Determinants of FDI in transition countries and estimation of the potential level of Croatian FDI

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Article**
JEL: F21, F23
doi: 10.3326/fintp.37.3.1

* This paper is a part of the research project No. 055-0551207-0776, financed through the Croatian Ministry of Science, Education and Sports. The author would like to thank three anonymous referees for their useful comments and suggestions.
** Received: December 20, 2012
Accepted: January 26, 2013

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FINANCIAL THEORY AND PRACTICE
37 (3) 227-258 (2013)

Abstract

In a global economy, foreign direct investment (FDI) represents the main form of international business activities. More than the mere cross-border movement of capital, FDI includes transfer of technology and know-how, thus contributing to competitiveness, employment and trade, and consequently, economic growth and the development of the local economy. The recent drop in international capital flows resulting from global financial and economic crisis has caused concerns regarding growth prospects for the world economy in general and that of less advanced transition countries in particular. By hypothesizing that Croatia, as the next member of the EU, has realized sub-optimal effects in attracting FDI, and that international competition in this field is expected to grow further, the aim of the paper is to find out determining factors behind inward FDI to transition countries, in order to detect the capacities of Croatia in hosting new foreign investment. Statistical analysis, focusing on bilateral FDI-flows and country-specific characteristics, proved the importance of typical "gravity"-type variables, as well as those based on increasing returns to scale, while showing that at present Croatia has exhausted its potentials in hosting new FDI.

Keywords: FDI, gravity equation, economies of scale, transition economies, Croatia

1 INTRODUCTION

In the global economy dominated by multinational enterprises (MNEs), foreign investment represents the main form of international business activities. As a non-debt form of financing economic growth, FDI brings capital, technology and know-how, thus contributing to a local economy's productivity and development. The resulting improvements in competitiveness contribute further to increasing internationalization and easier access to foreign markets.

However, the global financial crisis (2008/2009) has considerably reduced international capital flows and has almost halved FDI worldwide, with the most pronounced fall throughout developed countries, including the EU (by 40-60%), followed by a slight improvement in 2011 (16%). The main risk for further positive developments still comes from the unstable business environment and problems of global economic governance in light of the sovereign debt crisis and financial sector problems (euro-zone). As it is, the pressure for further internationalization compels MNEs to business restructuring, which recently helped them to improve their business performance and, hence generate new investments on a global scale (UNCTAD, 2012; 2011).

The different motives for FDI call for specific location advantages of recipient countries (Dunning, 1993; 1997). Resource-seeking FDIs look for valuable resources which can justify relocation of production to another country. This type of FDI is nowadays increasing in value and in number of projects, as it is mostly

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concerned with investments into oil processing, and agriculture and food production (UNCTAD, 2010). Meanwhile, market-seeking FDIs are primarily aimed at achieving a stable and growing market share through entering new markets, sometimes even with the purpose of avoiding trade barriers (more in: Bergstrand and Egger, 2007; Clausing and Dorobantu, 2005; Girma, Greenaway and Wackelin, 2002). Investments of this type are primarily focused on supplying local or neighboring markets, creating backward- and forward-linkages, or merely adjusting products and services to local tastes and consumer preferences (Leffileur and Maurel, 2010; Borrmann, Jungnickel and Keller, 2005). The main location advantage for this type of FDI is access to a large market with solid growth prospects and a favorable investment climate.

The main objective of efficiency-seeking FDI is improvement in production efficiency through differentiation and geographical separation of the stages of production, or individual business activities, according to the local comparative advantage of the host economies. Creation of such an international value chain makes it possible for a large number of companies from different countries to take part in business internationalization and come into possession of new technologies and know-how. This also enables less developed (transition) countries to take part in international production and achieve competitiveness in narrow market niches, as long as they foster an open market policy with solid absorption capacities in terms of human capital and knowledge creation[1]. However, local market conditions should also include human capital as the main factor for attracting FDI in the long run (Wang and Swain, 1995; Barell and Paine, 1999). Technological advance, internalization of MNE ownership advantages and market deregulation nowadays put strong emphasis on knowledge creation, thus destining low wage countries to attracting labor-intensive production of standard technology and stagnant market demand. Finally, strategic assets-seeking FDIs are focused on increasing and diversifying MNEs' own assets, also including strategic positioning on monopoly or oligopoly markets. Companies with this motive usually have a longer time horizon and are engaged in large privatization projects (e.g. Eastern Europe during the 1990s).

The significant inflow of FDI that Croatia realised throughout the 1990s and in the first decade of the new millennium failed to exert any significant positive effects on the local economy (Derado, Škudar and Rakušić, 2011; Vukšić, 2005; Bačić, Račić and Ahec Šonje, 2004). Regarding the current global economic turmoil, which was reflected in the amount and structure of FDI worldwide, as well as the only slow improvement in business climate throughout South East Europe, it is reasonable to expect a downward pressure on dynamics of FDI-inflow in Croatia and other South East European countries (SEEC) in the future. By hypothesizing that Croatia has realized sub-optimal effects in attracting FDI, and that competition

[1] Institutional conditions play important role in achieving technology transfer and improving local economy's absorption capacity (more in: Barrios and Strobl, 2002; Braunerhjelm and Svensson, 1996; Te Velde, 2001).

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in this field is expected to grow further (East Asia, new EU-members), the aim of the paper is to reveal determining factors behind total inward FDI to transition countries in order to find out the capacities of Croatia in hosting new FDI. Analysis will, thus, indicate the most important determinants of FDI, and empirically verify the underlying theoretical hypotheses.

The relevance of the topic arises from the fact that the model of economic growth based on increasing domestic demand financed through foreign credits is no longer sustainable due to the worsening external position of the analyzed countries and fiscal and financial problems of the main investor countries. Complexity of theoretical and empirical analysis in this paper comes from the combination of two models – gravity equation, and increasing returns to scale – in explaining inward FDI. Analysis at a lower level of data aggregation (bilateral FDI-flows for country pairs), longer time series and a large group of transition countries as a benchmark for the SEEC, as well as calculation of potential, also known as "theoretically expected" level of FDI, are the main characteristics of this approach which, to the best of author's knowledge, includes Croatia for the first time. The relevancy of this paper from the economic policy perspective lies in its contribution to a better understanding of the factors behind bilateral inward FDI and the limits to its further growth in Croatia.

The paper consists of five sections. After the introduction, section two gives the theoretical background of FDI with reference to relative factor endowment, increasing returns to scale and MNE cross-border operations. Section three includes an overview of the amount and composition of FDI in Croatia and other transition countries, including the SEEC. Empirical analysis of the main determinants and expected levels of inward FDI to Croatia are presented and discussed in section four. The final section concludes.

2 BRIDGING THE GAP TOWARDS THE THEORY OF FDI

2.1 FROM TRADE THEORY TO VERTICAL FDI: THE WORK OF HELPMAN AND KRUGMAN

Early papers used to explain capital flows (primarily portfolio investment) as pure interest rate arbitrage, while later contributions, based on the neoclassical paradigm, viewed them as an outcome of international differences in marginal revenues (Frenkel, Funke and Stadtmann, 2004; Hosseini, 2005). However, the first significant contribution to understanding FDI as an outcome of the MNE business activities was provided by Helpman (1984). His analytical model with labor and headquarters services as the main production factors included two products – a homogeneous (labor-intensive), produced with constant returns to scale, and a differentiated, intensive in headquarters services and produced with increasing returns to scale. By assuming the differences in the relative abundance of production factors across countries and without trade barriers, the pattern of trade is determined by differences in relative factor endowment and relative country size.

