4. FOREIGN DIRECT INVESTMENT, EXPORT AND ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM NEW EU COUNTRIES

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Abstract

Whether foreign direct investment (FDI) is beneficial to host country growth or not is a question debated since a long time. This paper provides a survey of the literature on FDI, export and growth, and empirically investigates the causal relationship between economic growth, export and FDI for the ten transition European countries (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia). The ARDL bounds testing approach is used to investigate the existance of long-run relationship between FDI, export and economic growth for these countries. After detection of cointegratin relationship, the error-correction based Granger causality test is employed to examine the both long-run and short-run causality issues between the variables by using quarterly data from 1994 to 2008. These causality results reveal that there is causal relationship between FDI, export and economic growth in four out of ten countries considered.

Keywords: FDI, causality, Bounds testing approach, export, economic growth, EU countries.

JEL Classification: C30, F21, F43, O40.

1. Introduction

The relationship between foreign direct investment (FDI), export and economic growth in both developing and developed countries continues to be of considerable theoretical and empirical interest among academics. Recent literature has highlighted the role of both exports and FDI on economic growth. While the export led growth (ELG) hypothesis states that exports are the main determinants of overall growth, the empirical evidence indicates that FDI flows have been growing at a pace far

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exceeding the volume of international trade. However, the ELG literature and the FDI-growth literature present different results. If there is a complementary relationship between FDI and exports, then foreign investments may increase the volume of exports in specific and international trade in general (Ekanayake et al., 2003). Blomstrom et al., (2000) argue that the beneficial impact of FDI is only enhanced in an environment characterized by an open trade and investment regime and macroeconomic stability.

FDI was the main source of flows to developing countries in the 1990s. Contrary to other capital flows, FDI is less volatile and does not show a pro-cyclical behaviour. It has therefore become the "favourite capital inflows" for developing countries. The FDI increased rapidly during the late 1980s and the 1990s in almost every region of the world revitalizing the long and contentious debate about the costs and benefits of FDI inflows. On one hand many would argue that, given appropriate policies and a basic level of development, FDI can play a key role in the process of creating a better economic environment. On the other hand potential drawbacks do exist, including a deterioration of the balance of payments as profits are repatriated and negative impacts on competition in national markets (Hansen and Rand, 2005, p.1). However, according to the most of the academics, the consensus view seems to be that there is a positive association between FDI inflows and growth provided receiving countries have reached a minimum level of educational, technological and/or infrastructure development.

As the world FDI inflows increased steadily and tremendously from US$ 200 billion in 1990 to US$ 1,996 billion in 2007 (UNCTAD, 2008), there is ongoing discussions on the impact of FDI on a host country economy, as can be seen from recent surveys of the literature. Most of the studies find positive effects of FDI on long run economic growth. In summary, consensus has been reached among academia and practitioners that FDI tends to have significant effect on eââconomic growth through multiple channels such as capital formation, technology transfer and spillover, human capital (knowledge and skill) enhancement, and so on (Ozturk, 2007, Alfaro et a. 2010). As mentioned by Busse and Groizard (2006), the enormous increase in FDI flows across countries is one of the clearest signs of the globalisation of the world economy over the past 20 years.

The share of FDI in GDP increased significantly after 1990s. In high-income countries, this share increased from some 0.5 to 1.0 percent in the 1980s to more than 5 percent in 2007 (http://www.unctad.org). While the increase in FDI inflows was less drastic in low and middle-income countries, the percentage of FDI in GDP remained at more than 2 percent after the year 2000, indicating a slightly higher significance of FDI flows in developing countries in the most recent period. In the case of Central and Eastern European countries, such as Czech Republic, Hungary and Poland as well as others, these countries experienced significant jumps in the FDI inflows as soon as the membership negotiations started (Busse and Groizard, 2006; Ozturk, 2007; Pop Silaghi, 2009). The foreign direct investment net inflows (% of GDP), exports of goods and services (% of GDP) and GDP growth (annual %) of selected European countries are given in Table 1.

