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# Are the Central and East European Countries attracting the appropriate type of foreign direct investments?

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## ABSTRACT

*Measuring and studying the relationship between the inflows of FDIs received by a country and the openness of its market might shed some light on the typology of foreign investments attracted by that country. The FDIs can be clustered, as the literature states, in a dichotomous fashion, in vertical FDIs, searching for efficiency and horizontal FDIs mainly interested in acquiring new markets. Thus, it is of crucial importance for an economy to be able to design policies that will encourage those foreign investments which bring the most important benefits for the host country. In this research paper, using the T-Y procedure, we try to identify some aspects useful in identifying the general typology of the FDIs attracted by a sample of five central and east European countries (members of the EU).*

*Key words: Foreign Direct Investment, Market openness index, Imports and Exports, Granger Causality analysis, Toda-Yamamoto procedure*

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## INTRODUCTION

The former communist countries located in the central and eastern Europe have been going, since 1990, through a process of severe changes meant to transform them, economically, into functional open markets. Thus, the foreign direct investments were regarded by the authorities and by the policymakers of these countries as a very important tool which could fuel this development process. However the policy makers should analyze if the attracted foreign direct investments are the most appropriate ones. Therefore, statistical techniques should be employed for more than measuring different phenomena, they should be used for assessing the impact of different policies and most important, they should be used for optimization purposes and also business intelligence and big data analysis should be employed in this regard (Bodislav, 2015).

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The scientific literature classifies the foreign direct investments in several typologies and provides evidence that these different types of foreign direct investments have significantly different impact on the economy of the host countries. Moreover, nowadays a significant trend of the literature brings evidence supporting the hypothesis that some foreign direct investments have a rather negative influence on the development of the economy of the host country.

Consequently the study of the general typology of foreign direct investments attracted by an economy is very important in order to assess the present and mainly the future impact of these investments. Going further we can argue that this kind of knowledge would offer the authorities the possibility to forge new policies which would, in a more efficient way, attract those types of investments that would bring the most benefits to local economies. Of increasing importance in this regard, for the decision makers, is also the spatial distribution of the previous attracted foreign direct investments (Strat, 2014).

Therefore in this study, following the binary classification of the foreign direct investments into market seeking investments and efficiency seeking investments, we try to identify which of these two types of investments are mostly attracted by five of the new member states of the European Union (Romania, Bulgaria, Hungary, Poland and Czech Republic).

## LITERATURE REVIEW

Among others, the globalisation is being considered responsible for bringing a new source of investment into the economies across the world in the form of foreign direct investments. The foreign direct investments are regarded nowadays as crucial development factors both at national level and at regional and local level. These kind of foreign direct investments are considered as being very important in fuelling the economic growth of a country (Borensztein, E., De Gregorio, J. et al. 1988) especially in countries which find themselves in a development phase.

The literature identifies a large variety of determinants which attract foreign direct investments into a country. Some of the most important are: infrastructure, identified by Mariotti and Pischitello (1995) and by Broadman and Sun (1997), the characteristics of the labor market, identified by Crozet et al (2004), market size identified by Crozet et al. (2004) and by Przybylska et al (2000), research and development level of the host country, identified by Cantwell et al (2005). The available human capital is another important factor identified by the researchers when dealing with the determinants of the foreign

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direct investments (Miyamoto, 2003, Al Sadig, 2009, Cleeve 2008). Borensztein et al. argues in the study conducted in 1998 on a sample of 69 developing countries that the impact of the foreign direct investments on a host economy depends on the capacity of each specific country to adopt the new technologies brought by the investors. Following the same direction Myamoto (2003) proves that states which neglect the investments in the development of the human capital remain unattractive for the foreign investors.

Another aspect which is regarded with attention by the foreign investors is the political and institutional stability of a country (Cleeve (2008), Asiedu (2006), Biswas (2002)) and also the size of the unofficial economy and the linkages with the official economy (Davidescu, 2014).

