FDI-assisted development in the light of the investment development path paradigm: Evidence from Central and Eastern European countries [*]

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Some forms of foreign direct investment (FDI)-assisted development strategies have been widely adopted among developing and transition economies. The Central and Eastern European countries (CEECs) are an interesting case because of the surge of inward FDI over the past decade and the recent increase in outward FDI from the region. But the uneven distribution of FDI among the CEECs raises a question as to whether and to what extent the CEECs are converging in terms of FDI-assisted development path with the EU15 countries, and with each other. The analysis in this study is based on the investment development path (IDP) framework. First, a cluster analysis is used to divide the CEECs into more homogeneous groupings. Econometric and statistical analyses are then carried out to delineate the different IDPs followed by the CEECs. The results indicate that (i) the position of the CEECs is at stage one or two of the IDP; (ii) the CEECs are diverging from EU15 in terms of outward investment position but converging in terms of GDP; (iii) the IDPs within the five sub-groups are converging, and (iv) less developed CEECs are converging with more developed CEECs in terms of outward investment position but not in terms of GDP.

Keywords: Central and Eastern European countries (CEECs), foreign direct investment (FDI), investment development path (IDP), transnational corporation (TNC), panel method

JEL classification: F21, F23, O11, O57

1.   Introduction

In the Central and Eastern European Countries (CEECs),[1] foreign direct investment (FDI) is expected to play a crucial catalytic role in their transition from a centrally planned economy to a market system. Not only are the CEECs experiencing a systemic upheaval in the economy but also they are undergoing integration into the EU. The opening up of these countries through the globalization process and EU accession are expected to favour institutional change and promote FDI (Kaminski, 2001).

But the CEECs do not make up a homogeneous group, either in terms of size and factor endowments, or of the macro-economic stabilization process, or of the extent to which they have enacted systemic reforms and, therefore, of their attractiveness to FDI. The accession to the EU of eight CEECs in May 2004 and two further countries in January 2007 may be perceived both as a result of these differences and as a source of the possible accentuation of these differences in the future. This gives rise to the hypothesis that the CEECs' development paths might diverge from one another. This article will examine whether or not the differences in the FDI-assisted development paths among the CEECs have become more significant. More specifically, it assesses to what extent the CEECs are converging in terms of their development paths among themselves and also in relation to the advanced core countries (EU15).

To this end, we apply the most widely used analytical framework for examining the relationship between FDI and development, i.e. the investment development path (IDP) paradigm. This approach was first put forward by Dunning (1981a, 1981b) and was subsequently revised (Dunning, 1986a, 1986b, 1988a, 1993a; Dunning *et al.*, 2001; Dunning and Narula, 1996; Narula, 1996; Narula and Dunning, 2000).

This article is organized as follows: section 2 reviews the IDP paradigm. Section 3 uses a cluster analysis to group the CEECs according to their international investment position and their level of development. Based on clustered groupings, section 4 undertakes an econometric and

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[1]   Unless otherwise stated, the term "the CEECs" here refers to the following countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Poland, Romania, Russia, Serbia and Montenegro (which separated in 2006), Slovakia, Slovenia, Tajikistan, The former Yugoslav Republic of Macedonia, Turkmenistan, Ukraine and Uzbekistan.

statistical analysis of the IDP for the CEECs. The final section presents our conclusion.

2. The IDP framework

2.1 Nature and characteristics of the IDP

The IDP is a dynamic concept which relates the international investment position of a given country to its level of development. It draws on Dunning's eclectic paradigm of international production and is framed by the OLI variables (ownership, locational and internalization advantages). The model assumes, first, that development induces significant structural change to the economy and, second, that such change has a systematic relationship with the pattern of FDI (Lall, 1996, p. 424). It contends that the change in the locational advantage of a country as well as in its firm's ownership and internalization advantages *vis-à-vis* other economies explains how its international investment position evolves from only receiving inward FDI to exporting FDI. Dunning initially postulated that a country would go through four stages of development (Dunning, 1981a, 1981b), to which Narula later added a fifth stage (Narula, 1993). The five stages are defined according to the propensity of a country to be a net recipient or a net exporter of FDI. This propensity depends on the relative importance of a country's natural and created assets, as defined by Dunning and Narula (1996, p. 38, note 4). The five stages of the IDP are summarized in table 1.

It is worth noting that similar approaches involving stages of development have been proposed by other scholars. Ozawa (1992, p. 30) suggested an "evolutionary path", starting from a labour-intensive stage and moving on to a physical capital-intensive stage and finally to a human capital-intensive stage. Porter (1990) distinguished four stages according to the countries' competitive advantages: factor-driven, investment-driven, innovation-driven and wealth-driven. But, as emphasized by Dunning himself (Dunning, 1992), Porter's approach does not provide a framework relevant for analysing the development path of developing countries, since the role of the globalization of economic activity is neglected, and only one developing country (the Republic of Korea), among eight selected countries, was taken into account in his exposition. Moreover, Porter's analysis is not supported by any formal testing, and is illustrated only by examples which could have been differently chosen and could have led to very different conclusions (Dunning, 1992, p. 141).

Table 1. Characteristics of the IDP

Stage	Inward FDI	Outward FDI	NOIP
1	Insufficient location advantages ➜ No inward FDI except natural resource-seeking FDI	Absence of domestic firms' ownership advantages ➜ No outward FDI	Around zero
2	Development of 'generic' location advantages ➜Faster growth of inward FDI than of GDP	Emergence of domestic firms' country-specific ownership advantages (O_a) ➜ Little outward FDI	Increasingly negative
3	Erosion of location advantages in labour-intensive activities Development of created-asset location-advantages ➜Decrease in the rate of growth of inward FDI	Growth of O_a advantages ➜ Increase in the rate of growth of outward FDI	Negative but increasing
4	Location advantages entirely based on created assets	Firm-specific ownership advantages (O_t) more important than O_a advantages ➜ Superiority of outward FDI over inward FDI	Positive
5	Theoretically, fall and then fluctuation around zero of the NOIP, but in fact no longer a reliable relationship between a country's international investment position and its relative stage of development		

Source: Author's tabulation based on Dunning (1986a, 1986b, 1988a, 1993a), Dunning and Narula (1996), Narula and Dunning (2000).

2.2 Limitations of the IDP

Dunning and Narula themselves (Dunning and Narula, 1996; Narula, 1996) pointed to the necessity of reconsidering the initial version of the IDP in two different ways.

First, unlike previous stages, the relationship between the international investment position of an economy and its level of development is no longer stable at stage 5. Indeed, the FDI profiles of industrialized countries are diverse and their international investment positions do not necessarily fluctuate around zero as initially postulated. The question regarding reconsideration of the fifth stage, however, does not affect the relevance of the IDP in the case of the CEECs, since they are far from reaching this stage.

