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THE IMPACT OF FOREIGN DIRECT INVESTMENT OVER ROMANIA'S EXPORTS

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Abstract:
The analyses concerned with the relationship between FDI – host country focus on its impact on the entire economy or only on trade in general, as well as on their subcomponents. Our approach focuses on the link between FDI – host country's exports, as a result of Romania's current situation, in which exports are clearly and strongly influenced by FDI. To confirm our results we used various econometric models from the statistical apparatus, applying and adapting the good practice recommended by OECD. The studies that highlight how foreign capital is involved in export activity gradually discovered a link between these two factors. The low level of FDI in the early 1990s and the original orientation of many MNCs towards domestic demand contributed to the gradual disclosure, in the scientific literature, of the effects of FDI on exports. The undertaken regression analysis cemented and, in the same time, diversified previous results, coming with more information about the effects exerted by FDI. The results and their interpretation must be viewed from the perspective of the limitations imposed by certain mathematical functions in the process of determining aspects of economic behaviour.

Key words: foreign direct investment (FDI), exports, Romania, competitiveness, regression analysis.

JEL classification: F41, F47

INTRODUCTION

Romania's post-revolution economic outlook highlighted mainly two major aspects: openness to Western markets and broadening the spectrum of capital formation, including foreign investment flows in the equation.

Capitalism has brought new challenges for the Romanian economy, competitiveness through quality being among them, but it also offered a major part of the solution, given the fact that it could not be ensured in the country.

Many of the solutions regarding competitiveness come from capitalist markets, due to inward investment, recognized in the literature as contributing factors in productivity growth, which, in its turn, triggers an increasing competitiveness.

This approach appears amid evidence of everyday economic reality embodied in the fact that the peak of the export is dominated by large multinational names, i.e. the Finnish giant, Nokia, and Dacia Renault.

1. THE IMPACT OF FDI ON ROMANIAN EXPORTS – EMPIRICAL STUDIES

Studies addressing different aspects of the issue of foreign direct investment (FDI) in the Romanian economy are limited to the left of the 1990-1991 temporal interval. To begin with, there is no established connection between FDI levels and Romanian exports.

Mazilu, A. (1999), in a broader approach on MNCs and competitiveness, reveals that the share of exports generated by companies with foreign capital amounted to 0.8% in 1991 and to 1.3% in 1992, out of the total Romanian exports. For the years 1994 and 1995, their respective weights were 2.1% and 1.8%.

These values allow us to orient our conclusions towards two possible directions. On one hand, although the trend is upward, the numbers could confirm our previous assumption, namely that companies, at least in the beginning, were characterized by a very weak orientation towards export, their contribution in this area being insignificant. On the other hand, even if all production would have been export oriented, the very low levels of this type of investment related to the Romanian GDP explains the very low percentage of MNC exports related to the total Romanian exports. In the scientific literature, a significant FDI stock as a percentage of GDP, capable of generating profound effects over the recipient country's economy, has to reach at least 40%; however, this level is attained by Romania only in the year 2010, when the FDI stock reaches 48,798 million Euros, which means a rate of 40.7% out of a 119,800 million-Euro GDP. Comparatively, in 1995, the share of FDI was the equivalent of 3.5% of Romania's GDP.

In conclusion, the author underlines that "at their current level, FDI do not produce macroeconomic effects in Romania […], and the export propensity (i.e. the propensity of firms receiving FDI) is reduced as a whole" (Mazilu, A., 1999, p. 231).

Arguments in favour of supporting these conclusions come from a large empirical study (Boscaiu, Mazilu, 2001), built on a database which aggregates information from the year 1998. The presented analysis does not focus strictly on the FDI – exports relationship, which is only a static component of the study that refers to solely one year. However, this does not prevent us from considering its results, especially since the period immediately before and after 1998 does not show significant alterations, U-turns or other major events in the Romanian economy, which could prevent us from extending these conclusions beyond the year of reference.

