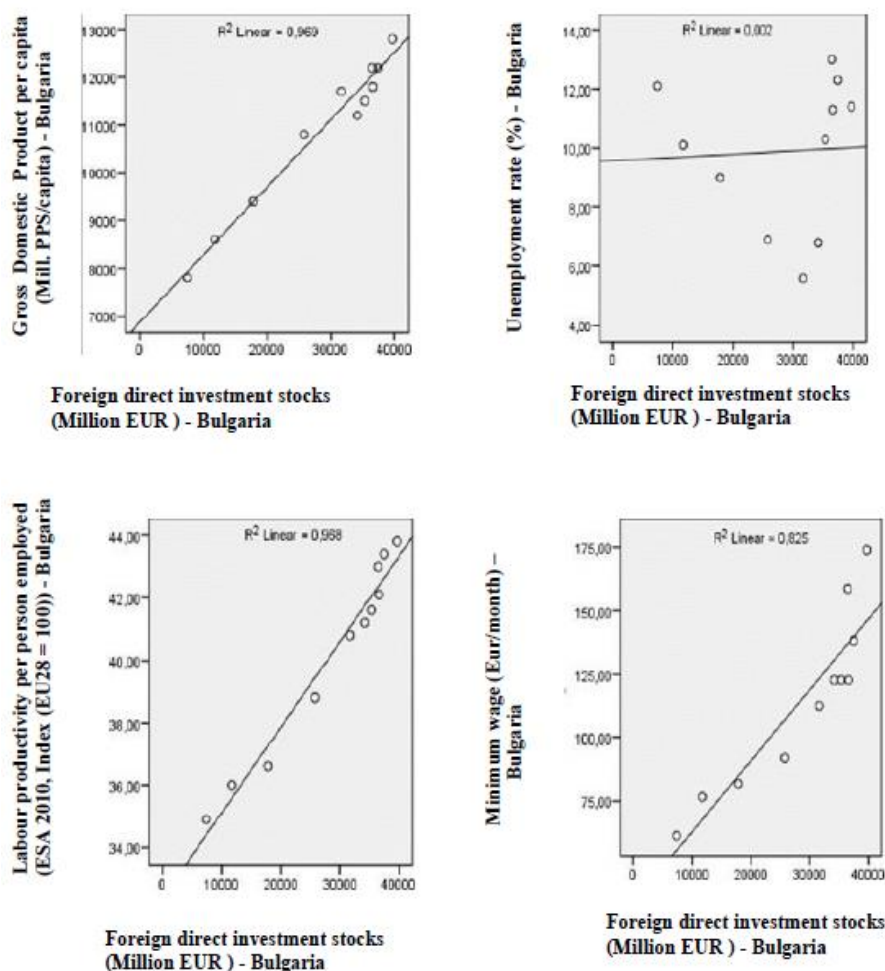

Figure 2. The link between FDI and the real convergence indicators in Bulgaria during the period 2004-2014

Source: Authors' representation

The Pearson bivariate correlation coefficients are positive and statistically significant if there is a link between the FDI stocks and the following indicators: GDP/capita,

labour productivity and the minimum wage. So in Bulgaria there is also a direct and close connection between FDI and the three indicators of convergence. Moreover, between the FDI stocks and the unemployment rate there is no link that can be statistically significant (the level of significance Sig. of the Student test applied in order to test the correlation coefficient is above 5%).

Table 11. The Pearson correlation coefficient between FDI and real convergence indicators, for Bulgaria

Correlations

		FDI stocks (Mill. EUR)	GDP/capita (Mill. PPS/capita)	Unemploymen t rate (%)	Labour productivity per person employed (ESA 2010, Index (EU28 = 100))	Minimum wage (EUR/month)
FDI stocks (Mill. EUR)	Pearson Correlation	1	,984**	,050	,984**	,908**
	Sig. (2-tailed)		,000	,885	,000	,000
	N	11	11	11	11	11
GDP/capita (Mill. PPS/capita)	Pearson Correlation	,984**	1	,037	,979**	,922**
	Sig. (2-tailed)	,000		,914	,000	,000
	N	11	11	11	11	11
Unemploy ment rate (%)	Pearson Correlation	,050	,037	1	,181	,291
	Sig. (2-tailed)	,885	,914		,594	,386
	N	11	11	11	11	11
Labour productivity per person employed (ESA 2010, Index (EU28 = 100))	Pearson Correlation	,984**	,979**	,181	1	,950**
	Sig. (2-tailed)	,000	,000	,594		,000
	N	11	11	11	11	11

Minimum wage (EUR/mont h))	Pearson Correlation	,908**	,922**	,291	,950**	1
	Sig. (2-tailed)	,000	,000	,386	,000	
	N	11	11	11	11	11

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Authors' Calculation

The estimation of the coefficients of the regression models and of the coefficient of determination (R-squared) is presented, synthetically in Table 12. The regression models between the FDI stocks and the indicators of real convergence were also estimated.