Trade openness is another factor identified in the literature as being connected with the flow of foreign direct investments received by a country (several approaches are used in order to quantify the trade openness of a country, from a ratio  $(\text{Imp}+\text{Exp})/\text{GDP}$  to different indices). Al Sadig, in a study conducted in 2009 and Asiedu in a study conducted in 2002 find evidence supporting this hypothesis. Also noteworthy is the fact that foreign investors tend to agglomerate their investments, meaning that they are more inclined to invest in developed national or local economies (Davidescu & Strat 2014). Therefore, it is obvious that the analysis of the previous foreign direct investments in a country (Anghelache, Manole et al., 2015) is also useful when discussing the determinants of the phenomenon.

Beugelsdijk et al. find in a study conducted in 2008 that the impact of the foreign direct investments on the economic growth of a host country depends severely on the typology of the investment. They argue that vertical foreign direct investments, which pursue efficiency, are inclined to locate in countries where labour costs and all other costs involved by their future business are low. Therefore these types of investors are not especially interested in the market of the host country, but are mostly interested in exporting the production. By doing so, it is obvious that this type of investment is not interested in developing the host country because in this way the company would diminish its efficiency. On the other hand the horizontal type of investment is mostly attracted by new markets and therefore it is interested in developing the host country's market because in this way it would increase its potential.

Consequently we can hypothesize that it might exist a direct connection between the general type of foreign direct investments attracted by a country and its trade openness (market permeability). Namely there should be a causal relation between the inflow of foreign direct investments and the market openness (exports, imports) for countries which are mostly a destination for the vertical foreign direct investments.

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## RESEARCH GOAL, DATA AND METHODOLOGY

According to the researchers, the inflow of foreign direct investment can be directly linked with the economic growth of a national or regional economy and therefore studying the typology of the attracted foreign direct investments needs to be regarded as being a crucial step when trying to assess this side of a national economy.

Consequently, in this research paper, by analysing the causality relationship between the inflow of the foreign direct investments and the permeability of a national economy, we try to provide some evidence which can help us decide whether an economy attracts mainly vertical foreign direct investments or horizontal foreign direct investments. In order to conduct such an analysis we study the causality between the yearly inflows of foreign direct investments and the following variables: yearly exports, yearly imports and market permeability (expressed through the market openness index). The market openness index is calculated as the ratio between the sum of total imports and total exports divided by the total GDP. A higher value of the index (it might be regarded as a composite index) signifies a higher permeability of the market.

In this study we have included a sample of five countries selected among the new EU member states, namely: Romania, Bulgaria, Hungary, Poland and the Czech Republic. Romania and Bulgaria were selected due to the fact that they are the poorest members of the EU. Poland, Hungary and the Czech Republic were included in the sample because they are the best performing economies (from the ex communist countries) from the ones accepted in 2004.

For each of the countries, the yearly inflow of foreign direct investments, the yearly value of the exports and the yearly value of the imports, were downloaded from the database of the World Bank, for the period 1990-2013. Noteworthy is the fact that for the Czech Republic data are available only from 1993 (after Czechoslovakia was divided) and also for Hungary data were only available from 1990 until 2011. Due to comparability reasons all these three variables were measured as percentage from the GDP. Another reason for using the ratio approach is due to the method employed to construct the market openness index which is constructed by simply adding the imports and the exports (expressed as percentage from GDP). Important to mention is the fact that we are aware of the potential spurious correlations that might appear between our variables due to the fact that they are expressed as ratios.

Another important limitation of the presented approach is the short time series included in the analysis. Even though we are aware of the implica-

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tion of such an aspect we need to mention the fact that this weakness is common to a large variety of studies conducted on the new members of the EU (only since 1990 these economies are open markets and trust worthy data for them is being collected).

The methodology implied in this study is based on the Toda Yamamoto procedure for testing for Granger Causality. The analysis was performed using the E-Views software package. We tested for the presence of the causality for each country for three models: 1) foreign direct investments and the openness index; 2) foreign direct investments and imports; 3) foreign direct investments and exports.

## EMPIRICAL RESULTS

In order to be able to speak about causality relationships we first need to identify the existence of correlations among the studied variables. The correlations were analysed for each country for the level variables expressed in current US \$ and also as percentages from the GDP. The main reason why we have performed such a double analysis was to find if the presence of the correlation among the variables expressed as percentages is a real one or it is only a spurious correlation caused by the usage of ratios.

