

FDI-Trade-Environment Linkages: Changing Flows Between EU (15), Enlarged EU and Non-European Countries

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Abstract

The aim of the paper is threefold. Identification of the determinants of the FDI outflows from the EU (12) at the industry and regional level can be counted as the first, searching the nature (more specifically substitutability/complementarity relationship) of FDI-trade linkages between the countries/regions under consideration as the second and finally, analysing the significance of environmental stringency differentials between these countries/regions on the outflow of FDI as the third aim. A panel econometric model is employed to analyse the relationships between variables and their level of significance with a given specific attention to the mining and manufacturing industries.

The empirical analysis in this paper finds some evidence to suggest that in the case of EU (12) cost related factors are not the only cause of FDI outflows but potential demand matters as well at the industry level. Similar trends are observed at the regional level. However, particular characteristics of each region should also be underlined.

The results associated with the environmental sensitivity seem to support the argument that overall environmental sensitivity significantly affects the FDI flows from the EU (12). Furthermore, substitutability relation between FDI outflows and exports is also found.

Key Words: Foreign Direct Investment, European Union, Trade and Environment, Panel Data Analysis.

JEL Codes: F21, F18, C23.

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1. Introduction

Global flows of investment, however oscillates within the last two decades, still remains as the major engine of globalisation and the most literary engaged into controversy in terms of its impacts on both home and host countries. Seldom former literature in the 1980s had shown a reasonable peak in the second half of those years and especially in the 1990s with increasing pattern in liberalisation processes of the world countries. At this point, one can properly expect that developing countries be the major recipient of direct investments. However, statistical data has shown an uneven distribution of FDI between developing countries like average outflows of \$110 billion in the previous decade with a share of approximately three fourths or more of this investment remaining within the OECD area (OECD, 1998). Underlying dynamic of this scheme was mainly due to the changing in attitudes and in policies of OECD countries towards FDI.

“A major factor was the change in attitude towards the role of the State in the economy. Along with sound macroeconomic management, structural policies were introduced to remove supply-side constraints and to boost productive capacity and stimulate economic growth. These policies involved deregulation, privatisation and de-monopolisation on an unprecedented scale, particularly in service-related activities. They brought major reforms in the financial sector, abolition of exchange controls and more integrated financial markets” (OECD 1998: 9).

Economic situations, especially possible unbalanced growth patterns and macroeconomic instability, as well as fluctuations in political arena in the OECD countries might reasonably affect the general FDI trends due to the fact of holding high-portion of the realised direct investment. For instance, four periods – in the mid 1970s, early 1980s, early 1990s and the beginning of 21st century – of sharp declines or high dullness in FDI growth within the passing three decades could easily be linked to the slowdown economic growth patterns of

OECD countries¹. As can easily be recognised from Table 1, current scheme of global FDI shows that there are some signs of hopeful recovery period in contrast to the scheme of the first three years of the 21st century, especially in terms of developing countries' positions. FDI inflows showed an increase of 2.5 per cent from 2003 to 2004, however inflows to developed countries declined by 14 per cent, developing countries experienced a 40 per cent increase within this period, and hence raised their share to a record level of 36 per cent since the late 1990s. FDI outflows in worldwide surged by 18 per cent with a rise in most developed countries other than EU. EU experienced a decline by 25 per cent that was also a record level of passing seven years.

<Insert Table 1>

OECD countries generally invest in the richest markets. Following the idea of relatively largest markets being in the OECD area, most of the outflows from OECD countries, ranging from 70 to 80 per cent of total realised values, have been directed to the other OECD countries. The United States and the United Kingdom are the major countries within OECD, and EU countries are the following ones in both outflow and inflow schemes of FDI. However, the developing world always preserves its role of being target; in reality, there are lots of factors affecting the decisions of Multinational Enterprises (MNEs) on the way of increasing their existent doubts about making higher and sustainable profits in developing countries. That is why there is an unbalanced distribution of investment flows across the countries. According to the Table 1, the region of Asia and Oceania was getting the 'Lion Share' by 63 per cent in total FDI inflows to and by 83 per cent in total outflows from all developing world, where Asian countries play a critical role in that scheme. However, only few countries can succeed to be the leading ones like China and Hong Kong, China from East Asia and Singapore from South-East Asia. Another region of Latin America and the Caribbean is the following one as the crucial region within the developing world. In that category, Brazil from South America and Mexico from Central America are the leading countries. This unbalanced scene is also similar for EU-accession countries. Poland, the Czech Republic and Hungary, for example, are the leading recipients of FDI flows. Furthermore, from EU (15) countries, Germany, the Netherlands, Austria and France have been the major investors to these countries. It is also meaningful but not surprising that in 2004, 95 per cent of the total decline in flows of FDI to EU (15) is due to the sharp fall in flows to three countries, Germany, Luxembourg and the Netherlands².

Since volume of international investment flows has been reached to unprecedented levels in the last two decades, and since there are serious disputes between theoretical foundations and empirical implications, FDI related issues, such that the interplay between trade and FDI, the trade-off between output and pollution as well as environmental regulations with their consequences should therefore be widely and critically investigated. For instance, developing countries with similar features can attract different amounts of FDI due to the fact that different types of FDI do not respond to the varied factors in the same direction and in the same magnitude. Thus, while studying on the determinants of direct investment outflow/inflow schemes of the countries under consideration, one has to recognise that focusing on total investment rather than disaggregated ones according to their entry modes and exploring the facts of the type "one, fits all" can, in some occasions, be misleading and hard to prove. Let the equity ownership type investment be under consideration, well then,

¹ For details, see Thomsen (2000).

² For details, see UNCTAD (2005).

factors like firm location, origin of the foreign partner, the duration of the joint venture agreement, the size of the joint venture, and the timing of the joint venture approval gain importance. In a similar fashion, foreign investors are more likely to prefer to do the business independently when they become more familiar about the location, which can be counted in reference to Greenfield FDI. If joint venture type investment is the case, then they become to seek a higher level of equity ownership (Chadee 2002; Pingyao 2002). Additionally, for the factors influencing the incentives of taking cross-border M&A activity, counting liberalisation of trade and investment; deregulation of services; privatisation of state-owned enterprises and relaxation of controls become worthwhile. Furthermore, cross-border M&A activities are the fastest means for firms to expand their production and markets internationally. Firms can utilize efficiency gains through synergies as well as size or diversification (Chen and Findlay 2003).

From the above perspective, the aim of the paper is threefold. Identification of the determinants of the FDI outflows from the EU (12) at the industry and regional level can be counted as the first and the main, searching the nature (more specifically substitutability/complementarity relationship) of FDI–trade linkages between the countries/regions under consideration as the second and finally, analysing the significance of environmental stringency differentials between these countries/regions on the outflow of FDI as the third aim. Therefore, current study commences with a brief literature review on the theoretical underpinnings of FDI and followed by an abstract descriptive analysis for exploring the possible determinants of the FDI outflows from the European zone. Then, a panel econometric model is employed to analyse both the determinants of FDI outflows from a sample of the European Union countries by giving a specific attention to the manufacturing industries, and the relative significance of the factors that determine FDI outflows from the EU to various regions. Finally, the last section recapitulates the main findings.

2. A Glimpse of FDI

Foreign investment can be defined as the investment outside the boundary of the investing side's home country. Foreign investments contain three subgroups: FDI, indirect foreign investments and official loans.

