

## FDI AND GROWTH IN EASTERN EUROPE: A SECTORAL ANALYSIS \*

### 1. INTRODUCTION

The argument that Foreign Direct Investment (FDI)<sup>1</sup> plays a significant role in promoting growth has provided support for the policy stance emerged since the end of the '80s, when the majority of developing and transition countries started to introduce measures to create a favourable climate for FDI. This role of FDI has been emphasized by the new growth theory suggesting that it may enhance economic growth not only through capital accumulation but, also, by promoting technological change and human capital spillovers. FDI is, in fact, considered an important source of growth as it supplements inadequate domestic resources to finance both ownership change and capital formation and helps to replace large amounts of obsolete capital accumulated during years of central planning. Moreover FDI, as stable long-term<sup>2</sup> capital flow, is also perceived as a catalyst of growth since it could bring technology, managerial know-how and skills necessary for restructuring firms and help local enterprises to expand into foreign markets.

However, the advantages of FDI and consequently the incentives offered to attract multinationals have begun to be questioned (Krugman 2000; Lipsey 2002). Fueling this debate, empirical

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\* The author is very grateful to Professor Bruno Jossa for reading this version of the paper and for his helpful comments and suggestions.

<sup>1</sup> Following the IMF, Foreign Direct Investment is defined as an international investment that reflects the objective of obtaining a lasting interest by a resident entity in one economy (direct investor) in an enterprise resident in another economy (direct investment enterprise). A direct investor is defined by its ownership of 10% or more of the ordinary shares or voting power in direct investment enterprise.

<sup>2</sup> In this sense it is preferable to short-term flows since it permits to avoid an increase in macroeconomic instability. See Krkoska (2001) for evidence of a strong relation between the lack of FDI, current account deficits and economic crises in central European countries.

analyses looking for FDI spillovers on host country economic growth, found contrasting evidence using either macro or micro data aggregation levels. This ambiguity can be attributed not only to the local conditions (a wide range of factors can be considered) but also to the sector into which FDI occurs. In fact, spillovers should not be expected in all kind of industries because foreign companies sometimes operate in 'enclaves' that offer little scope for the local economy to benefit. Thus, the type of FDI<sup>3</sup> matters for the potential benefits derived from it. This paper represents an attempt to add this further element of complexity to the study of FDI in the EECs. Following an extension of the growth theory that includes FDI as an additional determinant of growth, we build upon some previous work, exploring the roles FDI has played when it is controlled for the sector in which such an investment is involved. Usually, due to data limitations (FDI figures come from Balance of Payment data that do not allow crossing sectoral dimension) macro empirical works did not consider this sectoral perspective leaving any considerations on potential sectoral specific effects aside. Considering a countries sample of 12<sup>4</sup> transition European economies and a time period from 1999 to 2006 we use a panel model to look at differences among sectors hypothesising that in the primary sector, FDI tends to have a negative or a limited effect on growth because in these activities the scope for linkages between foreign affiliates and local suppliers is often limited. By contrast, in the manufacturing sector we expect to find a positive influence of FDI on growth because of the wide scope for dividing production into discrete stages and subcontracting out large parts to independent domestic firms. In the tertiary sector, again, since the presence of linkage intense activities is also broad, the relation we hypothesised is a positive one. The model is estimated controlling also for other factors such as the level of education, the

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<sup>3</sup> A firm decides to make a direct investment for three main reasons that give rise to different FDI typologies: i) directly supplying foreign markets (market seeking FDI); ii) rationalizing and integrating production, on an international scale, through outsourcing or delocalization of productive processes to countries where low cost factors are available (efficiency seeking FDI); iii) acquiring scarce resources (raw materials, immaterial goods such as licenses, patents etc.) (resource seeking FDI).

<sup>4</sup> This aggregate includes the 10 new EU members: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia and some Balkans states, (only those for which this sectoral breakdown was available): Croatia and Macedonia.

tax rate, the degree of openness etc. that certainly, contributing to the creation of an environment favourable to economic growth, could reinforce or interact with the FDI effect.

The paper is organised as follows. The next section presents a picture of the FDI sectoral trends in the region, focusing on the changes in the economic and political environment. Section 3 briefly surveys the theoretical and empirical literature on the topic providing motivation for our empirical results. Section 4 presents the data set and the methodology adopted. Section 5 illustrates and discusses the main econometric results. Section 6 summarises and draws conclusions.

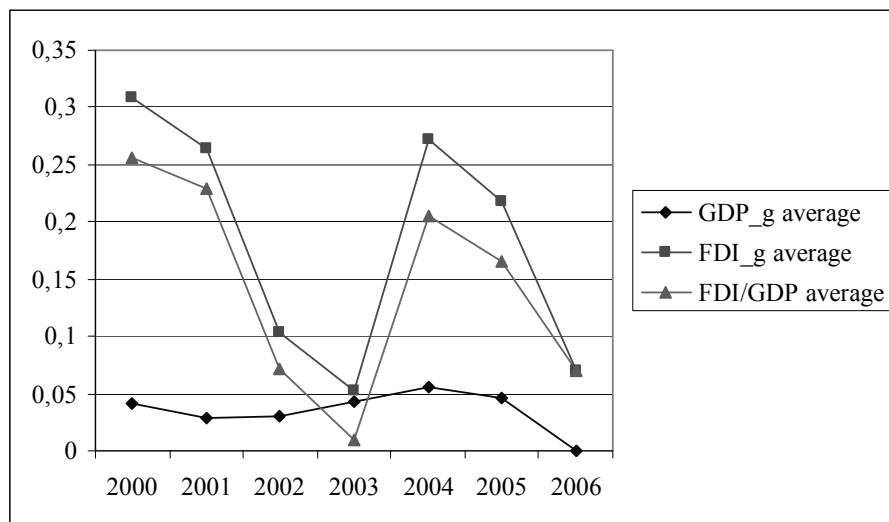
## 2. FDI SECTORAL TRENDS IN EASTERN EUROPEAN COUNTRIES (EEC)

In the years 1989 and 1990, most of the countries in Eastern Europe started the transition from communist states to market economies and democratic governments. They set out to implement economic and political reforms, applying different strategies: increasing openness to trade, privatization of previously government-owned production, liberalizing markets and lowering the barriers to FDI to varying degrees. For the most part, they had not been FDI recipients to any important degree before 1990 but the collapse of the socialist system created several investment opportunities, especially because these economies were industrialized and could count on a relatively cheap yet highly educated workforce.