The obtained results indicate direct and high correlations (around 0.5) for FDI and market permeability for Romania and Bulgaria and lower ones (around 0.27) for Hungary and Poland (similar results are obtained for the series of exports and imports also). For the Czech Republic the results reveal no correlation (very weak ones) for all three models. We can interpret these results in the following manner: a) there is a possibility of having causality relationships among FDI and market permeability for Romania and Bulgaria; b) it is unclear (there is a weak possibility) if there might exist a causality relationship between FDI and market permeability for Poland and Hungary and c) there is almost no possibility of having a causality relationship between FDI and market permeability for the Czech Republic.

After conducting the correlation analysis described above we have proceeded further with the Toda Yamamoto procedure to test the existence of the Granger non causality relationship.

**The presence of the unit root for each time series**

*Table 1*

Country		Level		1st Difference	
		ADF	PP	ADF	PP
Romania	FDI	-1.669634	-1.761402	-5.761616***	-5.731600***
	Exp	-2.903209	-2.880285	-3.550350*	-5.486715***
	Imp	-3.540134*	-3.513369*	-4.498307***	-17.80338***
	Mo	-3.502844*	-3.465493*	-6.394817***	-9.697856***
Bulgaria	FDI	-2.573669	-1.309230	-3.827227**	-2.759006**
	Exp	-2.998542	-2.998542	-5.709096***	-6.165505***
	Imp	-3.478373*	-3.486537*	-5.536534***	-8.076209***
	Mo	-3.790182**	-3.771272**	-5.766299***	-7.853850***
Poland	FDI	-1.087663	-0.847161	-5.020954***	-5.565682***
	Exp	-3.894794**	-3.882953**	-5.301765***	-5.407639***
	Imp	-2.824630	-2.845951	-4.054717**	-5.444850***
	Mo	-3.269523*	-3.290699*	-4.822558***	-4.899805***
Hungary	FDI	-5.79164***	-2.247655	-3.764698**	-3.469021*
	Exp	-1.894174	-1.895174	-3.315731*	-3.211781
	Imp	-1.826078	-1.934319	-3.917668**	-3.924306**
	Mo	-1.842444	-1.842444	-3.525243*	-3.539144*
Czech Rep.	FDI	-2.822323	-2.727136	-6.008362***	-11.58329***
	Exp	-3.269756	-2.658416	-3.337611*	-4.270160**
	Imp	-3.459424*	-2.385719	-4.315978**	-5.304756***
	Mo	-3.313717*	-2.538606	-2.820077	-5.048028***

\* Prob. lower than 10% \*\* Prob. lower than 5% \*\*\* Prob. lower than 1% (trend and Intercept)

As it is visible from the table above all the time series are stationary in the first difference. Also some of them are stationary in level for a 10% significance level (mostly, import series and market permeability series).

After setting a first VAR model for each of the 15 cases we have identified the recommended maximum lag length. For each of the models we have decided for the lag that was identified by the majority of the employed criteria. We have made also two exceptions. The first was for the FDI-Imp model for Bulgaria. The value 3 instead of 4 was chosen due to the shortness of the available time series. The same reason was used to select lag 1 instead of lag 3 for the second model utilised for the Czech Republic.

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**The maximum length selection criteria**

*Table 2*

Country	Var. Model	Lag length Criteria				
		LR	FPE	AIC	SC	HQ
Romania	FDI & Mo	1	3	3*	1	3
	FDI & Exp	1	2	2*	1	2
	FDI & Imp	3	3	3*	3	3
Bulgaria	FDI & Mo	1	3	3*	1	3
	FDI & Exp	3	3	3*	3	3
	FDI & Imp	2	3*	4	2	4
Poland	FDI & Mo	1	1	1*	1	1
	FDI & Exp	1	1	1*	1	1
	FDI & Imp	1	1	1*	1	1
Hungary	FDI & Mo	2	2	2*	2	2
	FDI & Exp	2	2	2*	2	2
	FDI & Imp	2	2	2*	2	2
Czech Republic	FDI & Mo	1*	1	3	1	3
	FDI & Exp	1*	3	3	1	3
	FDI & Imp	1	1	1*	1	1

We have also tested for co-integration for the models where this phenomenon might have been present (we mention once again the fact that it was the author's decision to conduct such a test even though it is not mandatory in the Toda Yamamoto procedure). We have obtained evidence of a potential co-integration only for the case of Romania and Bulgaria.