FDI can be classified according to the objectives that it possesses, such as *horizontal FDI*, in which serving foreign customers is the main purpose; and *vertical FDI*, in which natural resource using and/or export orientation constitute the underlying dynamics. Large and growing markets are the potentials for investors looking for opportunities to sell in where they invest. This type of investment is known as *market-seeking FDI* coinciding with the horizontal FDI. On the opposite side, *non-market seeking FDI*, where goods are produced in the host country and sold abroad can be associated with the vertical FDI. Furthermore, *production platform-seeking FDI* and *resource-seeking FDI* can also be considered within this category. Main aim of production platform-seeking FDI is to provide platform for production and sales in order to serve regional export markets. Resource-seeking FDI, however, possess distinct dynamics such as obtaining access to relatively scarce or low priced natural resources.

From the above perspective, two main categories are emerged in the FDI literature: horizontal and vertical FDI. Others are sub-groups of these two broad categories. International factor price differentials are important for vertical MNEs in order to save from

production costs. If the production process can be split into different stages, then it is in their advantage of locating their headquarters in the skilled labour-abundant parent country and performing the separated part of production process, unskilled labour-intensive production, in an unskilled labour-abundant host. More explicitly, the intermediate good production requiring skilled labour input is performed in skilled labour-abundant parent country and shipped to the unskilled labour-abundant host country in order to get the final form via using unskilled labour, which is relatively cheap in the host country. Then the final product is shipped back to the home country. This is considerably related with cost-saving phenomenon in production process. On the contrary, horizontal MNEs seek to save on trade costs by serving markets locally rather than trading. When trade costs are high, multinational firms highly favour to build production plants abroad and to carry on production both in parent and host country, each serving just that country's consumers (Hanson *et al.* 2001, Rivera-Batiz 2000; Baltagi *et al.* 2005).

FDI can also be classified according to its formation in the host country, namely its modes. Possible modes of FDI can be counted as, *Greenfield FDI*, which is defined as setting up a subsidiary completely controlled by the multinational firm; *Cross-border M&A* that is entering a foreign market by acquiring an existing enterprise such that local firm becomes a division of foreign firm; and *joint venture*, explained by any cooperation between foreign and local firm, such that constructing a platform of partial cooperation, like using jointly a production site, distribution network or developing jointly new products. Unlike the M&A case, local firm remains independent in joint venture type investment (Raff *et al.* 2005; Nocke and Yeaple 2004).

<Insert Figure 1>

Cross-border M&A can be separated into two concepts, *cross-border merger* and *cross-border acquisition*. Cross-border merger can take two forms, either *merger by absorption* or *merger by establishment*. In a cross-border acquisition, the control of assets and operations is transferred from a local to a foreign company. This type of investment can also be disaggregated into three-type structure like full acquisition (foreign interest of 100 per cent), majority acquisition (foreign interest of 50–99 per cent), and minority acquisition (foreign interest of 10–49 per cent). Acquisitions involving less than 10 per cent are classified as portfolio investment. Cross-border acquisitions can take two forms: *asset acquisitions* and *share acquisition*³.

3. Determinants of FDI Outflows from the European Zone

Developing countries in general, emerging markets and economies in transition in particular increasingly see FDI as a source of economic development and modernisation. Countries have liberalised their FDI regimes and pursued many creative policies to attract investment (Balasubramanyam 2001; OECD 2002; Christiansen 2004). But, how international investors are affected from these policies? To put differently, what are the main determinants of FDI outflows from the developed countries? This section briefly analyses recent trends in the European zone, and surveys empirical literature giving an emphasis on the experience of the European Countries.

³ For details, see Chen and Findlay (2003).

The main forces of international investors to invest in the newly accessed EU members remain the same as of the pre-accession period (UNCTAD 2004; UNCTAD 2003). Relatively high growth performance of the new EU member countries in 2004 attracts for market seeking FDI.⁴ On average, real GDP of the new EU members reached to 5.5 percent, more than twice the EU (15) average (IMF 2005).⁵

For efficiency seeking investors, low unit labour costs are particularly important in deciding the location of the investments.⁶ In 2000, wages in the then-accession countries reached one-fifth of the level of the EU (15), while in productivity there was only a one-third difference (UNCTAD 2004: 77). Additionally, as to one study (Sinn and Ochel 2003), although a smooth convergence will occur, average wages in new EU members in 2020 will still remain 60 per cent below the EU (15) average. Meanwhile, one should expect a rise in the employment rate of the EU (15) in the future.⁷

Furthermore, average corporate tax rates in the new EU member countries are approximately 30 percent lower than the EU (15) average (UNCTAD 2005: 86). Tax rate differentials clearly matter for FDI outflows (Mooij and Ederveen 2003). But, the mere comparison of the tax rates seems to be insufficient for assessing relative tax burden in each particular country. Other factors such as specific tax regimes should also be taken into consideration.

Additionally, transaction costs are declined due to the accession to the customs union, while full membership of the new countries to the EU in 2004 necessitated the adoption of EU laws that should gradually reduce risks for international investors, especially the European ones.

In fact, numerous empirical papers studying the impact of regional agreements on FDI flows generally find reasonably large and positive effects. A recent study by Clausing and Dorobantu (2005) sheds light to the impact of future membership announcements on FDI received by various Eastern European countries during the transition period. Between 1992 and 2001, FDI stocks soared in those countries from an average of 2 per cent of GDP to an average level of 40 per cent. Their regressions cover 28 host countries (both members, candidate countries and non members) over the 1992-2001 periods. EU membership substantially increases the amount of FDI received, and the most striking results relate announcements concerning negotiations on membership at various stages. The first announcement of the opening in negotiations in 1997 is associated with a doubling of FDI received, while the second announcements in 1997 about which countries would be part of the first or second wave of enlargement heavily benefited to second wave countries for which final membership was far more uncertain prior to the announcement. Therefore, deteriorations in the prospects of market access of a given country significantly change its attractiveness to foreign investors.

⁴ Market potential is indeed a key determinant of the location choice of the foreign investments (Mayer 2006; Redding and Venables 2004; Head and Mayer 2004).

⁵ For the transition economies, Campos and Konoshita (2002) identify positive and strong relation between FDI and economic growth. They suggest that while the transition economies started out far away from the technological frontier, they had a complete industrial structure and an educated workforce.

⁶ In a very recent empirical study, Braconier *et al.* (2005) find strong support that wage costs in general, and relative wage costs in particular have a stable effect on investment activities of the multinational firms in host countries.

⁷ According to the estimates of a recent study, a 20 per cent increase in the wage gap between Germany and Central and Eastern European countries would cut employment in Germany by 1 per cent (Becker *et al.* 2005).

Similarly, the study of Bevan and Estrin focusing on the determinants of FDI outflows from EU to Central and Eastern European countries (CEEC) finds that EU accession proposal have an important impact on the FDI for future member countries. Besides, as the most significant determinants of FDI flows, they underline unit labour costs, gravity factors, market size and proximity (Bevan and Estrin 2004).⁸ Along the same line, Carstensen and Toubal, empirically searching the determinants of FDI in CEEC, find that traditional determinants such as market potential, low relative unit labour costs, a skilled labour force and relative endowments have significant and plausible effects. Additionally, transition specific factors, such as the level and method of privatisation, the country risk play important roles in determining FDI flows into the CEEC and help to explain attractiveness of the individual countries to international investors (Carstensen and Toubal 2004). Similarly, in analysing location decision of the FDI flows in the transition economies, Bevan *et al.* (2004) also stress the positive relation between FDI flows and the quality of formal institutions.

Controversially, a study analysing regional effects of FDI in Central European countries like Czech Republic, Hungary, Poland and Slovakia during the 1990s points out adverse effects for economic development such as intensification of uneven development, development of a dual economy, failure to develop linkages with local and regional economies, and its contribution to regional economic instability (Pavlinek 2004).