Second, the factors influencing the IDP have changed since the 1980s. It is likely that the form of the IDP is now also shaped by differences in countries' economic structure, as transnational corporations (TNCs) have developed countless affiliates in an increasingly globalized world economy and the national boundaries of firms have blurred. Thus, the firm-specific ownership advantages of TNCs no longer depend solely on conditions in their home country but also on those of host

countries, i.e. their economic structure, the type of FDI undertaken and government policies (Dunning and Narula, 1996; Narula and Dunning, 2000). Moreover, the firm-specific ownership advantages of TNCs have become more "transaction advantages" than "asset advantages", since they result precisely from the firms' transnational nature, i.e. their ability to gain, enlarge and efficiently coordinate geographically dispersed created assets (Dunning, 1983a, 1983b, 1988b; Dunning and Narula, 1996). To sum up, if the basic relationship between FDI and economic development postulated by the IDP is still relevant, the nature of the relationship varies between countries. It may be argued that the IDP has become idiosyncratic, i.e. country-specific.

As far as the CEECs are concerned, these limitations of the IDP point to the need to consider their two distinctive characteristics: the specificity of their internationalization process and their heterogeneity.

2.3 Specificity of the internationalization process of CEECs

The internationalization of CEEC firms is very specific given its historical context. The IDP the CEECs followed before the fall of the Berlin Wall appears to be in reverse in some sense (Jaklič and Svetličič, 2001a): outward FDI did not follow inward FDI, as predicted by Dunning and Narula (1996, p. 35), but appeared before inward FDI really took off. Indeed, under the centrally planned economic system, outward FDI from the CEECs had a "system-escape dimension" (Jaklič and Svetličič, 2001a) and was a defensive instrument (Svetličič *et al.*, 2000), undertaken mainly to escape the system's failures, i.e. to facilitate trade and/or to facilitate foreign currency inflows. Exceptions were production-oriented investment in developing countries or operations abroad for political reasons.

The systemic transformation since the late 1980s again changed the rationale of the CEECs' outward FDI. During the first half of the 1990s, CEEC firms were confronted with the privatization process and the related disintegration of large firms, together with the opening-up process in a globalized world. In addition, in countries emerging out of the partition of former states, some firms experienced what Svetličič and Rojec call "forced and inherited transnationalization" (Svetličič and Rojec, 2003, p. xxxi) and suddenly became outward investors without necessarily having the requisite expertise. Until the mid-1990s, outward FDI from the CEECs was very low or even negative. But since then, it has been expanding under the pressure of globalization.

Because of these systemic circumstances, it is all the more difficult to compare the development path of the CEECs with the previous experience of developing countries. Indeed, the CEECs are not so much developing countries as "misdeveloped" countries. As such, they possess a relatively good endowment of human capital (Barro and Lee, 1996), technology and infrastructure. Such endowments, which are receptive to technology transfer, can be upgraded and contribute to economic growth through positive external economies related to FDI (Blomström and Kokko, 1997; Borensztein *et al.*, 1998; Dowrick and Gemmell, 1991). But, as the CEECs engaged in redesigning their economic system, it became evident that they lacked, above all, institutional structure for a functioning market economy (Dunning, 1993b, p. 227).

Two possible comparable cases would be the experience of the Asian NIEs and of the cohesion-fund countries in the EU. Economic development in East Asian economies was also based on an outward-oriented strategy. But it took place during the post-World War II era, a period very different from the globalized era of the past two decades. In fact, CEEC development is based on the opening-up of the economy, which involves deregulation and a reduction, or even absence, of restrictions on trade and investment flows. Openness, however, cannot be equated to outward orientation (Rowthorn and Kozul-Wright, 1998, p. 21), and it is unlikely the East Asian economic miracle can be repeated in today's global economic environment. The internationalization of CEEC firms is more "pulled" by external factors than "pushed" by internal factors (Svetličič and Rojec, 2003, p. xxi, foreword of Sanjaya Lall) and appears to be a proactive response to globalization and integration into the EU (Jaklič and Svetličič, 2001b). The CEECs' TNCs appear as "leapfrogging" TNCs (Svetličič, 2003, p. 11): they have not had time for a sequential internationalization process and are obliged to invest abroad without necessarily acquiring the experience of international market through exporting first. Outward FDI from the CEECs has therefore developed earlier than predicted at a lower level of development (Svetličič *et al*., 2000; Svetličič, 2003). The IDP model is nevertheless relevant to the study of the CEECs (Svetličič, 2003, p. 11), but only for the period beginning with the transition to market economy, i.e. from the early 1990s onwards.

Concerning the comparison with the cohesion-fund countries, it is worth noting that the internationalization process in the CEECs presents certain similarities with the experience of Portugal in terms of timing. Portuguese firms started to internationalize at a similar level of development to the CEECs' at present, and in particular its labour force

was comparable both in terms of wage and skills. To a certain extent, it faced similar organizational constraints (Simões, 2003). If Portugal's experience is any guide, outward FDI from the CEECs is likely to be further encouraged by EU membership as it brings an increasingly stable and competitive environment (Buckley and Castro, 1998; Simões, 2003). In fact, FDI into and from the CEECs is interlinked with the process of integration into the EU, which is likely to have a profound impact since, in addition to the level of development, external and macro-organizational factors are important determinants of FDI flows.

2.4   Heterogeneity of CEECs

Duran and Ubeda (2001) point out that countries at the same level of GDP per capita can have divergent economic structures. In the case of the CEECs, they are heterogeneous in terms of the distinguishing elements identified by Duran and Ubeda: the availability of natural resources; geographical and cultural distance from investors' home countries; potential market; economic system; and the types of action taken by government (Duran and Ubeda, 2001, p. 9). Hence, empirical analysis of the relationship for such a large group of countries must be carried out with care (Dunning and Narula, 1996, p. 22). In this respect, most recent empirical research on the IDP paradigm focus on a particular country (Bellak, 2001; Svetličič and Bellak, 2003; Buckley and Castro, 1998; Dunning *et al.*, 2001; Ozawa, 1996; Twomey, 2000; Zhang and Van den Buckle, 1996) or on a bilateral investment relationship (Barry *et al.*, 2003; Dunning and Narula, 1994) rather than cross-sectional studies across countries (see table 2).

In view of these methodological concerns, a cluster analysis was carried out to identify homogeneous groups among the CEECs, before testing the IDP over the 1991–2005 period, i.e. the period beginning with the transition to market economy.

3.   The grouping of CEECs according to their IDP: a cluster analysis

In the empirical analysis of the IDP, a country's international investment position is evaluated on the basis of its net outward investment position (NOIP), i.e. outward direct investment stock minus inward direct investment stock, while the level of development is proxied by GDP.