Table 1

Foreign direct investment, net inflows (% of GDP)												
Countries	1994	1996	1998	2000	2002	2004	2005	2006	2007	2008	2009	2010
Bulgaria	1,1	1,2	4,1	7,8	5,7	10,5	14,9	23,4	31,4	19,3	7,1	4,9
Czech R.	2,1	2,3	6,0	8,8	11,3	4,5	9,3	3,9	6,1	3,0	1,5	3,5
Estonia	5,4	3,2	10,4	6,8	3,9	8,0	21,2	10,6	12,6	7,4	9,9	8,0
Hungary	2,7	7,2	7,0	6,0	4,5	4,2	6,9	17,3	52,1	47,0	3,3	-32,9
Latvia	4,2	6,8	5,4	5,3	2,7	4,6	4,4	8,3	8,0	4,0	0,4	1,5
Lithuania	0,4	1,8	8,2	3,3	5,0	3,4	4,0	6,1	5,2	4,2	0,0	2,1
Poland	1,7	2,9	3,7	5,5	2,1	5,0	3,4	5,8	5,6	2,8	3,0	1,9
Romania	1,1	0,7	4,8	2,8	2,5	8,5	6,6	9,3	5,9	6,9	3,0	1,8
Slovak R.	1,4	1,3	1,9	7,1	11,8	5,4	3,9	6,0	4,0	3,3	0,0	0,6
Slovenia	0,8	0,8	1,0	0,7	7,2	2,5	1,5	1,7	3,2	3,5	-1,3	0,8
Exports of goods and services (% of GDP)												
Countries	1994	1996	1998	2000	2002	2004	2005	2006	2007	2008	2009	2010
Bulgaria	45,0	59,4	59,1	50,5	47,4	51,9	40,5	61,2	59,5	58,2	47,5	57,8
Czech R.	50,5	48,9	54,2	63,4	60,2	70,1	72,2	76,4	80,1	77,1	69,1	79,3
Estonia	71,8	61,9	74,6	84,6	70,9	73,1	77,7	72,7	67,6	71,5	64,7	78,3
Hungary	29,3	49,0	61,7	74,6	63,3	63,3	65,9	77,7	81,3	81,7	77,6	86,5
Latvia	46,5	46,8	47,2	41,6	40,9	44,0	47,8	44,9	42,3	42,8	43,9	53,4
Lithuania	55,4	50,0	45,1	44,7	52,7	52,1	57,5	59,1	54,1	59,9	54,6	68,2
Poland	21,6	22,3	26,0	27,1	28,6	37,5	37,1	40,4	40,8	39,9	39,5	42,3
Romania	24,9	28,1	22,6	32,7	35,4	35,9	32,9	29,6	30,7	31,0	33,3	23,5
Slovak R.	59,3	53,3	59,2	70,4	71,1	74,5	76,3	84,5	86,9	83,4	70,8	81,1
Slovenia	58,9	49,9	51,1	53,7	55,1	57,8	62,2	66,5	69,6	67,1	58,4	65,4
GDP growth (annual %)												
Countries	1994	1996	1998	2000	2002	2004	2005	2006	2007	2008	2009	2010
Bulgaria	1,8	-9,0	4,9	5,7	4,7	6,7	6,4	6,6	6,4	6,2	-5,5	0,2
Czech R.	2,2	4,0	-0,8	3,6	1,9	4,5	6,3	6,8	6,1	2,5	-4,1	2,3
Estonia	-1,6	5,0	5,4	9,6	7,9	7,2	9,4	10,6	6,9	-5,1	-13,9	3,1
Hungary	2,9	0,2	4,1	4,2	4,5	4,8	4,0	3,9	0,1	0,9	-6,8	1,3
Latvia	2,2	3,8	4,7	6,9	6,5	8,7	10,6	12,2	10,0	-4,2	-18,0	-0,3
Lithuania	-9,8	5,2	7,6	3,3	6,9	7,4	7,8	7,8	9,8	2,9	-14,7	1,3
Poland	5,3	6,2	5,0	4,3	1,4	5,3	3,6	6,2	6,8	5,1	1,6	3,9
Romania	4,0	4,0	-4,8	2,1	5,1	8,4	4,2	7,9	6,0	9,4	-8,5	0,9
Slovak R.	6,2	6,9	4,4	1,4	4,6	5,1	6,7	8,3	10,5	5,9	-4,9	4,2
Slovenia	5,3	3,6	3,5	4,3	3,8	4,4	4,0	5,8	6,9	3,6	-8,0	1,4

Source: *World Bank World Development Indicators Online (2010)*

As it can be seen from the table 1, almost all countries experienced significant increase in their foreign direct investment net inflows (% of GDP), exports of goods and services (% of GDP) and GDP growth (annual %) in the 1990s and 2000s. Their real exports increased especially after becoming an EU member.

The objective of this paper is to investigate the causal relationship between FDI, export and economic growth in ten European countries (Bulgaria, Czech Republic,

Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia). It is important to investigate the linkage between FDI, export and economic growth for transition European countries in order to provide evidence as to whether rapid economic growth in the region is driven by export and FDI, or whether there is reciprocal impact between growth, export and FDI.

This study employed recently developed autoregressive distributed lag (ARDL) bounds testing approach of cointegration developed by Pesaran and Shin (1999) and Pesaran et al. (2001). Despite the increasing role of FDI in economic growth, limited researchs have been carried out on the causal links between FDI, export and economic growth. Therefore, it is expected that this paper will contribute to the existing literature.