On the other hand, access of new member countries to EU funds that basically entail for the development of physical and human resource endowments may contribute to an improvement of the business activities. Furthermore, for new EU members, FDI potentially create large positive spill-over effects on the entire economy, through various channels like imitation, transfer of technology and know-how that are embedded in human capital and linkages with local suppliers and customers (Facchini and Segnana 2003:24).⁹ In addition, the full membership of the new comers in the European Monetary Union will probably lead to declining interest rates in the coming years, which would improve financing conditions in these countries.

Despite entry into the EU and the burst of international investor interest, however, risks still exist in the new EU member countries. EU reforms are expected to develop infrastructure investments and stabilize the EU single market, but economic and social costs of adjustment are also expected to be high. Rising incomes may eliminate wage competitiveness more rapidly than it is expected. EU law will definitely add a new set of regulations and may undermine new members' relative FDI advantages in areas such as taxes, labour costs and environment. Such factors have the potential to push investors to other parts of the world outside the new EU (UNCTAD 2005: 87).

Within the European zone, however, South-East European countries (SEEC) such as Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia and Romania are generally less developed, attract less FDI and are more backward in terms of transformation than CEEC like Czech Republic, Hungary, Poland, Slovakia and Slovenia. The country of origin

⁸ In examining the determinants of FDI flows to emerging economies using a panel approach, Frenkel *et al.* (2004) indicate that market size and distance which are classical explanatory variables in the gravity model play important role in FDI flows. Additionally, extent of risk and economic growth rate in host countries are also crucial for attracting FDI projects.

⁹ According to Blomstrom and Kokko (2003), potential spill-over benefits of FDI are realized only if local firms have the ability and motivation to invest in absorbing foreign technologies and skills. Hence, the authors support learning and investment in local firms as well.

of international investors in SEEC is similar to that in CEEC. US, Germany, Netherlands, Austria and Italy are among the top investors. But, EU countries are less important investors in SEEC than in CEEC. The more attractive SEEC Bulgaria, Romania and Croatia have an about 60 per cent share, approaching to the share of CEEC. In general, a significant part of FDI comes to SEEC from outside the EU, especially from neighbouring countries like Turkey and countries within the region (OECD 2000: 4-9). In the same vein, as to Altomonte and Guagliano (2003), CEEC display a greater potential in the attraction of EU countries' FDI flows when compared to Mediterranean region. But the findings of an empirical paper contradict to some extent with the above analyses. The paper examines patterns of FDI in two regions on the periphery of Europe, namely CEEC and the countries in Southern Europe. By using gravity model equations, Buch *et al.* (2003) investigate FDI redirection from Southern Europe to the CEEC, and they compare actual and expected FDI figures. At the final analysis, they find no redirection between these two regions.

With the economic and political turmoil of the recent decades in the European Continent and the globe, flows of international investment gained importance especially for the European countries. Therefore, the determinants of FDI outflows from the European Union countries should be investigated, and the empirical analysis in the next section attempts to do so.

4. Determinants of FDI Outflows from EU (12): A Panel Data Analysis

This section starts with the coverage of the empirical analysis, proceeds with the data and methodology used in the calculations. Finally, the main findings of the analysis are evaluated.

4.1. Coverage

In this section econometric analyses were carried out in order to find the determinants of FDI outflows from the EU (12). Two different approaches were used in the empirical specification. In the first specification, the main focus was on finding the factors behind FDI outflows in mining and quarrying and total manufacturing industries from the EU (12). In the second specification, relative significance of those factors determined in the first specification on the bilateral total FDI outflows from the EU (12) to various regions¹⁰ was searched.¹¹

In the applied literature, factors behind FDI outflows/inflows, as Dunning (1981; 1988; 1993) has several times specified in his integrated approach, are classified under three groups as location advantages (market size and potential), ownership-specific advantages (factor endowments) and, internalisation advantage (incentives and disincentives to FDI). Another approach to classify these factors is to use the main purpose of FDI outflows whether to benefit from production cost advantages (vertical FDI) or from potential demand (horizontal FDI) (Helpman 1984; Markusen 1984; Brainard 1993; Markusen and Venables 2000). This approach at the same time formed the main argument to be tested in this study as such whether FDI outflows from the EU (12) is vertical or horizontal and whether this fact changes by regions.

¹⁰ OECD countries; other European countries; Latin American and Caribbean countries; Asian countries; African countries; Near and Middle Eastern countries.

¹¹ One of the main limitations regarding FDI data availability in the literature is that FDI outflows/inflows by industry and country is still not available.

A number of estimation was carried out first to determine the factors behind vertical FDI and then behind horizontal FDI. Neither of these factors was solely found to explain the variation in FDI outflows and to provide the required statistical evidence. Hence, an integrated approach using both vertical and horizontal FDI factors together in the same specification was preferred. In this integrated approach, indicators such as gross fixed capital formation, wage rate/total labour cost, long/short term interest rate, price of electricity/petroleum/energy price index were used to proxy the changes in production cost. In addition, pollution abatement and control expenditures/environmental sensitivity index was used as well to proxy the extra burden on production cost sourced by environmental regulations. Per capita income, growth rate of real GDP, growth rate of population, share prices were used to proxy the changes in potential demand. To reflect the relationship between exports and FDI, in other words to clarify the substitute/complement relationship between the exports and FDI from the EU, share of exports/imports in GDP was utilized. Hence, the implicit form of the first estimated equation that represents the FDI outflows by selected industry and expected coefficient signs are specified as in equation (1).

$$FDIGDP_{i,m} = f(GFCF_i, LC_{i,m}, STINT_i, ESI_i, EXPGDP_{i,m}, REGDPGR_i) \quad (1)$$

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- i*: each member of EU (12)¹²
m: mining & quarrying and total manufacturing
FDIGDP: foreign direct investment from EU (12) over gross domestic product
GFCF: gross fixed capital formation
LC: real labour cost to the mining & quarrying and to manufacturing industries
STINT: short-term interest rate on bank loans
ESI: environmental sensitivity index
EXPGDP: share of mining & quarrying and manufacturing exports in gross domestic product
REGDPGR: growth rate of real gross domestic product

The dependent variable, FDI outflow, is included as percentage of the relating country's gross domestic product (*FDIGDP*). The share of exports in gross domestic product, *EXPGDP*, is used to proxy the market size and potential. Depending on the substitutability (complementary) between exports and FDI outflow of the country a negative (positive) sign is expected on the estimated coefficient. Another proxy used to reflect the domestic market size is growth rate of real gross domestic product (*REGDPGR*). As *REGDPGR* increases, a rise in overall domestic demand is expected which may cause a decline in FDI outflow. So, a negative relationship between *REGDPGR* and FDI outflow is expected. In order to represent the availability of investment capital, gross fixed capital formation (*GFCF*) in the reporter country is used. It is expected that, a rise in the domestically available capital would yield a rise in FDI outflow. Therefore, a positive relationship is expected between *GFCF* and FDI outflows. The variable *ESI* reflects the measure of overall environmental sensitivity in the reporter country. A rise in the environmental sensitivity in the reporter country is expected to cause a rise in the FDI outflow from the reporter country due to the rising production costs. Therefore, a positive relationship between the outward FDI and *ESI* is expected. Here, the main motive underlying the relocation decision is related to production costs. Short-term

¹² Austria, Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Portugal, Spain, Sweden and United Kingdom.

interest rates (*STINT*) and labour cost (*LC*) are used to proxy the cost of factors of production. Therefore, a positive relationship between factor cost and FDI outflow is expected.