Table 2. Summary of recent research carried out to test the IDP

Author(s) and date	Scope of the study	Main results
Barry, Görg & McDowell (2003)	Irish-US FDI relationship, 1980–1999	Confirmation of the IDP's idiosyncratic nature but Irish FDI outflows are disproportionately horizontal and concentrated in non-traded sectors
Bellak (2001)	Austria, 1990–1999	Confirmation of the IDP's idiosyncratic nature: the Austrian NOIP is below average and largely varies according to industry type and type of partner country
Buckley & Castro (1998)	Portugal, 1943–1966	- Confirmation of the IDP's idiosyncratic nature; - Beyond a country's level of development, non-economic variables affect FDI; - Replacement of the quadratic equation
Dunning & Narula (1994)	United States-Japanese FDI relationship	Modifications of the IDP paradigm: inclusion of macro-organizational policy variables and importance of acquisition of ownership advantages
Dunning & Narula (1996)	Cross-section of 88 developed and developing countries, 1980 and 1992	- Confirmation of the IDP's idiosyncratic nature; - Polarization of countries into three groups
Dunning et al. (2001)	Rep. of Korea, 1981–1997 and Taiwan Province of China, 1968–1997	Interface between the IDP and the trade development path
Durán & Ubeda (2001, 2005)	85 developed and developing countries, 1997 95 countries, 2000	- New approach to IDP using factor analysis - Test of the power of structural variables to explain inward and outward FDI - Reformulation of the fourth stage
Narula (1993)	Industrialized countries over 20 years six industrialized countries over a decade Japan and the United States over 40 years	Decreasing significance of country-specific determinants of the ownership advantages of TNCs and increasing significance of firm-specific determinants
Narula (1996)	Cross-section of 40 countries, 1975 and 1988	- Support for the J-shaped curve of the IDP - Polarisation of countries around two points due to the convergence among industrialised countries, and the divergence of developing countries away from industrialised countries.
Ozawa (1996)	Japan	- Support for the IDP when supplemented by the technology development path - Idea of a 'ratchet-like upscaling of the industrial structure stage by stage'
Svetlicic Bellak (2003)	Austria and Slovenia, 1993-1999	- Confirmation of the IDP's idiosyncratic nature - Importance of macro-organisational factors
Tolentino (1993)	Cross-section of 30 countries	Nullify the IDP relationship which could be due, according to Narula (1996), to the use of flow data instead of stock data
Twomey (2000)	Canada, 1900-1996	Confirmation of the IDP's idiosyncratic nature
Zhang & Van den Bulcke (1996)	China, 1979-1993	Support for the role of the government in the early stages of the IDP

3.1 Note on data

Following Dunning and Narula and most existing studies on the IDP, FDI stock data were used to estimate NOIP, and GDP per capita was used to proxy the level of development. Data on FDI stocks are obtained from UNCTAD, data on population from the World Bank and data on GDP from IMF. FDI stock as well as GDP are expressed in current prices and in the United States dollars.

FDI stocks are a better proxy than flows for the extent of international production.[2] Nevertheless, as pointed by Cantwell and Bellak (1998) and Bellak and Cantwell (2004), FDI stock data provide a very imperfect measure of international production, since they are reported at historical cost and not at replacement cost. In the case of the CEECs, however, the resulting underestimation of FDI stocks is less likely to be a problem than in other regions, since the CEECs have only recently emerged as significant host and home countries of FDI.

3.2 Main patterns of FDI coming into and from CEECs: some descriptive statistics

The opening-up of the CEECs is reflected in the rapid increase in both inward and outward FDI since 1990, while integration into the EU is evident from the fact that inward FDI originated mainly from the EU. The ratio of inward FDI stock to GDP grew from two-fifths of the EU average in 1995 (5.4) to more than 70% in 2003 (23.7) (UNCTAD, 2004, annex table B6[3]). This is more than the ratios for Greece, Portugal and Spain, though falling short of Ireland's, which was 129.7 in 2003. Nevertheless, there are striking differences among the CEECs, reflecting the divergence in the level of development and/or attractiveness to foreign investors. In 2004, 55% of the inward FDI stock in the CEECs was concentrated in the new EU members plus Croatia; the Czech Republic, Hungary and Poland alone accounted for 45%.[4]

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[2] The use of flows data by Tolentino (1993) was criticised by Narula (1996).

[3] These data do not take the Central Asian countries into account. Moreover, as of 2004, the FDI to GDP ratio is no longer available for the CEECs because of changes in geographical groupings used by UNCTAD. The eight new Eastern members of the EU have been reclassified from Central and Eastern Europe to EU and are now included among the developed countries. The rest of the CEECs as well as the CIS members are now classified under South-East Europe.

[4] Author's calculations based on UNCTAD data.

Compared to inward FDI, outward FDI remains at a low level. According to UNCTAD data, the CEECs' outward FDI accounted for 1.4% of world FDI in 2004 in terms of flows and for 2.2% in terms of stock, and the ratio of inbound FDI stock to outbound FDI stock is much higher for the CEECs than for EU15. But the CEECs' FDI outward stock soared more than 20 times between 1995 and 2002 to an estimated $131 billion.

As outward investors, the CEECs are very heterogeneous. In terms of absolute figures, the Russian Federation comes first with more than 80% of the CEECs' outward stock, followed by Hungary with a mere 4.6%. Croatia, the Czech Republic, Poland and Slovenia are all very similar, with approximately 2% of the total. Outward FDI from other countries in the region remains very limited. Only Azerbaijan has experienced growth in its outflows. In per capita term, the picture is somewhat different. Slovenia, whose outward FDI stock per capita reached $1,522 in 2004, has taken the lead, followed by Estonia ($1,052), the Russian Federation ($746) and Hungary ($596) (appendix 2).

As a result of such evolution of inward and outward FDI flows, every CEEC has an increasingly negative NOIP per capita (appendix 2). But these data show how unevenly FDI is distributed among the CEECs and therefore how unequal its effects on the host economies may be. In order to sub-divide the CEECs into homogeneous groups in terms of both their NOIP and GDP, a cluster analysis was carried out. This then allowed an econometric test and a statistical evaluation of the IDP for the CEECs to be implemented.

3.3   CEEC clustering groups

Based on a selected distance measure, the cluster analysis allows natural grouping of observations according to chosen variables. Since our data are standardized, no one variable dominates the cluster analysis. Among the two general types of methods (hierarchical and partition), we chose hierarchical analysis, which produces hierarchically related clusters. More specifically, we used Ward's linkage hierarchical agglomerative cluster analysis (also known as minimum-variance clustering), which is based on the minimization of squared error.

The results of clustering on the basis of their NOIP per capita and GDP per capita using 2004 data are presented in table 3. First, a two-cluster partition reveals two main groups among the CEECs. The first group (CEECs1) is composed of CEECs whose NOIP per capita

is the most negative. These countries are also the most economically developed and the most advanced in terms of economic stabilization and structural reform. As such, they are the most attractive to FDI, as can be seen from the high levels of inward FDI per capita. At the same time, they have emerged as nascent outward investors since the mid-1990s. Moreover, all of them with the exception of Croatia are new EU members, and are geographically located in Central Europe or the Baltic region. By contrast, CEECs in the second group (CEECs2) are less developed and their NOIP per capita is less negative, as a result of their lower attractiveness to inward FDI. In particular, they are experiencing difficulty in implementing the legal framework needed to switch to a market economy. Furthermore, many of them suffer from political instability. On the outward side, FDI of CEECs2 is very small except for the Russian Federation and, to a lesser extent, Azerbaijan. All of these countries are in the Balkans or the CIS.