Further refinements of this approach can be found in Helpman and Krugman (1986) where inferences of new trade theory are applied onto MNEs in a more straightforward manner. Apart from intra- and inter-industry trade, and with standard model assumptions and cross-country differences in relative factor endowment, the model introduces intra-firm trade in knowledge-intensive headquarters services[2]. By combining the principle of factor proportions with product differentiation and scale economies, this model explains FDI as a form of vertical business integration which occurs as an outcome of the differences in relative factor endowment between countries[3].

2.2 BRAINARD'S "PROXIMITY-CONCENTRATION TRADE OFF" AND HORIZONTAL FDI

Contrary to factor proportions, Brainard's approach assumes identical relative factor endowment across countries which, through multinational business activities, results in horizontal FDI. Here, two sectors are assumed – one with homogeneous goods produced under constant returns to scale, and the other with differentiated products and increasing returns to scale at firm level. Together with identical consumer preferences across countries, the model further supposes scale economies at plant level, existence of trade barriers and transport costs, and monopolistic competition of the Chamberlin type in a differentiated goods sector (Brainard, 1993). Due to the presence of transport and transaction costs on one hand, and scale economies on the other, the main reason for locating MNE affiliates abroad is to be found in a trade-off between the additional cost of exporting and the extra cost of starting production abroad. If the variable cost of exporting is higher, compared to operating business abroad (and closer to target market), horizontal FDI will increase.

This model results in three types of equilibrium – pure multinational, pure trade and mixed equilibrium. In a pure multinational equilibrium, due to high trade and transport costs and relatively small fixed costs of setting up production plant abroad, multinational production will dominate and completely replace trade in final goods with the sole exception of trade in "invisible" headquarters services (for further details see: Brainard, 1997).

2.3 MARKUSEN'S INTEGRATED TREATMENT OF HORIZONTAL AND VERTICAL FDI

Based on industrial organization approach, Markusen set multinational activities within the general equilibrium trade model and provided an explanation of horizontal and vertical MNE-activities. The "knowledge-capital model" consists of two countries, two homogeneous goods and two production factors (skilled and

[2] Model assumptions include: two production factors, two final goods (homogeneous – food; differentiated – industrial good) and one intermediary good (headquarters services), no transport and transaction costs, no trade barriers, and no differences in tax systems (Helpman and Krugman, 1986).

[3] Helpman (2006) improved this analysis by assuming within-industry heterogeneity in terms of different productivity levels and organizational forms among firms of the same industry.

unskilled labor). The unskilled-labor intensive product is produced under constant returns and perfect competition, while the skilled-labor intensive one is produced with increasing returns to scale under monopolistic competition, or oligopoly of the Cournot type. The skilled-labor intensive product uses headquarters services (Markusen and Maskus, 1999). It is further assumed that business activities can be differentiated geographically allowing each firm to have plants abroad. The model also hypothesizes the existence of transport costs and segmented national markets, with immobile production factors between countries (Markusen and Maskus, 2002; Carr, Markusen and Maskus, 1998).

The model assumes firm-level and plant-level scale economies, as well as the possibility of geographical separation of headquarters services and plant-level production, according to their factor intensities and the relative factor endowment of countries. If fixed costs at the firm level are high enough to make firm-level scale economies greater relative to those at plant-level, then MNE emerges through affiliate production abroad and supply of headquarters services from the MNE home country (Carr et al., 1998). Skilled-labor intensive headquarters services, which are central to the "knowledge-capital model", are assumed to be easily separated from production, transferred to dislocated production, and shared among different production plants (Markusen, 2002). Vertical or horizontal MNEs give rise, through the nature of their cross-border business activities, to vertical or horizontal FDI. Vertical FDI are seen as an outcome of the geographical separation of business activities by stages of business process, while horizontal FDI introduce expansion of the same production across countries. The simultaneous explanation of both types of FDI, that is, the greatest advantage of the knowledge-capital model is possible owing to the coexistence of trade costs and differences in factor intensity in the same model.

Country and industry characteristics have a significant impact on the nature of MNE activities and type of FDI. Horizontal FDI will arise when there is similarity in market size and relative factor endowment (factor costs) between FDI-home and -host country, and when the transport costs are high (Markusen and Venables, 1998). Vertical FDI occurs when countries are of a different size and with production facilities located in a country with a large domestic market that makes it possible to achieve plant-level economies of scale; headquarters services are performed by a country relatively endowed with skilled labor. An improvement of this model is offered by Bergstrand and Egger (2007), who demonstrated a complementarity between FDI and trade even between identical countries, and found out that trade, FDI and foreign affiliate sales can increase (on aggregate level) as GDP-size and -similarity between countries grow[4].

[4] Based on a similar model Baltagi, Egger and Pfaffermayr (2007) found out four types of FDI which, besides horizontal and vertical FDI, also include export-platform FDI and complex-vertical FDI.

3 FDI IN CROATIA AND OTHER EUROPEAN TRANSITION COUNTRIES

3.1 THE GLOBAL CRISIS AND ITS IMPACT ON SOUTH EAST EUROPE

The financial and economic crisis has made a huge negative impact on international capital flows and FDI in particular. Global FDI has fallen by approximately 50% in only two years and settled slightly above USD 1.1 bn by the end of 2009. The most pronounced impact of the crisis can be observed among developed countries, which experienced a 60% decrease, whereas developing countries have experienced a relatively modest reduction in FDI of approximately 15-20%. Meanwhile, the SEEC registered a decrease in inward FDI by approximately 40% with recovery still not on its way, since FDI-inflows have reached USD 4.1 bn in 2010, thus making a total fall of almost 70%. This negative dynamics is mostly determined by predominant motives of foreign investors in the region. Foreign investments in the SEEC are still mostly tied to privatization projects and realized through M&A, which are sensitive to business cycles and, therefore volatile in the medium term. Current problems on the international financial markets and fragile investment prospects contribute further to weak business outlook for the region, thus putting new investment plans on hold.

FDI-flows in the SEEC peaked in 2007, but as the crisis developed and investment flows decreased, the countries realized a lower share of inward FDI in national gross fixed capital formation. However, total inward FDI stock has considerably increased, reaching USD 76 bn in 2010, Croatia being the most prominent recipient of FDI in the region (45%). Investment slowdown in the SEEC can be seen from the decreasing number and value of investment projects (both M&A and greenfield), followed by just a slight recovery in 2010 (table 1).

TABLE 1

*Various indicators of FDI in the SEEC**

Indicator	2005	2006	2007	2008	2009	2010
Inflow (USD mn)	4,877	9,875	12,837	12,601	7,824	4,125
Outflow (USD mn)	273	395	1,448	1,896	1,371	52
Inward stock (USD mn)	26,913	46,951	74,036	67,320	77,299	76,414
Outward stock (USD mn)	2,139	2,545	4,200	9,644	11,170	8,775
Inflow (% of gross fixed capital formation)	15.5	24.3	33	27.4	21.8	13
Outflow (% of gross fixed capital formation)	1.4	1.3	1.3	4.1	3.8	0.2
Inward stock (% of GDP)	29.8	46.3	62.7	39.7	50.6	52
Outward stock (% of GDP)	3.1	3.2	4.3	5.7	7.3	6
Value of cross-border M&A sales (USD mn)	955	3,942	2,192	767	529	266
Number of cross-border M&A sales projects	30	39	73	46	17	18
Number of FDI greenfield projects	148	140	156	231	136	175

** Albania, Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, Serbia.*

Source: UNCTAD, 2011.