In the second equation, while the focus is still on determining the significance of vertical and horizontal FDI factors, determining the changing importance of these factors by regions is the other main concern. The second estimated equation that represents total FDI outflows by regions and expected coefficient signs are specified as in equation (2).

$$FDIGDP_{i,j,n} = g(REG_j, GFCF_i, LC_{i,n}, STINT_i, PPACGDP_i, EXPGDP_{i,n}, REGDPGR_i) \quad (2)$$

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- i*: reporter country (each member of EU (12))
j: partner country
n: total foreign direct investment
FDIGDP: bilateral total foreign direct investment from EU (12)¹³ over gross domestic product
REG: region (see footnote 10) intercept dummy variables
LC: real labour cost
PPACGDP: public pollution abatement cost over gross domestic product
EXPGDP: share of total exports in gross domestic product

In addition to the variables in the first equation, two new indicators are introduced in equation (2). The share of public pollution abatement and control expenditures (*PPACGDP*) in gross domestic product here replaces *ESI* in equation (1). As before, a rise in *PPACGDP* is expected to cause a rise in production cost, and therefore, a rise in FDI outflows. A positive sign is expected between *PPACGDP* and FDI outflow. Regional dummy variables are also utilized in this equation in order to differentiate between autonomous part of FDI outflow by regions.

4.2. Data and Methodology

The data were collected mainly from OECD and Eurostat database¹⁴. Fixed effect panel estimation method was employed to estimate the equations. In both equations time dimension consisted of 7 years (1997-2003) and while there were 12 countries and 2 industries (24 cross section units) in the 1st equation, there were 12 countries and 6 regions (72 cross section units) in the second equation. Therefore, the sample size was 168 and 504 respectively in the first and second estimation. The data was checked for collinearity and the results presented no possible collinear relationship between any pairs (see Tables A1 and A2 in the Appendix). Estimation results were corrected for serial correlation and heteroskedasticity as well. The diagnostics showed no obvious problems regarding the estimation outcomes.

¹³ Austria, Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Portugal, Spain, Sweden and United Kingdom.

¹⁴ *FDI*: OECD (2001; 2004). *GFCF*, *GDP*, *Total Exports*: OECD (1999; 2004a). *Exports by industry*: OECD (1999a; 2004b). *PPACGDP*: OECD ENV/OPEC/SE(2003)I <http://www.oecd.org/dataoecd/41/57/4704311.pdf>. *ESI*: WEF (2000; 2001 ; 2002 ; 2005). *LC*, *STINT*: Eurostat Database http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1090,30070682,1090_30298591&_dad=portal&_schema=PORTAL.

In the first equation, FDI outflows in mining & quarrying and manufacturing industries from the EU (12) to the rest of the world were estimated. Findings from estimation of the 1st equation are presented in Tables 2, 3 and 4. While fixed effects are given in Table 3, calculated elasticity figures are presented in Table 4. A different approach was used while estimating the bilateral total FDI outflows between the EU (12) and various regions, in equation (2). First, the fixed effect panel estimation was carried out. The outcomes are provided in Table 5. Regarding elasticity values are also given in Table 6. Then, based on factors and statistically significant regions, alternative models were constructed that included various slope dummy variables, in order to see the changing impact of explanatory variables by regions. These results are presented in a comparative way in Table 7.

4.3. Findings and Discussions

This sub-section can be further divided into two parts as FDI outflows from the EU (12) by industry and by region.

4.3.1. FDI outflows in mining & quarrying and total manufacturing industries from the EU (12)

The explanatory variables in the first equation were found to explain 79 per cent of the variation in FDI outflow from the EU (12). All the variables had *a priori* expected signs and most of the estimated coefficients indicated statistical significance at 1 per cent level, except short term interest rate which was statistically significant at 5 per cent level, and labour cost which was statistically not significant at all. Nevertheless, estimated coefficient of the labour cost had the expected sign.

<Insert Table 2>

The result related with the environmental sensitivity supports the argument that overall environmental sensitivity has a considerable impact on the FDI flows from the EU (12). The impact of the degree of environmental sensitivity on the FDI outflows in dirty industries (mining and manufacturing) is significantly positive suggesting a direct relationship between FDI outflows and the level of overall environmental sensitivity performance of the EU (12).¹⁵ It may be argued that the rise in the relative environmental sensitivity of the countries influences production structure and international competitiveness of the industries by rising production costs, and hence, decreasing production activities and increasing FDI outflows. Additionally, the positive relation between *ESI* variable and FDI outflows might also be interpreted as a sign of support for “industrial flight hypothesis”, since FDI outflows seems to increase when the level of overall environmental sensitivity performance of the countries rises. Consequently, the displacement of the investment location has been observed to obtain production cost advantages. To put differently, the rise in the sensitivity of domestic environmental standards, which adversely affects the competitive position of domestic firms,

¹⁵ A recent work of the same authors concentrating on the experience of the OECD countries also finds some empirical evidence to argue that environmental stringency has a significant impact on the FDI outflows of the OECD countries (Mihci *et al.* 2005). Similar findings can be found in the works of Co *et al.* (2004) and Kolstad and Xing (1998) in the case of US FDI outflows.

may push investments out of the national boundaries towards the countries with laxer environmental standards in the case of the EU (12).

The negative sign of the estimated coefficient for the share of mining and manufacturing exports in GDP (*EXPGDP*) may indicate that the exports and FDI outflows in these industries from the EU (12) are substitutes of each other.¹⁶ In other words, for the EU (12), exports and FDI tend to be substitutes that may be due to only slight difference in factor endowments. It may also be argued that in the case of EU (12) cost related factors are not the sole cause of FDI outflows but potential demand is important as well.

The above argument is supported by the estimated coefficient of growth rate of real GDP (*REGDPGR*). Since an increase in real growth rate proxies a rise in overall domestic demand, a shift of sources from the foreign to domestic market may be expected to meet the rising demand.

The results point out the importance of cost factors other than *ESI* as well. A rise in short-term interest rate (*STINT*) and in labour cost (*LC*) leads to an increase in FDI outflows. Putting it differently, rising production cost in the home country may push investment to foreign markets where production cost is relatively lower.

Finally, the availability of investment capital, proxied with gross fixed capital formation (*GFCF*) in the EU (12), presents a positive relationship with FDI outflows as expected. In the case of EU (12), factors related to both demand and production cost seem to be important in the investment of this accumulated capital or market destination/decision of investment.

In the empirical analysis, “constant term” is expected to stay constant over time. Therefore, fixed effects were derived in order to see whether the constant term varies by cross-section units, which are countries and industries. Estimation results presented in Table 3 indicate that the autonomous part of the FDI outflow from the EU (12) differentiates significantly by the EU member countries. Hence, it may be concluded that member countries are not homogenous and significance of explanatory factors in equation (1) does change depending on idiosyncratic factors that might have affected the dependent variable. While in Belgium, Finland, Netherlands and United Kingdom the explanatory factors may have similar effects on FDI outflows, in rest of the countries the significance of explanatory variables may differ from the above four. The divergence in constant term is also observed between mining & quarrying and total manufacturing industries as well. Therefore, the autonomous part of FDI outflow in both industries is significantly different from each other, which is due to the changing importance of explanatory factors in explaining the FDI outflow in these industries. To put differently, idiosyncratic factors peculiar to the total manufacturing industry have the potential to explain the variations in the FDI outflows of the European countries compared to the mining and quarrying industry.