Table 12. The regression coefficients for the regression model of the variable FDI and the real convergence indicators in Bulgaria

The dependent variable	The constant (b_0)	The regression coefficient (b_1)	The coefficient of determination (R^2)
GDP/capita (Mill. PPS/capita)	6882,973***	0,141***	0,969
Unemployment rate (%)	9,577***	1,100E-5	0,002
Labour productivity per person employed (ESA 2010, Index (EU28 = 100))	32,372***	0,000274***	0,968
Minimum wage (EUR/month)	34,934**	0,003***	0,825

*** - Sig. < 1%, ** - Sig. < 5%, * - Sig.< 10%

Source: Authors' calculation

The results from the ANOVA tables (Table 13, Table 14, Table 15 and Table 16) represent the decomposition of the total variance, of the dependent variable, on variation sources, the value of the Fisher test and its significance. For the regression models of the variable FDI stocks and the indicators GDP/capita, labour productivity and the minimum wage, the Fisher test is statistically significant so, the link between FDI and the indicators of convergence, is statistically significant (except the variable rate of unemployment) also in Bulgaria.

Table 13. The ANOVAs results for the regression model between the variables FDI and GDP per capita for Bulgaria

ANOVAᵃ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25241931,892	1	25241931,892	281,453	,000ᵇ
	Residual	807159,017	9	89684,335		
	Total	26049090,909	10			

a. Dependent Variable: Gross domestic product per capita (Mill. PPS/capita) – Bulgaria
b. Predictors: (Constant), Foreign direct investment stocks (Million EUR) – Bulgaria

Source: Authors' calculation

Table 14. The ANOVAs results for the regression model between the variables FDI and the unemployment rate for Bulgaria

ANOVAᵃ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,154	1	,154	,022	,885ᵇ
	Residual	62,375	9	6,931		
	Total	62,529	10			

a. Dependent Variable: Unemployment rate (%) - Bulgaria
b. Predictors: (Constant), Foreign direct investment stocks (Million EUR) - Bulgaria

Source: Authors' calculation

Table 15. The ANOVAs results for the regression model between the variables FDI and labour productivity per person employed for Bulgaria

ANOVAᵃ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	95,422	1	95,422	268,561	,000ᵇ
	Residual	3,198	9	,355		
	Total	98,620	10			

a. Dependent Variable: Labour productivity per person employed (ESA 2010, Index (EU28 = 100)) – Bulgaria
b. Predictors: (Constant), Foreign direct investment stocks (Million EUR) - Bulgaria

Source: Authors' calculation

Table 16. The ANOVAs results for the regression model between the variables FDI and the minimum wage for Bulgaria

ANOVAᵃ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9934,690	1	9934,690	42,362	,000ᵇ
	Residual	2110,663	9	234,518		
	Total	12045,353	10			

a. Dependent Variable: Minimum wage (EUR/month) - Bulgaria
b. Predictors: (Constant), Foreign direct investment stocks (Million EUR) – Bulgaria

Source: Authors' calculation

The tables of the coefficients for the regression model between the FDI and the convergence indicators, present the estimated values of the regression coefficients, the standard errors and the significance of the Student test.

The estimations of the regression coefficients are shown in Table 17, Table 18, Table 19 and Table 20.

The regression equations have the following form:

$GDP_t = 6882.973 + 0.141 * FDIstocks_t + e_t$;

$URt = 9.577 + 1.100 * FDIstocks_t + e_t$;

$LP_t = 32.372 + 0.000274 * FDIstocks_t + e_t$;

$MW_t = 34.934 + 0.003 * FDIstocks_t + e_t$

Table 17. The regression coefficients for the regression model between the variables FDI and GDP per capita, for Bulgaria

Coefficientsᵃ

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6882,973	256,409		26,844	,000
	FDI stocks (Mill. EUR) – Bulgaria	,141	,008	,984	16,777	,000

a. Dependent Variable: Gross domestic product per capita (Mill. PPS/capita) - Bulgaria
Source: Authors' calculation