3.2 DYNAMICS AND STRUCTURE OF INWARD FDI IN EASTERN EUROPE

Dynamic inflows of FDI marked the period of mature transition in Eastern Europe. The highest annual inflow has been realized by the advanced transition countries like Poland, the Czech Republic and Hungary which also stand out in 2010, according to their FDI stock. Meanwhile, the SEEC have realized much weaker inflows, mainly due to a sluggish economic liberalization and institutional reforms, as well as the slow association process with the EU. Among those, only Croatia and Serbia have realized a higher annual inflow (table 2).

TABLE 2

Various indicators of FDI in the European transition countries (USD mn)

Country	FDI-inflow						FDI-stock
	1990-2005 (cumulative inflow)	2006	2007	2008	2009	2010	2010
Czech Republic	56,297	5,463	10,444	6,451	2,927	6,781	129,893
Hungary	50,111	6,818	3,951	7,384	2,045	2,377	91,933
Poland	78,477	19,603	23,561	14,839	13,698	9,681	193,141
Slovakia	20,303	4,693	3,581	4,687	-50	526	50,687
Slovenia	5,237	644	1,514	1,947	-582	834	15,022
Bulgaria	14,451	7,805	12,389	9,855	3,351	2,170	47,971
Romania	23,977	11,367	9,921	13,910	4,847	3,573	70,012
Croatia	12,198	3,743	5,035	6,179	2,911	583	34,374
Albania	1,709	325	656	988	979	1,097	4,355
Bosnia & Herzegovina	2,472	766	2,080	932	246	63	7,152
Macedonia	1,642	433	693	586	201	293	4,493
Serbia	5,687	4,256	3,439	2,955	1,959	1,329	20,584
Montenegro	688	622	934	960	1,527	760	5,459

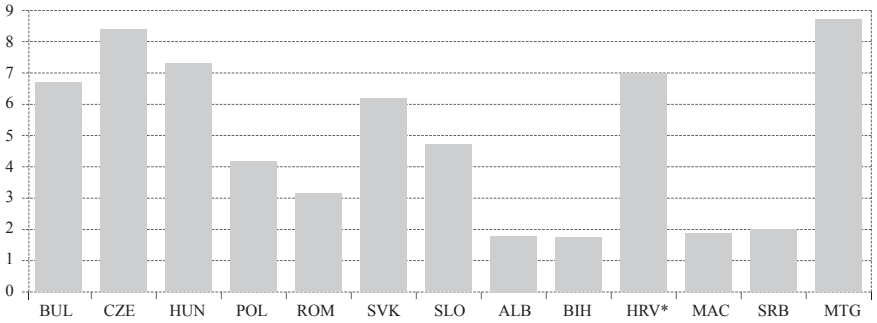
Source: UNCTAD, 2011.

Recently, FDI inflows have accounted for less than 25% of national gross fixed capital formation in the analyzed countries, although in some of them this indicator goes up to 30% (Albania) or even 130% (Montenegro). However, the crisis has considerably reduced reliance on this form of external financing, since in some countries this share is considerably below the EU-average (9.7%), or that of developed countries in general (8.4%).

Despite the increasing outward investment of countries like Hungary and Slovenia, transition countries generally remain net recipients of FDI. Indicator of cumulative per capita net FDI-inflow reveals a more accurate picture as to the success of individual countries in attracting foreign capital. In this respect the highest inflow is realized by the most successful transition countries, but also by Bulgaria, Croatia and, recently, Montenegro (figure 1).

Figure 1

Cumulative net inflows of FDI per capita in the European transition countries (in thousands USD), 1990-2010



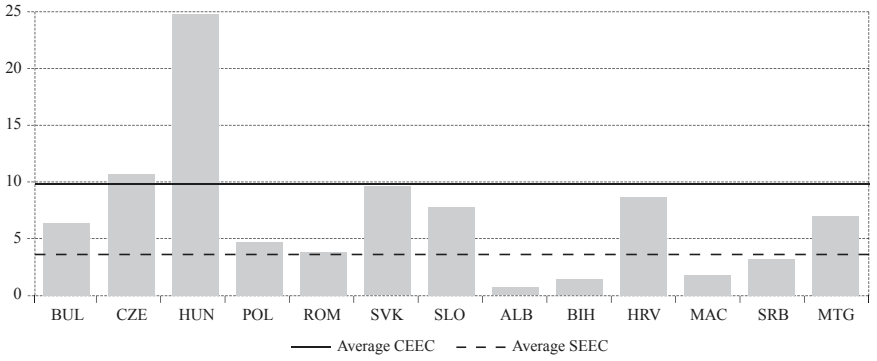
** HRV stands for Croatia (Hrvatska) throughout the paper.*

Source: UNCTAD, 2011; IMF, 2011.

While indicators of FDI inflow point to the amount and dynamics of incoming investment, FDI-stock reveals, however, real effectiveness of the realized investments[5]. Figure 2 shows that in Central Europe hardly any country compares to the Czech Republic in terms of the realized FDI stock *per capita*, followed by Slovakia and Hungary. In South East Europe Croatia and Montenegro exceed the average of the advanced transition countries. The remaining SEEC realize significantly lower values of this indicator.

Figure 2

FDI stock per capita in the European transition countries (in thousands USD), 2010



Source: UNCTAD, 2011; IMF, 2011.

[5] Unlike cumulative FDI inflow which merely represents a sum of incoming FDI, FDI stock is calculated on the basis of actual stock market value of the acquired company share, exchange rate fluctuations and the principle of adding together of individually acquired company shares, which together, might go beyond the 10% threshold.

Following the solid growth during the second half of the 1990s, foreign investment in Croatia has gone through a steady period marked by annual inflows of approximately USD 1 bn. After 2005, Croatian inward FDI rose substantially and peaked in 2008 at slightly more than USD 4 bn. As a consequence of the economic crisis, FDI was halved in 2009, leading to a steep fall to USD 400 mn in 2010 and just a modest recovery to approximately USD 1.5 bn in 2011 (CNB, 2012).

As far as the form of inward FDI is concerned, in the majority of the analyzed countries, including Croatia, equity capital dominates, whereas larger shares of reinvested earnings can be found only in the Czech Republic, Estonia, Lithuania and Slovakia. According to the structure of inward FDI-stock by economic activities, there are differences between the new EU members and the countries from South East Europe. The new EU members have realized about one third of inward FDI in manufacturing, followed by real estate, financial intermediation and trade. Among the SEEC the largest share of FDI in manufacturing was realized in Bosnia and Herzegovina and Macedonia (30%) which compares well with the figures of the advanced transition countries, while the Croatian share of manufacturing FDI amounts to 25.8%. By the beginning of 2012 Croatia had received most of its FDI in services (68.4%) with financial intermediation (33.9%) and trade (13.7%) leading the way, followed by investment in real estate (10.1%), transport, storage and communication (8.6%) and tourism (2.1%). As expected, investments in the SEEC went mostly to activities on a lower scale of value added like food processing, basic metals, non-metallic mineral products, and in some cases oil processing. Meanwhile, the advanced transition countries received FDI in production of transport equipment, electrical and optical instruments, and machinery and equipment. Regarding the sector composition of inward FDI, Croatia closely resembles the SEEC group with 40% of all manufacturing FDI in production of refined petroleum products, followed by other non-metallic mineral products (17.3%), food products (10.7%), and pharmaceuticals (9.4%) as the only exception to this general pattern. The regional structure of inward FDI to the SEEC reveals significant presence of investors from the EU with the Netherlands, Austria and Germany as the main FDI-home countries (WIIW, 2012).