The study concludes that at company level, the frequency and intensity of export activities deriving from FDI have reached their maximum. More precisely, for approximately 47% of these firms, their exports weigh over 75% of their turnover. The industries represented by these exporting companies are textiles, metallurgy, machinery and equipment, vehicles and furniture production. The situation is different for the manufacturing industry, where the share of exports represents 25% of its turnover. The remaining percentage is distributed between state-owned and private-owned companies. The seemingly paradoxical situation can be explained by the fact that the state-owned firms have a relatively small numerical proportion (approx. 25%), while the share of their turnover in all manufacturing industries is about 60%.

Pushing the analysis further in time, but not much, Hunya (2002) X-rays the structural evolution of Romanian manufacturing industry under the influence of FDI, for the period 1998-2000. This study also addresses the issue of FDI – exports relationship. Amid relatively small export levels of manufacturing companies, i.e. 23% of the total production in 1998, 27% in 1999 and 30% in 2000, Hunya stresses that the upward export trend is mainly supported by foreign capital companies. This highlights a reverse trend during 1998-2000 for the export rates of state-owned companies compared to foreign ones. While the latter register an increase, the first show a declining export. Additionally, in the specified interval, the share of MNC exports doubled to around 44% of the total Romanian exports. This is due to the entry of new foreign-owned exporting companies on the national market, as well as to the privatisation process, the injected foreign capital helping to increase their productivity and thereby increasing competitiveness in foreign markets. In terms of nominal increase in export sales, 78% was due to subsidiaries of multinational companies, while the domestic companies generated 22%. These data are strong evidence for the author regarding the overwhelming importance of foreign affiliates in the growth of export competitiveness as a whole. However, these figures are low compared with those of some neighbouring countries such as Poland or the Czech Republic where MNC subsidiaries have been providing approximately 60% of their total exports since 1999.

Complementing the series of studies on FDI in Romania, Anghel, I. (2002) agrees with the previous findings, emphasizing that "the share of exports generated by foreign investment in the national economy's total exports is low [...], the local market representing a higher interest for foreign investors compared to the external one" (Anghel, I., 2002, p. 193). Moreover, appreciating their upward trend, the author brings into question a possible incentive for the export production of firms with foreign capital participation, through the fiscal measures [1] taken since 1994.

In a first study on trade and production fragmentation in Central and East European economies, Kaminski (2001) shows that Romania does not take part in the integrated international production networks, thus losing the advantage of access to distribution networks of investing MNCs. He points out that 52 of the 60 best Romanian export products do not have a dual revealed comparative advantage (both in export and import), because these products are only assembled in Romania. In a subsequent study, Kaminski (2004) deepens the performance aspects of Romanian exports mainly trying to emphasize the link between them and FDI inflows. Given the fact that this interdependence, at least for economies in transition, is demonstrated in the literature and assuming that Romania makes no exception, Kaminski argues whether there is something particular about FDI in Romania, being intrigued by the extremely high level of exports amid a relatively low level of such investments for the period taken into consideration.

2. STATISTICAL ANALYSIS

2.1. CHOOSING THE REGRESSION MODEL

In general, empirical studies (Zhang and Song, 2000, Vuksic, 2005, Zhang, 2005, Kutan and Vuksic, 2007) are based on the multiple linear regression model in order to determine the intensity and nature of the link between a certain number of variables and exports of a country. Independent variables considered cover a wide enough range of indices and indicators which determine the level of exports.

In a report on good practice related to stressing the impact of FDI on a country's economy, OECD, through Hunya et al. (2007), recommends the use of Vuksic's model (2005) for an industry-wide analysis of the relationship between FDI and exports:

$$\ln EX_{jt} = \alpha_j + \beta 1 \ln PD_{jt} + \beta 2 \ln ULC_{jt} + \beta 3 \ln REER_t + \beta 4 \ln I_{j(t-1)} + \beta 5 \ln FDI_{j(t-1)}$$

where:

$\ln EX_{jt}$ - dependent variable, natural logarithm of real exports;

$\ln PD_{jt}$ - natural logarithm of productivity index;

$\ln ULC_{jt}$ - natural logarithm of the labour cost per unit index;

$\ln REER_t$ - natural logarithm of real effective exchange rate;

$\ln I_{j(t-1)}$ - natural logarithm of real domestic investment level;

$\ln FDI_{j(t-1)}$ - natural logarithm of FDI stock.

