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Determinants of foreign direct investment: empirical evidence from EU accession candidates

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This study examines bilateral foreign direct investments (FDI) between the members of the European Union and eight central and east European candidate (CEEC) economies in transition, awaiting accession into the European Union (EU). Cross-section data were obtained for Bulgaria, Czech Republic, Estonia, Hungary, Poland, Romania, Slovak Republic, and Slovenia for 1997. Once the main characteristics of FDI recipient and donor nations are identified in a bilateral framework, it will be feasible to predict future FDI inflows. This study reveals that the key determinants of FDI inflows in CEECs are size of the host economy, host country risk, labour costs in host country, and openness to trade. Countries that are receiving fewer foreign investments could make themselves more attractive to potential donor nations by focusing on some of the key determinants identified by this study.

I. INTRODUCTION

Foreign direct investment (FDI) has gained significant importance over the past decade as the tool for accelerating growth and development of economies in transition. It is widely believed that the advantages that FDI brings to the standard of living and prospects for economic growth of the host nation largely outweigh its disadvantages. FDI's importance lies in its fundamental difference from other forms of capital investment: the nature and duration of the commitment it involves (Barrell and Holland, 2000). Its purpose is to establish pan-commercial relations and at the same time exert a noticeable managerial influence over a foreign company. It also serves as an important means by which the central and east European candidate (CEEC) economies in transition awaiting accession into the European Union (EU) can begin to deviate from their communist legacies. Specifically, FDI is a tool, which enables these countries to break with their objective and organizational gaps through the introduction of new techniques, both managerial and technological (Barrel and Holland, 2000). The long-term nature of FDI fosters a high sensitivity to risk perception. Political and macroeconomic stability, as well as transparent legal regulations concerning foreign ownership and profit repatriation, are all important variables to potential investors (Resmini, 2000).

Taking into consideration the vital role of FDI in the future economic development of the CEE region, this paper seeks to identify the determinants for FDI inflows into economies in transition. This calculation is of particular importance since the understanding of common characteristics of host and source nations can help CEECs tailor their FDI strategies to improve their capital accumulation. Another objective of this study is to examine the variables that characterize countries that have successfully attracted FDI inflows from those that have not. Finally, this study recognizes some of the policy implications of the empirical work presented.

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II. BACKGROUND

There is a multitude of research focusing on foreign direct investment, yet literature dealing specifically with the topic in CEE transition economies is rather sparse. This scarcity is primarily due to the short period of the transition process, which began only a decade ago, and the initial lack of reliable statistics for the countries in this region. The existing research is based on reliable data that has become available as the reform process has intensified. Specifically, this study draws methodology from two principal studies that analysed FDI into the region.

Bevan and Estrin (2000) analyse the FDI flows between EU member countries and the transition economy using data covering years 1994 to 1998. Source and host specific variables include GDP, imports (from EU-15), investment risk rating, physical distance, and labour cost. Deichman (2001), based on data from 1990–1999, among the above mentioned variables applies a risk rating and incorporates an annual exchange rate variable.

Deichman's empirical model presents international trade as the most important determinant of investment via the argument that trade and investments complement one another. Investment climate, measured through the risk rating, was the second most important determinant of investment. Host transportation infrastructure was also quite significant as were labour costs. Investment is highly dependent on labour cost as it represents a large percentage of production cost. The labour cost is, however, an issue unique to the type of investment. Unemployment plays a critical role in determining labour cost as wages are often dictated by the interest and competition for that particular wage. Investment that is labour-specific will find that countries with high unemployment offer a lucrative market for production. On the other hand, investment that is market orientated will concentrate on a labour market that is capable of high consumption.