Evidence from EEC countries' data shows that FDI inflows into these 12 countries steadily increased from about 3.3 billion USD in 1999 to about 75 billion USD in 2006, from 0.9 percent to 3.5 percent of GDP during this period. In 1999, however, the total amount of FDI inflows to these countries appeared smaller compared to other developing countries aggregates; but by 2006, FDI inflows to EEC countries increased to 7.5 percent of the global FDI inflows while the percentage of the other developing countries remained more or less the same (WDI, 2007).

If we examine (Figure 1) trends in real GDP growth, FDI growth, and FDI/GDP ratio (all averaged across the cross-section of 12 EEC countries and expressed in percentages) between 1999 and 2006, it clearly appears that the real GDP growth decreased (although slightly) in the first years considered to register a moderate expansion after the 2003 and a new decline in 2005. Looking instead at the FDI growth, we can see a similar but more pronounced trend with a sharp drop starting from 2001 and worsening until 2003. One of the reasons could be that export oriented investments were delayed

FIGURE 1 - *Average GDP Growth, Average FDI Growth and FDI/GDP Ratio 1999-2006*



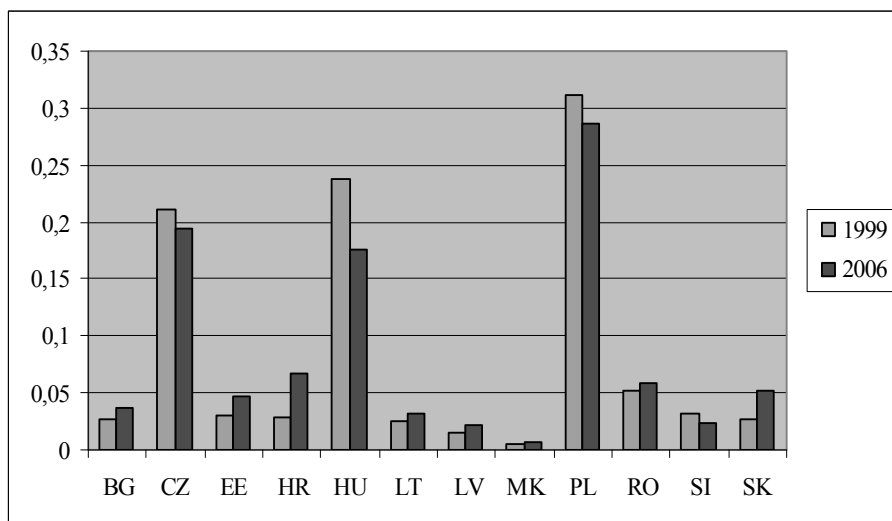
Source: World Bank (2007).

due to the downturn of the European business cycle. Uncertainties related to elections in some of the target countries like the Czech Republic and Hungary also made investors delay new investments and acquisitions. After the 2003, the rate of FDI growth enhanced until 2004 to worsen again in 2005 and 2006.

It appeared clearly, looking at the data (Figure 2), that a large proportion of the total FDI stocks is concentrated in a small group of Eastern European Countries (EEC) whereas many others in the region received very limited amounts of Foreign Direct Investment (FDI).

There is, in fact, wide variation across the recipient countries. For example, the Czech Republic, Hungary and Poland received, in 1999, about the 50 percent of total FDI inflows in the whole area. In 2006, there is a slight improvement in terms of FDI distribution in the area with a bigger share of FDI stocks registered by a larger group of countries: Bulgaria, Croatia, Estonia, Romania and Slovak Republic. This wide variation across the recipient countries can be explained, as other studies have shown, by the fact that the size of the FDI inflows depends on the country characteristics. In addition, FDI is not only strictly related to macroeconomic factors (economic

FIGURE 2 - *FDI Stocks in the Eastern European Countries as % of the Total Stocks in the Region*



Source: WIIW database (2007).

fundamentals, market size, natural resources endowment), as pointed out by the literature (Lankes and Venables 1996; Bevan and Estrin, 2000; Resmini, 2000; Kinoshita and Campos, 2001 among others) but also to political determinants (such as the degree of progress in transition reforms and political stability). FDI stocks to these countries, generally low during the first half of the '90s, have been increasing in line with improvements in all the governance measures, particularly political stability and progress in transformation as we can see looking at the World Governance Index (WGI) calculated by the World Bank<sup>5</sup> (Kaufmann *et al.*, 2007) and reported in Table 1. Considering the initial and the final year of the time period analysed<sup>6</sup>, it appears clearly an enhancement in terms of governance all across the region.

<sup>5</sup> The World Bank issued governance indicators, covering almost a decade until now.

<sup>6</sup> Czech Republic and Slovenia scored higher than Italy and Greece not only in 1996 but also in the 2005, while Estonia had scored higher than Greece in 1996 and higher than both in 2005.