<Insert Table 3>

The elasticity figures are given in Table 4. FDI outflow is found to be more sensitive to changes in *EXPGDP*, *ESI* and *GFCF* respectively and less sensitive to *REGDPGR*, *STINT* and *LC*.

¹⁶ The substitutability relation between FDI outflows and exports is also found in the empirical work of Helpman *et al.* (2003) in the experience of the US.

<Insert Table 4>

4.3.2. Total bilateral FDI outflows by region

In the second equation fixed effects regarding regions were modelled by using regional intercept dummy variables. The explanatory variables in this equation were found to explain only about 30 per cent of the variation in FDI outflow from the EU (12) to various regions. In this estimated equation, all the variables have *a priori* expected signs, which in turn show the consistency between the first and second equations. In general, estimated coefficients indicated statistical significance but share of exports in GDP and labour cost were statistically insignificant.

In four of the regions (OECD, other European, Latin American & Caribbean and Near and Middle Eastern countries) the autonomous part of FDI flow from the EU (12) to these regions were found to be different and statistically significant. Therefore, it may be concluded that these regions embody a heterogeneous structure in terms of factors attracting FDI from the EU (12). Besides regional dummy variables another difference introduced to the second equation was the variable that proxies environmental sensitivity. In this equation, share of public pollution abatement and control expenditures in GDP (*PPACGDP*) is used instead of *ESI*. However, the estimated coefficient did not have *a priori* expected sign and it was significant at 1 per cent level. Table 5 and 6 represents estimation results and calculated elasticity values respectively.

<Insert Table 5>

<Insert Table 6>

The above model later expanded by slope dummy variables in order to see the changing impact of explanatory factors by regions. The results regarding various estimated models are presented in Table 7. These models were found to explain between 28 and 46 per cent of the variation in bilateral FDI from EU (12) to various regions. The results regarding the 1st model (the one on the left of Table 7) shows that exports and FDI outflow from EU (12) to OECD, African and Asian countries are substitutes to each other and they are complementary to each other in the case of Latin American and Caribbean countries. No statistical significance was found for the relation between exports and FDI between EU (12) and other European and Near and Middle Eastern countries. In the second model (the 2nd from the left in Table 7), the growth in domestic demand (proxied with *REGDPGR*) was found to decrease FDI outflows from EU (12) to OECD, other European, African, Latin American and Caribbean countries.

The models that focus on the varying effect of production cost factors by regions (3rd, 4th and 5th models from the left in Table 7) provided interesting outcomes. The rise in labour cost (3rd model) and in short term interest rate (4th model) seem to decrease FDI outflow from EU (12) to other European and Latin American and Caribbean countries and to OECD and Near and Middle Eastern countries respectively. This may be caused by two reasons. First, the factor content of the industries that the FDI occurs is not labour intensive in the case of FDI flow to other European and Latin American and Caribbean countries and is not capital intensive in the case of FDI flow to OECD and Near and Middle Eastern countries. In other words, share of labour cost and capital cost respectively in total cost of production is lower compared to other regions. Secondly, the rise in production cost can be decreasing capital

formation in the home country that is positively related to FDI outflow. In the 5th model, except for the OECD countries, the share of pollution abatement and control expenditures in GDP observed to increase FDI outflow from the EU (12). Therefore it may be concluded that the share of *PPACGDP* in factor content of the industries that the FDI occurs between EU (12) and OECD countries is lower (or insignificant) compared to other regions.

<Insert Table 7>

Lastly, a final equation that combined the models in Table 7 was estimated and the outcomes were presented in Appendix Table A3.

5. Conclusion

The main objective of this study has been to identify the determinants of FDI outflows from the EU (12). To reach this aim, two complementary approaches are used in the empirical analysis. In the first approach, the main emphasis was on the searching for the factors behind FDI outflows from the EU (12) in certain pollution intensive industries. Second approach concentrated on the investigation of the relative significance of the factors that are determined in the first approach for the bilateral total FDI outflows from the EU (12) to various regions in the world. The use of both approaches in the model created a base to test whether FDI outflows from the EU (12) are originated from the production cost advantages or from the potential demand and whether this phenomenon changes depending on the characteristics of the various regions.

Relying on the results of the current study, it can be inferred that in the case of EU (12) cost related factors (vertical FDI) are not the only cause of FDI outflows but potential demand (horizontal FDI) matters as well.

At the industrial level, the result associated with the environmental sensitivity seems to support the argument that overall environmental sensitivity significantly affects the FDI flows from the EU (12). The impact of the degree of environmental sensitivity on the FDI outflows in dirty industries is positive suggesting a direct relationship between FDI outflows and the level of overall environmental sensitivity performance of the EU (12). Furthermore, the results underline the importance of cost factors other than environmental sensitivity as well. A rise in short-term domestic interest rate and in labour cost forces to an increase in FDI outflows. In other words, rising production cost in the home country has the potential to push investment towards foreign markets where production cost is relatively lower.

As far as potential demand factors are concerned, one should mention the substitutability relation observed between the share of mining and manufacturing exports in GDP and the FDI outflows in these industries from the EU (12). Similarly, negative relation between growth rate of real GDP and the FDI outflows could be attributed to the demand factors. But in this case, domestic demand is dominant rather than the foreign one.

Furthermore, the determinants of FDI outflows are also investigated in the case of different regions rather than the industrial level. The outcome of this further analysis shows again the importance of both cost and demand factors in the FDI outflows from the EU (12). But the impact of each determinant on the outflows differs depending on the peculiar characteristics of each region.

In conclusion, it can be argued that the current study contributed to the evidence supporting that the cost related factors are relevant alongside to the factors associated with the potential demand in identifying the determinants of FDI outflows. This statement is especially valid for the FDI outflows of the core European Union countries.

References:

- Altomonte, C. and Guagliano, C. (2003), "Comparative Study of FDI in Central and Eastern Europe and the Mediterranean", *Economic Systems*, 27: 223-246.
- Baltagi, B. H., Egger, P. and Pfaffermayr, M. (2005), *Estimating Models of Complex FDI: Are There Third Country Effects?* Center for Policy Research Working Paper: 73.
- Becker, S., Ekholm, K., Lackle, R. and Muendler, M-A. (2005), *Location Choice and Employment Decisions: A Comparison of German and Swedish Multinationals*, CEPR Discussion Paper, 4887.
- Bevan, A. and Estrin, S. (2004), "The determinants of Foreign Direct Investment into European Transition Economies", *Journal of Comparative Economics*, 32 (2): 775-787.
- Bevan, A. and Estrin, S. and Meyer, K. (2004), "Foreign Investment Location and Institutional Development in Transition Economies", *International Business Review*, 13: 43-64.
- Blomström, M. and Kokko, A. (2003), *The Economics of Foreign Direct Investment Incentives*, NBER Working Paper, 9489.
- Braconier, H., Norback, P-J. and Urban, D. (2005), "Multinational Enterprises and Wage Costs: Vertical FDI Revisited", *Journal of International Economics*, 67: 446-470.
- Brainard, S.L. (1993), *A Simple Theory of Multinational Corporations and Trade with a trade-off between Proximity and Concentration*, NBER Working Paper, 4269.
- Buch, C.M., Kokta, R.M. and Piazzola, D. (2003), "Foreign Direct Investment in Europe: Is there Redirection from the South to the East?", *Journal of Comparative Economics*, 31: 94-109.
- Campos, N.F. and Konoshita, Y. (2002), *Foreign Direct Investment as Technology Transferred: Some Panel Evidence from the Transition Economies*, CEPR Discussion Paper, 3417.
- Carstensen, K. and Toubal, F. (2004), "Foreign Direct Investment in Central and Eastern European Countries: A Dynamic Panel Analysis", *Journal of Comparative Economics*, 32: 3-22.
- Chadee, D. D., (2002), "Foreign Ownership Structure of Service Equity Joint Ventures in China" *International Journal of Service Industry Management* 13 (2): 181-201.
- Chen, C. and Findlay, C. (2003), "A Review of Cross-Border Mergers and Acquisitions in APEC", *Asian-Pacific Economic Literature*, 17 (2): 14-38.