Since each of the two groups is relatively heterogeneous, it is necessary to partition them further. Cluster analysis results in further demarcation into three sub-groups among CEECs1 and two sub-groups among CEECs2 (see table 3).

Among CEECs1, Slovenia stands alone in the first sub-group (CEECs1.1), placing it in front of the rest. On the one hand, Slovenia has experienced the most stable economic growth and has the highest GDP per capita in the region, not far short of Greece and Portugal. On the other hand, Slovenia's reluctance to attract inward FDI (Mencinger, 2003, note 4, p. 494), coupled with the internationalization through FDI of Slovenian locally owned firms, accounts for a less negative NOIP per capita than the Czech Republic, Estonia or Hungary, which comprise the second sub-group (CEECs1.2). Their NOIP per capita is the most negative in the region, reflecting the highest level of inward FDI per capita, while their GDP per capita, although among the highest in the region, lies far behind Slovenia's (tables 3 and 5). Finally, other 2004 accession countries plus Croatia constitute the third sub-group (CEECs1.3).

Among CEECs2, the poorest countries in the region (CEECs2.2) are behind in terms of inward FDI, except Azerbaijan, and their NOIP is negative, though less negative than other CEECs. All of them belong to the CIS. The countries of the second sub-group (CEECs2.1) are more developed and attract more FDI, but lag behind the countries of the first group (CEECs1).

Table 3. The clustering of CEECs according to their NOIP per capita and GDP per capita using Ward's linkage hierarchical agglomerative method, US dollars, 2004

	NOIPpc	GDPpc		NOIPpc	GDPpc
CEECs1			Bosnia	-442	2209
CEECs 1.1			Bulgaria*	-789	2550
Slovenia	-2268	16267	Kazakhstan*	-1159	2064
CEECs 1.2			Romania	-933	3464
Czech Republic	-5238	10602	Russian Fed.	-74	4105
Estonia	-6411	8311	Serbia	-484	2691
Hungary	-5606	9966	TFYR Macedonia	-876	2648
CEECs 1.3			Turkmenistan	-272	2871
Croatia	-2351	7943	*CEECs 2.2*		
Latvia	-1883	5923	Armenia	-324	992
Lithuania	-1736	6517	Azerbaijan	-1171	1040
Poland	-2158	6618	Georgia	-410	1188
Slovakia	-2745	7773	Kyrgyzstan	-117	434
CEECs2			Moldova	-210	720
CEECs 2.1			Tajikistan	-73	329
Albania	-430	2390	Ukraine	-198	1372
Belarus	-208	2361	Uzbekistan	-35	384

Sources: Author's calculations based on IMF data (World Economic Outlook database, available on-line, www.imf.org, accessed on April 2007), UNCTAD data (FDI interactive database, available on-line, www.unctad.org, accessed on April 2007) and World Bank data (World Development Indicators database, available on-line, devdata.worldbank.org, accessed on April 2007).

* 2003 figures since 2004 figures are not available.

Based on this clustering, an econometric test and then a statistical evaluation were carried out in order to answer the research question: are CEECs converging in terms of IDP with EU15 members, and among themselves?

4. Evaluation of the convergence of the CEECs' development trajectories

4.1 Difficulty of an econometric test

The relationship between NOIP and GDP for the CEECs was analysed by estimating the quadratic equation proposed in Dunning (1981b):

$$NOIPpc = \alpha + \beta_1\, GDPpc + \beta_2\, GDPpc^2 + \mu \,,$$

where *NOIPpc* is net outward investment position per capita, *GDPpc* is real gross domestic product per capita, and μ is a regression error term. All FDI and GDP figures are in the nominal United States dollars.

The IDP has generally been tested on a cross-sectional basis (i.e. across countries), using OLS regression. Cross-sectional analysis is, however, problematic for studying the IDP, which is a dynamic concept (Durán and Ubeda, 2001, p. 2). Moreover, as discussed in subsection 2.4, heterogeneity among the CEECs has to be taken into account and evaluation of the CEECs' IDP based on cross-sectional equations may not be appropriate. It was therefore decided to test Dunning's quadratic equation on a panel of the NOIP per capita of the 27 CEECs over the 1991–2005 period and to run the regression not only for the entire sample, but also for the two identified clustering-groups, CEECs1 and CEECs2. Since data are not available over the whole period for every country (see appendix 3), the panel is incomplete. In order to check the robustness of the results, the equation was also tested on a balanced panel, by excluding two years (i.e. 1991 and 1992) and four economies (Bosnia and Herzegovina, Georgia, Kazakhstan and Serbia and Montenegro). Table 4 gives descriptive statistics on the dependent variable and the explanatory variables for both panels, and appendix 4 presents the correlation matrix. The figures are very close for both panels. The results for both the unbalanced and balanced panels are presented in table 5.

It would have been preferable to run the regression on the basis of the five sub-samples or of each country throughout the 1991–2005 period, but due to the limited size of the sample, this was not possible. The time-span is very short and therefore the number of observations is very small (15 observations, at the most).

The equation was tested using a fixed-effect model. From a conceptual point of view, since individual effects are linked to country-specific characteristics, they can be assumed to be deterministic and non-random. From a statistical point of view, a fixed effect model seems more appropriate since NOIP is examined for countries which are not randomly drawn from a larger population but belong to a predetermined sample. Finally, from an econometric point of view, whether individual effects should be modelled as random or fixed depends on the correlation between the explanatory variables and the individual effects. The Hausman specification test revealed (see note below table 5) that the random-effect model suffers from correlation between the individual effects and the regressors at 1% significance level and gives biased

parameter estimates, which led to the rejection of the use of a random-effect model in favour of a fixed-effect model. Heteroskedasticity detected by the Breusch-Pagan/Cook-Weisberg test was corrected by using White's method for heteroskedasticity robust variances.

Table 4. Summary statistics

	Unbalanced panel		Balanced panel	
	NOIPpc	GDPpc	NOIPpc	GDPpc
	CEECs		CEECs	
N	346	346	298	298
Mean	-581	2637	-636	2841
Standard deviation	1032	2796	1098	2947
	CEECs1		CEECs1	
N	121	121	117	117
Mean	-1316	5380	-1357	5468
Standard deviation	1453	3066	1461	3078
	CEECs2		CEECs2	
N	225	225	181	181
Mean	-185	1162	-170	1143
Standard deviation	247	868	240	918

Source: Author.

Table 5. The estimation of CEECs' IDP based on a quadratic relationship over the 1991−2005 period

Tested equation: NOIPpc = α + β1 GDPpc + β2 GDPpc² + μ
Panel estimation with fixed effects[a] and with robust standard errors

	Unbalanced panel			Balanced panel		
	CEECs	CEECs1	CEECs2	CEECs	CEECs1	CEECs2
GDPpc	-0.5587684 ***	-0.7487564 ***	-0.4422752 ***	-0.5735609 ***	-0.754003 ***	-0.4127117 ***
GDPpc²	0.0000042	0.0000146 ***	0.0000457 ***	0.00000527	0.000015 ***	0.000042 **
Adj. R-squared	0.8337	0.8214	0.6217	0.8401	0.8263	0.5924
F statistic	***	***	***	***	***	***
N	346	121	225	298	117	181

Source: Author's calculations based on IMF data (World Economic Outlook database, available on-line, www.imf.org, accessed on April 2007), UNCTAD data (FDI interactive database, available on-line, www.unctad.org, accessed on April 2007) and World Bank data (World Development Indicators database, available on-line, devdata.worldbank.org, accessed on April 2007).