TABLE 1 - *World Bank Average of Governance Ratings, 1999 and 2006 and Global Competitiveness Rankings 2006*

| Countries | Governance Scores |             | Global Competitiveness Rankings |
|-----------|-------------------|-------------|---------------------------------|
|           | 1999              | 2006        | 2006                            |
| Bulgaria  | 0.56              | 0.29        | 72                              |
| Croatia   | 0.11              | 0.47        | 51                              |
| Czech Rep | 0.78              | 0.75        | 29                              |
| Estonia   | 0.67              | 0.78        | 25                              |
| Hungary   | 1.04              | 0.73        | 41                              |
| Latvia    | 0.13              | 0.81        | 36                              |
| Lithuania | 0.41              | 0.89        | 34                              |
| Macedonia | -0.92             | -0.66       | 80                              |
| Poland    | 0.62              | 0.22        | 48                              |
| Romania   | 0.20              | 0.12        | 68                              |
| Slovak    | 1.00              | 0.85        | 37                              |
| Slovenia  | 1.06              | 1.05        | 33                              |
| EU 15     | <i>1.40</i>       | <i>1.39</i> |                                 |

Source: Kaufmann *et al.* (2007); World Economic Forum (2007).

Economies with the highest governance scores, such as the Czech Republic, Hungary and Estonia registered also the highest stocks while, by contrast, Bulgaria and Romania had the lowest governance scores and recorded the lowest FDI stocks. Slovenia was an outlier, with high governance score but only average FDI stocks because the general investment environment is still considered risky. Countries such as Macedonia have recently gained more stability but the transformation into a market economy is still incomplete and investors are not prone to take the risk of entering this market. Inward FDI into the region was also encouraged by a general enhanced economic environment. This improvement is measured by the competitiveness rankings of the Global Competitiveness Reports (World Economic Forum, 2007, Table 1). Estonia, Czech Republic and Slovenia, were the leaders, not far behind the EU average, but the other economies ranked much lower<sup>7</sup>. This improvement in governance and in the general climate

<sup>7</sup> In this ranking, Estonia, the Czech Republic and Slovenia outranked both Greece and Italy, and were close to Portugal and Spain.

may have helped to attract FDI inflows but it could also be that the hope of attracting FDI led to the improvements in governance.

With respect to the distribution of FDI<sup>8</sup> by economic sector, it reflects the modest endowment of the Eastern European Countries. Agriculture was mostly closed to foreign investment<sup>9</sup>. FDI in the manufacturing sector was higher than in services, until the privatization of banks, telecommunications and utilities opened the door to foreign investors. In the late '90s, the services sector saw FDI increase more rapidly than manufacturing, except in Bulgaria and Slovakia. FDI in the manufacturing sector represented more than one third of the invested capital in 2000 in the Czech Republic, Hungary, Poland, Slovakia and Slovenia. Most of these countries have attracted export-oriented Greenfield investments. The production of motor vehicles and transport equipment is the most important manufacturing FDI target in the Czech Republic, the third in Hungary and Poland. In Croatia, it was chemical products. Only Hungary features the high technology segment of electrical and electronic equipment as a main investment target.

### 3. REVIEW OF THEORETICAL AND EMPIRICAL LITERATURE

The importance of FDI for host countries economic growth has been emphasized in both theoretical and empirical literature. The theoretical ground to support the idea that FDI may enhance economic growth is offered by the Endogenous growth framework. This theory, taking into account a variety of factors enabling innovation, such as human capital accumulation and technological externalities in the development process, provides a very useful tool to analyse how the introduction of new inputs and technologies (Romer, 1993) influences the production function of a given economy and how external factors affect the research efforts of economic agents and the diffusion of knowledge. In fact, the role of FDI, as a composite bundle of capital stocks, know-how, and technology, has been widely recognized as a growth-enhancing factor especially for developing and transition countries taking nevertheless into account that, as

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<sup>8</sup> Most FDI in EE countries comes from other EU economies and from the United States.

<sup>9</sup> Becoming member of the EU, these countries have received derogations for liberalizing their land markets.

Romer writes in his 1990 paper<sup>10</sup>, some important preconditions are necessary for endogenous growth to happen<sup>11</sup>. FDI enables host countries not only to boost capital formation but also to enhance the quality of the capital stock transferring modern technology and innovation. Thus, by attracting FDI, host countries hope to 'close the gap', acquiring product, process and distribution technologies, as well as, management skills and market access. In fact, multinationals are assumed to use best practice technology and management which, allow them to compete successfully with local firms raising the level of competition in the host economy. Although foreign companies will try to minimize technology leakages, the use of a new technology by one subject does not preclude others from using it, since knowledge possesses the characteristics of public goods, giving rise to R&D spillovers (Grossman and Helpman, 1991)<sup>12</sup>. TNCs, thus, can play a special role as conduits of productive ideas flow across national borders (more than arms length transactions) reducing what Romer (1993) calls 'idea gap'<sup>13</sup>. 'Ideas' (in the form of blueprints for new products or new processes), generated by investment in R&D, lead to new processes and products that are used as inputs in the production of final goods, raising productivity (Romer, 1990). More importantly, R&D-based innovation is a crucial determinant of the competitiveness

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<sup>10</sup> Romer (1990).

<sup>11</sup> Among these preconditions there is openness to trade. Governments can make the recipient economies more appealing to foreign investment not only by offering an adequate reward to TNCs but, also, by favouring freer trade that may be supportive of growth and technological development. In fact, as Romer and Rivera-Batiz (1991) stated, when barriers to trade are too high, and new inventions can't cross national lines, the incentive to innovate decreases suggesting a role for trade policy.

<sup>12</sup> Spillover is defined as the external effects of R&D that a firm puts in place for enhancing its own productivity compared to the other firms. Spillovers can occur both with the country and across the country (Sjöholm, 1997).