The empirical results of Bevan and Estrin's research present a negative correlation between labour cost and FDI. This association is understandable, especially when considering labour-specific investment. The estimation, however, does not exhibit such a relationship when manufacturing wage is used to represent labour cost. This new analogy implies that attraction of investment is driven not only by cheap labour, but by productive labour as well. Credit rating (risk) is significant and positively correlated with FDI that parallels the findings of Deichman. In short both these studies conclude that the investment climate is a strong determinant of the FDI inflows. Bevan and Estrin's estimation employed several dummy variables that accounted for exceptionally large German investment and the added risk of the Baltic States (Latvia, Lithuania, and Estonia), which might pose an investment risk due to their identification as part of the former Soviet Union. Deichman labels similar 'place specific attributes' which determine FDI inflows such as geographical proximity, cultural ties, economic contrasts, and informational gaps, as present but not always easily quantifiable in empirical estimations.

The model presented by Deichman differs in methodology from that of Bevan and Estrin in several significant ways. Deichman's model utilizes population instead of GDP as a proxy for market size, conversely arguing that change in GDP is best used as a proxy for market growth. A further variable not present in the Bevan and Estrin model is the annual exchange rate which serves as a proxy for market stability, but also retains a risk rating variable to represent the investment climate. Instead of employing a physical distance variable (i.e. a measurement of physical proximity to the source nation), the author uses a transportation infrastructure variable (i.e. length of roads and railroads within the transition country) as a proxy for transaction cost. Hence, the present study combines some of the key factors of these two studies in analysing the bilateral flows of FDI between source countries and a set of transition economies. Details of the empirical methodology employed in this study are discussed in the next section.

III. EMPIRICAL ANALYSIS

To estimate the determinants of FDI between countries, the data for 1997 was employed. The pool of source countries from which FDI originates is the EU-15 set of nations (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Ireland, Luxemburg, The Netherlands, Portugal, Spain, Sweden, and United Kingdom). Due to a data constraint, Belgium and Luxemburg were combined resulting in only 14 donor countries. The receiving countries are nine[1] 'EU accession candidates'; specifically, Bulgaria, Czech Republic, Estonia, Hungary, Poland, Slovakia, Slovenia, Romania, and Ukraine.[2] Hence the sample size is 126 ($=14 \times 9$). The following empirical[3] model is proposed:

$$FDI_{ij} = \beta_0 + \beta_1 IMP_{ij} + \beta_2 \ln GDP_j + \beta_3 LCD_{ij} + \beta_4 II_j + \varepsilon$$

[1] Although both Lithuania and Latvia are considered accession candidates, they are excluded from the analysis due to the fact that the necessary FDI inflow data could not be obtained.
[2] As in Bevan and Estrin (2000), Ukraine is included though not currently engaged in EU accession negotiations.
[3] The foreign direct investment (i.e. dependent variable) flows (measured in millions of 1997 US $) is obtained from the *International Direct Investment Statistics Yearbook* published by the OECD. FDI flows into Estonia are provided courtesy of the Bank of Estonia, as they are unavailable through the OECD source.

where, i = Austria, Belgium, ..., UK[14], and j = Bulgaria, Czech Republic, ..., Ukraine [9].

The quantity of imports (IMP_{ij})[4] is listed in percentage of host country GDP. The imports variable is also a bilateral variable and represents the annual value obtained by the host country from each individual EU source. The level of imports into the transitional economy is an indicator of openness of the country and represents established trading links to each source nation (Buch *et al*., 2001).

The second variable ($\ln GDP_j$)[5] represents the log value of gross domestic product of host country j in 1997 in millions of US dollars. The original values are adjusted for purchasing power parity (PPP) to allow for a difference in purchasing power in the host economy. Due to the low overall per capita income of individuals in the transitional country, PPP allows for a fair measure of 'buying-power'. The larger the host economy, meaning the larger the market of the country, the more FDI is expected. Thus a positive relationship between FDI and GDP_j is expected; however, the log value of GDP_j enables one to capture the possible 'tapering off' effect.

LCD_{ij}[6] represents the labour cost of each transitional economy. These data are given as an average of 1995–1999 annual wages listed in 1997 dollars per annum per worker in the manufacturing sector. To produce a greater contrast in the labour costs between host and source nation, a simple absolute value differential was used to show magnitude of cost change from source to host nation. Intuitively, the investment could be driven by a cheap source of labour. The expectation is for a positive relationship; the greater the difference in labour costs, the greater the inflow of FDI.