[a] The Hausman specification test led to reject the random effect model in favour of a fixed effect model. Hausman statistic : Chi2(2) = 165.62, Prob > Chi2 = 0.
    Significant at *** 1% and ** 5% levels.

The results of the estimation are consistent with the IDP model. Excluding countries and years in order to have a balanced panel does not substantially alter the results. In both cases, the coefficients on *GDPpc* and on *GDPpc²* are significant and have the expected sign: the coefficient on *GDPpc* is negative while the coefficient on *GDPpc²* is positive. In other words, the IDP for the CEECs has a U-shape as proposed by Dunning and Narula, capturing the increasing marginal effect of GDP on NOIP. The fact that the coefficient on *GDPpc²* is not significant when testing the equation on the entire sample and becomes significant in the CEECs1 and CEECs2 specifications confirms the need to test the equation on homogeneous sub-groups.

There is a turning point (or minimum of the function), i.e. a positive value of GDP per capita, where the effect of GDP per capita on NOIP per capita is zero. This point represents the beginning of stage 3. Before this point, GDP per capita has a negative effect on NOIP per capita; after that, GDP per capita has a positive effect on NOIP per capita. In the estimated equation, the turning point occurs at minus the coefficient on *GDPpc* over twice the value of the coefficient on *GDPpc²* ($GDPpc* = - \beta_1 / 2 \beta_2$). For CEECs1, the point is at about \$25,642 and for CEECs2 at about \$4,838. In fact, none of the CEECs1 or of the CEECs2 countries has reached the turning point, so that the part of the curve to the right of the points representing per capita income of \$25,642 and \$4,838 respectively can be ignored. A conclusion that may be drawn from this finding is that, whichever group they belong to, the CEECs are still either at stage 1 or stage 2.[5]

Working out a finer interpretation of the turning points would require testing the IDP per country or on the basis of the five sub-samples. However, as pointed out before, the lack of data makes it particularly difficult to undertake a rigorous econometrical test of the IDP relationship at the individual country level and does not allow us to assess which stage should be attributed to each CEEC. In any case, the investigation of how the nature of the relationship changes over time for the same country is outside the scope of this article. Rather, its aim is to examine if the nature of the relationship changes between the groups and sub-groups among the CEECs, and between the CEECs and EU15. Thus, following Dunning and Narula (1996) and Narula and Dunning (2000), a statistical analysis was conducted next by using three measures of dispersion in order to assess these changes.

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[5] For detailed explanations on quadratic equations, see Wooldridge (2006).

4.2 A statistical evaluation of the convergence of CEECs' development trajectories

Three measures of dispersion, i.e. the mean, standard deviation and ratio of the standard deviation to the mean, were used. Calculations were based on 1995 and 2004, rather than on the last available year, 2005, taking into account the likelihood of data revision.

Results are given in table 6 for the whole CEECs' sample and sub-samples and, in addition, for the EU. Calculations were made for EU15 as a whole, but also on its less developed members, the so-called cohesion-fund countries (i.e. Greece, Ireland, Portugal and Spain). In view of the significant structural differences, Ireland was excluded. [6]

In line with the predictions of the IDP, the mean of the CEECs' NOIP becomes more negative as time passes, decreasing by a factor of 9.6, while for EU15, it is increasingly positive and for the cohesion-fund countries, it is still negative but slightly increasing. The increasingly negative NOIP per capita of the CEECs is due to the faster growth of inward FDI compared to that of outward FDI. This expected divergence between the CEECs and EU15 members illustrates differences in the stage on the IDP; the CEECs are somewhere between the first stage and the end of the second stage while EU15 countries are at more advanced stages.

By contrast, the CEECs appear to be converging within the sub-groups, as shown by the decrease of the ratio of the standard deviation to the mean of NOIP per capita, except for CEECs2.2 whose ratio is increasing (0.7 to 1.2). Moreover, a greater decline in their NOIP per capita occurs for CEECs2 (the coefficient is 13), while CEECs1 experience a significant but smaller decrease (the coefficient is 9). But among CEECs1, the CEECs1.3 sub-group exhibits a greater decline (with a 20.7 coefficient) than the two sub-groups among CEECs2 (with a coefficient of 11.6 for CEECs2.1 and 17.4 for CEECs2.2). It may thus be inferred that the less developed CEECs have become more attractive to FDI than the more developed CEECs, which are emerging as nascent outward investors.

In terms of GDP per capita, the situation is rather the opposite: whereas the CEECs converge on EU15 and within the sub-groups, they

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[6] The difference between mean NOIP and mean of NOIP was calculated for all cohesion-countries on the one hand and for the group less Ireland on the other. The fact that the discrepancy is much higher in the first case than in the second case indicates that the inclusion of Ireland induces strong structure effects.

do not converge between the groups. For the CEECs as a whole, GDP per capita grows by a factor of 2.1. This coefficient is higher than that of the cohesion-fund countries (1.6), as well as that of EU15 (1.4). It means that convergence in terms of income levels does occur, albeit on a small scale, between the CEECs and the cohesion-fund countries, and between the CEECs and EU15. Convergence also occurs within the CEEC sub-groups: the ratio of the standard deviation to the mean of GDP per capita decreases slightly for each CEEC sub-group, except for CEECs2.2 whose ratio remains unchanged. But GDP per capita rises more rapidly for CEECs1 – with the exception of Slovenia – than for CEECs2, reflecting a tendency to diverge in terms of income level.

Finally, it is apparent that the GDP per capita of the CEECs rises more slowly than their NOIP per capita decreases. The difference may be explained by the fact that part of inward FDI has been driven by privatization rather than by growth in the first stage of the transition process.

4.3   Are CEECs1 on their way to stage three?

The improvement in the locational advantages of CEECs1 has led to the growth of inward FDI, especially import-substituting manufacturing investment (e.g. in consumer goods) and/or vertical investment (i.e. driven by factor costs and associated with the international fragmentation of production). Government policies (e.g. incentives, tariff and non-tariff barriers, etc.) have reinforced this trend in targeted industries (for example, the automotive industry in Central Europe in the first half of the 1990s) or areas (through incentives such as free economic zones). As the larger recipient of the region, CEECs1 appear to have attracted the threshold level of inward FDI, which has created spillover effects and led indigenous firms to develop their ownership-specific advantages (Scott-Kennel and Enderwick, 2005).

