FDI role in promoting the economic growth – a problem still ambiguous

Teaching Assistant, PhD Simona-Gabriela SERBU
Department of Finances
Faculty of Economics and Business Administration,
"Babes-Bolyai" University, Cluj-Napoca, Romania
(PhD of University of Orleans, France)
e-mail: simonalba@yahoo.com

Abstract

Even promoted in a systematic manner, the policy of FDI attraction in order to generate economic growth in the Central and Eastern European countries (CEECs) is not totally justified. There are numerous theoretical fundaments but also the empirical evidences that contradict the catalytic role or condition it of some factors (qualification of labor force for example). Our analysis joins to these studies through the results obtained on a sample of Romanian companies, with or without foreign participation. The results make us to have real doubts in pronouncing in favor of an attractive policy in front of foreign capital.

1. Introduction

Accepted in the most developed countries as yielding conflicting effects on economic growth (Vu&Noy, 2007, Bode&Nunnenkamp, 2007), FDI inflows are still encouraged in CEECs, expecting real improvements from it.

Confronted with the past of a centralized economy and knowing the tumult of the transition, the Central and Eastern European Countries (CEECs)[1] have led a policy of resumption the economic growth, more or less inspired. Apparently, the resumption of growth was first possible where a policy of sustaining the investment (national and foreigner) was driven. Hungary favored the investment to the detriment of consumption, by taking back the economic growth in 1999. On the contrary, Romania, Russia and Moldova chose to sustain the consumption, neglecting the investments and that was proved to be a failure.

If during 1994-1997 a particular trend of interdependency between the foreign investment and the economic growth in the CEECs takes contour, the year 1998 brings a significant "cut", because the plus of investments does not accelerate the growth, but on the contrary lead to its relaxation. The economic growth of the region is taken back in 1999, due to additional investment, reaching the maximum level in 2000. The year 2001 brings a reduction in the FDI flow level (and not

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[1] In our apprehension the Central and Eastern European Countries are the 19 transitional economies placed on the European continent: Albany, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Moldavia, Poland, Romania, Russian Federation, Serbia and Montenegro, Slovakia, Slovenia and Ukraine.

in terms of FDI/capita), being followed by an economic slow down. Still, starting to 2001 we can see some stability in the manifestation of this correlation; the trend defines more and more clearly[2].

In Romania, excepting the first years (1994-1996) when FDI stocks were still less significant and weak correlated with the economic progress, we can infer a quite strong interaction between the two variables starting to 1997 (see Figure 1). The accumulated FDI stock contributed step by step to the translation from negative growth rates to the positive ones, with important jumps during 1998-2001. Even if year 2002 brought a regress in this matter, the "FDI – economic growth" correlation remains at the side of the trend defined previously, expecting an acceleration of growth of 0.11% in average to an increase of 1% of the FDI stock (under the region average).

Figure 1: FDI and economic growth in Romania (1994-2004)

Correlation FDI-economic growth, Romania 1994-2004

$y = 0.1186x + 1.1175$
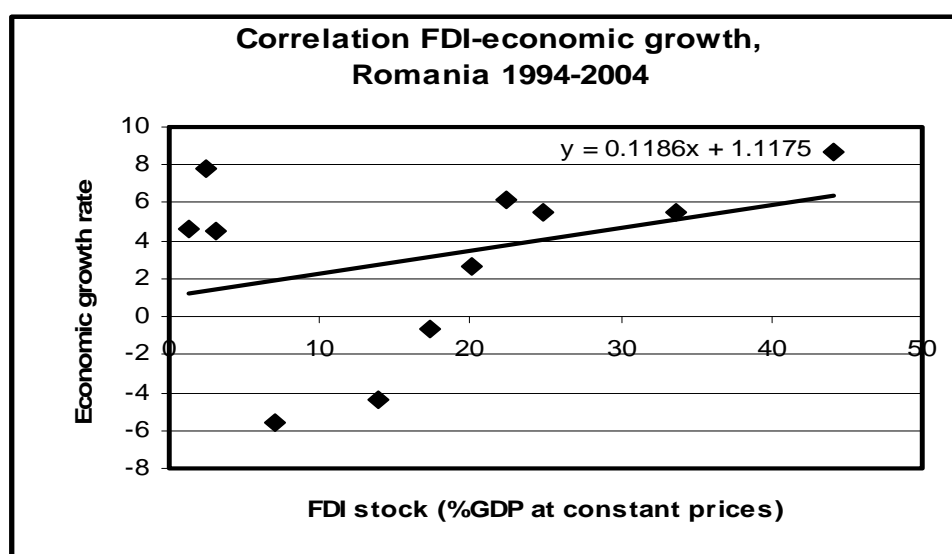
Source: processing of UNCTAD, National Accounts Main Aggregates Database, Statistics Division, UNECE