<sup>13</sup> Romer (1993) underlined that "*a developing nation apart from suffers from an object gap due to the lack of valuable objects such as roads, factories, raw materials, can also suffer from an idea gap due to the fact that it has not access to the ideas used in the developed economies to generate economic value. The notion of an idea gap include something broader than a simple technology gap, some kind of economic activity that does not take place in the factories but outside. Ideas include the innumerable insights about packaging, marketing, distribution, inventory, control, payments, information system, transaction processing, quality control and worker motivation that are all used in the creation of economic value in an economy*".

of firms since it does not exclusively affect the performance of those undertaking these activities but the new knowledge of one agent stimulates the development of new knowledge by others enhancing their technological capabilities. Thus, the rate of technical progress in host countries increases through a 'contagion' or knowledge diffusion effect from the more advanced technologies in parent countries, as suggested by Findlay (1978). Wang and Blomström (1992) argue that this contagion can also take the form of imitation of processes or organizational innovations and consequently, increased competition can push other firms to adopt new technologies and modernize. Employee training and subsequent workers' turnover can help disseminate a foreign firm's superior know how. However, as Findlay (1978) and Wang and Blomström (1992) argue, FDI operates as a conduit for transferring technology particularly in the manufacturing sector. In addition, Hirschman (1958) pointed out that FDI's potential to create linkages to domestic firms, might vary across sectors, since not all of them have the same potential to absorb foreign technology or to create linkages with the rest of the economy. For example,

"in agriculture and mining, linkages are weak" (Hirschman, 1958)

since, often, multinationals were involved in the exploitation of natural resources and consequently, foreign investments could have a limited effect in spurring growth in an economy. The absence of direct linkage effects of primary production increases the possibility to generate enclaves with respect to the case of foreign investment in manufacturing or in services. There is clearly a difference between a 'resource seeking' FDI and one directed towards labour-intensive manufacturing ('efficiency seeking' FDI). Furthermore, following Rodriguez-Clare (1996), multinationals, using intermediate goods, enhance production efficiency<sup>14</sup> in the host economies and increase demand for inputs, leading to a positive externality to other producers due to an increase in variety. Greater varieties of inputs, however, seem to be more relevant to the manufacturing than to the agricultural sector.

Following the new growth theory paradigm, there have been many attempts, over the years, to test the impact of FDI on host country

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<sup>14</sup> This will lead domestic firms entering into the intermediate goods sector, which can result in lower costs that, reflected in lower final prices which increase demand, can benefit domestic firms producing final goods (Markusen and Venables, 1999).

economic growth. The vast literature on the topic shows, however, a contrasting evidence. On the one hand, at the macroeconomic (economy wide) level, positive effects of FDI spillovers were reported by Blomström and Wolff (1994) who find that, although FDI has a significant positive influence on growth rates, this influence seems to be confined to higher income developing countries. De Mello (1996), also, finds a positive correlation for selected Latin American countries but, however, the evidence would seem to suggest that, in general, intervention should be targeted largely at providing a supportive economic environment. More specifically, this flags up the role for education and training policies aimed at upgrading general skills; technology policies aimed at developing clusters; public investment policies aimed at developing efficient and reliable transportation and communication networks. In the study of Borensztein *et al.* (1998) the FDI inflows to 69 developing countries in the period 1970-89 have a marginally positive significant influence on growth but, when they interact with a measure of average educational attainment, they have a stronger and more consistent influence. The higher the level of education of the labour force, the greater the gain in growth from a given inflow of FDI. A recurring need for the host economy, thus, appears to be the achievement of a certain development threshold level. Balasubramanyam *et al.* (1996) find that the influence of FDI on growth depends on the trade policy regime followed by host countries; in a protectionist environment the spillovers associated to FDI are likely to be limited, as the allocation of capital takes place in an economy in which prices are distorted, while a high degree of openness will determine a favourable climate for the development of FDI spillovers. Rodriguez-Clare (1996) too, sustained that most of the investment activities which activate technology transfers took place in the export-oriented industries and resulted in important scale effects and externalities for GDP growth. Marino (2000) found similarly that an open trade policy regime influences significantly the impact of FDI on growth. However, a dissenting view is echoed in Rodrik (1999) who argues that the effect of FDI on growth tends to be weak and suggests that much if not most of the correlation between FDI and a superior performance is driven by reverse causality. Hausmann and Fernández-Arias (2000) also cast doubts on the special merits of FDI. Carkovic and Levine (2002) concluded that there is no reliable cross-country empirical evidence supporting the claim that FDI *per se* accelerates economic growth. Blomström and Kokko (2003) concluded from their review of the literature that spillovers are not automatic and local conditions influence firms' adoption of foreign technologies and skills.

Coming to microeconomic studies on the FDI-growth impact, they also found controversial results. This alternative methodology considers the impact of FDI on the productivity at the firm level, expecting that TNCs affiliates increase the efficiency of domestic firms in the manufacturing sector via productivity spillovers. In terms of positive impact, the earliest contributions are the studies by Caves (1974) who examines Australian manufacturing in 1966 and Blomström and Persson (1983) with data for Mexican manufacturing industries. Later, Blomström and Wolff (1994) who analyses Mexican manufacturing, in the period 1970-75, argue that spillovers have contributed to total factor productivity growth. Moreover, positive inter-industry spillovers were identified by many other studies, among which there are: Sjöholm (1999) for Indonesian manufacturing, Driffield (2001), Liu *et al.* (2000) and Pain (2000) all find statistically significant spillovers in the UK, as do Chuang and Lin (1999), Dimelis and Louri, (2002), and Lipsey and Sjöholm (2001) in their studies of Taiwan, Greece and Indonesia, respectively.

Kokko (1994) provided evidence of a positive relationship between the share of FDI in a manufacturing sector and the productivity growth rate of domestic firms in that sector, since when foreign affiliates and local firms are in more direct competition with each other, spillovers are more likely to be generated. Later Kokko *et al.* (2001) find evidence for positive productivity spillovers only from multinationals which located in Uruguay during the import substituting trade regime, and no evidence for spillovers of export oriented multinationals. Thus, they argue multinationals are more likely to rely on skills in international marketing or distribution networks rather than production technologies, implying that there is less potential for productivity spillovers.

