

**THE MANAGEMENT OF FOREIGN DIRECT INVESTMENT  
AND INFLUENCE ON TOTAL EMPLOYMENT RATE  
AND LABOUR PRODUCTIVITY**

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**Abstract:** An increasing importance is paid today to the issue of foreign direct investment (FDI), which is seen as the main factor stimulating economic growth. The foreign direct investment has had an important role in the stabilization of macroeconomic processes in our country and in the revival of economic growth, although training and propagation effects were not fully exploited, there are some key points on which further action is required. In this paper, the author studies the connection and the influence that foreign direct investment (FDI) in Romania has on the Total employment rate and Labour productivity indicators, with the help of econometric model. With the help of the EViews statistical package, we have performed a series of statistical tests meant to provide a more accurate view on the evolution of the three indicators in Romania from 1997 to 2014.

**Key words:** foreign direct investment, total employment rate and Labour productivity, a unifactorial econometric model

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**Introduction**

The literature which includes the analysis of the impact of foreign direct investment (FDI) on host countries classifies the effects of FDI as: direct/indirect and horizontal/vertical – Table 1.

**Table 1. The effects of FDI**

<p><b>Direct effects</b> consist of:</p> <ul style="list-style-type: none"> <li>➤ employment,</li> <li>➤ increasing the volume of commercial transactions,</li> <li>➤ capital formation.</li> </ul>	<p><b>Indirect effects</b> are: transferring technology and managerial skills to local firms. They are also called demonstration effects (Jutta Gunther, 2002).</p>
<p><b>Horizontal spillovers:</b></p> <p>a) positive (diffusion of technology within the industrial sector by: - reallocating jobs; - imitation process; - entry of international companies specialized in related services)</p> <p>b) negative (competition or market / business stealing effect).</p>	<p><b>Vertical spillovers:</b></p> <ul style="list-style-type: none"> <li>➤ <i>upstream chains</i>: the local firms are suppliers of inputs for the foreign ones</li> <li>➤ <i>downstream chains</i>: foreign companies are suppliers of inputs for local businesses</li> </ul>

Some specialized works suggest different approaches to the impact of FDI on the labour market and labour productivity. Alfaro et al. (2003) consider that FDI

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promotes economic growth in the economies that have their financial markets sufficiently developed. This idea is supported by Carkovic and Levine (2003), but Balasubramanyam, Salisu and Sapsford (1996) noted that the liberalization of trade is crucial for achieving positive effects of FDI.

### The Effects of FDI on Employment

In terms of the labour market, a country's population is divided as follows (Figure 1):

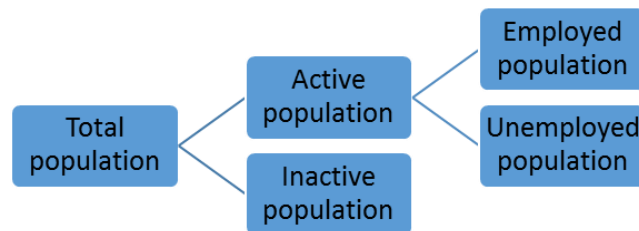


Figure 1. The population structure

Most research focuses on the impacts of labour reallocation due to the relocation of companies from developed countries to developing countries where associated labour costs are lower (wages are lower). Masso et al. (2007) performed an analysis for Estonia's economy (1995-2002) regarding the impact of investments on employment in "low-cost" countries with average income per capita. Their study is based on regression analysis and score granting (propensity score matching). The authors analyze the situation of foreign investment flows (direct: of national companies and indirect: of foreign companies). The impact is positive, especially after 1999. Blomström et al. (1994) argue that FDI has a positive effect, given that the country is sufficiently rich.

Lee and Vivarelli (2006) argue that the employment effects arising from FDI are very diverse in different areas of the world and could lead to marginalization or concentration phenomena.

Borensztein et al. (1998) argue that FDI has a positive growing effect when the country enjoys a workforce with a high level of education, able to exploit spillover effects that FDI brings.

An analysis on the impact of FDI on employment and labour productivity in Italy was carried out by Mariotti and Piscitello (2003). The analysis was performed using paired t tests among samples of companies that have gone through ownership changes comparing them with samples of firms that have not experienced any ownership change (size and sector of the companies are controlled). Thus, compared to the companies that have not gone through ownership changes, the companies targeted by foreign investors recorded increase both in productivity and employment, after several years from purchase. This is especially true if businesses are small and the investors are multinationals.

Nunnenkamp et al. (2007) performed an analysis for the period 1994-2006 regarding employment in 200 manufacturing industries in the economy of Mexico. These authors conclude that FDI has a positive impact on employment in manufacturing industry.