$j = 1....n$ – various industries, and t – time of reference

The level of domestic investment and FDI stock is appropriate for the previous year, the justification being that for an investment to expand its effects on an economy, and thus on exports, it requires a certain amount of time. All variables are logarithmic in order to reduce potential collinearity, and independent variables are influencing each other to some extent. The author chooses to use FDI stocks rather than flows. His explanation subscribes to the idea that when a certain industry branch is infused with capital at time t, after which the inflow becomes zero for the next years, it continues to propagate its effects on the economy in the next years as well. Therefore

it would be unfair that the effects occurring in year t+1, given that FDI flows from that period are null, were not attributable to investments made in year t.

In his study on the impact of FDI on Croatian exports, Vuksic states that the chosen model is a development of the macroeconomic one used before him by Zhang and Song (2000). Later, Vuksic uses the macroeconomic model (Kutan and Vuksic, 2007) as well, which is the variant that we are going to apply to Romania's example, to capture the aggregate effects of FDI on exports. For the macroeconomic analysis, the model takes the following form:

$$EXR_{it} = \alpha + \beta 1REER_{it} + \beta 2PGDP_{i(t-1)} + \beta 3TLI_{it} + \beta 4EXR_{i(t-1)} + \beta 5FSR_{i(t-1)} + e_{it}$$

The update which distinguishes it from the micro model is the introduction of new variables such as GDP trend (PGDP) and an index of the degree of trade liberalisation (TLI). In addition, all variables refer to the national economy and not to the industry. The GDP trend is obtained by applying the Hodrick – Prescott filter [2] over the actual value of GDP. The liberalisation of trade index (TLI) is calculated by the European Bank for Reconstruction and Development as an indicator within the analyses of structural and institutional changes occurring in transition countries. Given that it can take values between 1 and 4.3 (1 - low degree of liberalisation, 4.3 - high degree of liberalisation) and Romania was credited for most of the time range with 4.3 (EBRD), we considered unnecessary using this indicator as a determinant of Romania's exports, eliminating it from the regression equation. Under these conditions, the new model will be presented as follows:

$$(1) \qquad EXP_t = \alpha + \beta 1REER + \beta 2PGDP + + \beta 3FDI_{t-1} + e_t$$

where:
index t represents the year taken as reference for the variable;
PGDP – real trend of GDP;
EXP – real value of exports;
REER – real effective exchange rate;
FDI – FDI stock.

2.2 EXPLANATION OF CHOSEN REGRESSION MODEL

The impact of FDI on exports can be found in many forms. Firstly, they can contribute directly by increasing domestic supply and implicitly by engaging in such activities with other upstream or downstream sectors. But in this case we cannot make a precise distinction within different types of domestic investment that can produce the same effects. On the other hand, FDI can help increase competitiveness through technological contribution of specific elements such as education, mastery of best practice of foreign trade activities, knowledge of foreign markets and intra-firm trade. All these aspects can be considered as part of the specific effects of FDI on export capacity.

The econometric model captures separately the effects of FDI on exports, firstly through the national output capacity (PGDP) and secondly through the FDI – specific effects as defined above. To represent the national output we chose as proxy indicator the trend of real GDP. This was achieved by applying the Hodrick-Prescott filter on actual annual values of GDP. In turn, real GDP values were obtained by updating them using the GDP deflator, in order to eliminate influences caused by price increase. PGDP will serve to capture the effects of the development of the national output capacity (partly due to FDI) on exports. The real values of this variable are entered into the model with a lag of one year, the elapsed time required for an output increase to generate an export increase. In order to enhance model accuracy, other factors that are found in certain proportions among the determinants of exports need to be represented.