Other studies suggest that spillovers are *not significant* or, that they do not take place in all industries. Haddad and Harrison (1993), in a test of the spillover hypothesis for Moroccan manufacturing during the period 1985-1989, conclude that spillovers do not take place in all industrial sectors. Aitken and Harrison in the 1999 study that examines firms data for Venezuela, fail to find evidence of economy wide spillovers from the presence of multinationals. Only firms in neighbouring activities or industries, they argue, are likely to be able to take advantage of spillovers generated by foreign subsidiaries because spillover effects tend to be localized. This is particularly true in large countries where they are likely to be confined geographically within the state or area where the FDI takes place. They also find, as Cantwell (1989) who claims that technology spillovers take place

mainly where local firms are initially relatively strong, that large domestic firms located close to foreign firms tend to exhibit higher growth rates of factor productivity particularly in sectors where levels of technology are relatively low. Also Perez (1998), in a study of UK industries argue that positive technology spillovers did not occur in all industries. Blomström (1986) observes that the mechanism through which productivity spillovers work is the competitive pressure from TNCs on domestic firms, finding that competition from foreign firms appears to push local ones toward best practice technologies particularly in sectors with low or moderately advanced technology. Kathuria (2000) analysing panel data for Indian manufacturing, finds that the evidence for spillovers is weak and if inter-industry spillovers occur it is rather implausible that such spillovers extend very far beyond the industry of the subsidiary. Kokko (1996) in a study of Mexican manufacturing, argues that positive spillovers are less likely in industries with highly differentiated products and large economies of scale. Foreign and local firms may use entirely different technologies when products are differentiated and economies of scale may allow the foreign affiliates to crowd out local firms from their segments of the market. In both cases, technologies may be irrelevant for local firms so that the potential for spillovers is small. He points out that, first of all, spillovers should not be expected in all kinds of industries and secondly, that they may not occur if foreign affiliates operate in enclaves, where neither products nor technology have much in common with those of local firms. From this comes that spillovers are not automatic consequences of FDI and they are less likely in industries where high foreign market shares and large productivity gaps between foreign and local firms coincide. Spillovers are not determined only by the extent of foreign presence but rather by the simultaneous interactions between foreign and local firms, in other word by competition. Only the existence of a competitive environment forces domestic firms to imitate the better technology and thus, productivity increases may materialize. This may explain why spillovers do not appear in many cases.

Most transition economies are middle-income countries known for their high level of education. Therefore, one can imagine that they have a sufficiently good capacity to absorb knowledge spillovers. Nonetheless, the evidence concerning intra-industry spillovers in such countries is also inconclusive. Yudaeva *et al.* (2003) show that this effect is positive in the case of Russian firms, Javorcik and Spatareanu (2004) and Damijan *et al.* (2003) find positive spillovers in Romania, while the studies of Djankov and Hoekman (2000) and

Konings (2001) observe negative effects for some other Eastern-European Countries.

Despite the numerous alleged benefits attributed to foreign direct investment, what, clearly, researches show is that spillovers vary systematically between countries and sectors (industries) and that the positive effects of FDI are likely to increase with the growing level of local capabilities and competition (Blomström and Kokko, 1998) and also, with other factors that contribute to create a favourable environment. In sum, a clear significant positive impact of FDI on host countries' economic growth depends on local conditions and on the economic sector considered. Finally, it is worth noting that the contrasting results could be due to the fact that, except some recent studies that employed panel techniques, many of the others have relied upon cross-section methods to which several methodological shortcomings are associated. Thus, the presence of diverging estimates could also be due to econometric issues<sup>15</sup> and to differences in the sample selection procedure.

#### 4. DATA AND METHODOLOGY

##### 4.1 Data Collection

Since most of the empirical work at the intra-industry level (micro) on FDI growth effects, as Blonigen (2001) and Lipsey (2002) point out, might not be suitable for capturing wider spillovers on the host economy, such as those created by backward and forward linkages with domestic firms, in this paper we use macro-level data with sectoral breakdown to study overall growth effects. We would have also tested the hypothesis that FDI in different sub-

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<sup>15</sup> One problem with the interpretation of these studies is the difficulty of disentangling the direction of causation, in other words was an economy growing faster than another because the level of FDI was higher or was the rate of FDI higher because the economy was growing faster? To the extent to which factors like the available stock of infrastructures, the market size, the presence of skilled labour, etc. are recognized to be fundamental determinants of foreign capital inflows to developing countries, we should expect that growth itself is conducive to higher levels of inward FDI. This means that a positive correlation between FDI flows and growth says nothing about the underlying causal relationship. Even when a researcher takes care to account for the endogeneity bias, it is not easy to find suitable instrumental variables, that is variables which are correlated with FDI flows but not with growth.

sectors within manufacturing or services has different effects but, unfortunately such data were not available for the whole countries sample. In fact, usually, major sources present FDI data in broad aggregates limiting the study of the effects of FDI in the host economies. In order to overcome these difficulties, we collected data for the period 1999-2006, from different sources. Data on GDP (at constant prices), used as dependent variable were taken from the World Development Indicators of the World Bank (2007). Detailed information on FDI stocks (inflows were not available for all the countries and the years considered) were collected from WIIW<sup>16</sup> database on direct investments which breaks FDI investments down by sector: primary (FDIP), manufacturing (FDIM), tertiary (FDIS). We collected, also, data relative to the other independent (control) variables from WDI (2007). These are: GSP to proxy for central government final consumption expenditure (constant 2000 US\$); TAX to proxy for taxes on income, profits and capital gains (% of revenue); TRADE that is total trade as percentage of GDP used as a measure of openness; CREDIT to measure the domestic credit to private sector (% of GDP). EDU, in other words the public expenditure on education (% of GDP) as proxy for the presence of human capital is taken from EUROSTAT as data on exchange rates. We also controlled for other factors such as the political stability and the global country competitiveness. The first variable called WGI remind to the World Governance Index <sup>17</sup> created by the World Bank (Kaufmann *et al.*, 2007) while the second, named GCI, is the Global Competitiveness Index<sup>18</sup> taken from the World Economic Forum.