4 COUNTRY-SPECIFIC FACTORS AS DETERMINANTS OF FDI IN TRANSITION ECONOMIES

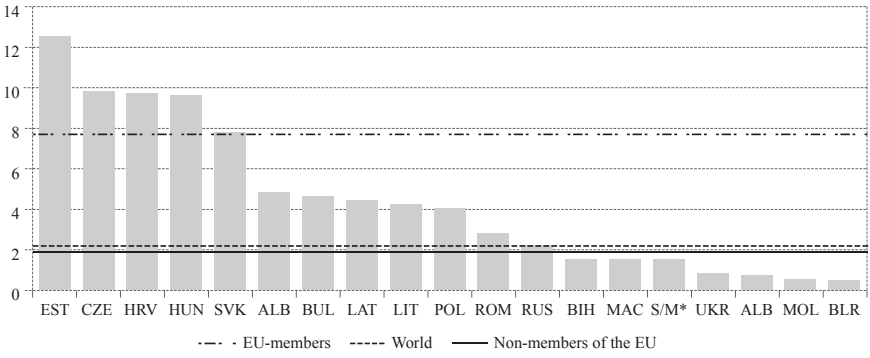
4.1 RELEVANCE OF THE CONCEPT OF POTENTIAL FDI

The question of "the upper boundary", or economic capacity for receiving new FDI is an important topic on the economic policy agenda for all countries, especially those that are net recipients. The reasons for this are manifold. Foreign direct investment has a strong potential for economic growth and development, and usually takes precedence among the strategic goals of many less developed countries. Although the advanced transition countries of Central and East Europe have enjoyed positive FDI spillovers, and have successfully gone through structural and economic reforms towards the EU membership, the countries of South

East Europe have either failed to take advantage of the foreign presence in their economies, or have started receiving large amounts of FDI relatively late. Due to slow economic and institutional reforms and non-membership in the EU, it becomes important for the SEECs to find out factors upon which the amount and quality of inward FDI depend, as well as to find out their real capacities for hosting new FDI in the future[6]. Furthermore, FDI opens the way to capital inflows without pressure on the recipient country's external position (Ramirez, 2006; Chakrabarti, 2001). Finally, after the "first wave" of FDI, mostly related to privatization projects and aimed at strategic market positioning of foreign investors, these economies should now develop into genuine investment-friendly locations with stabile long-term inflow of foreign capital. This calls for identification of the most important factors which determine a country's economic capacity for hosting new FDI. However, uncertainties on the international market do not contribute to easy realization of the above goals. A slow recovery of global FDI, the rising importance of developing countries, and a shift of FDI from the manufacturing to the primary sector and services will determine the situation on international capital markets in the medium and long run[7].

Figure 3

FDI stock/capita in the European transition countries (in thousands USD), 2010



** S/M stands for Serbia and Montenegro.*

Source: UNCTAD, 2011.

Attracting new FDI has become an internationally competitive task for governments (Dunning and Narula, 1997) in which both trends on the international capital markets and a country's own economic capacities for hosting FDI, together with factors determining the expected amount and structure of inward FDI, have

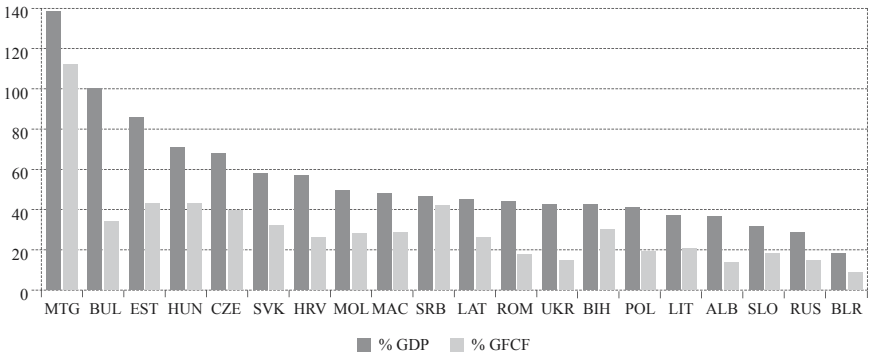
[6] In the Vinerian tradition of trade creation and diversion, many studies tried to find out the effects of economic integration on FDI. Generally, economic integration contributes to increasing FDI for participating countries, yet without negative effects on "third countries" (Kreinin and Plummer, 2008; Baltagi, Egger and Pfaffermayr, 2008; Brento, Di Mauro and Lücke, 1999; Buch, Kokta and Piazolo, 2003; Brouwer, Paap and Viaene, 2008).
[7] On the counter-cyclical effects of FDI, see: Levy Yeyati, Panizza and Stein (2007) and Frenkel, Funke and Stadtmann (2004).

to be considered. Furthermore, finding out FDI-growth potentials by benchmarking the countries with the more successful counterparts (e.g. new EU members), should indicate the remaining economic and institutional reforms necessary to increase local market attractiveness for new investments[8]. According to the FDI-stock-to-population ratio, Croatia is relatively well positioned among the transition countries, as its FDI *per capita* (USD 7,800) compares well with the average of the 10 new EU-member countries. Croatian FDI-stock/*capita* is double the average of non-EU-members which makes Croatia a leading recipient of FDI in the region (figure 3).

Relative indicators of FDI show that Croatia had large amounts of inward FDI, both compared to the ten new EU member countries and the remaining transition countries (figure 4). According to the FDI-to-GDP-ratio and the ratio of FDI inflow to gross fixed capital formation, the advanced reform countries of Central and East Europe are ranked high, while the less advanced countries take lower positions with the respective shares of approximately 40% or less. Croatia is again relatively well positioned with almost 60% of FDI-to-GDP ratio and a relatively low level of FDI inflow, as measured by the value of gross fixed capital formation.

FIGURE 4

FDI stock (% of GDP; 2010) and average annual FDI-inflow (% of gross fixed capital formation; 1990-2010) in the European transition countries

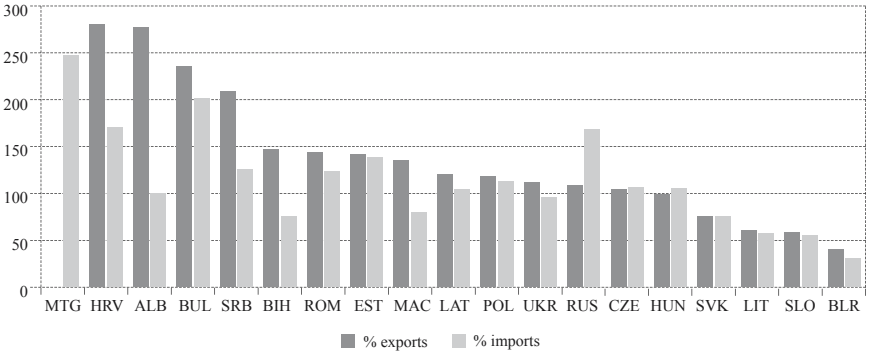


Source: UNCTAD, 2011.

According to the share of FDI stock in trade flows, the analyzed countries can be divided into two groups. The first group, with the FDI share in exports exceeding 100%, comprises less advanced countries of South East Europe and Croatia. On the other hand, the advanced reform countries and the new members of the EU are grouped at the bottom of the list indicating that their inward FDI does not go far beyond their created export capacities (figure 5).

[8] On economic policy effectiveness in attracting FDI, see: Borensztein, De Gregorio and Lee (1998), and Yu, Chang and Fan (2007).