After the contribution of foreign equity flow to capital, foreign direct investment can be classified into:

- Greenfield: establishment of enterprises by or together with foreign investors (greenfield investment);
- Mergers and acquisitions: partial or full takeovers of enterprises by foreign investors from residents;
- Corporate development: increase in the capital of foreign investors in foreign direct investment enterprises;
- Restructuring of companies: financing by foreign investors, by capital inflows, of foreign direct investment enterprises with losses, in order to capitalize them.

FDI facilitates access to technology, know-how and managerial skills, accelerates the integration of national economies with international markets, with production and distribution networks, as well as the strengthening of international competition between companies. In order to characterize the European market, Nowakowska-Grunt and Kabus (2014) focused on the latest strategy called "Europe 2020" which aims to harmonize the functioning of the European market, to increase the competitiveness and productivity of the European economy by creating new jobs and higher standards of living.

### Defining the Indicators

**Foreign direct investment** refers to direct investment equity flows in the reporting economy. It is the sum of equity capital, reinvestment of earnings, and other capital. Data are in current U.S. dollars.

**Labour productivity** per hour worked is calculated as real output per unit of labour input (measured by the total number of hours worked). Measuring labour productivity per hour worked provides a better picture of productivity developments in the economy than labour productivity per person employed, as it eliminates differences in the full time/part time composition of the workforce across countries and years.

**The employment rate** of the total population is calculated by dividing the number of person aged 20 to 64 in employment by the total population of the same age group. The employment rate of men is calculated by dividing the number of men aged 20 to 64 in employment by the total male population of the same age group. The employment rate of women is calculated by dividing the number of women aged 20 to 64 in employment by the total female population of the same age group. The indicators are based on the EU Labour Force Survey.

### Analysis of FDI in Romania on Total Employment Rate and on Labour Productivity

This paper focuses on the analysis of the influence of foreign direct investment in Romania on the total employment rate and labour productivity and the need for a strategic approach of these factors in connection with EU Europe 2020 strategy. On a theoretical research level, this paper is centred around a deductive approach based on the definition and evolution of the FDI and total employment rate as well as on labour productivity indicators. On a practical research level, the paper focuses on performing a quantitative study for analyzing the connection between these indicators.

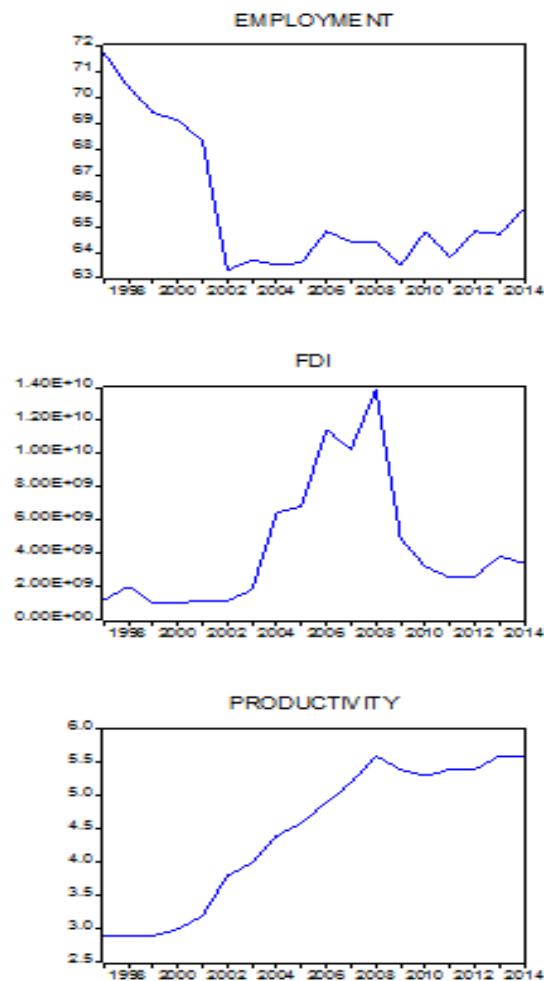
Thus, we will learn if there is a correlation between the FDI and total employment rate. We also wish to analyze the influence of the FDI on the evolution of labour productivity. The method that we propose for this study, in order to answer the question we are now researching, is the analysis of a unifactorial econometric model.

With EViews software package, we performed a series of statistical tests to ensure a more accurate picture on FDI in Romania and on the two indicators: total employment rate and labour productivity between 1997-2014.