Clausing, K. and Dorobantu, C. (2005), "Re-entering Europe: Does European Union Candidacy Boost Foreign Direct Investment?" *Economics of Transition*, 13 (1): 77-103.

Co, C.Y., List, J.A. and Qui, L.D. (2004), "Intellectual Property Rights, Environmental Regulations and Foreign Direct Investment", *Land Economics*, 80 (2): 153-173.

Dunning, J., (1993), *Multinational Enterprises and the Global Economy*, Workingham: Addison-Wesley.

Dunning, J., (1988), *Explaining International Production*, London: Unwin Hyman.

Dunning, J., (1981), *International Production and the Multinational Enterprise*, Sydney: George Allen and Unwin.

Eurostat Database, (2006), http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1090,30070682,1090_30298591&_dad=portal&_schema=PORTAL

Facchini, G. and Segnana, M.L. (2003), "Growth at the EU Periphery: the next Enlargement", *The Quarterly Review of Economics and Finance*, 43: 827-862.

Frenkel, M., Funke, K. and Stadtmann, G. (2004), "A Panel Analysis of Bilateral FDI Flows to Emerging Economies", *Economic Systems*, 28: 281-300.

Hanson, G. H., Jr. Mataloni, R. J., and Slaughter, M. J., (2001), *Expansion Strategies of U.S. Multinational Firms*, NBER Working Paper, 8433.

Head, K. and Mayer, T. (2004), "Market Potential and the Location of Japanese Firms in the European Union", *Review of Economics and Statistics*, 86 (4): 959-972.

Helpman, E. (1984), "A Simple Theory of International Trade with Multinational Corporations", *Journal of Political Economy*, 92 (3): 451-471.

Helpman, E., Melitz, M.J. and Yeaple, S.R. (2003), *Export versus FDI*, NBER Working Paper, 9439.

IMF (2005), *World Economic Outlook April 2005: Globalization and External Imbalances*, Washington D.C.

Kolstad, C. and Xing, Y. (1998), *Do Lax Environmental Regulations attract foreign Investment?* Department of Economics, US Santa Barbara, Economics Working Paper, 1078.

Markusen, J.R. (1984), "Multinationals, Multi-plant Economies and the Gains from Trade", *Journal of International Economics*, 16 (1): 205-226.

Markusen, J.R. and Venables, A. (2000), "The Theory of Endowment, Intra-industry, and Multinational Trade", *Journal of International Economics*, 52 (2): 209-234.

Mayer, T. (2006), *Policy Coherence for Development A Background Paper on Foreign Direct Investment*, OECD Development Centre, Working Paper, 253.

Mihci, H., Cagatay, S. and Koska, O. (2005), “The Impact of Environmental Stringency on the Foreign Direct Investments of the OECD Countries”, *Journal of Environmental Assessment Policy and Management*, 7 (4): 679-704.

Mooij de, R. and Ederveen, S. (2003), “Taxation and Foreign Direct Investment: A Synthesis of Empirical Research”, *International Tax and Public Finance*, 10: 673-693.

Nocke, V. and Yeaple, S., (2004), *An Assignment Theory of Foreign Direct Investment*, PIER Working Paper 05-003.

OECD (2004), *International Direct Investment Yearbook 2004*, Paris.

OECD (2004a), *Quarterly National Accounts 2004*, Paris.

OECD (2004b), *Monthly Statistics of Foreign Trade 2004*, Paris.

OECD (2003), *Pollution Abatement and Control Expenditure in OECD Countries*, ENV/OPEC/SE(2003)I, Paris.
<http://www.oecd.org/dataoecd/41/57/4704311.pdf>.

OECD (2002), *Foreign Direct Investment for Development; Maximising Benefits, Minimising Costs*, Paris: OECD Publication Services.

OECD (2001), *International Direct Investment Yearbook 2001*, Paris.

OECD (2000), *Recent Trends, Policies and Challenges in SEE Countries*, OECD Working Papers on International Investment, 2000/5, OECD Publishing.
doi:10.1787/361306126481.

OECD (1999), *Quarterly National Accounts 1999*, Paris.

OECD (1999a), *Monthly Statistics of Foreign Trade 1999*, Paris.

OECD (1998), *Survey of OECD Work on International Investment*, OECD Working Papers on International Investment, 1998/1, OECD Publishing.
doi:10.1787/506472485858

Pavlinek, P. (2004), “Regional Development Implications of Foreign Direct Investment in Central Europe”, *European Urban and Regional Studies*, 11 (1): 47-70.

Pingyao, L. (2002), “Foreign Direct Investment in China: Recent Trends and Patterns” *Special Reports, China & World Economy*, 2: 25-32.

Raff, H., Ryan, M. and Staehler, F. (2005), “*The Choice of Market Entry Mode: Greenfield Investment, M&A and Joint Ventures*” University of Otago, Economics Discussion Paper, 0513.

Redding, S. and Venables, A. (2004), “Economic Geography and International Inequality”, *Journal of International Economics*, 62 (1): 53-82.

Rivera-Batiz, F. (2000), *Foreign Direct Investment in Latin America: Current Trends and Future Prospects* Working Paper-Columbia University.

Sinn, H.W. and Ochel, W. (2003), “Social Union, Convergence and Migration”, *Journal of Common Market Studies*, 41: 869-896.

Thomsen, S. (2000), *Investment Patterns in a Longer-Term Perspective*, OECD Working Papers on International Investment, 2000/2, OECD Publishing. doi:10.1787/150177306672

UNCTAD (2005), *World Investment Report 2005: Transnational Corporations and the Internationalization of R&D*, United Nations: New York and Geneva.

UNCTAD (2004), *World Investment Report 2004: The Shift Towards Services*, United Nations: New York and Geneva.

UNCTAD (2003), *World Investment Report 2003: FDI Policies for Development: National and International Perspectives*, United Nations: New York and Geneva.

World Economic Forum (2000), *2000 Environmental Sustainability Index*, Geneva.

World Economic Forum (2001), *2001 Environmental Sustainability Index*, Geneva.

World Economic Forum (2002), *2002 Environmental Sustainability Index*, Geneva.

World Economic Forum (2005), *2003 Environmental Sustainability Index*, Geneva.