FIGURE 5
FDI stock in the European transition countries (% of exports, % of imports), 2010



Source: UNCTAD, 2011.

The data presented indicate that some countries have reached relatively high levels of FDI, measured in terms of their domestic market and its absorption capacity, and that it might become difficult for them to host new FDI in the future without generating stronger economic growth.

4.2 REFERENCES TO SIMILAR EMPIRICAL LITERATURE

The question of finding out potential FDI is closely related to investigating the determinants of FDI flows. Empirical studies which include today's transition countries before the 1990s, are relatively scarce and mostly focused on the "core economic variables" and the cost-related factors. Wang and Swain (1995) analyzed the determinants of inward FDI to Hungary and China (1978-1992) and proved the relevance of local market size and its growth potential, together with typical cost-related factors (wages, trade barriers and exchange rate). Ang (2008), in his study on Malaysian FDI, came to a similar conclusion on the importance of local market conditions and factors influencing production costs. This study also proved that Malaysian inward FDI grew despite the problems of increasing country risk and the Asian financial crisis. A similar analysis of Chilean FDI during the 1990s proved the relevance of GDP from previous periods as a determinant of inward FDI (lagged GDP variable), assuming that investment decisions are based on the future expectations generated from the realized level of development and implicitly on the perception of growth dynamics (Ramirez, 2006). This study makes strong reference to a country's external position (balance of payments and external vulnerability), as well as to the political stability, as determinants of inward FDI.

Chakrabarti (2001) carried out a cross-country analysis of 135 countries in 1994 and found out that cost-related factors strongly determine inward FDI, but the results proved to be strongly sensitive to changes in the state of macroeconomic stability (inflation, budget deficit, external debt, etc.). Moosa and Cardak (2006)

performed a similar analysis and proved the relevance of the level of development, income and trade openness as the determinants of inward FDI.

Bellak, Librecht and Riedl (2008) analyzed the factors behind bilateral FDI-flows of the CEEC. Based on the panel-gravity approach this study proves relevance of all typical gravity variables and cost-related factors as an approximation of the cost competitiveness of FDI recipient country. The analysis proved that the strongest impact on the dependent variable came from the baseline gravity specification of the regression, while showing that cost-related factors offer large "playing field" for government intervention aimed at increasing inward FDI. Garibaldi, Mora, Sahay and Zettlemayer (2001) carried out analysis on a large sample of transition countries during the 1990s. They differentiated between greenfield and portfolio investment and ran independent regressions on these two dependent variables. A detailed specification of explanatory variables includes indicators of macroeconomic stability, institutional reform indicators, and specific structural variables describing financial market development. This paper gives strong support to "economic fundamentals" (such as macroeconomic stability, level of economic reforms, trade liberalization and privatization method) as the determinants of greenfield investments. Carstensen and Toubal (2004) hypothesized that differences between the advanced CEEC and the SEEC in attracting foreign investment cannot be explained only by "traditional variables" (GDP, cost-related factors and level of education), and introduced transition-specific variables, which proved relevant, into the dynamic panel model.

In an analysis of Croatia, Deichmann (2013) tried to find out the determinants of inward FDI during the second decade of transition (2000-2009). With a gravity-type regression equation he analyzed bilateral Croatian FDI and found out that the agglomeration forces, relations with the EU, historical linkages and bilateral trade relations determine the nature of Croatian inward FDI, whereas he found no support for typical gravity variables.

The analyses of the economic integration effects included a dilemma about complementarity, or substitutability between FDI and trade[9]. In an attempt to answer that question Di Mauro (2000) created a model which combined aspects of a gravity equation and the increasing returns to scale variables, in an analysis of bilateral FDI-flows among OECD-countries. This group of variables included composite indicators like size similarity, "economic space" (sum of two countries' GDPs), and index of differences in the relative production factor endowment. Besides confirming the relevance of variables originating from new trade theory, Di Mauro (2000) showed that the exchange rate had no adverse impact on FDI flows (as long as it remained reasonably stable), nor do tariffs (implying the absence of the "tariff-jumping"-motive of FDI). These results come as no surprise taking into

[9] For further reference, see: Hejazi and Safarian (2001), Lipsey (2002), Lin (1995), Graham (1996) and Portes (2007).

account the analyzed sample of developed open economies with stable exchange rates. Christie (2003) used a similar methodology to analyze bilateral inward FDI to the CEEC and the SEEC in order to determine the pattern of FDI. The results showed that FDI to the advanced transition countries (CEEC) were mostly of a horizontal type, whereas that pattern for the SEEC remained unclear. Further, the paper proved the relevance of similarities in market size, "size effect", and the relative difference in factor endowment as explanations for the differences in cross-country investment flows.

Buch, Kokta and Piazolo (2003) were primarily concerned with the application of the concept of "potential" FDI on estimating the effects of the EU-enlargement (CEEC) on old members (Portugal, Spain). By estimating typical gravity equation for bilateral FDI-flows, they came to a conclusion that there occurred no "redirection" of FDI from the old to the new EU-members, as they proved that potential or theoretically predicted FDI generally correspond to the actual level of FDI. Brenton, Di Mauro and Lücke (1999) came to a similar conclusion regarding the estimated potential level of FDI for the Czech Republic, Hungary, Poland and Romania. In an analysis of the integration effects on FDI for the CEEC, Clausing and Dorobantu (2005) confirmed a positive influence of the EU-accession, as well as the relevance of cost-factors and other "fundamentals" (GDP, income and trade openness).

Other analyses primarily focused on estimating potential FDI include Demekas, Horváth, Ribakova and Wu (2007) and Borrmann, Jungnickel and Keller (2005). Demekas et al. (2007) observed a large sample of countries over a short period (2000-2002), whereas the analysis of non-privatization-related FDI as the dependent variable was performed on the aggregate level, as well as for country pairs. The results showed no statistically significant difference between the CEEC and the SEEC regarding the determinants of FDI inflows. An interesting insight into the analysis of potential FDI is offered by Borrmann et al. (2005) who focused primarily on German outward FDI, trying to find out the position of actual vis-á-vis potential FDI from Germany to four recipient countries from Central and East Europe. The novelty of this approach is that it takes into account not only the market potential of FDI target countries, but also that of the neighboring markets. General conclusion is that the realized German FDI to the analyzed countries is higher than the estimated level of potential FDI. Babić and Stučka (2001) analyzed the determinants of Croatian inward FDI and found out that the strongest influence on FDI inflows came from agglomeration effects and income, followed by indicator of credit rating. The variable of trade openness is not significant in the analyzed model, which is not surprising regarding the ongoing process of Croatian trade liberalization at the time of the analysis (1992-1999).

The above evidence shows that the SEEC have been much less analyzed than their more successful counterparts from Central Europe, and that Croatia has rarely

been in the focus of these analyses. This paper adds to the existing literature on FDI in transition countries by focusing on the SEEC which still lag behind in terms of inward FDI and their location characteristics. In doing so, the originality of the paper arises from investigating the determinants of inward FDI by combining typical gravity variables and those of increasing returns to scale. The paper, furthermore, uses the advanced CEEC as a benchmark and calculates potential level of Croatian inward FDI by individual FDI-home countries. In contrast to similar empirical studies, this paper considers a larger group of countries for the analysis of bilateral FDI and observes data over a longer period (1990-2004), which is strictly determined by the first wave of the EU-enlargement in 2004, as otherwise the analysis would go into the direction of estimating the integration effects on FDI flows, which is beyond the scope of the paper (see: Medvedev, 2011; Kim, 2007; Petroulas, 2007).