In fact, the 1980s and 1990s have been accompanied by a great enthusiasm concerning FDI. The firm belief after which FDI leads to economic fast growth spread right away in the most developing countries, more that the access to bank credits as an alternative source of capital become restrictive in that period. Further to the debts crisis of the 1980s and of the tumult on the emergent markets at the end of the 1990s, countries followed active policies of FDI attraction (tax benefits, subventions) owing to the benefits which they could bring in terms of growth (Carkovic&Levine, 2002).

We can mention four ways across which FDI contributes to economic fast growth: the transfer of technology, the access to the market worldwide, the capital accumulation, benefits in terms of job. This is the positive perspective that we can have on the correlation "FDI – economic growth".

Still, the FDI catalytic role is not unanimously accepted. It is

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[2] processing of Chelem, Global Market Information Database, National Accounts Main Aggregates Database, Statistics Division, UNECE (United Nations Economic Commission for Europe), UNCTAD, IMF – International Financial Statistics – International Investment Position (IIP)

surprising the intuitions according to which FDI doesn't generate economic growth, without being lacked of arguments. For instance, if the profitability and the market segments owned by the national investors decrease in front of the foreign competition they will suffer in terms of productivity. The only factors that might transform FDI in a factor of promoting the economic growth are linked to the characteristics of the host country: the skills of the work force, adequate infrastructure, a sufficient endowment that allows the national investors to assimilate technology, relatively a high national income. (Deepak Mishra, 2001).

These are nothing but some intuitions about the FDI role in creating economic growth, obtained by the transition reality. Alongside these intuitive appreciations we can also bring some theoretical and empirical fundaments.

The paper is structured as follows. The theoretical fundamentals and the empirical results in favor of the absence of correlation or its conditionality are presented in section 2. Section 3 rejoins all the elements of the empiric microeconomic analysis upon a sample of Romanian companies, while section 4 presents our conclusions.

2. Theoretical fundaments and empirical results

There is a wide theoretical base which sustains the existence of a positive relation between FDI and economic growth. There are relevant for their theoretical role the benign model of FDI (Moran, 1998), but especially the models of endogenous economic growth that belong to Romer (Romer, 1986), Barro and Sala-i-Martin (Borensztein, De Gregorio&Lee, 1998), Graham and Wada (2001), or Aitken and Harrison (1999). Between the empirical studies that confirm this hypothesis we present those of Krkoska (2001), Borensztein, De Gregorio&Lee (1998), Graham&Wada (2001). The majority of these studies identify the technology transfer as the main way across which FDI contributes to economic growth.
But as the empirical results don't always confirm the positive relation "FDI – economic growth" (especially in the microeconomic studies), there were set off and empirical verified also those theoretical fundaments behind the hypothesis of the correlation absence, its conditionality or even of the negative correlation. We will insist on the last ones in order to justify the results of our empirical study. In fact, we will demonstrate that technology transfer associated to FDI contribute to economic growth only by interacting with the absorption capacity of a company (high research-development expenditures).

Theoretical fundaments
The "malign" FDI model (Moran, 1998), where FDI don't generate economic growth, is based on the interaction of imperfect markets, international and national ones. It implicates the bankruptcy of the local producers, the extension of the multinational companies' power on the local market, and fluxes of repatriated benefits. Nor the impact on the income distribution and social development is favorable.

According to the economic growth model of Solow, the impact of FDI on the growth rate is restricted by the existence of diminishing efficiency on the physical capital. As a result, the FDI effect is only verified at the level of production per capita and not in terms

of growth rate (Calvo&Sanchez-Robles, 2003).

Aitken and Harrison model (1997) presents the negative effect that the foreign presence would have on the local companies' productivity. The foreign company, with lower marginal costs is encouraged to raise its production comparative to its national competitor. As long as both companies produce for the local market the demand for the domestic companies' products is affected. Determined to reduce its production, the national company confronts with a decline of its productivity.

So, according to these theoreticians, FDI don't generate economic growth to the level of domestic companies.