**Table 2. Descriptive statistics of the variables**

Sample: 1997 2014			
	EMPLOYMENT	FDI	PRODUCTIVITY
Mean	65.77222	4.39E+09	4.450000
Median	64.75000	2.92E+09	4.750000
Maximum	71.70000	1.38E+10	5.600000
Minimum	63.30000	1.04E+09	2.900000
Std. Dev.	2.703768	3.91E+09	1.076077
Skewness	1.021605	1.230077	-0.401928
Kurtosis	2.549607	3.328546	1.531416
Jarque-Bera	3.283171	4.620223	2.102194
Probability	0.193673	0.099250	0.349554
Sum	1183.900	7.89E+10	80.10000
Sum Sq. Dev.	124.2761	2.59E+20	19.68500
Observations	18	18	18

The analysis obtained on the basis of 18 observations, on average, median, minimum and maximum makes the difference between the influence factor (FDI) and the influenced factors: total employment rate and labour productivity.



**Figure 2. The evolution of total employment rate, FDI and labour productivity between 1996-2014**

Minimum and maximum values reinforce that total employment rate and labour productivity varies by FDI.

The Table 2 shows that for all three sets of data, the average and median are close in value. The only exception is FDI. The distribution is platykurtic (and has a lower height than a normal distribution) for both indicators (total employment rate and labour productivity), as Kurtosis  $< 3$ . For FDI, the distribution is leptokurtic, there is a deviation range of extreme values from their average.

Asymmetry coefficient (Skewness) measures the symmetry of distribution around its average. Skewness  $< 0$ , hence the distribution curve has a bulkier tail to the left for the labour productivity indicator. And for the other two indicators, the series

tend to be asymmetric (as Skewness took nonzero values). The model is representative for the data because the probability is different from zero.

**Table 3. Characteristics of the regression model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	-3.08E-10	1.55E-10	-1.990239	0.0639
C	67.12425	0.898541	74.70363	0.0000
R-squared	0.198439	Mean dependent var		65.77222
Adjusted R-squared	0.148341	S.D. dependent var		2.703768
S.E. of regression	2.495181	Akaike info criterion		4.771039
Sum squared resid	99.61488	Schwarz criterion		4.869969
Log likelihood	-40.93935	F-statistic		3.961052
Durbin-Watson stat	0.564777	Prob(F-statistic)		0.063932

Modelling the FDI influence made in Romania on total employment rate between 1997-2014 involves the use of a simple linear regression:

$$\text{EMPLOYMENT} = \alpha + \beta \times \text{FDI} \quad (1)$$

where:

EMPLOYMENT = is the dependent variable, namely, total employment rate,

$\alpha$  = constant,

$\beta$  = independent variable parameter,

FDI = independent variable, foreign direct investment.

Least squares method involves minimizing the errors by minimizing the sum of waste squares. Specifically, we will follow to quantify the link which exists between FDI and EMPLOYMENT. From Table 3 it follows that the independent variable FDI:  $\alpha = 67.12425$  and  $\beta = -3.08E-10$ , which leads to the equation:

$$\text{EMPLOYMENT} = 67.12425 + -3.08E-10 \times \text{FDI} \quad (2)$$

F test measures how well the independent variable explains the evolution of the dependent variable. R-squared indicator shows whether the regression model is well specified and what percentage of the total variance of the dependent variable is due to the independent variable. It can take values between 0 and 1, and the closer to 1 its value is, the better specified the regression. R-squared is 0.198439, which means that 19.8% of the EMPLOYMENT variable variation is explained by FDI. The value of R-squared being low, it means that there are other influence variables of EMPLOYMENT, not only FDI. The estimated parameter value is -

3.08E-10, which means that a 1% increase in the FDI causes a decrease in total employment rate with 3.08E-10. The standard error of the regression is high, which indicates that the model explains the dependence of the analyzed variable EMPLOYMENT.

**Table 4. Characteristics of the regression model**

Dependent Variable: PRODUCTIVITY				
Method: Least Squares				
Sample: 1997 2014				
Included observations: 18				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	1.50E-10	5.77E-11	2.605846	0.0191
C	3.790645	0.334678	11.32625	0.0000
R-squared	0.297951	Mean dependent var		4.450000
Adjusted R-squared	0.254073	S.D. dependent var		1.076077
S.E. of regression	0.929376	Akaike info criterion		2.795832
Sum squared resid	13.81983	Schwarz criterion		2.894763
Log likelihood	-23.16249	F-statistic		6.790432
Durbin-Watson stat	0.168054	Prob(F-statistic)		0.019112

The same econometric model is used in the study of the influence of FDI on labour productivity indicator (denoted: PRODUCTIVITY). The equation becomes as follows:

$$\text{PRODUCTIVITY} = \alpha + \beta \times \text{FDI} \quad (3)$$

where:

PRODUCTIVITY = is the dependent variable, namely, Labour productivity per hour worked