Exchange rate is certainly making its mark on export. Thus, the depreciation of national currencies against the target country favours exporters, as they cash the equivalent value of products in foreign currency. In our model we cannot consider a particular exchange rate between two

currencies, as data are collected at national level, so that all of Romania's trading partners are being involved. Considering only one exchange rate, we would distort the impact of the export indicator. This problem can be solved by using the real effective exchange rate (REER). This reflects the relative position of a currency against those of major trading partners in terms of price and cost competitiveness. The increase of this indicator shows a real currency appreciation, so it is expected to register a negative coefficient β1.

To capture specific effects due to FDI, we introduced in this equation the explanatory value of real FDI stock. As in other cases, this variable is adjusted by the GDP deflator and introduced with a one year-lag. The reporting year for both the GDP deflator and REER is 2005.

2.3 INTERPRETATION OF EMPIRICAL RESULTS

The data used to estimate this model cover the period 1991-2010. Since at the beginning of this reference period the FDI flow was very low, as many of these types of investment aimed at the domestic market, the effect of FDI on exports might have been reduced. However, we did not shrink the left side of the interval, in order to benefit from the contribution of a larger number of data, thus supporting the accuracy of the model. The primary data used in the estimation of this model are shown in Appendix 3. For our analysis we used the multiple linear regression and to reduce collinearity and heteroskedasticity following test plots, we opted for the use of the weighted least squares method, to the detriment of logarithmic variables, solution adopted in our reference studies.

In what concerns testing the parameters and estimating the model accuracy, we obtained the results presented in table 1.

Table 1. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,906[a]	,821	,785	1,79239

a. Predictors: (Constant), ISD, RRES, TPIB

Table 2. ANOVA[b,c]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	220,550	3	73,517	22,883	,000[a]
	Residual	48,190	15	3,213		
	Total	268,740	18			

a. Predictors: (Constant), ISD, RRES, TPIB
b. Dependent Variable: EXR
c. Weighted Least Squares Regression - Weighted by Weight for EXR from WLS, MOD_47 ISD** -1,000

The Model Summary table indicates a determination ratio of 0.821 (R Square), which means that the variation of the EXP (exports) dependent variable is explained in a proportion of 82.1% by the simultaneous variation of independent variables (REER, PGDP and FDI stock).

To test the proposed model we used Fisher's exact test. After SPSS processing, the results from table 2 were obtained. The significance of Fisher's exact test is *SigF* = 0, lower than the threshold of significance (0.05), therefore the decision to overrule the null hypothesis is accepted, i.e. the assumption that the proposed multi-linear model could not explain the dependence between variables, which is also confirmed by the value of the determination ratio *R Square* = 0.821.

The table below (Table 3) presents the correlation matrix for the variables included in the model.

Tabel 3. Correlations[a]

		EXR	RRES	TPIB	ISD
Pearson Correlation	EXR	1,000	,513	,655	,809
	RRES	,513	1,000	,941	,674
	TPIB	,655	,941	1,000	,679
	ISD	,809	,674	,679	1,000
Sig. (1-tailed)	EXR	.	,012	,001	,000
	RRES	,012	.	,000	,001
	TPIB	,001	,000	.	,001
	ISD	,000	,001	,001	.

a. Weighted Least Squares Regression - Weighted by Weight for EXR from WLS, MOD_47 ISD** -1,000

The Correlation matrix, through its correlation coefficients, measures the intensity of the relationship between two variables, without considering interaction with other variables in the model. Between variables EXR and REER, PGDP and FDI we obtained the following values for correlation coefficients: 0.513, 0.655 and 0.809. Student test coefficient results (0.012, 0.001, 0.000) show that they are statistically significant, the links between variables being direct and strong, the FDI stock holding the supremacy (*Sigt* = 0 for a correlation coefficient equal to 0.809). To build the estimated model the results from table 4 were obtained on the punctual estimation of the parameters.

Student test significance for each parameter, *Sigt* is lower than the significance threshold value (0.05), thus rejecting the null hypothesis (absence of links between variables) with a probability of 95%.