An important contribution at theoretical level belongs to Leahy and Neary (2004), inspired by the numerous empirical studies that considerably supported the idea that research-development (R&D) improves the absorption capacity of a company (ability to internalize the externalities derived from other companies) and directly contributes in raising its performances. Even since economists as Nelson or Arrow it is well known the idea of difficulty in information rapprochement, while more recent contributions (Cohen and Levinthal (1989)) show that in order to internalize the results of one R&D activity it is necessary a certain effort of the receiver company. Leahy and Neary develop a theoretical model for the absorption capacity which is defined as the ratio between its disposable knowledge, deriving from opponent companies, and the actual knowledge level in economy. The theoretical demarche allows to Leahy and Neary showing that FDI always leads to productivity increase of the investor company, while productivity increase of the host country is conditioned by the existence of a high enough externalized degree. Externalization, or better, the knowledge internalization by the host country companies is more facile in intensive sectors of R&D or at the level of companies disposing of an enough knowledge stock for starting.

Empirical results

In general, microeconomic studies (Aitken&Harrison (1999), Germidis (1977), Haddad&Aitken (1993), Mansfield&Romeo (1980)) are those who do not identify strong links between FDI and economic growth. Even more there are some studies that bring empirical evidence for a negative influence of FDI stocks upon economic growth (Dutt, 1997). Nor the conditionality of the correlation existence of some factors is missing in the empirical studies.

A reference study belongs to Aitken and Harrison (1999) that looks to identify the effects brought by FDI in the Venezuela's economy during 1976-1989. Although the estimations results indicate significant benefits at the production level, associated to the foreign participation, it is obviously that this effect is valuable only for companies that beneficiate of FDI; for domestic companies externalities of this kind aren't verified. Even more, the national companies acting in the sectors with a large foreign presence are much less productive than those of sectors with low interest for the foreign investors. The positive effect on the companies with foreign participation productivity can be explained by the simple fact that the foreign companies invest in the most productive ones.

Following closely the line developed by Aitken and Harrison, Konings (1999) realizes a study upon the emergent countries of CEE, more

precisely upon Bulgaria, Romania and Poland during 1993-1997. According to their results, it seems that also in the transition countries the foreign companies are much more performed than the national ones. The externalities at the domestic companies' level aren't obvious.

Among macroeconomic studies, that of Rodrik&Rodriguez (1999) finds a not significant correlation between the international opening of one country and its development level.

Even more persuasive is the analysis of Carkovic&Levine (2002) concerning a panel of 72 countries (developed and developing), analyzed from 1960 till 1995. The authors find that the FDI flows do not exercise an independent influence on economic fast growth. These results allow reconciling the macroeconomic analyses with those microeconomic.

Borensztein, De Gregorio&Lee study (1998) regards 69 developing countries, followed during 1970-1989. Results show that the effect of FDI on economic fast growth depends on level of the available human capital in the host country. It means that the flow of high technology, brought by FDI, augments the growth rate of the host country only in conditions where there is a sufficient capacity of absorption.

3. Empirical microeconomic analysis

3.1. Database and the problems

What follows is a try to delimitate the FDI effects on production and economic growth in Romania, based on the analysis of some micro data. As micro data are generally appreciated as being even more suggestive than the macro ones (which suffers due to the aggregation procedures) we expect that the results of our micro analysis to be eloquent[3].

The analyzed panel consists of 833 companies of Romania, of which 731 beneficiating of a FDI (with foreign participation of minimum 10% of the company registered capital) and 102 domestic companies (with foreign participation of maximum 10% of the company social capital), analyzed during 1995-2002. The available information is deriving from AMADEUS database.

The analysis of this companies sample gravitates on two big problems: (1) how much the companies beneficiating of FDI are more productive than the national ones; (2) how much the national companies beneficiate of externalities at technological level due to the foreign companies implanted in Romania.

3.2. The model

Following the line developed by Aitken&Harrison (1999), we estimate a log – linear production function at the company level, with the following specification:

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[3] One of our studies constitute a macroeconomic analyze of that correlation in CEECs, bringing some different results comparative to the present study.

$$OUTPUT_{ijt} = c_0 + c_1 CAPITAL_{ijt} + c_2 WORK_{ijt} + c_3 MATERIALS_{ijt} + c_4 FI\_FIRM_{ij} +$$
$$c_5 FP\_SECTOR_{jt} + c_6 FI\_FIRM_{ij} * FP\_SECTOR_{jt} + e_{ijt}$$

Variable description:

$OUTPUT_{ijt}$ represents the value of company's i production (sales volume in the logarithmic form) of sector j, at t moment (t=1995,..., 2002). The next three variables are proxy for the inputs of the production, usually found in a production function.