4.3 MODEL SPECIFICATION AND RESULTS

In order to explain the factors which determine FDI flows to transition countries, the following model incorporates three groups of explanatory variables: the typical gravity variables, variables based on increasing returns to scale and institutional variables (for detailed explanation of the variables and the data sources see table A1 in the appendix).

The gravity-type variables are designed according to Linnemann (1966) and include GDP, population and income of both FDI home and host countries, but also the factors that can additionally influence bilateral economic relations – either positively (common border, participation in the same economic integration, cultural similarities), or negatively (trade and transaction costs commonly approximated by physical distance). Gross domestic product, as the absolute measure of market size and the realized level of economic development, determines a local economy's general efficiency level and its capacity for achieving economies of scale, the latter being critical for small economies (Chakrabarti, 2001; Ang, 2008). GDP is, therefore expected to significantly influence FDI flows. By approximating the potentials of economies of scale, GDP is expected to put less pressure on FDI outflow in the case of big economies, while the opposite holds for small developed economies. In the case of recipient countries, increasing GDP is expected to influence inward FDI positively. Variable of income (GDP/capita), as an indicator of purchasing power on the local market, but also an approximation of local labor costs, can have both a positive and a negative effect on inward FDI[10]. Population of both source and recipient country of FDI usually have opposite effects on bilateral FDI flows. Whereas a large population of the FDI home economy might reduce local companies' interest in foreign markets, large population of host economy can, however, turn this lack of interest into generation of new investments. The role of distance in the FDI-gravity-model is not always straightforward. In

[10] Eaton and Tamura (1996) found out that FDI prefer middle income countries over low income ones with weak local market absorption capacity, or high income ones with high production costs.

light of the "proximity-concentration hypothesis" and assuming that FDI is used to replace the existing trade flows, a positive relationship between distance and FDI can be expected. In a simpler case in which capital circulates between countries at different levels of development, a negative relation between distance and FDI can be expected. The variable of a common border, can, in the same sense, have a positive influence on FDI-flows. Association with the EU will presumably also have a positive influence, since it includes economic reforms and restructuring, implementation of common policies, as well as legal and institutional approximation with the EU-standards.

The analysis also includes variables based on increasing returns to scale, imperfect competition and product differentiation (Helpman and Krugman, 1986) which make it possible to disentangle various types of FDI (horizontal and vertical) and the underlying motives for investment (market- and efficiency-seeking) empirically. These composite variables are based on GDP of FDI home and host countries and are, therefore appropriate for analyzing bilateral investment flows (Di Mauro, 2000). The variable of GDP similarity explains the extent to which similarity in economic size between countries is responsible for generating bilateral cross-border investment. Consequently, the more similar the countries, the larger investment flows they create. The variable of GDP size, which, by adding together GDPs of two countries, measures the size of their bilateral "economic space", is expected to positively influence FDI. Finally, the variable of differences in the relative factor endowment (GDP/capita-difference) should capture the impact of different composition of production factors across countries, on the structure and the amount of inward FDI. Accordingly, large differences in endowment between countries would indicate vertical FDI, while small differences would indicate horizontal FDI.

Institutional variables aim at capturing specific characteristics of transition economies like trade and foreign exchange liberalization, privatization, and the share of trade with non-transition countries. Contractual relations with the EU can also be seen as an indirect measure of institutional reforms, since they incorporate legal and institutional approximation to standards of the developed countries, usually seen as a solid guarantee for an investment-friendly environment.

The analysis that follows is primarily focused on country-specific determinants of inward FDI and aims at revealing the main factors behind the bilateral FDI flows to Eastern Europe during the period in which some countries became significant recipients of FDI (1996-2004). In doing so, this analysis incorporates 12 FDI host economies[11] and the five single most important foreign investor countries in the region (the Netherlands, Germany, Austria, France and USA). The dependent

[11] Based on contractual relations with EU this group includes: Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Poland, Romania, Slovakia and Slovenia. By 2004, the majority of them had finished accession negotiation (Bulgaria and Romania being prospective members), whereas Croatia and Macedonia had signed their Stabilization and Association Agreements.

variable of the standard multiple regression model is inward FDI stock which includes all types of investments (privatization and non-privatization-related). This type of variable is more appropriate for analyses with longer time series and focused on FDI determinants. The variable of FDI stock is usually more stable over time and, unlike flow-variables, rarely takes negative value or zero[12]. Correlation matrix of explanatory variables can be found in table A2 in the appendix.

Regression equation of ln-linear form in all variables (except dummies) is analyzed by the OLS-method:

$$Ln\ inwardFDIstock = Const. + \beta_1 Ln\ X_1 + \beta_2 X_2 + \ldots + \beta_n Ln\ X_n + \mu \qquad (1)$$

and has produced the results presented in table 3.

TABLE 3

Results of regression analysis for the European transition countries (1996-2004)

	Model 1			Model 2		
	Coefficient	**Std. error**	**t-statistics**	**Coefficient**	**Std. error**	**t-statistics**
Const.	-34.784	2.787	-12.085 ($t^*_{0.005}$=2.576)	-27.996	3.017	-9.279 ($t^*_{0.005}$=2.576)
Ln GDP host	1.399	0.081	17.282 ($t^*_{0.005}$=2.576)			
Ln GDP home	0.147	0.057	2.580 ($t^*_{0.005}$=2.576)			
Ln POP host						
Ln POP home						
Ln GDPcap host	-0.516	0.127	-4.079 ($t^*_{0.005}$=2.576)			
Ln GDPcap home	1.981	0.257	7.700 ($t^*_{0.005}$=2.576)			
GDPsim_Ln				1.461	0.082	17.875 ($t^*_{0.005}$=2.576)
GDPsize_Ln				1.593	0.087	18.399 ($t^*_{0.005}$=2.576)
GDPcapDIF_Ln				-0.802	0.160	-5.000 ($t^*_{0.005}$=2.576)
Ln DIST	-0.674	0.088	-7.691 ($t^*_{0.005}$=2.576)	-0.639	0.093	-6.875 ($t^*_{0.005}$=2.576)
Ln relDIST						
Ln relDIST GDP						
Ln ULC						
Ln ULC ERadj						
Ln ULC PPPadj						
Ln OPEN g						
Ln OPEN gs	1.395	0.251	5.557 ($t^*_{0.005}$=2.576)	1.383	0.245	5.654 ($t^*_{0.005}$=2.576)

[12] Nevertheless, some studies, mostly concerned with policy measures, use FDI-flows as dependant variable (Bellak et al., 2008; Grosse and Trevino, 2005; Ang, 2008; MacDermott, 2007).

	Model 1			Model 2		
	Coefficient	**Std. error**	**t-statistics**	**Coefficient**	**Std. error**	**t-statistics**
Ln PRIVAT rev	0.150	0.057	2.617 ($t^*_{0.005}$=2.576)	0.171	0.058	2.966 ($t^*_{0.005}$=2.576)
Ln TRADE nont	1.307	0.325	4.026 ($t^*_{0.005}$=2.576)	1.555	0.363	4.281 ($t^*_{0.005}$=2.576)
Ln EBRDi ss				3.664	1.135	3.227 ($t^*_{0.005}$=2.576)
ln EBRDi ls						
ln EBRDi ft						
BORD	0.315	0.190	1.661 ($t^*_{0.050}$=1.645)	0.171	0.026	0.863 ($t^*_{0.100}$=1.282)
EU	0.293	0.186	1.573 ($t^*_{0.100}$=1.282)	0.290	0.039	1.492 ($t^*_{0.100}$=1.282)
No. obs. = 469	R=0.829	R^2=0.687	R^2_{adj}=0.681	R=0.812	R^2=0.659	R^2_{adj}=0.653
	F=131.238	$F^*_{0.05}$=1.83		F=115.710	$F^*_{0.05}$=1.83	

Source: Author.