The summary descriptive statistics for the variables of interest (GDP, FDI and the other control variables) are presented in Table 2.

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<sup>16</sup> Wiener Institut für Internationale Wirtschaftsvergleiche (2007).

<sup>17</sup> This indicator is constructed covering six dimensions of governance: (1) voice and accountability, (2) political stability and absence of violence, (3) government effectiveness, (4) regulatory quality, (5) rule of law, and (6) control of corruption.

<sup>18</sup> For more information see the World Economic Forum website.

TABLE 2 - *Summary Statistics*

| <i>Variables</i> | <i>Obs</i> § |       | <i>Mean</i> | <i>Std. Dev.</i> | <i>Min</i> | <i>Max</i> |
|------------------|--------------|-------|-------------|------------------|------------|------------|
| l_gdp            | Overall      | N= 96 | 23.79204    | 1.035662         | 21.95424   | 26.01657   |
|                  | Between      | n= 12 |             | 1.070131         | 22.00416   | 25.92494   |
|                  | Within       | T= 8  |             | .1086065         | 23.53423   | 24.00468   |
| l_fdip           | Overall      | N= 96 | 4.377647    | 152.0336         | -.7143545  | 6.78788    |
|                  | Between      | n= 12 |             | 1.372307         | .9971546   | 6.007466   |
|                  | Within       | T= 8  |             | .7529669         | 1.824789   | 6.33746    |
| l_fdim           | Overall      | N= 96 | 7.870526    | 1.325915         | 5.466745   | 10.45679   |
|                  | Between      | n= 12 |             | 1.273545         | 6.100586   | 9.89226    |
|                  | Within       | T= 8  |             | .5056128         | 6.913154   | 9.062495   |
| l_fdis           | Overall      | N= 96 | 8.475809    | 1.229911         | 4.978217   | 10.99926   |
|                  | Between      | n= 12 |             | 1.112398         | 6.403935   | 10.39957   |
|                  | Within       | T= 8  |             | .6053355         | 7.050091   | 9.928676   |
| trade            | Overall      | N= 96 | 114.3312    | 29.63405         | 54.24469   | 180.3605   |
|                  | Between      | n= 12 |             | 29.26929         | 66.03665   | 165.782    |
|                  | Within       | T= 8  |             | 9.198378         | 88.92244   | 132.1951   |
| l_gsp            | Overall      | N= 96 | 22.01379    | .9930331         | 20.29675   | 24.34317   |
|                  | Between      | n= 12 |             | 1.028516         | 20.36218   | 24.25235   |
|                  | Within       | T= 8  |             | .0788433         | 21.77809   | 22.20841   |
| tax              | Overall      | N= 88 | 13.91401    | 4.002987         | 7.193462   | 22.54461   |
|                  | Between      | n= 11 |             | 3.458293         | 8.345906   | 19.42179   |
|                  | Within       | T= 8  |             | 2.241963         | 6.751914   | 19.12473   |
| credit           | Overall      | N= 96 | 32.61454    | 14.33332         | 7.169175   | 61.20644   |
|                  | Between      | n= 12 |             | 10.86678         | 12.94418   | 49.84532   |
|                  | Within       | T= 8  |             | 9.800926         | 12.49558   | 57.85778   |
| wgi              | Overall      | N= 96 | .5141667    | .5304966         | -1.03      | 1.28       |
|                  | Between      | n= 12 |             | .5219773         | -.91125    | 1.05375    |
|                  | Within       | T= 8  |             | .1704182         | -.1070833  | .9029167   |
| gci              | Overall      | N= 96 | 47.22917    | 16.29238         | 20         | 85         |
|                  | Between      | n= 12 |             | 16.40224         | 24.625     | 81.75      |
|                  | Within       | T= 8  |             | 4.028843         | 38.60417   | 58.72917   |
| edu              | Overall      | N= 96 | 4.640521    | .9132018         | 2.86       | 6.74       |
|                  | Between      | n= 12 |             | .8887156         | 3.335      | 5.81125    |
|                  | Within       | T= 8  |             | .3198735         | 3.856771   | 5.934271   |

Note: § n is the number of countries, T are the years and N is (n \* T).

It appears clearly that some variables show an high degree of variability such as TRADE or CREDIT. It should also be noted that we have some missing data in the TAX series for Macedonia.

#### 4.2 THE METHODOLOGY

The general model we use to investigate the role of FDI, broken down by sector, on economic growth is derived from a production function framework:

$$Y = g(F, K, X) \quad (1)$$

where  $Y$  is GDP growth and  $g$  is a linear function of Foreign Direct Investment respectively in the primary (FDIP), manufacturing (FDIM) and service sector (FDIS) and also of other variables reflecting host country characteristics of interest. FDI is included in the production function in order to capture externalities, learning by watching and spillover effects in the three sectors since it influences the growth process directly, by increasing the stock of physical capital in the recipient economy and indirectly, by promoting technological change and inducing human capital development. TRADE is also introduced, as an additional factor input, into the production function, following a large number of empirical studies (Feder, 1983; Balassa, 1985; Salvatore and Hatcher, 1991; Greenaway and Sapsford, 1994) since openness, providing access to international market, determines a higher rate of innovations. The other control variables are introduced in line with a large empirical literature, since, in the broadest sense, these influence economic growth but, are also FDI determinants and consequently, can reinforce or reduce the FDI effect on growth. EDU, as suggested by Borensztein *et al.* (1998), is included because a minimum threshold of human capital in the host country is necessary to develop positive spillovers from FDI. Government spending (GSP) is also included in the equation as a proxy of the host country general favourable climate to FDI. The same idea holds for TAX because a reduced level of profits taxation contributes to attract multinationals. CREDIT is, again, part of the measure which identifies the presence of a favourable environment for FDI. WGI is introduced because the goodness of the governance and the political stability should constitute important FDI determinants. The same we can say for GCI as a measure of the general degree of competitiveness of the country. We use a panel data estimation technique (Baltagi, 2002) for our empirical analysis.