$CAPITAL_{ijt}$ is the social capital (expressed in thousand dollars) taken from the balance sheet of each company in each year (modified to the logarithmic form).

$WORK_{ijt}$ is the employee number of the company, of sector j, at moment t (modified to the logarithmic form).

$MATERIALS_{ijt}$ represents the material expenditures of company i, from sector j, at moment t, taken from the profits and losses account of the company (initial expressed in thousand dollars, but transformed in logarithmic form).

FI_FIRM_{ij} is the part of foreign participation to company's capital, which varies between 0 and 100%, at moment 2002[4]. If the foreign participation in one company brings gains at the productivity level, the variable coefficient is positive.

FP_SECTOR_{jt} constitutes proxy for the foreign presence in sector j, at moment t, measuring technologic externalities at sector j level, derived from foreign investors. Such as Konings (1999), we calculated the variable as ratio of the volume of foreign companies' production (with participation over 10%) in the total production of sector j where they activate. If it registers positive externalities from foreign companies to the national ones, the variable coefficient is positive.

Introducing in our regression the interaction of the two last variables allows us to determine if the effects of foreign presence on other foreign companies differ of those on national companies. If the foreign companies beneficiate due the presence of other foreign companies, the coefficient should be positive.

We add to these variables also the dummy variables for each year in order to surprise the factors of that year, other than inputs and foreign presence, that have influenced the production level (managerial changes for example). We also introduce the dummy variables for each of the 99 sectors of NACE classification, 2 digits, in order to isolate the effect of productivity differences at sector level upon company production/productivity.

The estimation method follows the panel techniques often considering the existence of individual random effects. We can argue our choice by three reasons: (1) the panel is preferred to cross-country analyses generating more robust results by exploring also the temporal dimension of the data; (2) we appreciate that there are consistent

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[4] The database Amadeus do not offer the information on foreign participation to the capital also for other moments of analyzed period, so we consider that the variable do not change over time. A similar choice belongs to Konings (1999) – he chooses the foreign participation at the end of the analyzed period.

unobserved individual effects, proper to each company and influencing the endogenous variable beyond the exogenous variables impact (individual effects are preferred to pool); (3) we assume that individual effects are random and not fix (random effects are preferred to fix effects); in fact, the estimation with fix effects is not possible as long as there is a constant exogenous variable over the analyzed period (FI_FIRM) which make difficult the centering operation on the mean in the coefficients determination.

3.3. The results

The regression results are synthesized in the following tables.

Table 1: FDI impact on the Romanian firms' productivity (1995-2002)

Independent variable	(1)	(2)	(3)	(4)
Constant	1.96***	1.89***	2.16***	1.26
CAPITAL	−0.004	−0.004	−0.003	0.006
WORK	0.21***	0.21***	0.21***	0.22***
MATERIALS	0.65***	0.65***	0.65***	0.66***
FI_FIRM	0.27***	0.25***	−0.21	−0.42***
FP_SECTOR	−	0.10	−0.21**	−0.62***
FI_FIRM*FP_SECTOR	−	−	0.58***	0.74***
DUM_1996	0.04	0.04	0.04	0.05*
DUM_1997	0.01	0.01	0.01	0.02
DUM_1998	0.07**	0.06**	0.06**	0.07**
DUM_1999	0.09***	0.08***	0.09***	0.11***
DUM_2000	0.11***	0.11***	0.11***	0.13***
DUM_2001	0.18***	0.18***	0.18***	0.20***
DUM_2002	0.26***	0.25***	0.25***	0.26***
DUMMY SECTOR	−	−	−	x
Obs	*4873*	*4873*	*4873*	*4873*
R2	*0.94*	*0.94*	*0.94*	*0.94*

Note: *** mark the coefficients significant at 1%, ** significant at 5% and * significant at 10%. The estimations followed the panel techniques, using WinRATS. The regressions assume the existence of individual random effects, GLS being the estimation method of the coefficients. The total number of observations is 6664 (meaning 833 firms observed alongside eight years).

The coefficient of foreign participation at company level, positive and significant in the first two regressions become negative and even significant in the last ones, while new variables are introduced. But the result isn't a robust one. Before getting an explanation for this ambiguous result we will estimate some other regressions in order to follow the evolution of that coefficient.