At present, CEECs1 have the lowest NOIP per capita among the CEECs (table 3). However, as outlined above, NOIP per capita in CEECs1 is now decreasing more slowly than in the other groups, because of the convergence in the growth rates of outward and inward FDI flows. On the one hand, the growth of inward FDI is decreasing because of the gradual decline of privatization-related FDI. In future, the growth of inward FDI will depend on the magnitude of the impact of Eastern EU enlargement, both on inward FDI coming from EU15 members and from non-accession countries, which may try to gain a foothold in the EU. On the other hand, outward FDI has shown significant growth since 1995,

Table 6. Changes in GDP per capita and NOIP per capita, 1995 and 2004, US dollars and ratio (absolute values)

	1995			2004			Ratio of means	Ratio of standard deviations
	Mean	Standard deviation	Ratio	Mean	Standard deviation	Ratio		
EU								
Inward FDI pc	3566	2844	0.8	14381	12333	0.9	4.0	4.3
Outward FDI pc	4000	3380	0.8	15682	11187	0.7	3.9	3.3
NOIP pc	434	2199	5.1	1301	4910	3.8	3.0	2.2
GDP pc	23831	7700	0.3	32544	8011	0.2	1.4	1.0
Greece, Ireland, Portugal, Spain								
Inward FDI pc	1863	817	0.4	6184	3373	0.5	3.3	4.1
Outward FDI pc	505	330	0.7	4848	3729	0.8	9.6	11.3
NOIP pc	-1358	536	0.4	-1336	777	0,6	1.0	1.4
GDP pc	12548	2315	0.2	20367	4392	0.2	1.6	1.9
CEECs: all								
Inward FDI pc	175	291	1.7	1637	1999	1.2	9.3	6.9
Outward FDI pc	27	58	2.2	201	376	1.9	7.5	6.5
NOIP pc	-149	263	1.8	-1430	1757	1.2	9.6	6.7
GDP pc	2017	2161	1.1	4212	3902	0.9	2.1	1.8
CEECs1								
Inward FDI pc	447	382	0.9	3870	2054	0.5	8.7	5.4
Outward FDI pc	72	86	1.2	493	501	1.1	6.9	5.8
NOIP pc	-375	365	1.0	-3377	1828	0.5	9.0	5.0
GDP pc	4176	2542	0.6	8880	3174	0.4	2.1	1.2
CEECs1.1: Slovenia								
Inward FDI pc	948			3790			4.0	
Outward FDI pc	263			1522			5.8	
NOIP pc	-684			-2268			3.3	
GDP pc	10194			16267			1.6	
CEECs1.2: Czech Republic, Estonia, Hungary								
Inward FDI pc	758	315	0.4	6423	949	0.1	8.5	3.0
Outward FDI pc	36	10	0.3	672	348	0.5	18.7	33.3
NOIP pc	-723	325	0.4	-5751	600	0.1	8.0	1.8
GDP pc	4088	1392	0.3	9626	1183	0.1	2.4	0.8
CEECs1.3: Croatia, Latvia, Lithuania, Poland, Slovakia								
Inward FDI pc	160	64	0.4	2354	469	0.2	14.8	7.3
Outward FDI pc	55	65	1.2	179	172	1.0	3.3	2.7
NOIP pc	-105	92	0.9	-2175	398	0.2	20.7	4.3
GDP pc	3025	1115	0.4	6955	869	0.1	2.3	0.8
CEECs2								
Inward FDI pc	39	46	1.2	521	406	0.8	13.2	8.9
Outward FDI pc	4	6	1.5	55	175	3.2	12.8	27.1
NOIP pc	-35	47	1.3	-456	372	0.8	13.0	7.9
GDP pc	937	633	0.7	1878	1114	0.6	2.0	1.8
CEECs21: Albania, Belarus, Bosnia, Bulgaria, Kazakhstan, Romania, Serbia, TFYR Macedonia, Turkmenistan								
Inward FDI pc	56	56	1.0	650	318	0.5	11.6	5.7
Outward FDI pc	7	8	1.1	83	233	2.8	11.7	31.0
NOIP pc	-49	60	1.2	-567	354	0.6	11.6	5.9
GDP pc	1383	486	0.4	2735	620	0.2	2.0	1.3
CEECs22: Armenia, Azerbaijan, Georgia, Kyrgyzstan, Moldova, Tajikistan, Ukraine, Uzbekistan								
Inward FDI pc	19	13	0.7	359	466	1.3	18.9	34.8
Outward FDI pc	1	2	2.1	20	40	2.0	26.7	26.2
NOIP pc	-18	13	0.7	-317	367	1.2	17.4	27.5
GDP pc	380	175	0.5	808	398	0.5	2.1	2.3

Source: Author's calculations based on UNCTAD data (UNCTAD FDI database, available on-line, www.unctad.org, accessed on April 2007) and World Bank data (World Development Indicators database, available on-line, devdata.worldbank.org, accessed on April 2007).

except for Latvia and Lithuania. This can be interpreted as an indication that indigenous firms have acquired firm-specific assets by reaping the benefits of the learning-by-doing process and have thus become able to compete abroad.[7]

Nevertheless, it must be pointed out that part of FDI originating from the CEECs is "indirect" FDI (Altzinger *et al.*, 2003), since it is undertaken by foreign affiliates, i.e. resident but not necessarily domestic firms. The unavailability of detailed outward FDI data according to the ultimate nationality of the investor makes it impossible to say to what extent the CEECs' outward FDI stock is "direct" or "indirect". However, "indirect" outward FDI is positively correlated with the level of inward FDI that a country attracts (Altzinger *et al.*, 2003, p. 92), and empirical studies indicate that a substantial share of outward FDI is made by foreign affiliates in the case of Estonia (particularly in the banking sector), Hungary and the Czech Republic (e.g. Svetličič and Rojec, 2003). By contrast, outward FDI is directly made by locally owned firms in the Russian Federation and Slovenia. In particular, Slovenian firms are in the best position to invest abroad because of their exposure to Western markets over the past 30 years (Svetličič *et al.*, 2000; Jaklič and Svetličič, 2003).

Although the NOIP per capita of CEECs1 is not yet increasing, it is very likely that the upswing of outward FDI together with the slowing down of inward FDI will gradually close the gap. The upward pressure on labour cost makes this hypothesis even more plausible. Indeed, rising unit labour costs affect both inward and outward FDI flows. On the inward side, the deterioration of the cost advantages of CEECs1 in activities based on unskilled labour, together with improving indigenous innovatory capacity, create push factors for foreign investors to shed lower value-added industries and to enter into more capital- and technology-intensive industries. Thus, foreign firms increasingly invest in the service sector activities such as logistical and R&D centres in

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[7]   Research by the Internationalisation Studies Research Group managed by Urmas Varblane at the University of Tartu provides some evidence for such learning-by-doing effects, particularly in the Estonian case. The author of the present research studied the case of Vistula, a Polish clothing firm, which has become a TNC through a learning-by-doing process (Bensebaa and Boudier, 2008). During the 1990s, Vistula learnt from Western contractors through OPT relationships, assembling garments to the specifications desired. At the turn of the 21st century, the firm became able to engage in OBM (Original Brand Manufacturing) and ODM (Original Brand Design) for foreign markets.

the CEECs. This shift can also occur at an intra-industrial level, as in the electronics industry of Hungary, where TNCs are closing facilities in low value-added product segments in favour of higher value-adding segments (UNCTAD, 2003, p. 61). On the outward side, rising labour costs are likely to encourage indigenous firms to move the labour-intensive segments of the production process to less advanced countries. Outward FDI is likely to play a crucial role in the restructuring of CEECs1' declining activities, whose cost advantages are eroding.