Then, the general form of the model is represented by the following equation:

$$\begin{aligned} \ln \text{GDPG}_{it} = & \alpha_i + \beta_1 \text{FDIP}_{it} + \beta_2 \text{FDIM}_{it} + \beta_3 \text{FDIS}_{it} + \beta_4 \text{TRADE}_{it} \\ & + \beta_5 \text{GSP}_{it} + \beta_6 \text{CREDIT}_{it} + \beta_7 \text{TAX}_{it} + \beta_8 \text{WGI}_{it} + \beta_9 \text{CGI}_{it} \\ & + \beta_{10} \text{EDU}_{it} + \varepsilon_{it} \end{aligned} \quad (2)$$

where  $\alpha_i$  are the individual (country) effects,  $\varepsilon_{it}$  are idiosyncratic errors and  $i=1,2, \dots, 12$ ,  $t=1999, \dots, 2006$ .

This formulation takes into account not only the most important factors identified by the literature but also what we consider important to explain economic growth and to reinforce the FDI effect on it. However, in order to improve the goodness of the estimates, we decide to use only the variables available in reliable sources restricting the sample dimension to the countries and the years for which these data were available. Furthermore, given the differences in terms of growth experiences among the selected economies, one would expect, as appears in the descriptive statistics reported in Table 2, that a remarkable heterogeneity both in time and across countries will affect the reliability of the results.

The expected sign of the FDIP coefficient is negative since multinationals that invest in the primary sector tend to exploit natural resources and consequently, generate enclaves. The absence of forward and backward linkages determines a negative or no effect in terms of economic growth. The FDIM coefficient, instead, should have a positive sign since in this sector, the scope for segmenting production into discrete stages and subcontracting out large parts to domestic firms, is wide, generating spillovers. Similarly, we can imagine that, in the services sector, the presence of linkage intense activities, positively influences economic growth. With regard to the trade variable a positive sign is expected since the more open is a country, the more prices reflect comparative advantages determining a favourable climate for the development of FDI spillovers. Positive are, also, the hypothesized signs of GSP and CREDIT since a consistent government expenditure and an extensive credit granted to the private sector contribute to reinforce the above-mentioned good environment for FDI spillovers. By contrast, a negative coefficient is expected for the TAX variable since the higher are taxes on profits the less prone are multinationals to invest in the country and, in any case, the less they will be oriented to create linkages. With regard to the WGI variable the sign is expected to be positive since, as a long term capital flow, FDI tends to prefer countries with political stability in order to

reduce the risks associated with nationalization. The GCI variable is also hypothesized to have a positive influence on economic growth because a highly competitive country will have the best prospect of growing and attracting FDI. So future expectations influence the actual growth attracting FDI. The role of EDU is expected to be a positive one since the greater the education level of the workforce, the greater will be the possibility to absorb technology and developing learning by doing, the greater will be the gains in terms of growth from FDI.

## 5. RESULTS

Taking into account the previous concern, conducting some preliminary estimations of equation (2) and the analysis of the usual diagnostic tests (Hausman specification test; Wooldridge serial correlation test; LR test for Heteroskedasticity) we observe first of all, the presence of heteroskedasticity in the data set and secondly, a serious autocorrelation in the estimated residuals due to GDP dynamic. This evidence leads to a different specification with respect to model (2); in particular, we take first differences on both sides of equation, so the estimated model is:

$$\begin{aligned} \Delta \ln \text{GDPG}_{it} = & \mu_1 + \beta_1 \Delta \ln \text{FDIP}_{it} + \beta_2 \Delta \ln \text{FDIM}_{it} + \beta_3 \Delta \ln \text{FDIS}_{it} \\ & + \beta_4 \Delta \ln \text{TRADE}_{it} + \beta_5 \Delta \ln \text{GSP}_{it} + \beta_6 \Delta \ln \text{CREDIT}_{it} + \beta_7 \Delta \ln \text{TAX}_{it} \\ & + \beta_8 \text{WGI}_{it} + \beta_9 \text{CGI}_{it} + \beta_{10} \Delta \ln \text{EDU}_{it} + \varepsilon_{it} \end{aligned} \quad (3)$$

Model (3) has the advantage to take into consideration the GDP dynamic, controlling for a potential endogeneity. Moreover, we decide to introduce a general constant. For model (3) the Hausman test for fixed versus random effects model suggests FE ( $\chi^2(10) = 20,71$ ; pvalue 0,02); the Wooldridge test does not signal serial autocorrelation ( $F(1, 10)=2,4$ ; pvalue 0,15) and the LR Test for heteroskedasticity accepts the null hypothesis ( $\chi^2(10) = 14,24$ ; pvalue 0,16). Nevertheless, even if the LR test gives us a different advice, taking into consideration the country's differences and the small dimension of the sample in terms of countries and years, we decide anyhow to estimate equations (3) using feasible GLS estimator that specifies an heteroskedasticity error structure with no cross sectional correlation. We couldn't exploit the time variation of the data using statistical techniques such as the GMM followed by Carkovic and Levine (2002) because of the limited time frame. The results are reported in Table 3.