Concerning the variable of the foreign presence at sector level, that proves significant in explaining the national companies' productivity[5]. As the coefficient is negative we conclude that national companies acting in sectors with important foreign presence are less productive than those confronting less with the foreign presence (negative externalities). Aitken&Harrison (1999) suggests that from a specification that doesn't consider the productivity differences at

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[5] The absence of significance of this coefficient in regression (2) can be explained by the fact that in this regression the effect of foreign participation on the domestic firms productivity was not isolated from the effect on foreign firms productivity. This problem is solved in regression (3) by introducing the interactive variable.

sector level can results overestimates externalities (in the case where the foreign investors are orientated towards the most productive industries). So, in regression number (4) we add sector dummy in order to control the productivity differences. Confirming Aitken&Harrison's hypothesis, the coefficient of the foreign presence becomes even more important and with an increased significance degree. Negative externalities are confirmed also when we limits the sample at the national companies.

The coefficient of interactive variable is positive and significant, suggesting that companies with foreign participation to capital, different of the national ones, beneficiate of positive externalities due to the foreign presence at sector level.

Table 2: FDI impact on the Romanian firms' output and productivity variation (1995-2002)

Independent variable	(5) FDI impact on output	(6) FDI impact on productivity variation
Constant	7.86***	−
CAPITAL	−	0.006
WORK	−	0.22***
MATERIALS	−	0.65***
FI_FIRM	−3.93***	−0.34
FP_SECTOR	−2.32***	−0.57***
FI_FIRM*FP_SECTOR	4.31***	0.90***
DUM_1996	0.19***	0.01
DUM_1997	0.28***	0.02
DUM_1998	0.42***	0.06*
DUM_1999	0.43***	0.11***
DUM_2000	0.66***	0.14***
DUM_2001	1.03***	0.22***
DUM_2002	1.39***	0.29***
DUMMY SECTOR	x	x
Obs	*5041*	*3802*
R2	*0.73*	*0.71*

Note: *** mark the coefficients significant at 1%, ** significant at 5% and * significant at 10%. The estimations followed the panel techniques, using WinRATS. The regressions assume the existence of individual random effects, GLS being the estimation method of the coefficients. The total number of observations is 6664 (meaning 833 firms observed alongside eight years).

FDI impact on production, and not on productivity, can be measured by making estimations on a model that excludes the inputs (regression 5). The result doesn't modify considerably.

Regression (6) is realized in first degree differences. We use this estimation in order to verify the robustness of the results by controlling the fixed effects that could appear at company level and not at the sector one. We find the same negative externalities of the foreign presence at the national companies level. The coefficient upon the foreign investment is negative and significant; the absence of a robust result upon this variable suggests us that the positive and significant effect appeared in regressions (1) and (2) might be only the result of the fact that foreign investors pursue the most productive companies. Still the interactive variable's coefficient remains positive and significant at 1% confirming the positive externalities of the foreign presence on companies with foreign

participation. So, we might conclude that companies with foreign participation beneficiate due to the foreign investment, but gains are concentrated in sectors with a large foreign participation. More, the fact that our sample is composed of the biggest companies (top 250000), and big companies beneficiating of foreign investment were the most productive ones, explains the absence of robustness of the variable upon the foreign investment. With this result we join Aitken & Harrison's study (1999) who find a robust result for small companies an another one, not robust, for big companies.

The result on the presence of negative externalities at domestic companies level, doesn't surprise us because the most national companies confronted during transition with obsolete equipment, wick performances and low research-development expenses. Thus, negative externalities can be explained by the insufficient absorption capacity of the national companies. In order to verify empirically this hypothesis we include in the initial regression the research-development expenditures and the interactive variable resulted of the foreign presence interaction at sector level with research-development expenditures.

RD_{ijt} are research-development expenditures of company i, of sector j, at moment t. We use as proxy the intangible assets of the company (expressed in thousand dollars), taken from the company balance sheet and brought at the logarithmic form.

$FP\_SECTOR_{jt} * RD_{ijt}$ is the interactive variable; if we find a positive interaction than we can appreciate that companies investing in research-development might beneficiate of positive externalities.

Table 3: Absorptive capacity of domestic firms (dependent variable OUTPUT)

Independent variable	(1)	(2)
Constant	–	6.003***
CAPITAL	0.002	–0.006
WORK	0.17***	0.19***
MATERIALS	0.76***	0.75***
FP_SECTOR	–0.58***	–0.57***
RD	–0.03**	–0.03**
FP_SECTOR*RD	0.08***	0.07***
Obs	*376*	*376*
R2	*0.98*	*0.98*

Note: *** mark the coefficients significant at 1%, ** significant at 5% and * significant at 10%. The estimations followed the panel techniques, using WinRATS. The regressions assume the existence of fixed individual effects (1), respectively random individual effects (2); OLS, and respectively GLS are the estimation methods of the coefficients. The total number of observations is 6664 (meaning 833 firms observed alongside eight years). Both regressions add in the dummy variables for years and sectors according to NACE classification (2 digits).

