



FOREIGN TRADE AND FDI AS MAIN FACTORS OF GROWTH IN THE EU¹

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Abstract

In the last decade, a number of empirical studies tried to highlight a strong correlation among foreign trade, foreign direct investment and economic growth. Moreover, the recent crisis affecting firstly the GDP growth had also a negative impact on foreign trade and on FDI inflow. Today, there is a strong competition both on the goods market and on the capital market. As a rule, in countries where the stock of FDI is high, the foreign trade is in expansion and has a high level of efficiency and, consequently, a relatively stable economic growth is demonstrated. Based on available statistical data, we estimated a model to simulate the impact of FDI on GDP growth in the EU. Further, a similar approach permitted us to investigate the FDI-Export-GDP relationship in the case of Romania for the last decade. As a conclusion, to recover economic growth a growth in FDI is needed, taking into account its major impact on the efficiency of foreign trade and its contribution to the general economic growth.

Keywords: FDI, export, economic growth, spatial distribution, convergence

JEL Classification: C21, E27, F47, O11, O47, O52

1. Introduction

In the current period of globalisation, movement of goods, labour and capital tend to become the most significant factor of economic development. In the EU, the advance in integration and convergence is equivalent to the free movement of all economic factors. Starting with earlier studies on economic growth and convergence (Solow, 1956; Hirschman, 1958), today there is a large number of studies attempting to estimate the impact or the contribution of FDI and foreign trade on economic growth,

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especially published after 1990 (Levine and Renelt, 1992; Barro and Sala-i-Martin, 1992; Borensztein, Gregorio and Lee, 1998; etc.). In Romania, Iancu (2009) investigated the problem of the so-called real convergence and integration into the EU by insisting on the favorable impact of an advanced structure on the economic growth. Recently, Dobrescu (2011) proposed new methods to identify the causality between the sectoral structure and economic growth.

Taking into account some results presented in literature and data published in the last decade by EUROSTAT, we analysed distribution of foreign trade indicators and that of FDI in the EU, trying to estimate the main correlations among variables along with economic growth and convergence. Moreover, we applied a simple model to evaluate for the post-crisis period (up to 2020 horizon) the potential impact of FDI and export on economic development in Romania (see for details Albu *et al.*, 2012).

2. Spatial Distribution of Foreign Trade

In the current conditions of expansion of the so-called phenomenon of globalization, but also of the prolonged crisis facing the global economy and, in particular, the European Union, foreign trade continues to be one of the fundamental factors of economic growth and, why not, of ending the crisis.

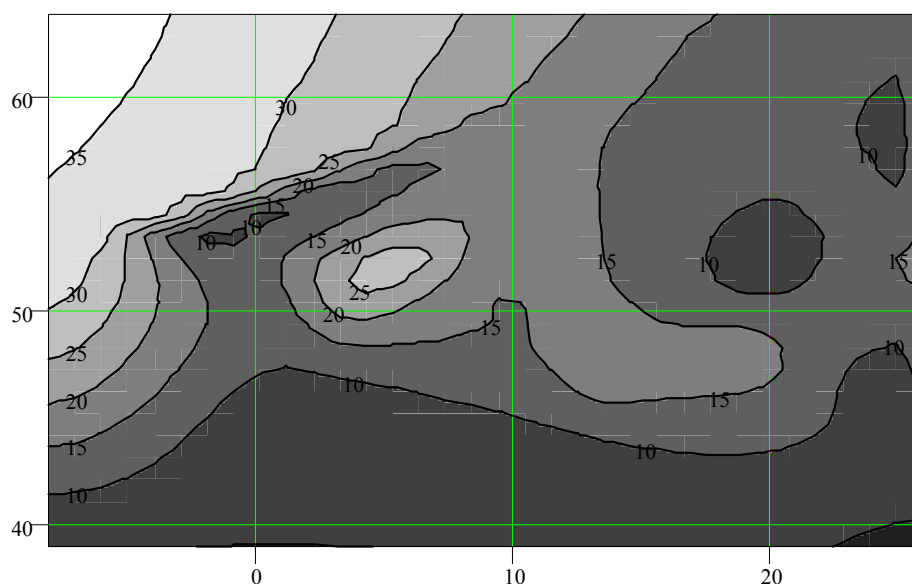
Despite efforts to convergence, there are still large differences among countries and even regions within the EU in matter of foreign trade development and participation in the intercommunity trade. For illustration, we present below the spatial distribution of some indicators in the EU expressing the foreign trade development by using a series of geodesic maps (or contour plots).