Table 18. The regression coefficients for the regression model between the variables FDI and the unemployment rate, for Bulgaria

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9,577	2,254		4,249	,002
	FDI stocks (Mill. EUR) – Bulgaria	1,100E-5	,000	,050	,149	,885

a. Dependent Variable: Unemployment rate (%) - Bulgaria

Source: Authors' calculation

Table 19. The regression coefficients for the regression model between the variables FDI and labour productivity per person employed, for Bulgaria

Coefficients[a]

Unstandardized Coefficients		Standardized Coefficients		
B	Std. Error	Beta	t	Sig.
32,372	,510		63,429	,000
,000274	,000017	,984	16,388	,000

a. Dependent Variable: Labour productivity per person employed (ESA 2010, Index (EU28 = 100)) - Bulgaria

Source: Authors' calculation

Table 20. The regression coefficients for regression model between the variables FDI and the minimum wage, in Bulgaria

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	34,934	13,112		2,664	,026
	FDI stocks (Mill. EUR) - Bulgaria	,003	,000	,908	6,509	,000

a. Dependent Variable: Minimum wage (EUR/month) - Bulgaria

Source: Authors' calculation

The effect of FDI on the convergence indicators is measured through the regression coefficients (slope): If in Bulgaria, the FDI stock increases by one Million Euros, the variable GDP/capita increases on average by 0.141 Million PPS/inhabitant; If in Bulgaria, the FDI stock increases increases by one Million Euros, the variable labour

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productivity increases, on average, by 0.000274%; If in Bulgaria, the FDI increases by one Million Euros, the variable minimum wage increases, on average, by 0,003 Euro. Therefore, the results show that in Bulgaria, the impact of FDI on real convergence is significant.

5. Conclusion

The topic of foreign direct investments is widely debated in the economic literature and analyzed from different perspectives, which refer to the potential effects, positive or negative, in the origin or host economies, to benefits, to costs, to their contribution in amplifying real convergence and development by bringing capital, technology, know-how, superior management, help to increase the revenues on the state budget, generate creative activities with added value and demonstrate excellence in the conduct of operations on technological innovation.

Regarding real convergence, it may constitute an important challenge for the current field of research, given that the economic theory offers a variety of disputed contents, variables and meanings that make it difficult to perform meaningful comparisons between the results of different studies in the profile literature regarding real convergence.

The purpose of this paper was to analyze the impact of FDI on real convergence. From this perspective based on analyzes carried out it was found that the link between FDI and indicators of real convergence for both Romania and Bulgaria is statistically significant (except for the variable rate of unemployment), which confirmed our expectations because logically, foreign firms bring their own technology, appropriate for the work of the employees, in order for their employees to produce as much as possible. In addition, foreign enterprises bring know – how, superior management within the companies and pay relatively higher wages than domestically - owned firms, but ask in return for higher productivity. Instead, in what concerns the unemployment rate, the analyzes showed a reversed and weak link between the FDI and the unemployment rate in Romania, while in Bulgaria, there was a direct link between the FDI and the unemployment rate, however, similarly, the link between these two variables is weak, even very weak in Bulgaria.

The explanation of these results concerning the impact of FDI on the unemployment rate could be given by the relatively modest FDI stock in both the Romanian and the Bulgarian economy, which cannot generate yet significant effects on the unemployment rate in the economies analyzed (Romania and Bulgaria).

In order to stimulate the FDI, decision makers may establish a set of general measures intended to attract FDI, namely: stimulating FDI by creating a favorable business environment, an appropriate legislative and institutional framework, simplifying the procedures for the entrance of foreign investors in the economy and

not least providing facilities to attract FDI, especially in the disadvantaged regions, which have the highest unemployment rates, in order to create jobs (for example in December 2014 the regions in Romania which registered the highest unemployment rates were the following: south west Oltenia (8.2%), followed by the south region (7.3%) and the southeast region with an unemployment rate of 6.9%, according to data from the the Romanian National Institute of Statistics. While in Bulgaria the regions that have the highest unemployment rates in 2014 were: Severozapaden (14.2%), Severen tsentralen (13.2%), Severoiztochen (12.6%) and the Yuzhen tsentralen region with an unemployment rate of 12.0 %, according to data from the Bulgarian National Institute of Statistics.

Another alternative with possible effects in increasing employment would be attracting European funds to generate jobs. In this context, we propose as future directions of research and analysis, the impact of European funds on real convergence.

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