$\alpha$  = constant;

$\beta$  = independent variable parameter;

FDI = independent variable, foreign direct investment;

From Table 4 it follows that the independent variable FDI  $\alpha = 3.790645$  and  $\beta = 1.50E-10$ , which leads to the equation:

$$\text{PRODUCTIVITY} = 3.790645 + 1.50E-10 \times \text{FDI} \quad (4)$$

R-squared is 0.297951 which means that 29.7% of the PRODUCTIVITY variable variation is explained by FDI. The value of R-squared shows that there are other influence variables of GGE, not only GDP. The estimated parameter value is 1.50E-10, which means that a 1% increase in the FDI causes a decrease in Labour productivity per hour worked with 1.50E-10. The standard error of the regression is high, which indicates that the model explains the dependence of the analyzed variable Labour productivity per hour worked (PRODUCTIVITY).

## Conclusions

However, what can be generally said and without any doubt, is that FDI generates and develops business, helps to stimulate employment.

Ivan and Iacovoiu argue that the issue of the influence of foreign direct investment (FDI) on host country is not only delicate, but also interpretable, due both to the diversity of possible effects and to the potentiality of generating beneficial or negative effects, depending on the characteristics of FDI flows and the existing specific conditions in the receiving economy. Thus, the practice has shown that developed countries, as main recipients of FDI, receive significantly greater benefits than the developing countries, which justifies the specialists' reluctance to judge a priori the negative or beneficial nature of foreign direct investment flows in a particular country.

It should be noted that there are no official statistical series with a large number of observations, the scientific approach is hit by some inaccuracies and deficiencies, which however does not invalidate its quality. From the results generated by Eviews, we can assert that: the correlation coefficients, with values of 0.297951 and 0.198439, show that the statistical link between the dependent variables PRODUCTIVITY and EMPLOYMENT and the independent variable FDI is not very strong, yet it exists, the changes in foreign direct investment not bringing a major influence, yet, a significant one. Therefore, although the number of statistical observations is quite small and is limited to publicly available data, it can be appreciated that the constructed model is representative in order to describe, at the macroeconomic level, the link between foreign direct investment and total employment rate and labour productivity indicators. Future research could be done on the line of broadening the set of analysis, taking into account other countries of Central and Eastern Europe, using the Pool Data model.

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### ZARZĄDZANIE BEZPOŚREDNIMI INWESTYCJAMI ZAGRANICZNYMI I WPŁYW NA CAŁKOWITY WSKAŹNIK ZATRUDNIENIA I WYDAJNOŚĆ PRACY

**Streszczenie:** Coraz większe znaczenie przywiązuje się dziś do kwestii bezpośrednich inwestycji zagranicznych (FDI), która postrzegana jest jako główny czynnik stymulujący wzrost gospodarczy. Bezpośrednie inwestycje zagraniczne odegrały ważną rolę w stabilizacji procesów makroekonomicznych w naszym kraju i ożywieniu wzrostu gospodarczego, choć efekty szkoleń i propagacji nie zostały w pełni wykorzystane, istnieje kilka kluczowych punktów, na których wymagane są dalsze działania. W niniejszym artykule autor, z pomocą modelu ekonometrycznego, bada związek i wpływ, jaki bezpośrednie inwestycje zagraniczne (BIZ) w Rumunii mają na całkowitą stopę zatrudnienia i wskaźniki wydajności pracy. Z pomocą pakietu statystycznego EViews, przeprowadziliśmy szereg testów statystycznych mających na celu zapewnienie bardziej dokładnego spojrzenia na ewolucję trzech wskaźników w Rumunii od 1997 do 2014 roku.

**Słowa kluczowe:** bezpośrednie inwestycje zagraniczne, całkowita stopa zatrudnienia i wydajność pracy, jednoczynnikowy model ekonometryczny.

#### 外商直接投資及對總就業率和勞動生產率的管理

**摘要：**日益增加的重要性在今天支付給外國直接投資的問題（FDI），這被看作是拉動經濟增長的主要因素。外商直接投資已在我國促進經濟增長的復甦過程中的宏觀經濟的穩定具有重要作用，雖然培訓和傳播效應沒有得到充分利用，也有在其上需要進一步採取行動前的一些關鍵點。在本文中，筆者研究了連接，並在羅馬尼亞的外國直接投資（FDI）對總就業率和勞動生產率指標的影響，用計量模型的幫助。隨著EViews的幫助統計軟件包，我們已經進行了一系列旨在提供關於在羅馬尼亞三項指標的演變1997年至2014年的一個更準確的觀點的統計檢驗。

**關鍵詞：**外商直接投資，總就業率和勞動生產率；一種計量經濟學模型。