On such "maps", which we call EU stylized maps, LO is the longitude (expressed for the Western regions beyond the meridian 0 by negative values) and LA means the latitude. Also, between the longitude and latitude dimensions, the proportion was conserved as in the actual geographical maps. As in the case of geographical maps, light colours correspond to high values and dark colours to small values. We consider that the advantage of such maps is that the transition from one country to another or from one region to another is smooth and not abrupt, just like when using maps with a limited number of colours (as the conventional borders could block transition of economic factors, of the economic phenomena and processes generally between neighbouring geographic areas, which is not real, especially in the actual situation of disappearance of borders, as is the case of the European Union).

Usually, exports and imports per capita (expressed in thousand PPS) are considered synthetic indicators of foreign trade development. Their distribution in the EU in 2011 is shown graphically in Figures 1 and 2, respectively (where, for reasons of image enhancement, two island countries, Cyprus and Malta, and also Luxembourg, due to its too large level, were excluded).

As a general rule in Europe we notice: rise in the value of the two indicators from East (predominance of darker areas on the right side of the maps) to West (predominance of the lighter areas in the centre and on the left side of the graphs) and from South (predominance of darker areas at the bottom of graphs) to North (predominance of the lighter areas in the centre and at the top of the graphs).

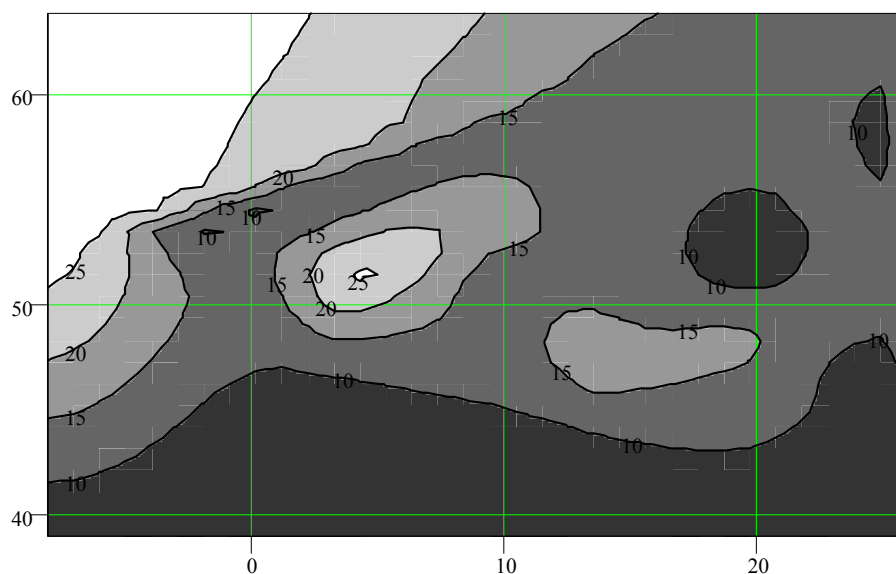
Figure 1



LO, LA, exPPS

Source: Own calculations based on EUROSTAT data.