The structure of the paper is as follows: Section 2 presents the theory and reviews the existing literature on the subject. Section 3 presents model, methodology and data. Section 3 presents the empirical results and also examines the direction of causality between FDI, export and growth for the sample countries considered. Finally, the paper is concluded with some remarks on policy lessons.

2. Theory and Literature Survey of Empirical Studies

The relationship between economic growth and FDI has been studied well in the empirical literature focusing on both developing and developed countries. The relationship has been studied by explaining four main channels: (i) determinants of growth, (ii) determinants of FDI, (iii) role of multinational firms in host countries, and (iv) direction of causality between the two variables. A large number of empirical studies on the role of FDI in host countries suggest that FDI is an important source of capital, complements domestic private investment, is usually associated with new job opportunities and enhancement of technology transfer and spillover, human capital (knowledge and skill) enhancement, and boosts overall economic growth in host countries (Chowdhury and Mavrotas, 2006:2)[3].

Macro-empirical work on the FDI-growth relationship has shown that—subject to a number of crucial factors, such as the trade regime, the human capital base in the host country, financial market regulations, banking system and the degree of openness in the economy—FDI has a positive impact on overall economic growth concerning developing countries[4]. However, a number of firm-level studies do not support the view that FDI promotes economic growth[5]. While the literature has heeded the importance of FDI on growth, it also realizes that economic growth could be an

[3] See De Mello (1997, 1999), Ozturk (2007), Ozturk and Acaravci (2010), Alfaro et al. (2010), for a comprehensive survey of the nexus between FDI and growth as well as for further evidence on the FDI-growth relationship.

[4] See Balasubramanyam et al. (1999) and Borensztein et al. (1998), and Nair-Reichert and Weinhold (2001) for a critical assessment of the empirical literature. See Aitken and Harrison (1999) regarding recent assessments for the micro studies at the firm level that examine the impact of FDI on growth in developing countries.

[5] See Gorg and Greenaway (2004) for the comprehensive discussion at the firm level.

important factor in attracting FDI flows. The importance of economic growth to attracting FDI is closely linked to the fact that FDI tends to be an important component of investing firms' strategic decisions (Ozturk, 2007; Pelinescu & Radulescu, 2009).

In addition to the increase of capital formation of the recipient economy, FDI may also help increasing growth by introducing new technologies, such as new production processes and techniques, managerial skills, ideas, and new varieties of capital goods. The growth rate of less developed countries is perceived to be highly dependent on the extent to which these countries can adopt and implement new technologies available in developed countries. By adapting new technologies and ideas (i.e. technological diffusion) they may catch up to the levels of technology in developing countries (Hermes and Lensink, 2003). It has been emphasised in the literature that the spillover effect can only be successful given certain characteristics of the environment in the host country. These characteristics together determine the absorption capacity of technology spillovers of the host country. Thus, FDI can only contribute to economic growth through spillovers when there is a sufficient absorptive capacity in the host country (See Hermes and Lensink, 2003).

Many empirical studies have tried to explain the relationship between FDI and growth (See Ozturk, 2007). As it can be seen in the most of these studies, FDI has positive effect on growth. Alfaro et al. (2001), Lensink and Morrissey (2001), Campos and Kinoshita (2002), Basu et al. (2003), Hermes and Lensink (2003), Nath (2004), Maki and Somwaru (2004), Li and Liu (2005), Hansen and Rand (2006), Lensink and Morrissey (2006), Ghatak and Halicioglu (2007), Apergis et al. (2008), Batten and Vo (2009), and Alfaro et al. (2010), among others, have found positive effects of FDI on growth. In general, recent empirical literature survey shows that the causality relations vary with the period studied, countries studied, treatment of variables (real or nominal), the econometric methods used, and the presence of other related variables or inclusion of interaction variables in the estimation equation (Hsiao and Hsiao, 2006). The results may be bidirectional, unidirectional, or no causality relations.

3. Model Specification, Data and Methodology

The long-run relationship among real gross domestic product (GDP), real export (EX) and foreign direct investment (FDI) in ten transition European countries may be expressed as:

$$GDP_t = \alpha + \phi EX_t + \gamma FDI_t + \varepsilon_t \quad (1)$$

where GDP_t is the real GDP (constant 2005 national currency, millions); EX_t, is the real EX (constant 2005 national currency, millions) and FDI_t is the ratio of FDI to GDP (in percent) and ε_t is error term. All variables are depended on our calculations: First, they are deflated to get their real values. Although export price deflators are nonavailable we used the GDP deflator (2005=100) for ten transition European countries. Second, GDP and EX variables are seasonally adjusted by using X-12 multiplicative method to remove seasonal effects, and then their natural logarithms

have been taken. Therefore, FDI variable has negative values for some periods in some countries; it is employed as the ratio of FDI to GDP (in percent).