By replacing the coefficients of variables in equation 1 with the previous results, the following model is obtained :

$$(2)\ EXP = 26{,}31 - 0{,}58REER + 0{,}28PGDP_{t-1} + 0{,}41FDI_{t-1}$$

Interpretation of coefficient values leads to the following conclusions:
- as expected, the nature of the relationship between the real effective exchange rate (REER) and exports (EXP) is reversed (β1 = -0.58), showing that an increase of one unit of REER (appreciation of national currency) triggers an export value reduced by 0.58 billion RON. In other words, export growth is closely related to the depreciation of national currency;
- the output capacity of the economy (PGDP) exerts a positive influence over exports (β2 = 0.28);
- FDI stocks directly and positively affect exports (β3 = 0.41).

Table 4. Coefficients[a,b]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	26,318	6,489		4,056	,001
	RRES	-,587	,169	-1,140	-3,483	,003
	TPIB	,281	,076	1,219	3,701	,002
	ISD	,414	,083	,750	4,982	,000

a. Dependent Variable: EXR
b. Weighted Least Squares Regression - Weighted by Weight for EXR from WLS, MOD_47 ISD** -1,000

To determine the influence of FDI stocks on the output capacity of the economy, i.e. the influence of FDI on exports due to their contribution towards the increase of domestic output, we

resort to a new regression, this time a simple one, between PGDP as a dependent variable and FDI as an explanatory variable.

(3) $\ln PGDP = \alpha + \beta 1 \ln FDI$

As a result of the statistical analysis (Appendix 4), the following model is obtained:

(4) $\ln PGDP = 5{,}17 + 0{,}10 \ln FDI$

By using logarithms on variables we obtain their respective elasticities. We note that the FDI stock is positively correlated with GDP. Interpreting the coefficient β we estimate that a 1% increase in FDI stock generates a 0.10% increase of GDP.

From equation (4) and equation (2) it appears that although the FDI stock contributes to export growth by increasing the output capacity of the economy, this contribution is relatively small: an increase of 1% of the FDI stock leads to a 0.10% increase of the potential output capacity PGDP (equation 4) and a one unit increase of PGDP translates into an increase of 0.28 billion RON in exports (equation 2).

Given that both PGDP (0.28) and FDI (0.41) coefficients are positive, we can say that FDI acts on exports both by increasing the output capacity of the national economy, as well as by the specific characteristics of MNCs. It seems that the latter contribute to a greater extent in increasing the competitiveness of exports. In other words, an increase of 1 billion RON in the FDI stock translates into an increase in exports of 0.28 billion RON in the short term (in the following year) and into an increase of 0.56 billion RON in the long term, due to specific effects of FDI. Short-term growth can be attributed directly to MNCs, but in the long term it may ascribe positive externalities generated by FDI in the host economy. Some of these effects are closely linked to improved export performance of domestic companies, and these often have a lot to learn about this activity from the foreign capital companies. The fact that the long-term effect is greater than the short-term one can be explained by appealing to the theory of indirect effects of FDI on host country exports. These effects are often more diverse and more important for the economy of the host country than direct ones, continuing to make their presence felt even after a possible withdrawal of the multinational company from the market. According to the above mentioned theory, there are three main indirect ways in which FDI influences an increased export performance (Blomstrom, 1990): (1) local firms can increase their exports by observing similar activities of MNCs and using the same infrastructure (transport, communications, financial services) that they use to support their activities; (2) the transfer of new technologies to local firms; (3) structural links between foreign and local firms.

CONCLUSIONS

The studies that highlight how foreign capital is involved in export activity gradually discovered a link between these two factors. The low level of FDI in the early 1990s and the original orientation of many MNCs towards domestic demand contributed to the gradual disclosure, in the scientific literature, of the effects of FDI on exports.