Figure 2

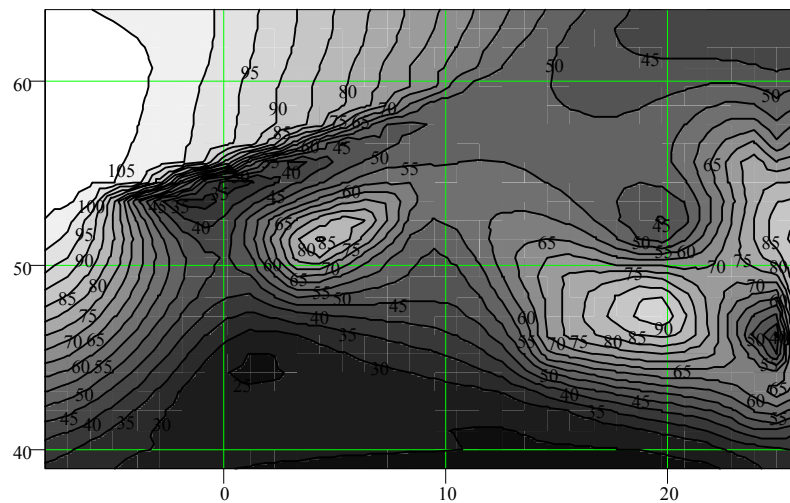


LO, LA, imPPS

Source: Own calculations based on EUROSTAT data.

Differences among countries in the EU area are really impressive regarding the two indicators of trade intensity per capita (expressed in PPS), as values range from 4700 to 5100 in Romania and in Greece up to 33700 and 117700 in Ireland and in Luxembourg, for export, and from 5300 to 6700 in Romania and Greece up to 26800 in Ireland and 96600 in Luxembourg for import.

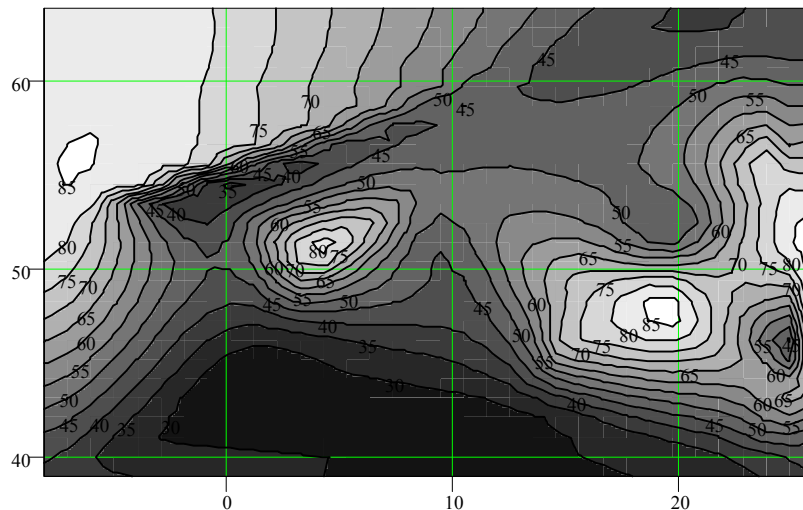
Figure 3



LO, LA, ex%

Source: Own calculations based on EUROSTAT data.

Figure 4



LO, LA, im%

Source: Own calculations based on EUROSTAT data.

Unlike the distribution of per capita indicators in the EU, in the case of export share and import share in GDP the distribution is very different. According to Figures 3 and 4, we may see high levels (areas marked with light colours) also in the Eastern part of the EU. For example, in some developed countries such as the United Kingdom, France and Italy, in 2011 there were even lower values of those shares than in countries such as Bulgaria, the Czech Republic, and Hungary. This is because, on the one hand, of the lower levels of GDP per capita in the Eastern countries as compared to the Western countries, and, on the other hand, of the fact that a high foreign trade enables faster economic growth which may reduce future gaps in terms of overall development.