The *Institutional Investor* country risk rating surveyed in January 1998 is our final independent variable (II_j). The rating ranks countries from 0 to 100 on the probability of a host country's safety from default. The information comes from surveys from international banks that are selected on international exposure. Countries with a lower risk rating value (typically developing and transitioning economies) face more restricted private capital flows[7] than source countries. Our final estimated model after correction for heteroscedasticity[8] is reported in Table 1.

The findings suggest that the estimation does have significant overall explanatory power due to the adjusted R^2 value 0.3060. The reported F-ratio is large enough to conclude that there is joint significance of chosen independent variables. Broadly speaking, the four variables examined do in fact impact FDI inflows into the CEE region and are also individually significant.

Table 1. *Regression (WLS) results (dependent variable: FDI*)*

Independent variable*	Estimated coefficient	*t*-ratio	*p*-value
IMP_{ij}	140.28	4.108	0.000
$\ln GDP_j$	170.16	3.572	0.001
LCD_{ij}	0.017278	2.946	0.004
II_j	10.315	2.955	0.004
CONSTANT	−2602	−4.86	0.000
Adjusted $R^2 = 0.3060$	F-ratio = 14.782 (p-value = 0.001)	Sample = 126	DF = 121

*Descriptions in the text.

Openness to trade

It has been proven through our model that international trade is perhaps the most important determinant of investment. A coefficient of 140.28 was obtained for the *IMP* variable (measured as imports as a share of GDP) significant at the 0.00 significance level (*t*-ratio 4.108), a result that conforms to the general consensus. More specifically, an increase of one percentage point in bilateral import in relation to GDP leads to a surge in the volume of FDI inflows by $140.28 million for each specific country. This finding, namely that trade integration is the most significant of all variables, is supported by Deichman's earlier research, and is explained by the fact that trade and investments complement each other. Similarly, Bevan and Estrin also argue that countries that are more liberal in their trade approach tend to export more, and this situation represents an attractive opportunity for foreign firms, especially ones which are considered export-driven.

Market size

The coefficient of the variable, $\ln GDP$ (i.e. the size of the market) accurately reflects theoretical expectations. The high overall *t*-ratio (3.572) confirms that the variable is

[4] Source: IMF, *Direction of Trade Statistics Yearbook* (2001).
[5] Source: World Bank, *World Development Indicators* (2001).
[6] Source: World Bank, *World Development Indicators* (2001).
[7] Source: World Bank, *World Development Report* 1998/1999. The rating is provided through international bank responses finalized through a formula that weighs the worldwide exposure of each institution. This ranking is neither created or endorsed by the World Bank, but provides a useful measurement of economic stability.
[8] The Breush–Pagan–Godfrey test indicated possible presence of heteroscedasticity yielding an observed χ^2 value = 22.295 with six degrees of freedom resulting in a p-value < 0.001. Hence, the Weight Least Squares (WLS) method is employed to neutralize the problem of heteroscedasticity. The weight variable in this regression was log of GDP of the source economies (GDP_i). The source of GDP_i is identical to that of independent variable GDP_j.

indeed significant. Flows are expected to be greater in larger economies with well-built markets. Multinationals are probably interested in capturing a greater share in the market when they are expanding to the CEE countries. As explained earlier, the variable is in log form. The significance of the variable even in log form confirms that the relationship between FDI and market size is not a simple linear relationship, but one in which the benefit from expanding market size is increasing but at a decreasing rate. The marginal benefit of broadening the market yields a smaller proportional benefit in terms of investment. In other words, the opportunity to expand into new markets is enticing to investors, though not to an equal degree as other country attributes due to decreasing marginal returns.