Table 1: FDI flows, by region and economy, 2002-2004
(Millions of dollars)

Region/economy	FDI inflows			FDI outflows		
	2002	2003	2004	2002	2003	2004
World	716128	632599	648146	652181	616923	730257
Developed economies	547778	442157	380022	599895	577323	637360
<i>Europe</i>	427560	359369	223400	396868	390021	309498
European Union	420433	338678	216440	384549	372400	279830
Other developed Europe	7127	20691	6961	12319	17621	29668
<i>North America</i>	92838	63183	102152	161704	140859	276747
Other developed countries	27379	19604	54469	41323	46443	51115
Developing economies	155528	166337	233227	47775	29016	83190
<i>Africa</i>	12994	18005	18090	427	1215	2824
North Africa	3872	5262	5270	22	115	514
Other Africa	9122	12743	12821	404	1100	2310
West Africa	2928	3117	3562	649	274	325
Central Africa	3212	6346	6122	9	-32	35
East Africa	1521	2013	2098	108	74	87
Southern Africa	1460	1267	1038	-362	783	1863
<i>Latin America and the Caribbean</i>	50492	46908	67526	11351	10562	10943
South and Central America	45359	37906	57437	7040	9887	14381
South America	28463	24357	37872	4099	5246	10587
Central America	16896	13548	19565	2940	4641	3794
Caribbean and other America	5133	9002	10089	4311	675	-3438
<i>Asia and Oceania</i>	92042	101424	147611	35998	17239	69423
Asia	92009	101278	147545	35994	17231	69422
West Asia	5691	6522	9840	910	-3954	-6
South, East and South-East Asia	86318	94755	137705	35083	21186	69429
East Asia	67282	72060	105037	27555	14442	53521
South Asia	4528	5331	7005	1149	962	2288
South-East Asia	14507	17364	25662	6379	5781	13620
Oceania	33	146	67	5	8	1
South-East Europe and the CIS	12821	24106	34897	4511	10584	9707
South-East Europe	3790	8365	10778	589	140	158
CIS	9032	15741	24119	3921	10443	9549

Source: Data compiled from UNCTAD, 2005.

Figure 1: Entry Modes into Host Country

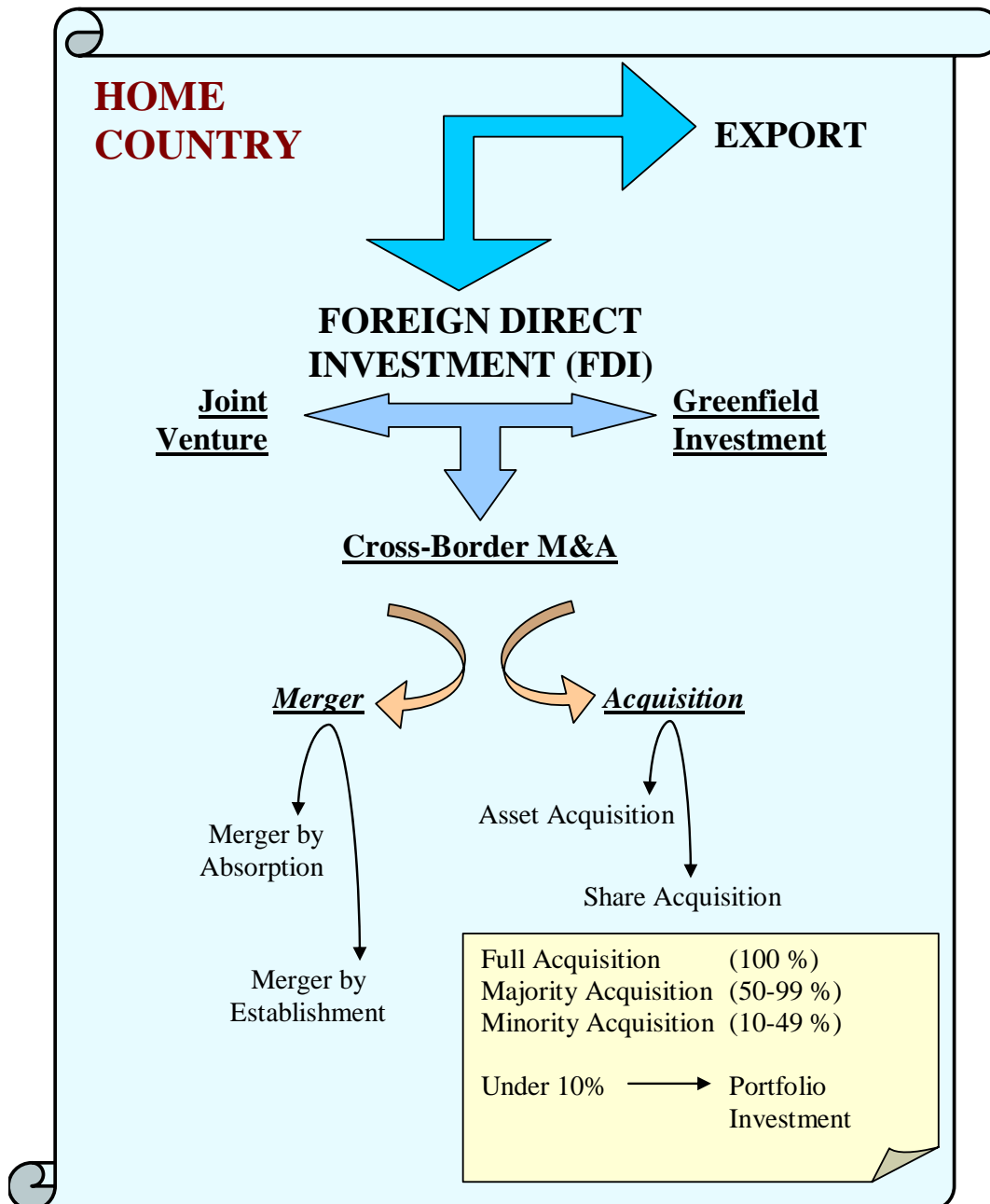


Table 2: Estimation Results-FDI Outflow by Industry

Sample: 1997 2003				
Total panel (unbalanced) observations: 148				
Dependent Variable: FDIGDP				
Estimation results				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GFCF	0.01	0.00	7.32	0.00
EXPGDP	-1.52	0.65	-2.35	0.02
REGDPGR	-0.02	0.00	-5.87	0.00
STINT	0.05	0.03	1.91	0.06
LC	0.005	0.01	0.71	0.48
ESI	0.01	0.00	3.54	0.00
C	-0.79	1.13	-0.70	0.49
Diagnostics				
R-squared	0.83	Durbin-Watson statistic		2.11
Adjusted R-squared	0.79			
S.E. of regression	0.86			
F-statistic	20.09			
Prob(F-statistic)	0.00			

Table 3: Estimation Results-FDI Outflow by Industry: Fixed Effects

Country based effects		Industry based effects	
Austria	-1.48	Mining and Quarrying	-17.80
Belgium	3.26		
Denmark	-1.27		
Finland	3.06	Total Manufacturing	17.27
France	-1.47		
Germany	-1.20		
Italy	-1.32		
Netherlands	3.37		
Portugal	-2.05		
Spain	-1.08		
Sweden	-0.47		
United Kingdom	0.12		

Table 4: Estimation Results-FDI Outflow by Industry: Elasticity

Variables	Value
GFCF	1.25
EXPGDP	-1.40
REGDPGR	-0.08
STINT	0.39
LC	0.65
ESI	1.28

Table 5: Estimation Results-Total FDI Outflow by Regions

Sample: 1997 2003				
Total panel (unbalanced) observations: 444				
Dependent Variable: FDIGDP				
Estimation results				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
OECD1D	5.17	1.13	4.58	0.00
OTEU1D	0.03	0.02	1.68	0.09
LACA1D	0.11	0.04	2.42	0.02
NMEA1D	-0.09	0.03	-3.42	0.00
EXPGDP	-0.003	0.00	-0.96	0.34
GFCF	0.001	0.00	1.93	0.05
REGDPGR	-0.01	0.00	-4.47	0.00
LC	0.003	0.01	0.54	0.59
STINT	0.05	0.03	1.82	0.07
PPACGDP	-0.10	0.04	-2.59	0.01
C	-0.25	0.59	-0.43	0.67
Diagnostics				
R-squared	0.30			
Adjusted R-squared	0.29			
S.E. of regression	2.87			
F-statistic	18.81			
Prob(F-statistic)	0.00			