3. Convergence and Divergence in Foreign Trade

The most used indicator to evaluate the convergence process in the EU is the GDP per inhabitant. Based on available data and using a set of concentration indicators, we analysed the distribution of this indicator by countries in the EU during the period 2000-2011 (Albu, 2012; Albu, Caraianni, and Iordan, 2012). Along with increasing GDP per capita level (from 19.4 thousand to 25.5 thousand PPS) there was a significant convergence, as the variation coefficient, for instance, decreased from 26.2% in 2000 to 18.0% in 2011.

Regarding the trends in foreign trade during the period 2000-2011, for example, the volume of export per inhabitant (in thousand PPS) in EU increased almost continuously from about 7.0 in 2000 to 11.2 in 2011 (except for the years 2009 and 2010, when the level was below the maximum value recorded before crisis, namely 10.5 thousand PPS in 2008).

By groups of EU countries, there is a convergence tendency in the export per capita. Thus, in the period under review, the export per capita as compared to the EU average increased in the EU-10 (Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia) from 55.1% in 2000 to 80.1% in 2011, while in the EU-15 (Austria, Belgium, Denmark, Germany, Greece, Finland, France, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the UK) it decreased from 112.3% in 2000 to 104.2% in 2011.

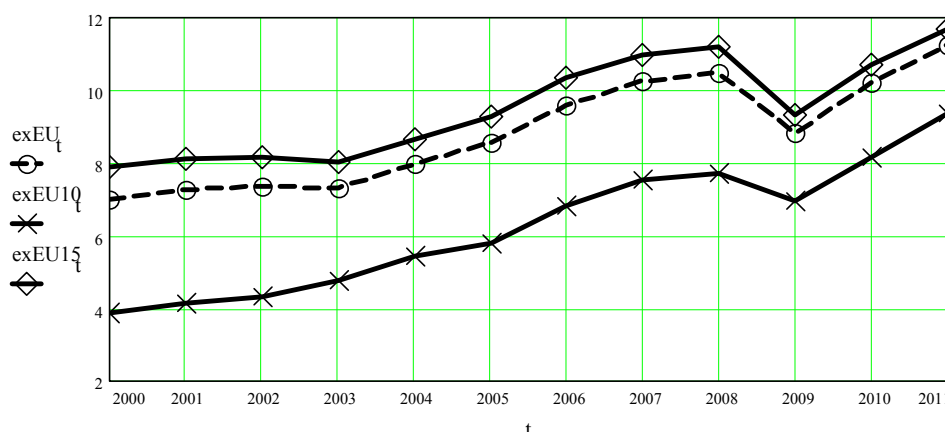
The trend of convergence between the two groups of EU countries is graphically illustrated in Figure 5, where the values of export per capita (in thousand PPS), in the period 2000-2011, are denoted by exEU for the EU (EU-27), exEU10 for the Eastern group of countries (EU-10), and exEU15 for the Western group of countries (EU-15).

Analysis of trends by groups of countries in the period 2000-2011 shows that, during the general increase in the absolute value of export per capita (both in the EU-10, by more than 2.4 times, and in the EU-15, by almost 1.5 times), while in the EU-10 it was a significant process of convergence, in the EU-15 it was one of divergence. These trends are reflected synthetically by data presented in Table 1. To evaluate the convergence or divergence inside the two groups of countries we used the variation coefficient.

Since 2009, we find that the coefficient of variation in the EU-10 is lower than that in the EU-15, which reflects a higher degree of concentration towards the end of the

reporting period for the first group of countries. This reversal of trend is probably a result of the global crisis, which seems to have more seriously affected trade in the EU-15 group of countries than in the EU-10 countries.

Figure 5



Source: Own calculations based on EUROSTAT data.

Table 1

Year	Variation Coefficient (%)		Export per capita (thou PPS)	
	EU-10	EU-15	EU-10	EU-15
2000	57.306	31.289	3.865	7.874
2001	58.467	29.896	4.143	8.117
2002	52.794	31.785	4.301	8.179
2003	48.344	33.028	4.747	8.006
2004	44.510	35.826	5.446	8.630
2005	48.690	37.452	5.785	9.290
2006	47.366	38.530	6.822	10.334
2007	47.655	40.948	7.515	10.995
2008	45.276	41.601	7.722	11.207
2009	39.796	41.240	6.945	9.301
2010	40.121	42.896	8.165	10.707
2011	39.679	43.077	9.358	11.699

Source: Own calculations based on EUROSTAT data.