The countries included in this study are Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia. The quarterly time series data are obtained from the International Monetary Fund's (IMF) International Financial Statistics (IFS) database. The data periods have varied for countries (see Table 3).

We use the two-step procedure from the Engle and Granger (1987) model to examine the causal relationship among real GDP, real EX and FDI in ten transition European countries. In the first step we explore the long run relationships between the variables. In the second step, we employ error-correction based on Granger causality model to test causal relationship among variables in the model.

3.1. Autoregressive Distributed Lag (ARDL) Cointegration Analysis

This study employed recently developed ARDL bounds testing approach of cointegration developed by Pesaran (1997), Pesaran and Shin (1999) and Pesaran *et al.* (2001). Due to the low power and other problems associated with other test methods, the ARDL approach to cointegration has become popular in recent years. The ARDL cointegration approach has numerous advantages in comparison with other cointegration methods such as Engle and Granger (1987), Johansen (1988), and Johansen and Juselius (1990) procedures: First, the ARDL procedure can be applied whether the regressors are I(1) and/or I(0), while Johansen cointegration techniques require that all the variables in the system be of equal order of integration. This means that the ARDL can be applied irrespective of whether underlying regressors are purely I(0), purely I(1) or mutually co-integrated and thus no need for unit root pre-testing. Second, while the Johansen cointegration techniques require large data samples for validity, the ARDL procedure is statistically more significant approach to determine the cointegration relation in small samples. Third, the ARDL procedure allows that the variables may have different optimal lags, while it is impossible with conventional cointegration procedures. Finally, the ARDL procedure employs only a single reduced form equation, while the conventional cointegration procedures estimate the long-run relationships within a context of system equations.

Basically, the ARDL approach to cointegration involves two steps for estimating long run relationship (Pesaran *et al.,* 2001). The first step is to investigate the existence of long run relationship among all variables in the equation under estimation. The ARDL model for the standard log-linear functional specification of long-run relationship among gross domestic product (GDP), export (EX) and foreign direct investment (FDI) may follows as:

$$\Delta GDP_t = \alpha_1 + \sum_{h=1}^{p1} \beta_{1h} \Delta GDP_{t-h} + \sum_{i=0}^{q1} \phi_{1i} \Delta EX_{t-i} + \sum_{j=0}^{r1} \gamma_{1j} \Delta FDI_{t-j} + \delta_1 GDP_{t-1} + \delta_2 EX_{t-1} + \delta_3 FDI_{t-1} + \varepsilon_{1t} \quad (2)$$

where ε_{1t} and Δ are the white noise term and the first difference operator, respectively. The ARDL method estimates $(m+1)^n$ number of regressions in order to

obtain the optimal lag length for each variable, where *m* is the maximum number of lags to be used and *n* is the number of variables in the equation. An appropriate lag selection based on a criterion such as Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC). According to Pesaran and Shin (1999), the SBC is generally used in preference to other criteria because it tends to define more parsimonious specifications. The bounds testing procedure is based on the joint F-statistic or Wald statistic that test the null of no cointegration, $H_0 : \delta_n = 0$, against the alternative of $H_1 : \delta_n \neq 0$, $n = 1, 2, 3$. Two sets of critical values (*CVs*) that are reported in Pesaran et al. (2001) provide *CV* bounds for all classifications of the regressors into purely *I(1)*, purely *I(0)* or mutually cointegrated. If the calculated *F*-statistics lies above the upper level of the band, the null is rejected, indicating cointegration. If the calculated *F*-statistics is below the upper *CV*, we cannot reject the null hypothesis of no cointegration. Finally, if it lies between the bounds, a conclusive inference cannot be made without knowing the order of integration of the underlying regressors. Recently, the set of critical values for the limited data (30 observations to 80 observations) were developed originally by Narayan (2005).

If there is an evidence of long-run relationships (cointegration) between the variables, the second step is to estimate the following long-run and short-run models that are represented in Equations (3) and (4):

$$GDP_t = \alpha_2 + \sum_{h=1}^{p2} \beta_{2h} GDP_{t-h} + \sum_{i=0}^{q2} \phi_{2i} EX_{t-i} + \sum_{j=0}^{r2} \gamma_{2j} FDI_{t-j} + \varepsilon_{2t} \quad (3)$$

$$\Delta GDP_t = \alpha_3 + \sum_{h=1}^{p3} \beta_{3h} \Delta GDP_{t-h} + \sum_{i=0}^{q3} \phi_{3i} \Delta EX_{t-i} + \sum_{j=0}^{r3} \gamma_{3j} \Delta FDI_{t-j} + \psi ECT_{t-1} + \varepsilon_{3t} \quad (4)$$

where ψ is the coefficient of error correction term (hereafter *ECT*). It shows how quickly variables converge to equilibrium and it should have a statistically significant coefficient with a negative sign.