But at present, outward FDI of CEECs1 seems to be driven more by market considerations than cost considerations (Jaklič and Svetličič, 2001a). Indeed, the small size of markets (except for Poland) pushes domestic firms to engage in horizontal FDI. Geographical proximity and cultural and historical ties reinforce this tendency. Outward FDI from CEECs1 is increasingly directed to neighbouring countries, often based on links inherited from the past, whereas it is decreasing to the EU and more generally to developed countries. Thus, 95% of Estonian outward stock in 2001 was located in the Baltic States and 58% of Slovenian stock was located in Croatia.[8] The increase towards the CEECs and the decrease towards the EU are linked. One the one hand, CEECs1' domestic firms possess ownership-specific advantages with regard to the CEEC markets through their long-standing ties, and therefore face lower transaction costs (Jaklič and Svetličič, 2001a). On the other hand, firms originating from abroad, and more particularly from the EU, use their affiliates in the CEECs as a springboard for outward FDI in other CEECs, but have little interest in investing back into their home country.

The emergence of this concentration pattern in some geographically and/or culturally close host countries presents strong similarities with the IDP of other small emerging or late-developed countries. For example, outward FDI from Portugal is concentrated in Brazil and Spain (Buckley and Castro, 1998; Simões, 2003); from Ireland in the United States and the United Kingdom (Barry *et al.*, 2003); and from Finland (Luostarinen, 1979) in Denmark, Norway, Sweden and the former Soviet republics.

4.4   CEECs2 as hinterland for the enlarged EU?

The loss of competitive advantages based on low labour costs in CEECs1 should prompt a shift of cost-sensitive investment from

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8   Author's calculations based on OECD online database.

CEECs1 to South-East Europe and CIS countries. At the very least, it will certainly ensure a shift in FDI from EU15. In fact, this shift concerns all labour-intensive activities, whether they are relocated through equity or non-equity forms of investment.[9] For example, outward processing trade, particularly in clothing, is moving from Central Europe (especially Poland) to South-East Europe and CIS countries. But this transfer of foreign firms' activities to CEECs2 through cooperative agreements are not incorporated into FDI data, which only take into account equity forms of investment. If the non-equity forms of investment were taken into account, it would probably make the NOIP of CEECs2 more negative.

Since CEECs2 appear essentially as labour-surplus economies[10], the question is whether they attract too much "footloose" FDI to the detriment of "good" FDI, even if they receive market-seeking FDI in the frame of TNCs' overall strategies. Even worse, CEECs2.2 countries, above all Kyrgyzstan, Tajikistan and Uzbekistan, do not appear to possess sufficient assets to attract FDI. These countries suffer from insufficient locational advantages because of the limited domestic market, slow structural reform, difficult business environment and political instability. Except for Azerbaijan, which possesses oil and gas fields, these countries are marginalized in terms of FDI inflows, a situation unlikely to change in the near future. TNCs prefer to access these countries through trade or non-equity forms of investment.

Among CEECs2, Azerbaijan and Kazakhstan emerge as the most attractive location for FDI in terms of relative figures (appendix 2). The importance of natural resource-seeking FDI in the oil industry[11] makes the NOIP per capita of Kazakhstan and Azerbaijan much more negative than other countries in the group. But as few other locational

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[9] According to UNCTAD, non-equity forms of investment allow foreign investors "to obtain an effective voice in the management of another business entity through means other than acquiring an equity stake" (UNCTAD, 2006, p. 294).

[10] Labour-surplus economies refer to dualistic economies in which there exist some sectors or sub-sectors with high unemployment rate or a high number of disguisedly unemployed workers. Initially developed in a closed economy context, the analysis has been amended to take openness into account. This has led to a recognition that labour-surplus activities may be agricultural activities as well as industrial and services-oriented activities, particularly in the informal sector, which is more urban than rural. See for example, Ranis (2004).

[11] Two thirds of the FDI stock in Kazakhstan in 2002 and more than 70 per cent of the accumulated FDI inflows attracted into Azerbaijan in the 1995-2002 period were in the petroleum sector (UNCTAD WID country profile, available on-line, accessed on April 2007, and our own calculations).

assets beyond natural resources have been developed, the potential of Azerbaijan and Kazakhstan to attract FDI is limited. Unlike these two countries, the Russian Federation, whose GDP per capita is the highest of the group, receives very little FDI in relation to its size and natural resources (table 5). Its NOIP per capita is hovering around zero.

Azerbaijan, Kazakhstan and the Russian Federation are the only outward investors among CEECs2. But the rationale for undertaking outward FDI differs from that of CEECs1. As resource-rich countries, these countries may have developed sufficient ownership advantages in the exploitation of natural resources and invested abroad on this strength. Furthermore, outward FDI from the Russian Federation in the oil and gas industries is motivated by the desire of Russian firms to become global players (UNCTAD, 2003, p. 61).

However, the level of outward FDI from the Russian Federation, whose FDI outflows have been higher than its inflows since 2000, has to be interpreted with care. First, the increases in FDI flows into and out of the Russian Federation partly reflect the "round-tripping" phenomena.[12] Second, Russian outward FDI may be underestimated because of capital flight (UNCTAD, 2002, p. 2) generated by domestic instability or because some investments have been made carrying flags other than the Russian Federation's (Liuhto and Jumpponen, 2003).

It is difficult to assess which stage of the IDP should be attributed to Azerbaijan and Kazakhstan, since the relationship between a country's natural resource endowment and its level of development on the one hand, and its FDI inflows and outflows on the other, is uncertain, if not nonexistent, as pointed out by Durán and Ubeda (2001, p. 11). The presence of natural resources can be considered as an exogenous variable (Durán and Ubeda, 2001, p. 10). The NOIP per capita of the Russian Federation, which remains near zero, might suggest a stage one or stage five position. Stage five is usually associated with wealthy industrialized countries. Developing resource-rich countries are often at stage one, but would not have such large outward FDI, as is the case with the Russian Federation.[13]

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[12]   According to UNCTAD (1998, p. 290, note 3), the term, "round-tripping", refers to "the transfer of funding abroad in order to bring some or all of the investment back as FDI and claim the tax and other benefits to foreign investors".

[13]   The fact that a net FDI position of zero can be a characteristic of countries at both the first and fifth stages of IDP is pointed to by Durán & Ubeda (2001, pp. 3-4) as one of the two disadvantages of the use of NOIP.

5.   Conclusion

This article applies the concept of the IDP for the CEECs and investigates whether the CEECs' development trajectories converge on those of EU15 members, as well as between sub-groups. This kind of study has never, to our knowledge, been carried out for these countries.