Based on the analysis of the period 2000-2011, it is noteworthy that the correlation between the variation coefficient and the export per capita has opposite sign in the case of the two groups of countries. Thus, while for the EU-10 there is a significant negative correlation (-0.836) between the per capita export value and the coefficient of variation, for the EU-15 it is strongly positive (+0.910). Thus, we may say that for the EU-10 increasing the export value per capita is an important impetus for convergence, but for the EU-15 it almost automatically leads to divergence.

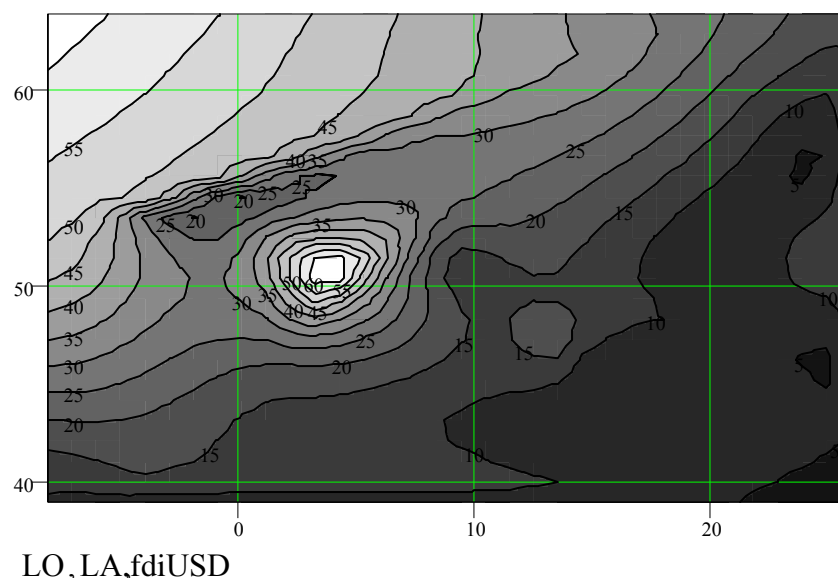
4. Spatial Distribution of FDI

As international experience has shown in recent years, in the EU, characterized by complete liberalization of capital movement, foreign trade and economic growth in general were directly influenced by foreign direct investment. At least theoretically, the more developed it is, the more the destination country benefits from the infusion of modern technology and knowhow of creating additional jobs, and the better productive exploitation of national resources.

In the case of the European Union, the spatial distribution of foreign investments per capita (in stock of FDI in U.S. dollars) in 2011 is presented in Figure 6. It is a distribution where high values are concentrated mainly in the Western and Northern EU.

Although the less developed countries urgently need foreign capital, making serious efforts to attract it, today the developed countries continue to be the main beneficiaries of FDI. The latter, being also major exporters of FDI, are the main destinations for the international capital flows.

Figure 6



Source: Own calculations based on CIA World Factbook data.