The results confirm the theoretical expectations about the relevance of the selected variables, as well as their signs and statistical significance, in explaining transition countries' inward FDI. Model 1 corroborates the existence of a "gravity-type behavior" of FDI which means that typical "push and pull" factors have played important roles in determining the amount and the direction of FDI, a finding consistent with that of Bellak et al. (2008). Model 2, based on imperfect competition and increasing returns to scale, reveals that motives like economies of scale, or dispersion of business activities across countries according to factor intensity and relative factor endowment add to the explanation of the forces behind the realized FDI in Eastern Europe.

The strongest influence on inward FDI in the gravity model comes from the level of development (GDP) and the income of both source and recipient countries of FDI. This outcome shows that high-income and capital-abundant countries have created more direct investment and were primarily attracted by large economies with lower production costs. In contrast to the existing empirical literature, this analysis proved a negative sign and statistical significance of GDP/capita variable for FDI-host economy confirming the above, and indicating that high income (and high wages) reduced the amount of inward FDI to transition countries. A strong influence also comes from trade openness, indicating that free access to the international market was an important factor in attracting FDI. This is further corroborated by the presence of the variable "trade with non-transition countries" in the final model. This variable resembles the degree of the transition countries' trade re-orientation towards developed markets and the underlying growing competitiveness and successful restructuring they have gone through. This can, at least partially, explain the lagging behind of some SEEC in terms of modest investment inflows. As expected, distance had an adverse impact on FDI, indicating that geographical proximity contributes to generating more FDI. Furthermore, the

presence of dummy variable for common border corroborates the above, by indicating that neighboring countries have stronger potentials for this type of economic cooperation. Finally, another dummy variable, intended to grasp positive influence of manifold aspects of relations with the EU, is again proved relevant for transition countries, as also confirmed in Deichmann (2013) and Clausing and Dorobantu (2005). This outcome comes as no surprise since it is known that association with the EU opens up free access to large market, stimulates legal and institutional reforms, and gives credibility to a country as investment-friendly location.

Model specification based on the concept of increasing returns to scale confirms the relevance of the variables, which show that market size and respective (dis) similarities among countries play an important role in determining bilateral FDI (similar to findings in Di Mauro, 2000). This is shown by a high value of the estimated parameter for variable GDP-size, as a measure of "common economic potential" of two countries. However, the variables measuring the degree of similarity of GDPs (GDP-similarity and GDP/cap-difference) have realized a slightly weaker influence on the transition countries' inward FDI. The relatively low value of the estimated parameter for the variable "differences in GDP per capita", shows that the degree of income similarities did not strongly determine the realized level of FDI, while the negative sign indicates that the majority of FDI were horizontal, or market-seeking. Regarding the dominant share of the CEEC in total inward FDI of the analyzed sample, this result is not surprising and correlates well with that in Christie (2003). However, this model specification abandoned the importance of the common border, since this variable entered the model, but remained statistically insignificant.

As for the institutional variables, the only one which entered the final model specification is that of small scale privatization which achieved the highest parameter value estimated. Other institutional variables such as large scale privatization, or foreign exchange and trade liberalization did not prove relevant and were, therefore, left out of both models. Explanation for that possibly lies in different models of large scale privatization across countries (e.g. direct sale vs. insider privatization). On the other hand, absence of the indicator of exchange rate from the model can perhaps be explained through its relative stability (finding in line with Di Mauro, 2000). However, these issues need further research, possibly through improvement of the presented analytical models, either in terms of alternative variable selection, measurement method of the variables like privatization method, exchange rate, or unit labor costs (see: Bellak et al., 2008), or taking into account the dynamic nature of FDI.

The above models have been used to calculate potential Croatian inward FDI stock. Based on the actual macroeconomic data and the best scores for institutional reforms (according to EBRD-scoring matrix) values of potential inward FDI

are calculated for the period 2005-2010, on aggregate and by individual countries of origin[13]. This analysis includes 19 countries which in 2010 accounted for approximately 90% of Croatian inward FDI-stock.

Results in table 4 show that, according to the gravity model (Model 1), the realized level of FDI stock is over the years usually higher than the estimated one, however with some exceptions. Results for the years 2009 and 2010 should be interpreted with caution due to the global economic slowdown, which obviously reduced the capacities to both generate and host new FDI, while a simultaneous slowdown in global investments additionally confirms that. During these years, and based on actual data, Croatian inward FDI was realized at approximately 30% higher level than predicted by the model. In 2006 and 2007 this difference is much smaller (10-20%), while data for 2005 and 2008, years preceding the crisis, even show a "shortage" in the realized level of FDI-stock, compared to figures estimated by the model[14].

Table 4

Realized and estimated level of inward FDI-stock for Croatia (USD bn)

Inward FDI-stock	2005	2006	2007	2008	2009	2010
Realized	13.7	22.2	35.6	28.6	31.1	30.6
Estimated (Model 1)	15.8	20.2	30.4	40.5	23.7	23.8

Source: Author.

Analysis by individual countries further confirms a relatively strong gravitational character of Croatian inward FDI as presented by indicators in table 5. The ratio of potential-to-realized FDI below one shows that the country received more FDI than predicted by the model, while values above one show that there exist more scope for receiving new FDI. The neighboring and geographically close countries to Croatia (Austria, Hungary, Germany and Slovenia) have invested more than theoretically expected, while the majority of other countries, according to these results, have not yet reached their full capacity in bilateral FDI-flows to Croatia. Regarding the selection of time-varying variables in the model (GDP, trade openness, privatization and contractual relations with the EU), it can be said that the Croatian capacity to induce economic growth and structural reforms, and continue with institutional reforms, including EU membership, will appear as the critical factors in attracting new FDI in the future.

[13] Potential FDI-stock is obtained as the value which would prevail if the entire Croatian inward FDI would be determined by variables and parameters estimated by the model (Nilsson, 2000; Fidrmuc and Fidrmuc, 2003).
[14] Regarding the non-privatization related FDI only, Demekas et al. (2007) found out a relatively small gap between actual and potential Croatian FDI.

Table 5

Ratio of potential-to-realized level of Croatian inward FDI-stock by countries of origin (Model 1)

FDI-country of origin	2005	2006	2007	2008	2009	2010
Austria	0.36	0.43	0.24	0.51	0.28	0.27
Hungary	0.16	0.14	0.18	0.25	0.09	0.06
Germany	0.53	0.79	0.51	0.83	0.43	0.42
Netherlands	0.82	0.25	0.31	0.44	0.27	0.35
Slovenia	0.75	0.86	1.13	1.28	0.72	0.67
Italy	1.68	0.56	3.06	3.69	2.10	1.80
United Kingdom	1.53	0.80	0.75	1.32	0.58	0.62
France	5.36	0.90	1.09	1.26	0.77	0.71
Sweden	7.85	2.72	2.82	6.37	2.53	4.18
Switzerland	6.75	3.81	4.16	8.24	6.46	7.13
Belgium	15.79	25.10	3.67	6.91	5.56	3.73
United States	0.68	1.33	1.81	2.18	1.60	1.81
Ireland	16.38	13.92	19.78	19.44	7.41	3.26
Denmark	9.59	12.82	12.24	14.35	10.00	7.12
Russia	1.03	0.82	0.50	1.04	0.36	0.45
Norway	198.47	153.05	71.70	77.64	25.46	26.39
Spain	8.37	7.01	5.44	8.71	5.46	4.40
Bosnia and Herzegovina	0.05	0.07	0.12	0.42	0.20	–
Israel	9.98	11.15	12.82	9.40	5.66	6.16

Source: Author.