Going further, we have specified new VAR models, using the identified maximum length for each of the fifteen combinations. For each of the models we have employed the Granger non-causality test in order to validate our initial hypothesis.

### The Granger non-causality test

Table 3

Country	VAR Model	Granger Causality		
		A → B	B → A	Sig. level
Romania	FDI & Mo	YES	NO	5% / no
	FDI & Exp	YES	NO	1% / no
	FDI & Imp	YES	NO	10% / no
Bulgaria	FDI & Mo	YES	NO	10% / no
	FDI & Exp	YES	NO	5% / no
	FDI & Imp	YES	NO	1% / no
Poland	FDI & Mo	NO	NO	no / no
	FDI & Exp	NO	NO	no / no
	FDI & Imp	NO	NO	no / no
Hungary	FDI & Mo	NO	NO	no / no
	FDI & Exp	NO	NO	no / no
	FDI & Imp	NO	NO	no / no
Czech Republic	FDI & Mo	NO	NO	no / no
	FDI & Exp	NO	NO	no / no
	FDI & Imp	NO	NO	no / no

The obtained results support the hypothesis that there exists a causality relation between the inflow of foreign direct investments and the market openness (also imports and exports) only for the cases of Romania and Bulgaria. The relationship is unidirectional for all three models for both countries. Thereby the inflow of foreign direct investments can be regarded as having a significant influence on the market openness of both countries. On the contrary we can not support the idea that the market openness causes inflows of foreign direct investments. Therefore we can argue that there are evidences to support the idea that the Romanian economy and the Bulgarian one are mainly a target for foreign investors in search of efficiency. Thus, we can argue that Romania and Bulgaria are targets for “vertical” foreign direct investments.

For Hungary, Poland and the Czech Republic we have no evidence that can support the causal link between the analysed variables. We can not say neither that the market openness is Granger caused by the inflow of foreign direct investments nor that the market openness Granger causes the inflows of foreign direct investments.

## CONCLUSION

Before listing the main findings of the paper we believe it is of major importance to provide a clear description of the main limitations of the presented study.

For comparability reasons the data are expressed as percentages from the GDP, and therefore we might be dealing with spurious correlations be-



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tween variables. The time series are shorter for Hungary (data not available for 2012 and 2013) and for the Czech Republic (data are available only from 1993). In the period 1990 - 1998 (2000) the economical environment of all these states was not characterised by stability and therefore some of the indicators might have a low reliability level. Finally the main methodological limitation is represented by the short time series. However noteworthy is the fact that this shortcoming is common to a great variety of studies regarding the east European countries.

Therefore it is necessary to mention that the findings of this study should be regarded more as an exploratory research than as strong and indestructible evidence.

The main finding of this research is represented by the fact that we have identified Granger causality relations between the inflows of foreign direct investments and the market openness (also imports and exports) for Romania and Bulgaria. Also by not identifying the same phenomenon for Poland, the Czech Republic and Hungary we can state that these five countries attract different types of FDI's

To be more precise we can conclude that foreign investors which are more inclined to search for efficiency (vertical foreign direct investment) will first consider Romania and Bulgaria as potential destinations. Therefore the authorities of these two countries will need to forge new policies that will make them more appealing to foreign investors which are interested in developing horizontal foreign direct investments because those bring significantly more benefits to a host country.

For further research we propose that this approach should be enlarged to other east European countries.

In order to have a clearer picture the policymakers should conduct similar studies at sector level in order to provide a more detailed description of the typology of the attracted foreign direct investments. In these conditions the greatest challenge for the official statistics is to provide enough (long enough time series) and appropriate data.

Also, employing this approach of studying the causal linkages between the inflows of foreign direct investments and the main socio economic characteristics of a country should be a priority for the authorities when trying to optimize the existing policies or when developing new policies in this sector.

Finally, I will end the paper by stating that the greatest challenge for the official statistics will be in the future years to fuel these studies with appropriate and reliable data.

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