TABLE 3 - *Estimates (FGLS)*

| <i>dl_gdp</i>    | <i>Coeff.</i> | <i>Std. Err.</i> | <i>z</i> | <i>P&gt; z </i> | <i>[95% Conf. Interval]</i> |           |
|------------------|---------------|------------------|----------|-----------------|-----------------------------|-----------|
| <i>dl_fdip</i>   | -.0026696     | .0039103         | -0.68    | 0.495           | -.0103337                   | .0049946  |
| <i>d_fdim</i>    | .0150942      | .0089385         | 1.69     | 0.091*          | -.0024248                   | .0326132  |
| <i>dl_fdis</i>   | .0292771      | .0107389         | 2.73     | 0.006***        | .0082292                    | .050325   |
| <i>dl_trade</i>  | .0778216      | .0275035         | 2.83     | 0.005***        | .0239158                    | .1317275  |
| <i>dl_gsp</i>    | .0978063      | .055822          | 1.75     | 0.080*          | -.0116028                   | .2072153  |
| <i>dl_tax</i>    | -.0229259     | .0131859         | -1.74    | 0.082*          | -.0487699                   | .002918   |
| <i>dl_credit</i> | .0849536      | .0132334         | 6.42     | 0.000***        | .0590167                    | .1108905  |
| <i>wgi</i>       | -.0064947     | .0098936         | -0.66    | 0.512           | -.0258857                   | .0128963  |
| <i>gci</i>       | -.0004896     | .0002177         | -2.25    | 0.025**         | -.0009164                   | -.0000628 |
| <i>dl_edu</i>    | -.0533204     | .0379244         | -1.41    | 0.160           | -.1276509                   | .0210101  |
| <i>_cons</i>     | .0430445      | .0158569         | 2.71     | 0.007***        | .0119656                    | .0741234  |

Note: \*\*\* significant at 1% level; \*\* significant at 5% level; \* significant at 10% level.

It appears that, as expected, FDIP has a negative sign showing that the exploitation of natural resources does not generate linkages but rather produces a negative although not significant effect on growth. FDIM and FDIS coefficient are instead, as we hypothesized, positive and significant showing that they generate wide linkage activities that spur economic growth. Regarding the other control variables, in line with our hypothesis, TRADE, GSP and CREDIT exercise a positive and significant influence, creating a favourable environment for economic growth in which FDI can exercise its beneficial effects. In an opposite way, a high level of profits taxation (TAX) represents a deterrent for FDI, producing a negative and significant effect on growth. The WGI and GCI variables show instead, the wrong signs. Finally, for what concerns EDU, the coefficient, although not significant, shows a negative sign which could be explained suggesting that, perhaps, FDI in these countries looks for low cost unskilled labour rather than for a high educated workforce.

Finally, some considerations in terms of diagnostic statistics should be made. According to STATA 10, which we used for the estimation, the R-squared statistic is not reported because when model's parameters are estimated using GLS, the total sum of squares cannot be broken down in the same way, making the R-squared statistic less useful as diagnostic tool for GLS regression.

Specifically, an R-squared statistic computed from GLS sums of squares need not be bounded between zero and one and does not represent the percentage of total variation in the dependent variable that is accounted for by the model.

## 6. CONCLUSIONS

A great deal has already been discussed about the effect of FDI on economic growth in different countries and time periods, considering a wide range of variables that control for country characteristics. The less studied aspect of FDI is about sectoral patterns. This is due to the lack of consistent sectoral data. The objective of this paper was, following an extension of growth theory, to empirically evaluate the impact of FDI, broken down by sectors, on the economic growth of 12 Eastern European Countries (EEC) for the period 1999-2006. The basic motivation for this study is that the empirical literature has had difficulties in establishing the result predicted by economic theory, namely that there is a strong effect of FDI on host country growth. These Eastern European Countries have witnessed substantial increase in FDI during the period examined so it appeared interesting to verify if the FDI exercised its positive effects (spillovers) on economic growth. Applying a panel estimation method to the data set, this paper finds that FDI effects on growth are different when we consider the various sectors. In the primary sector, FDI appears to have no effect on growth in line with our hypothesis of absence of linkages that often determines an exploitation of natural resources by multinationals. In the manufacturing and in the tertiary sector, FDI has, instead, a significant and positive effect on country's economic growth because of its different potential to create forward and backward linkages and to operate through the contagion effect by means labour turnover. In other words, the evidence suggests that not all forms of FDI have the same effects on economic growth. These results are robust to the inclusion of other growth determinants, such as human capital, domestic financial development, political stability, country competitiveness. These are important findings when one considers that some countries, through special incentives, target or contemplate targeting certain types of FDI in particular sectors over others.

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## ABSTRACT

Eastern European Countries have attracted large FDI in the last decade, so, accordingly to the theoretical literature, they should receive significant gains from inward foreign direct investment in terms of economic growth. However, often it is neglected the fact that the benefits of FDI vary greatly across sectors: primary, manufacturing and services. This paper, starting from a critical review of recent studies, proposes an empirical analysis of the role of FDI, broken down by sectors, in promoting growth in 12 Eastern European Countries (EEC) for the period 1999-2006.

Keywords: Foreign Direct Investment, Economic Growth, Transition Economies.

JEL Classification: F21, O40, P27

## RIASSUNTO

*Investimenti diretti e crescita in est-Europa: un'analisi settoriale*

Nell'ultimo decennio i paesi dell'Europa dell'Est hanno attratto ingenti flussi di Investimenti Diretti per cui, in linea con un ampio filone della letteratura, significativi dovrebbero essere i benefici derivanti in termini di crescita economica. Tuttavia, spesso non si tiene in considerazione il fatto che tali benefici variano fortemente tra settori: primario, manifatturiero e terziario. Questo lavoro, partendo da una rassegna critica degli studi sul tema, propone un'analisi empirica del ruolo degli Investimenti Diretti, considerati a livello settoriale, nel promuovere la crescita in 12 paesi dell'Europa dell'Est per il periodo 1996-2006.