The undertaken regression analysis cemented and, in the same time, diversified previous results, coming with more information about the effects exerted by FDI. These investments can make a difference in exports by increasing the potential output of the national economy, which is a common aspect of domestic investment as well, but also through their specific effects, i.e. higher productivity of capital, advanced technology, an international distribution network or experience in export activity. This gives them an important place in establishing foreign trade policies. The fact that the mentioned effects spread beyond the ones referring to domestic output growth, make FDI a compulsory variable in the equation of export growth potential. The existence of long-term effects in the field of exports, effects due to the engagement of local companies that can meet the imposed

quality standards, comes as a confirmation of their importance in the economy and, at the same time, as a challenge for the local business environment to constantly raise quality standards.

Therefore, our analysis would be superficial if we fell into the trap of simple conclusions derived from a quick glance at the direct dependencies found within the binomial FDI - Exports. Beyond the benefits of export augmentation due to the activity of MNCs, and without diminishing the positive contribution of FDI on the quality of exports, we must look at the situation in perspective, at the effects generated on the national economy by a possible intervention of factors which not are found in the control sphere of decision-makers on the national territory. It is good that Romania is exporting, it is good that exports have contributed in recent years at balancing payments, but it is not quite positive that they were conducted at an alarming rate mainly by foreign companies.

All data show a massive concentration of export activity around MNCs, actually around a group of MNCs. We can already say that Romania's contribution to these exports has to do solely with the a certain geographic area where production and workforce are localised, thus contributing in a very small proportion to the total value of the product. This massive concentration of exports in the hands of a few MNCs is worrying, given the fact that their respective positive externalities do not return to the local exporters, externalities much needed in order to compensate the negative effects of a possible migration of foreign capital.

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ENDNOTES

[1] According to GEO no. 70/1994, taxpayers who charged through a bank account in Romania currency revenues from the export of goods resulting from their own activity, pay a tax rate of only 5%, opposed to 25% paid for the rest of their activities, a rate that applies to taxable income corresponding to the share of these revenues out of their total revenues.

[2] A mathematical tool used in macroeconomics in order to separate the cyclical component of a time series from raw data. Its automatic calculation is available at http://translate.google.ro/translate?hl=ro&sl=en&tl=ro&u=http%3A%2F%2Fdge.repec.org%2Fcgi-bin%2Fhpfilter.cgi&anno=2

REFERENCES

1. Anghel, I.(2002), *Investiţiile Străine Directe în România*, Expert, Bucharest.
2. Boscaiu, V., Mazilu, A.(2001), *Investiţiile străine dircte şi competitivitatea industriei prelucrătoare din România,* CRPE-Paper no. 29-November 2001.
3. Blomstrom, M.(1990), *Transnational Corporations and Manufacturing Exports from Developing Countries,* United Nations Publications, New York, 1990.
4. Hunya, G.(2002), Restructuring through FDI in Romanian manufacturing, *Economic Sistems,* Elsevier, 26(2002), pp. 387-394.
5. Hunya, G., Holzner, M., Worz, J.(2007), *How to Asses the Impact of FDI on an Economy?*, OECD, 2007.
6. Kaminski, B., Ng, F(2001)., Central European Economies in European Union Networks of Production and Marketing, *Policy Resarch Working Paper,* World Bank, Development Research Group, 2001.

7. Kaminski, B., Ng, F.(2004), Romania's Integration into European Markets: Implication for Sustainability of the Currnt Export Boom, *World Bank Policy ResearchWorking Paper* 3451, 2004.
8. Kutan, M.A., Vuksic, G.(2007), Foreign Direct Investment and Export Performance: Empirical Evidence, *Comparative Economic Studies,* September, 2007.
9. Vuksic, G.(2005), Impact of Foreign Direct Investment on Croatian Manufacturing Export, *Financial Theory and Practice* 29(2), pp. 131-158*,* Zagreb.
10. Mazilu, A.(1999), *Transnaţionalele şi Competitivitatea: o perspectivă est-europeană*, Bucharest, 1999.
11. Zhang, H.K., Song, S.(2000), Promoting Exports. The Role of inward FDI in China, *China Economic Review* 11, pp. 385-396.
12. Zhang, H.K.(2005), *How Does FDI Affect a Host Country's Export Performance? The Case of China*, available on-line from http://faculty.washington.edu/karyiu/confer/xian05/papers/zhang.pdf.