3.2. Causality Analysis

ARDL cointegration method tests whether the existence or absence of long-run relationships among real GDP, real EX and FDI. It doesn't indicate the direction of causality. Granger (1988) emphasizes that a vector error correction (hereafter VEC) modeling should be estimated rather than a vector autoregression (hereafter VAR) as in a standard Granger causality test, if variables in model are cointegrated. Once estimating the long-run model in Equation (3) in order to obtain the estimated residuals, the next step is to estimate error-correction based on Granger causality models. Thus, the following models may employ to explore the causal relationship among variables:

$$\Delta GDP_t = \alpha_4 + \sum_{h=1}^{p4} \beta_{4h} \Delta GDP_{t-h} + \sum_{i=0}^{q4} \phi_{4i} \Delta EX_{t-i} + \sum_{j=0}^{r4} \gamma_{4j} \Delta FDI_{t-j} + \psi_1 ECT_{t-1} + \varepsilon_{4t} \quad (5.a)$$

$$\Delta EX_t = \alpha_5 + \sum_{h=0}^{p5} \beta_{5h} \Delta GDP_{t-h} + \sum_{i=1}^{q5} \phi_{5i} \Delta EX_{t-i} + \sum_{j=0}^{r5} \gamma_{5j} \Delta FDI_{t-j} + \psi_2 ECT_{t-1} + \varepsilon_{5t} \quad (5.b)$$

$$\Delta FDI_t = \alpha_6 + \sum_{h=0}^{p6} \beta_{6h} \Delta GDP_{t-h} + \sum_{i=0}^{q6} \phi_{6i} \Delta EX_{t-i} + \sum_{j=1}^{r6} \gamma_{6j} \Delta FDI_{t-j} + \psi_3 ECT_{t-1} + \varepsilon_{6t} \quad (5.c)$$

Residual terms, ε_{4t} , ε_{5t} and ε_{6t} , are independently and normally distributed with zero mean and constant variance. An appropriate lag selection is based on a criterion such as AIC and SBC. Rejecting the null hypotheses indicate that FDI or EX does Granger cause GDP, GDP or FDI does Granger cause EX, and GDP or EX does Granger cause FDI, respectively.

As opposed to the conventional Granger causality method, the error-correction based causality test allows for the inclusion of the lagged error-correction term derived from the cointegration equation. By including the lagged error-correction term, the long-run information lost through differencing is reintroduced in a statistically acceptable way (see Narayan and Smyth, 2008, and Odhiambo, 2007, 2009). This approach allows us to distinguish between "short-run" and "long-run" Granger causality. The Wald-tests of the "differenced" explanatory variables give us an indication of the "short-term" causal effects, whereas the "long-run" causal relationship is implied through the significance or other wise of the t test(s) of the lagged error-correction term that contains the long-term information since it is derived from the long-run cointegrating relationship. Nonsignificance or elimination of any of the "lagged error-correction terms" affects the implied long-run relationship and may be a violation of theory. The nonsignificance of any of the "differenced" variables reflects only short-run relationship. However, it does not involve such violations. Because, theory typically has little to say about short-term relationships (Masih and Masih, 1996).

Using equations (5.a), (5.b), and (5.c), Granger causality can be examined in three ways:

1) Short-run or weak Granger causalities are detected by testing $H_0 : \phi_{4i} = 0$ and $H_0 : \gamma_{4j} = 0$ for all *i* and *j* in equation (5.a); $H_0 : \beta_{5h} = 0$ and $H_0 : \gamma_{5j} = 0$ for all *h* and *j* in equation (5.b); and $H_0 : \beta_{6h} = 0$ and $H_0 : \phi_{6i} = 0$ for all *h* and *i* in equation (5.c). Masih and Masih (1996) and Asafu-Adjaye (2000) interpret the weak Granger causality as 'short run' causality in the sense that the dependent variable responds only to short-term shocks to the stochastic environment.

2) Masih and Masih (1996) point out that another possible source of causation is the ECT in equations. The coefficients on the *ECT*'s represent how fast deviations from the long run equilibrium are eliminated following changes in each variable. Thus, long-run causalities are examined by testing $H_0 : \psi_1 = 0$, $H_0 : \psi_2 = 0$ and $H_0 : \psi_3 = 0$ for equations (5.a), (5.b), and (5.c). For example, if ψ_1 is zero, *GDP* does not respond to the deviations from the long-run equilibrium in the previous period. $\psi_i = 0$, $i = 1, 2, 3$ for all *i* is equivalent to both Granger non-causality in the long-run and the weak exogeneity (Hatanaka, 1996).