Labour costs

Also of high statistical significance is the labour costs (*LCD*) variable, the differential between the individual EU nation and that of the CEEC (*t*-ratio 2.946). Due to its profound claim on production cost, investment largely depends on wage levels. Hence, it follows as good news that a positive correlation is seen between FDI and labour costs differential in our model. More precisely, a change of $1 in the annual wage difference between the host and source economy in the manufacturing sector results in a corresponding change of $17 278 of FDI. Cheap labour is of particular interest for countries whose wage levels are high, and where firms are looking to reduce costs by relocating production to a region where resources are available at a lower cost.

Country risk

Corresponding to Deichman's and Bevan and Estrin's specifications, credit rating or proxy for risk (*II*) is found to be significant, specifically (at 0.04 level), with a *t*-ratio of 2.955, and positively related to FDI. The relationship implies that a healthy investment climate characterized by macroeconomic and political stability benefits the FDI recipient country. In summary, the coefficient can be translated as such: a unit improvement in credit rating results in $10.315 million increase in FDI. Therefore countries that have succeeded in creating a strong economic and political environment, characterized by financial market stability, that is to say little worry of a financial crisis or default, are likely to gain through increased foreign investment.

IV. POLICY IMPLICATIONS AND CONCLUSIONS

The idea of utilizing FDI as a development tool for CEE countries is much more complicated than conventional wisdom has previously explained. The gains from FDI inflows are substantial, but they do not come easily. If a country wishes to enjoy the advantages that international investors could offer, it must continually adjust its economic and political agenda to suit the needs of investors.

At the top of the list are policies aimed at mobilization of anti-protectionism and anti-dumping campaigns to protect foreign investors. Consistency with World Trade Organization (WTO) obligations and a strong commitment to further liberalize trade improve a country's appeal as an investment opportunity. There is no doubt that giving up the imposition of strict import limits can be painful for countries such as those in transition, for they may suffer from current account deficits. Trade integration, however, offers gains that outweigh its costs in the long run, and thus, is worth the short-term consequences.

The market needs to appeal to the investor. As shown in the presented data, cheap labour relative to that of the source country provides great motivation for investors; however, low wages do not raise the purchasing power of the source country. The labour cost variable is difficult to justify politically and in the realm of social welfare. Why? There is an obvious trade-off between foreign financial inflows and compensation to the domestic worker. The above results attest to the reality of the underlying condition through which investors make decisions. Increasing wages to the level in the source nation (in the manufacturing sector in our example) will, according to the results, lead to a reduction in investments as investors will continue to seek cheaper forms of labour elsewhere.

Last but not least in importance is the observation that a healthy economic and political climate makes investments flow in countries in transition to a market system. Fear of macroeconomic problems, such as budget deficits, large debts, and drastic inflation rates, prevented developed economies from putting their money into this region in the years after the collapse of the Soviet Union. Nonetheless, the past ten years have been characterized by dramatic improvements in these areas, and likewise a reduced possibility of economic crisis in this region. As a survey by OECD points out, even early in the transition process, international firms have been impressed at how well the CEE countries have adjusted since the transition and at their commitment to the newly adopted market system (OECD, 1994).

The countries of the European Union have taken a keen interest in investing into the CEEC since the beginning of the transition process. Our attempt to identify the determinants of FDI in CEECs from the EU was driven by the belief that FDI can be an important tool for accelerating growth and development for the economies in this region. A rigorous empirical analysis reveals that the key determinants of FDI inflows in CEECs are market size, host country risk, lower labour costs for investors into the host country, and openness to trade. These findings are somewhat similar to those from previous studies.

A suggestion for future studies would be to investigate the significance of the factors not analysed in this study to determine their relevance as determinants of FDI in transition economies. For instance, an important factor found to be a significant determinant of FDI not discussed herein is host transportation infrastructure.

Our own findings allow us to offer a number of policy recommendations for CEECs and other economies in transition. Policies aimed at trade liberalization are important and should not be overlooked. Furthermore, a healthy economic and political climate attracts foreign investments and it is therefore critical that political stability be maintained in countries in transition.

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