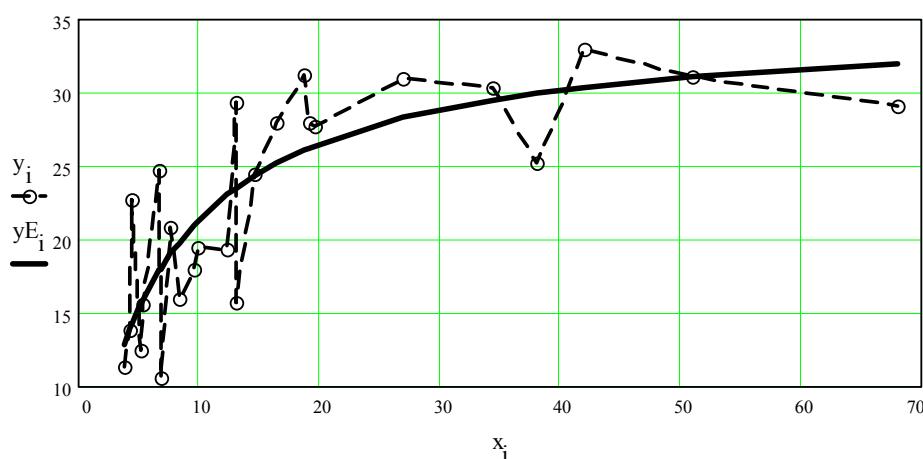
For example, in 2010, as estimated in the EU, the first by FDI stock (in dollars) was France (second in the world), with 1207 billion, followed by the United Kingdom with 1169 billion and Germany with 1057 billion. At global level, the US was ranked first, with 2581 billion. According to this ranking, in 2010 Romania was the 42nd, with a volume of \$ 80.2 billion of FDI, among the Eastern countries, being surpassed by Poland (\$ 198.8 billion), the Czech Republic (with \$ 130.4 billion) and very little by Hungary (\$ 82.1 billion).

To highlight the important role of FDI in economic growth, at the European Union level the correlation between FDI per capita and GDP per capita was estimated by a regression function using a model that assumed, in line with the theory of Solow, a flattening when the development level reaches very high levels (models of this type are known in the literature as Saturation Growth-Rate Model). The basic relationship can be written in the following form:

$$y = (a \cdot x) / (b + x) \quad (1)$$

where, in case of our application, y is GDP per capita, x - FDI stock per capita, and a , b - parameters. The graphical representation of the correlation for 2010 is shown in Figure 7 (where yE_i is the estimated theoretical curve and i are EU countries).

Figure 7

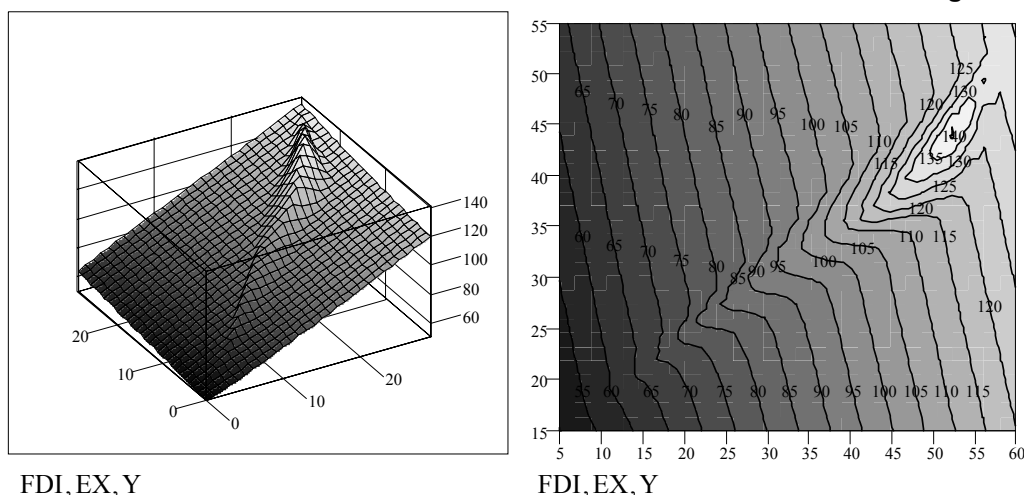


Source: Own calculations based on Eurostat and CIA World Factbook data.

5. Correlations in the Case of Romania

In order to study the trend in the FDI-Export-GDP relationship in Romania, we used available data from Central Bank publications. Thus, in Figure 8 we present a three-dimensional image of the correlation among the three selected variables and its attached "contour plot" for the period 2003-2011. We may see how higher values of FDI and Export (EX) lead to a rising level of GDP. Moreover, the graphical representation suggests that this direct correlation is not a linear one, being probably a more complex one.