3) Asafu-Adjaye (2000) emphasizes that the joint test of two sources of causation indicates which variable(s) bear the burden of short run adjustment to re-establish

long run equilibrium, following a shock to the system. Lee and Chang (2008) referred it as strong Granger causality tests that are detected by testing $H_0 : \phi_{4i} = \psi_1 = 0$ and $H_0 : \gamma_{4j} = \psi_1 = 0$ for all *i* and *j* in equation (5.a); $H_0 : \beta_{5h} = \psi_2 = 0$ and $H_0 : \gamma_{5j} = \psi_2 = 0$ for all *h* and *j* in equation (5.b); and $H_0 : \beta_{6h} = \psi_3 = 0$ and $H_0 : \phi_{6i} = \psi_3 = 0$ for *h* and *i* in equation (5.c), respectively.

4. Empirical Results

In this study we investigate the causal relationship among real gross domestic product (GDP), real export (EX) and foreign direct investment (FDI) in ten transition European countries by using quarterly time series data. To examine this linkage, we use the two-step procedure from the Engle and Granger (1987) model: In the first step, we explore the long run relationships between the variables by using recently developed ARDL bounds testing approach of cointegration. In the second step, we employ a dynamic VEC model to test causal relationships between variables.

Table 2 presents the estimated ARDL models that are based on SBC. The bounds *F*–test for cointegration test yields evidence of a long-run relationship among real gross domestic product (GDP), real export (EX) and foreign direct investment (FDI) at 1 percent significance level for Poland and at 5 percent significance level for Czech Republic, Latvia and Slovak Republic. On the other hand, the ARDL bounds test results show that there is no a unique long-term or equilibrium relationship among real GDP, real EX and FDI in Bulgaria, Estonia, Hungary, Lithuania, Romania and Slovenia. Shortly, there is no cointegration among real GDP, real EX and FDI in these countries. Thus, the econometric analysis suggests that any causal relationships within dynamic VEC model for latter countries cannot be estimated.

Table 2

Estimated ARDL Models and Bounds *F* –Test for Cointegration

Countries	Periods	Models	F-Statistics	C.V. 1 percent		C.V. 5 percent	
				I(0)	I(1)	I(0)	I(1)
Bulgaria	1994Q1-2008Q4	(1,2,0)	2.378	4.610	5.563	3.303	4.100
Czech R.	1994Q1-2008Q4	(3,1,0)	4.324**	4.610	5.563	3.303	4.100
Estonia	1996Q1-2008Q4	(4,1,1)	1.900	4.695	5.758	3.368	4.178
Hungary	1997Q1-2008Q4	(1,1,0)	2.295	4.800	5.725	3.368	4.203
Latvia	1993Q1-2008Q4	(1,3,1)	5.010**	4.558	5.590	3.288	4.070
Lithuania	1993Q1-2008Q4	(4,0,0)	2.561	4.558	5.590	3.288	4.070
Poland	2000Q1-2008Q4	(3,2,0)	7.562***	5.155	6.265	3.538	4.428
Romania	1998Q1-2008Q4	(3,1,0)	1.835	4.770	5.855	3.435	4.260
Slovak R.	2002Q1-2007Q4	(4,0,0)	4.469**	5.155	6.265	3.538	4.428
Slovenia	1995Q1-2006Q4	(1,2,0)	1.383	4.800	5.725	3.368	4.203

Notes: The critical values for the lower I(0) and upper I(1) bounds are taken from Narayan (2005, Appendix: Case II).

**** and ** are 1% and 5% significance levels, respectively.*

The existence of a cointegrating relationship among real GDP, real EX and FDI in Czech Republic, Latvia, Poland and Slovak Republic suggests that there must be Granger causality in at least one direction. The causality test results (see Figure 1 and Table 3 for details) for these countries are as follows:

i) There are an evidence of one-way strong Granger causality from FDI to GDP in Czech Republic and an evidence of one-way both weak (short-run) and strong Granger causalities from FDI to GDP in Slovak Republic. There are an evidence of one-way both weak and strong Granger causalities from GDP to FDI in Latvia. There is no evidence of Granger causalities between FDI and GDP in Poland.

ii) There are an evidence of two-way both weak and strong Granger causalities between FDI and EX in Latvia and an evidence of one-way both weak and strong Granger causalities from FDI to EX in Poland. There is no evidence of Granger causalities between FDI and GDP in Czech Republic and Slovak Republic.

iii) There are an evidence of two-way weak Granger causality between EX and GDP but there exists one-way strong Granger causality from GDP to EX in Latvia. While there exist an evidence of one-way weak Granger causality from GDP to EX, there is an evidence of one-way strong Granger causality from EX to GDP in Slovak Republic. There is no evidence of Granger causalities between EX and GDP in Czech Republic and Poland.