Table 6: Estimation Results-Total FDI Outflow by Region: Elasticity

Variables	Value
EXPGDP	-0.24
GFCF	0.12
REGDPGR	-0.02
LC	0.22
STINT	0.26
PPACGDP	-0.06

Table 7: Further Estimation Results-Total FDI Outflow by Regions

Sample: 1997 2003														
Total panel (unbalanced) observations: 444														
Dependent Variable: FDIGDP														
Estimation results														
Variable	Coefficient	t-Statistic	Variable	Coefficient	t-Statistic	Variable	Coefficient	t-Statistic	Variable	Coefficient	t-Statistic	Variable	Coefficient	t-Statistic
OECD1D	20.72	2.89	OECD1D	5.86	10.01	OECD1D	5.16	4.56	OECD1D	7.46	5.21	OECD1D	7.63	4.63
OTEU1D	-0.27	-1.54	OTEU1D	0.01	1.21	OTEU1D	0.86	1.88	OTEU1D	0.02	1.22	OTEU1D	-0.01	-0.13
LACA1D	-0.97	-2.20	LACA1D	0.06	2.38	LACA1D	2.30	2.95	LACA1D	0.11	2.40	LACA1D	0.23	2.22
NMEA1D	-0.38	-2.13	NMEA1D	-0.07	-5.88	NMEA1D	-0.09	-3.41	NMEA1D	0.21	1.47	NMEA1D	-0.14	-3.29
EXPGDP1	-0.16	-2.19	EXPGDP	-0.002	-1.88	EXPGDP	-0.002	-0.71	EXPGDP	-0.003	-1.41	EXPGDP	-0.002	-0.84
EXPGDP3	-0.003	-1.88	GFCF	0.000	1.00	GFCF	0.001	1.79	GFCF	0.001	1.84	GFCF	0.001	1.73
EXPGDP4	0.01	1.59	REGDPGR1	-0.47	-4.50	REGDPGR	-0.01	-4.26	REGDPGR	-0.01	-5.25	REGDPGR	-0.01	-5.36
EXPGDP6	-0.003	-1.61	REGDPGR2	-0.01	-1.48	LC	0.01	1.99	LC	0.002	0.46	LC	0.002	0.37
GFCF	0.002	2.07	REGDPGR3	-0.004	-1.53	LC2	-0.01	-1.83	STINT	0.06	1.81	STINT	0.05	1.69
REGDPGR	-0.01	-5.88	REGDPGR4	-0.004	-1.28	LC4	-0.02	-2.82	STINT1	-0.45	-1.45	PPACGDP	-3.08	-3.56
LC	0.002	0.42	LC	0.001	0.52	STINT	0.05	1.85	STINT5	-0.05	-1.87	PPACGDP2	3.08	3.60
STINT	0.05	1.91	STINT	0.03	2.01	PPACGDP	-0.10	-2.56	PPACGDP	-0.09	-2.48	PPACGDP5	3.08	3.45
PPACGDP	-0.10	-2.52	PPACGDP	-0.08	-3.01	C	-0.89	-1.47	C	-0.13	-0.26	PPACGDP6	3.02	3.40
C	-0.19	-0.31	C	-0.03	-0.08							PPACGDP3	3.02	3.38
												PPACGDP4	2.87	3.42
												C	-0.20	-0.34
Diagnostics														
R-squared	0.29		R-squared	0.47		R-squared	0.31		R-squared	0.30		R-squared	0.33	
Adj.R-squared	0.27		Adj.R-squared	0.46		Adj.R-squared	0.29		Adj.R-squared	0.28		Adj.R-squared	0.30	
S.E. of reg.	2.87		S.E. of reg.	2.90		S.E. of reg.	2.88		S.E. of reg.	2.78		S.E. of reg.	2.88	
F-statistic	13.62		F-statistic	29.84		F-statistic	15.91		F-statistic	15.36		F-statistic	13.87	
Prob(F-statistic)	0.00		Prob(F-statistic)	0.00		Prob(F-statistic)	0.00		Prob(F-statistic)	0.00		Prob(F-statistic)	0.00	

Appendix

Table A1: Correlation Matrix-FDI Outflow by Industry

	FDIGDP	EXPGDP	REGDPGR	STINT	LC	ESI
FDIGDP	1.00	0.31	-0.13	-0.17	-0.10	0.24
EXPGDP	0.31	1.00	-0.03	0.11	0.05	-0.14
REGDPGR	-0.13	-0.03	1.00	-0.13	0.20	-0.30
STINT	-0.17	0.11	-0.13	1.00	-0.14	-0.12
LC	-0.10	0.05	0.20	-0.14	1.00	-0.51
ESI	0.24	-0.14	-0.30	-0.12	-0.51	1.00

Table A2: Correlation Matrix-Total FDI Outflow by Region

	FDIGDP	OECD1D	OTEU1D	NMEA1D	LACA1D	GFCF	EXPGDP	REGDPGR	LC	STINT	PPACGDP
FDIGDP	1.000	0.445	-0.090	-0.101	-0.067	0.011	-0.031	-0.121	0.018	0.053	-0.047
OECD1D	0.445	1.000	-0.200	-0.200	-0.200	0.000	0.000	0.000	0.000	0.000	0.000
OTEU1D	-0.090	-0.200	1.000	-0.200	-0.200	0.000	0.000	0.000	0.000	0.000	0.000
NMEA1D	-0.101	-0.200	-0.200	1.000	-0.200	0.000	0.000	0.000	0.000	0.000	0.000
LACA1D	-0.067	-0.200	-0.200	-0.200	1.000	0.000	0.000	0.000	0.000	0.000	0.000
GFCF	0.011	0.000	0.000	0.000	0.000	1.000	0.034	0.092	0.273	-0.224	-0.028
EXPGDP	-0.031	0.000	0.000	0.000	0.000	0.034	1.000	0.189	-0.023	0.307	0.193
REGDPGR	-0.121	0.000	0.000	0.000	0.000	0.092	0.189	1.000	0.168	-0.133	0.011
LC	0.018	0.000	0.000	0.000	0.000	0.273	-0.023	0.168	1.000	-0.236	-0.077
STINT	0.053	0.000	0.000	0.000	0.000	-0.224	0.307	-0.133	-0.236	1.000	0.165
PPACGDP	-0.047	0.000	0.000	0.000	0.000	-0.028	0.193	0.011	-0.077	0.165	1.000

Table A3: Combined Estimation Results-Total FDI Outflow by Regions

Sample: 1997 2003		
Total panel (unbalanced) observations: 444		
Dependent Variable: FDIGDP		
Estimation results		
Variable	Coefficient	t-Statistic
EXPGDP1	0.12	7.37
EXPGDP3	-0.001	-3.30
EXPGDP4	0.01	1.98
EXPGDP6	-0.001	-2.70
REGDPGR1	-0.58	-6.70
REGDPGR2	-0.003	-2.25
REGDPGR3	0.000	-1.01
REGDPGR4	-0.01	-3.23
LC	0.003	1.64
LC2	-0.001	-3.43
LC4	-0.01	-1.44
STINT	0.01	3.16
STINT1	-0.77	-3.88
STINT5	-0.02	-4.01
PPACGDP	-1.86	-2.20
PPACGDP2	1.94	2.28
PPACGDP3	1.85	2.18
PPACGDP4	1.67	1.94
PPACGDP5	1.86	2.20
PPACGDP6	1.85	2.19
C	-0.22	-1.22
Diagnostics		
R-squared	0.54	
Adj.R-squared	0.52	
S.E. of reg.	3.07	
F-statistic	24.71	
Prob(F-statistic)	0.00	