Figure 8



Source: Own calculations based on National Bank of Romania data.

Furthermore, in the case of Romania, we used a version of the regression model similar to the Saturation Growth-Rate Model used above for the EU, but here applied to the available time series for the period 2003-2011, as follows:

$$Y = f(FDI) = (a_1 * FDI) / (b_1 + FDI) \quad (2)$$

where: Y is GDP, and a_1 and b_1 are parameters.

Also, to express the relationship between FDI and exports (EX), it should be noted that in the case of the Romanian economy during the selected period the best results were obtained by using a linear regression model, which can be written as follows:

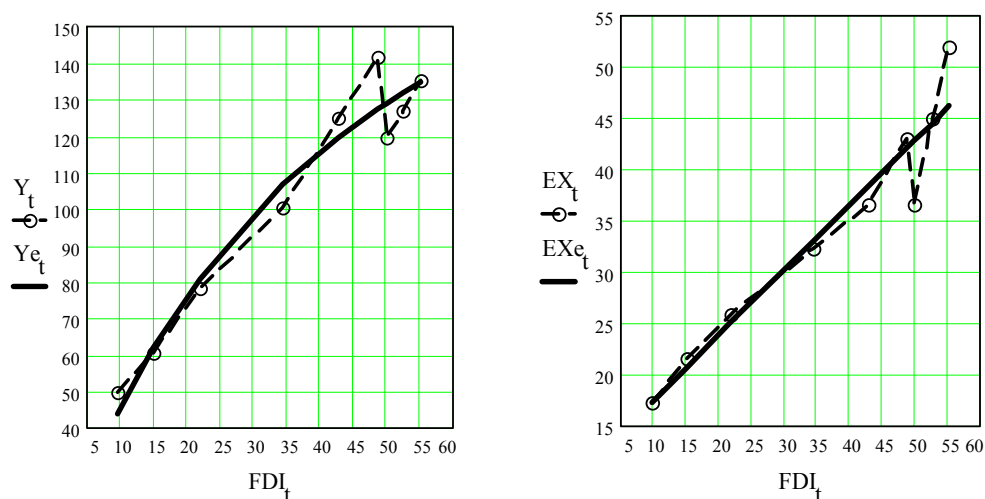
$$EX = f(FDI) = a_2 + b_2 * FDI \quad (3)$$

where: a_2 and b_2 are parameters.

The results of applying the above regression models to data from the period 2003-2011 are synthetically shown in Figure 9 (where Y_e and EX_e are estimates of GDP and exports, respectively, in euro at current prices). Calling to the FDI variable is justified for Romania, given that currently 70-75% of the export volume is produced by firms receiving FDI. For scenario forecast, the future volume of FDI can be estimated based on equation (2) and considering the estimated GDP in the official forecasts, according to the following inverse relationship:

$$FDI = (b_1 * Y) / (a_1 - Y) \quad (4)$$

Figure 9



Source: Own calculations based on National Bank of Romania data.

Conclusions

The analysis of available data for the EU has demonstrated, in the context of a general increase in the absolute value of export per capita, different trends inside groups of countries. Thus, while in the EU-10 (less developed countries) it was a significant process of convergence, in the EU-15 (developed countries) it was one of divergence.

Despite of the general convergence in the EU during the last decade, currently there are still significant differences among the group of newly integrated countries and the old member states.

Although the less developed countries need foreign capital to accelerate their convergence to the EU average level, today the developed countries continue to be the main attractor of FDI in the EU.

To take into account FDI as an important variable for post-crisis recovering it is justified for Romania, given that currently 70-75% of the export volume is produced by firms receiving FDI.

Based on empirical data for the last period, in the case of Romania it was proved that higher values of FDI and Export (EX) lead to a rising level of GDP, but this direct correlation is not a linear one, but more complex.

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