Table 3

Granger Causality Test Results for Czech Republic, Latvia, Poland and the Slovak Republic

Wald-Tests for Short-run (or Weak) Granger Causality				
The Null Hypotheses	Czech Republic	Latvia	Poland	Slovak Republic
$\Delta \mathrm{EX} \Rightarrow \Delta GDP$ $H_0 : \phi_{4i} = 0$	0.0112 (0.9156)	3.3897* (0.0656)	0.4984 (0.4802)	2.0604 (0.3569)
$\Delta FDI \Rightarrow \Delta GDP$ $H_0 : \gamma_{4j} = 0$	2.4986 (0.1139)	0.1186 (0.7306)	0.5740 (0.4487)	12.0898*** (0.0024)
$\Delta \mathrm{GDP} \Rightarrow \Delta EX$ $H_0 : \beta_{5h} = 0$	0.0813 (0.7756)	23.1242 (0.0000)	0.4467 (0.5039)	3.1529* (0.0758)
$\Delta FDI \Rightarrow \Delta EX$ $H_0 : \gamma_{5j} = 0$	0.0216 (0.8832)	6.1162** (0.0134)	3.3960 (0.0654)	2.1733 (0.1404)
$\Delta \mathrm{GDP} \Rightarrow \Delta FDI$ $H_0 : \beta_{6h} = 0$	0.0040 (0.9493)	16.4864*** (0.0000)	0.1858 (0.6664)	3.7942 (0.1500)
$\Delta EX \Rightarrow \Delta FDI$ $H_0 : \phi_{6i} = 0$	0.0132 (0.9083)	10.7529*** (0.0010)	2.1048 (0.1468)	0.7207 (0.6974)

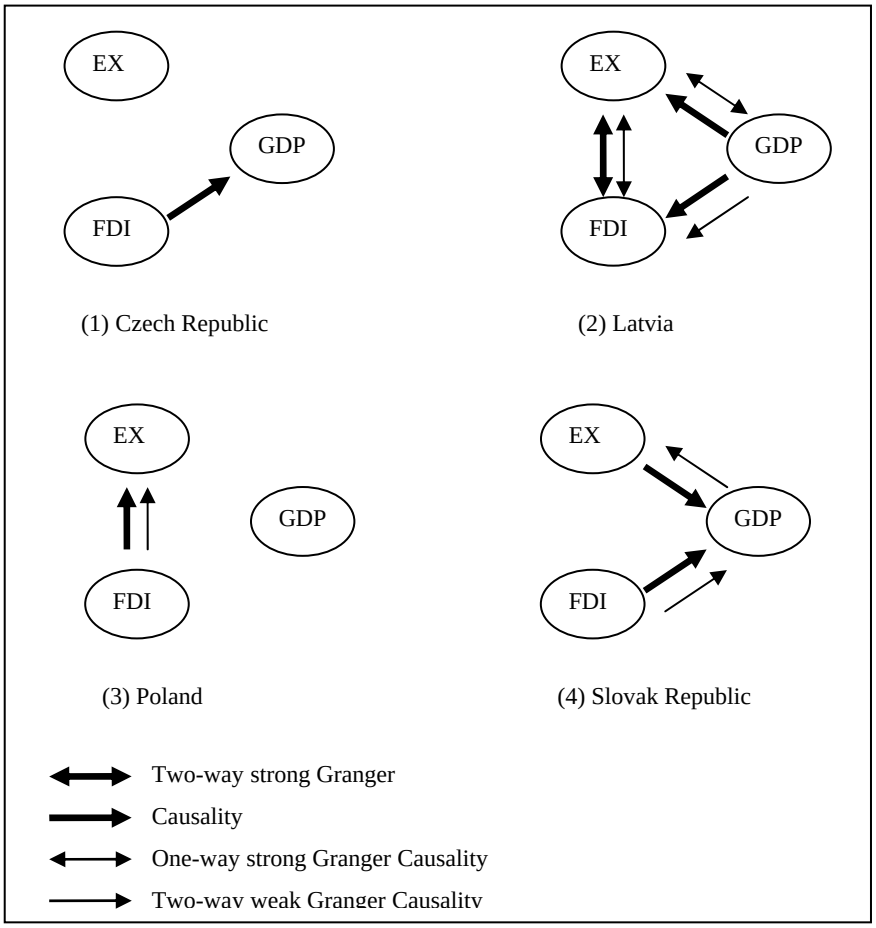
Wald-Tests for Long-run Granger Causality				
The Null Hypotheses	Czech Republic	Latvia	Poland	Slovak Republic
$\text{ECT} \Rightarrow \Delta GDP$ $H_0: \psi_1 = 0$	0.3388 (0.5505)	0.5258 (0.4684)	1.4943 (0.2216)	15.6526*** (0.0001)
$\text{ECT} \Rightarrow \Delta EX$ $H_0: \psi_2 = 0$	0.0581 (0.8095)	9.0689*** (0.0026)	3.2004* (0.0736)	0.0232 (0.8790)
$\text{ECT} \Rightarrow \Delta FDI$ $H_0: \psi_3 = 0$	0.1430 (0.7054)	4.1931** (0.0406)	1.0309 (0.3099)	1.8884 (0.1694)
Wald-Tests for Strong Granger Causality				
The Null Hypotheses	Czech Republic	Latvia	Poland	Slovak Republic
$\Delta\text{EX}, \text{ECT} \Rightarrow \Delta GDP$ $H_0: \phi_{4i} = \psi_1 = 0$	0.4495 (0.7987)	3.6575 (0.1606)	1.4980 (0.4728)	20.4559*** (0.0000)
$\Delta FDI, \text{ECT} \Rightarrow \Delta GDP$ $H_0: \gamma_{4j} = \psi_1 = 0$	4.7201* (0.0944)	0.6208 (0.7332)	4.1206 (0.1274)	18.0483*** (0.0004)
$\Delta GDP, \text{ECT} \Rightarrow \Delta EX$ $H_0: \beta_{5h} = \psi_2 = 0$	1.3486 (0.5095)	25.5701*** (0.0000)	3.9107 (0.1415)	3.3007 (0.1920)
$\Delta FDI, \text{ECT} \Rightarrow \Delta EX$ $H_0: \gamma_{5j} = \psi_2 = 0$	0.0922 (0.9549)	12.8675*** (0.0016)	4.7020* (0.0953)	2.1888 (0.3347)
$\Delta GDP, \text{ECT} \Rightarrow \Delta FDI$ $H_0: \beta_{6h} = \psi_3 = 0$	0.6663 (0.7167)	22.5177*** (0.0000)	1.0826 (0.5820)	3.7978 (0.2841)
$\Delta EX, \text{ECT} \Rightarrow \Delta FDI$ $H_0: \phi_{6i} = \psi_3 = 0$	0.1574 (0.9243)	13.6557*** (0.0011)	2.4180 (0.2985)	2.0979 (0.5523)