Using the IDP framework is helpful in evaluating the CEECs' FDI assisted-development trajectories in the context of globalization and integration into the EU. There is undoubtedly a causal relationship between a country's FDI profile and its level of development, and therefore its locational advantages and the ownership advantages of its domestic firms. But the case of the CEECs exemplifies the change in the nature of the IDP and the difficulty in testing it. Indeed, the present research confirms the idiosyncratic nature of the IDP, and thus the difficulty of econometrically testing its applicability on a large group of economies. Due to the problem of the short observation time-span for the CEECs, it is not possible to test the validity of the paradigm on each CEEC. But the difficulty was overcome by using cluster analysis in order to identify homogeneous groups and sub-groups among the CEECs and by carrying out a statistical evaluation in addition to the econometric test.

The results indicate that (i) the position of the CEECs is at stage one or two of the IDP; (ii) the CEECs are diverging from EU15 in terms of NOIP per capita but converging in terms of GDP per capita; (iii) the IDPs within the five sub-groups are converging, and (iv) less developed CEECs are converging with more developed CEECs in terms of outward investment position but not in terms of GDP per capita.

These results raise questions for further research addressing the fragmentation of the eastern periphery of EU15. First, accession to the EU of more CEECs is likely to affect the international investment position of these countries. EU15 countries are expected to account for a growing part of inward FDI into new EU members and in the destination of their outward FDI. Depending on the pace of convergence of the new EU members, the question then is whether an enlarged homogeneous core is likely to emerge as a result of the enlargement process or the periphery continues to lag behind.

Second, among the less developed-country periphery (CEECs2) of the EU, some CEECs are likely to be marginalized in that they may prove unable to draw significant FDI (except in natural-resource activities). In this respect, one question is how the Eastern EU enlargement will

affect FDI from EU15 as well as from accession countries towards non-accession CEECs. In particular, it is an interesting question to ask whether a further division in terms of economic performance between accession CEECs and non-accession countries is likely to emerge.

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Appendix 1. Magnitude of inward FDI stock compared to outward FDI stock, 2004

Accession countries + Croatia		Non-accession countries	
Czech Rep.	15.2	Albania	17.3
Croatia	5.8	Armenia	40.8
Estonia	7.1	Azerbaijan	4.9
Hungary	10.4	Belarus	250.8
Latvia	20.8	Bosnia and Herzegovina	46.0
Lithuania	15.1	Bulgaria	143.7
Poland	26.6	Kazakhstan	1.6
Slovakia	26.3	Kyrgyzstan	8.1
Slovenia	2.5	Moldova	33.9
		Romania	89.7
European Union	0.7	Russian Federation	1.1
		TFYR Macedonia	805.5
		Ukraine	48.5

Source: Author's calculations based on UNCTAD data (UNCTAD FDI database, available on-line, www.unctad.org, accessed on April 2007).

Note: Since no outward stock was recorded in 2004 for Bulgaria and Kazakhstan, the ratio has been calculated on 2003 data. The ratio cannot be calculated for those countries whose outward FDI stock is nil (Serbia, Tadjikistan, Turkmenistan, Uzbekistan).

Appendix 2. Inward FDI stock per capita, outward FDI stock per capita, and NOIP per capita, 1995, 2004, US dollars

	1995			2004		
	Inward stock pc	Outward stock pc	NOIP pc	Inward stock pc	Outward stock pc	NOIP pc
European Union	3049	3563	630	10865	13771	2907
Ireland	17410	5300	-12110	57509	25802	-31707
Spain	2666	883	-1782	9257	8694	-563
Portugal	1893	382	-1582	6719	4603	-2117
Greece	1032	276	-755	2576	1247	-1329
CEECs	94	14	-80	1159	346	-813
Accession countries	397	35	-362	3385	269	-3116
Czech Republic	711	33	-678	5605	368	-5237
Croatia	102	151	48	2837	486	-2351
Estonia	469	47	-422	7463	1052	-6411
Hungary	1094	27	-1067	6202	596	-5606
Latvia	245	92	-153	1978	95	-1883
Lithuania	97	0	-97	1860	123	-1736
Poland	203	14	-189	2242	84	-2158
Slovakia	151	16	-135	2853	108	-2745
Slovenia	948	263	-684	3790	1522	-4530
Non-accession countries	22	9	-13	589	365	-224
Albania	64	15	-49	456	26	-430
Armenia	20	0	-20	332	8	-324
Azerbaijan	43	0	-43	1468	297	-1171
Belarus	5	18	13	209	1	-208
Bosnia and Herzegovina	3	4	-1	452	10	-442
Bulgaria*	53	12	-41	798	9	-789
Georgia	6	0	-6	414	4	-410
Kazakhstan*	183	0	-183	1180	20	-1159
Kyrgyzstan	31	0	-31	132	16	-117
Moldova	22	4	-17	216	6	-210
Romania	36	5	-31	946	14	-933
Russian Federation	2	16	14	819	746	-74
Serbia and Montenegro	31	0	-31	484	0	-484
Tajikistan	7	0	-7	73	0	-73
TFYR Macedonia	81	0	-81	877	1	-876
Turkmenistan	99	0	-99	272	0	-272
Ukraine	17	2	-16	202	4	-198
Uzbekistan	5	0	-5	35	0	-35

Sources: Author's calculations based on UNCTAD data (UNCTAD FDI database, available on-line, www.unctad.org, accessed on April 2007) and World Bank data (World Development Indicators database, available on-line, devdata.worldbank.org, accessed on April 2007).
* 2003 (2004 outward stock figures not available).

Appendix 3. Data availability

Country	Covered period	Number of observations
Bulgaria, Czech Rep., Hungary, Poland, Romania	1991-2005	15
Albania, Armenia, Belarus, Croatia, Latvia, Lithuania, Macedonia, Slovenia, Tajikistan, Ukraine, Uzbekistan	1992-2005	14
Azerbaijan, Estonia, Kyrgyzstan, Moldavia, Russia, Slovakia, Turkmenistan	1993-2005	13
Georgia	1994-2005	12
Kazakhstan	1993-2003	11
Bosnia	1996-2005	10
Serbia	1998-2005	8

Appendix 4. Correlation matrix

	Unbalanced panel			Balanced panel		
	NOIPpc	GDPpc	GDPpc^2	NOIPpc	GDPpc	GDPpc^2
	CEECs			CEECs		
NOIPpc	1.0000			1.0000		
GDPpc	-0.7228	1.0000		-0.7195	1.0000	
GDPpc^2	-0.6303	0.9205	1.0000	-0.6248	0.9210	1.0000
	CEECs1			CEECs		
NOIPpc	1.0000			1.0000		
GDPpc	-0.6005	1.0000		-0.5908	1.0000	
GDPpc^2	-0.4969	0.9558	1.0000	-0.4879	0.9559	1.0000
	CEECs2			CEECs2		
NOIPpc	1.0000			1.0000		
GDPpc	-0.4865	1.0000		-0.4697	1.0000	
GDPpc^2	-0.4095	0.9240	1.0000	-0.4066	0.9259	1.0000