The results don't considerably modify by changing the estimation method. The externalities prove to be negative and significant (1%) and the interaction of absorption capacity of know-how externalized by the foreign companies, with foreign presence, is positive and significant. Thus, national companies engaged in research-development activities have beneficiated of positive externalities due to the foreign presence. More precisely, companies having research-

development expenses of minimum 1.4 million dollars[6] annually could experiment positive externalities from foreign companies. Of those 102 national companies only four had appropriate research-development expenses in order to internalize the know-how of foreign companies. In conclusion, FDI are followed by positive externalities only if the technologic gap between the foreign companies and the national ones isn't too high. Our result is in line with those obtained by Konings (1999).

4. Conclusions

Due to the fact that the catalytic FDI role upon economic growth isn't very well clarified, we proposed in this study a microeconomic analysis of this correlation, hoping to find some robust results, not being exposed to the aggregation inconveniences of a macroeconomic analysis. The theoretical fundaments as well as the empirical ones are split in two categories: one favorable to that correlation and the other unfavorable. Even our intuitions constitutes in arguments pro and contra regarding this hypothesis.

The first contradiction we are confronted with is about the relation FDI – economic growth. If for the whole 19 CEECs the macroeconomic analysis (of which results aren't presented here, but they are available on request) indicates us a complementarity between FDI and national investment, the micro analysis for Romania contradicts this result. The foreign presence on Romanian market generates negative externalities: when raising the foreign presence in the sector of 10%, the companies' productivity decreases by 4.6%.

In change, conditioning the economic growth of the FDI complementarity with qualification of labor force is confirmed by the macroeconomic study as well as the microeconomic one. FDI produce positive effects on growth only in countries where it is attaint a minimum threshold of 20%, representing the active population with superior studies (Bulgaria, Estonia, Lithuania, Russia and Ukraine). In Romania countries having research-development expenses of at least 1.4 million dollars annually could experiment positive externalities from foreign companies. In conclusion, FDI are followed by positive externalities only if the technologic gap between the foreign companies and the national ones isn't too high. At much reduced levels of labor force qualification the FDI contribution at growth is almost zero, but it rapidly rises according to the education level improvement.

A less robust result of both categories of studies suggests that FDI are more efficient than domestic investments in promoting economic growth. In particular, in Romanian sectors with a large foreign participation, companies with foreign participation beneficiate in terms of production and productivity due to the foreign investments and to externalities resulted by the foreign presence in sector, while domestic companies confront themselves with negative externalities that affect their production and productivity.

These results make us be prudent in encouraging the politics of FDI promotion as an essential factor in promoting economic growth.

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[6] From (-0.58 +0.08*P>0) results P>7.25 (R&D expenses are in the logarithmic form)

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*** AMADEUS

*** CHELEM

*** GLOBAL MARKET INFORMATION DATABASE

*** INTERNATIONAL FINANCIAL STATISTICS – International Investment Position (IIP)- IMF

*** LABORSTA - International Labor Office (ILO)

*** NATIONAL ACCOUNTS MAIN AGGREGATES DATABASE, Statistics Division, UNECE (United Nations Economic Commission for Europe)

*** UNCTAD

Simona-Gabriela SERBU

Born at 25th of February 1977, in Alba Iulia (Romania), I beneficiate of a University and Master Degree in Economics. At 26th of April 2007, I was awarded with the PhD title by a mix jury (French - Romanian) for the co-tutelage thesis named „IMPACT OF EUROPEAN UNION INTEGRATION ON NATIONAL POLITICS CONCERNING FOREIGN DIRECT INVESTMENT". With a didactical and research activity started in 2000, I am the author of 18 scientific papers published in revues or conference volumes (from Romania, Hungary, Bulgaria, Czech Republic) and the co-author of a book on fiscal harmonization.

Contact address:
Faculty of Economics and Business Administration, Department of Finances
"Babes-Bolyai" University
58-60 Street Teodor Mihali
400591, Cluj Napoca, Romania
Telephone: 00 40 264 41.86.52/3/4/5
E-mail: simonalba@yahoo.com