Notes: The numbers of optimal lags are 2 for equations 5.a and 5.c for Slovak Republic and 1 for others. P-Values for Wald Statistics are in ( ).
*** and * are 1% and 5% significance levels, respectively.*

As a result, no cointegration is found in six out of ten Transition European countries studied in this paper. The cointegration and causal relationship is found only in four countries. Thus, we may conclude that FDI has been driven the economic growth directly in Czech Republic and Slovak Republic, and indirectly (via export) in Latvia.

Figure 1

Ganger Causality Relationships for Czech Rep., Latvia, Poland and the Slovak Republic



5. Conclusion

This study provides a survey of the literature on FDI, export and Growth, examining both the theory that underlies the work in this area and the results of empirical studies. Overall, a large number of studies appear to favour the conventional assumption that FDI has positive effect on growth. The ARDL bounds testing approach is used to investigate the existance of long-run relationship between FDI, export and economic growth for ten transition European countries (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia) in this study. And then the error-correction based Granger causality test is employed to

examine the both long-run and short-run causality issues between the variables by using quarterly data from 1994 to 2008.

The ARDL bounds testing approach and the error-correction based Granger causality test used in this paper have revealed that there is a long-run relationship and both long-run and short-run causality between export, FDI and economic growth in four of the ten countries considered. The main results are as follows: i) There is evidence of FDI-led growth in Czech Republic and Slovak Republic. ii) There is evidence of growth-led FDI for Latvia. iii) The causality runs from FDI to export only for Poland. iv) There is two way causality between economic growth and export for Latvia and Slovak Republic. v) There is two way causality between export and FDI in Latvia. vi) There is no a unique long-term or equilibrium relationship among real GDP, real EX and FDI in Bulgaria, Estonia, Hungary, Lithuania, Romania and Slovenia.

The most important implication of the econometric results of this research for the current literature is to use inward FDI, more than exports, as the main engine of growth. A number of policy implications emerge from the study. For instance, results suggest that the country's capacity to progress on economic growth will depend on its policies to promote FDI. The most efficient way to attract FDI is to focus on strenghten the following areas; such as free trade zones, trade regime, tax incentives, the human capital base in the host country, financial market regulations, financial system and infrastructure quality.

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