5 CONCLUDING REMARKS

Recent evidence on the negative impact of the global economic crisis on FDI-flows and weak prospects for their recovery in the medium term, have challenged the concept of economic growth that prevailed in Eastern Europe. It included market expansion through economic integration, growth of external debt, and FDI inflows related to privatization projects. Regarding the changes in the world FDI flows and search for the new investment opportunities, both by economic activity and host economies, the role of FDI as an engine of local economic growth will be challenged in the future.

The results of the empirical analysis showed that both "gravity-type" factors, and factors based on increasing returns to scale, can offer explanation to FDI in Eastern Europe. This means that market size, trade openness and geographical proximity between countries have had a strong impact on bilateral FDI-flows. Such an outcome is reasonable considering the period of the analysis. The initial years of transition and the opening up of new business opportunities on markets traditionally scarce in capital have made size of domestic market, international trade relations and opportunities for participation in privatization projects the main factors for attracting FDI. Contractual relations with the EU have proven relevant and

helped the advanced transition countries to receive additional direct investment. Variables based on increasing returns to scale have revealed somewhat more sophisticated explanations according to which similarities in the level of development, as well as in the degree of correspondence in income between countries, have positively influenced bilateral FDI flows. With respect to this, it was shown that foreign direct investments made during the 1990s and afterwards were horizontal and searched primarily for expansion on new markets.

Although policy implications of the paper are not straightforward, understanding factors behind FDI-flows should help policy makers in designing strategies for attracting new FDI. The estimated values of potential FDI in Croatia reveal that a further increase in inward FDI can be achieved only upon realization of further economic growth and increasing trade openness which includes integration with the EU[15]. Hence, efforts in the field of policy-making should be concentrated on creating conditions for sustainable economic growth, thus reducing the development gap towards potential FDI-home countries. These findings are in line with the "threshold analysis" by Demekas et al. (2007) according to which Croatia, as a medium-developed country, should increasingly concentrate on market size (including free access to the EU market) and macroeconomic stability, while in the future, attention should be given to factors determining competitive production costs like corporate taxes, exchange rate and productivity, as the main location factors for FDI. The pure "gravitational factors" that determined FDI-flows so far will probably cease to do so in the future, with the further development of transition countries. However, further research in that respect will be useful, as well as some refinements of the presented analytical model. These might include separation of FDI by type (greenfield vs. brownfield, and non-privatization-related) and by sector, as well as broader selection of institutional variables, not only the transition-specific ones, but also those which describe quality of the internationally competitive business environment. The analysis of cost-related factors as determinants of inward FDI presents an additional field for future research for the SEEC and Croatia alike. The global recession demonstrates, in light of the above, the importance of sustainable economic growth as the main precondition for increasing a local economy's absorption capacity for new FDI. This conclusion agrees well with the concept of increasing returns to scale and similarities in levels of development as a driving force behind international investment.

[15] Conclusion corroborated by Bellak et al. (2008) and Brenton et al. (1999) for advanced transition countries at earlier stage of development, similar to that of Croatia at present.

APPENDIX

TABLE A1

Description of variables and data sources

Variable name	Symbol	Unit of measurement/calculation	Data source
Inward FDI-stock	inwardFDIstock	USD mn	WIIW – Database on foreign direct investment, 2012
FDI host country GDP	GDP host	USD mn	IMF – International Financial Statistics Yearbook 2011
FDI home country GDP	GDP home		
FDI host country population	POP host	mn	
FDI home country population	POP home		
FDI host country GDP per capita	GDPcap host	USD	
FDI home country GDP per capita	GDPcap home	USD	
GDP-similarity	GDPsim_ln	$\ln(1-(\frac{GDP_{host}}{GDP_{host}+GDP_{home}})^2-(\frac{GDP_{home}}{GDP_{host}+GDP_{home}})^2)$	
GDP-size	GDPsize_ln	$\ln(GDP_{host}+GDP_{home})$	
GDP/capita-difference	GDPcapDIF_ln	$\ln(\frac{GDP_{host}}{POP_{host}})-\ln(\frac{GDP_{home}}{POP_{home}})$	
Distance	DIST	km	Google Earth (http://earth.google.com)
Relative distance	relDIST	$(\frac{DIST_{host1}}{DIST_{host1}+DIST_{host2}+...+DIST_{hostn}})\times 100$	
Relative distance weighted by GDP	relDIST GDP	$(\frac{(DIST\times GDP)_{host1}}{(DIST\times GDP)_{host1}+(DIST\times GDP)_{host2}+...+(DIST\times GDP)_{hostn}})\times 100$	
Trade openness by goods	OPEN g	$(\frac{(EX+IM)_{goods}}{GDP})\times 100$	IMF – International Financial Statistics Yearbook 2011
Trade openness by goods and services	OPEN gs	$(\frac{(EX+IM)_{goods}+(EX+IM)_{services}}{GDP})\times 100$	

Variable name	Symbol	Unit of measurement/calculation	Data source
Unit labor costs	ULC	% (2000=100)	Astrov et al. (2006)
Unit labor costs adjusted by exchange rate	ULC ERadj	% (2000=100)	
Unit labor costs adjusted by purchasing power parity	ULC PPPadj	% (2000=100)	
Common border	BORD	dummy (yes=1, no=0)	Google Earth map (http://earth.google.com)
Contractual relations with the EU	EU	dummy (yes=1 for full-fledged membership, European Agreement, or Stabilization and Association Agreement, otherwise no=0)	MFAEI – Croatia on the road to the EU, 2009
Privatization revenues	PRIVAT rev	cumulative as % of GDP	EBRD – Transition Report 2002; EBRD – Transition Report 2009
Trade with non-transition countries	TRADE nont	% of total trade volume	
Small-scale privatization	EBRDi ss	index (min.=1, max.=4.3)	
Large-scale privatization	EBRDi ls		
Foreign exchange and trade liberalization	EBRDi ft		

Source: Author.

TABLE A2

Correlation matrix of independent variables

Variable symbol	GDP host	GDP home	POP host	POP home	GDPcap host	GDPcap home	DIST	OPEN g	OPEN gs	ULC	BORD	EU	PRIVAT rev	TRADE nont	EBRDi ss	EBRDi ls	EBRDi ft
GDP host	1.000																
GDP home	0.084	1.000															
POP host	0.888	0.052	1.000														
POP home	0.080	0.990	0.061	1.000													
GDPcap host	0.176	0.089	-0.134	0.066	1.000												
GDPcap home	0.096	0.529	-0.064	0.468	0.322	1.000											
DIST	0.035	0.958	0.046	0.952	-0.008	0.494	1.000										
OPEN g	-0.323	0.027	-0.539	0.010	0.344	0.174	-0.021	1.000									
OPEN gs	-0.401	0.007	-0.609	-0.010	0.296	0.157	-0.032	0.954	1.000								
ULC	0.056	0.052	-0.025	0.018	0.210	0.194	0.009	0.221	0.196	1.000							
BORD	0.141	-0.178	0.058	-0.184	0.159	-0.188	-0.253	0.145	0.110	0.015	1.000						
EU	0.156	0.019	0.164	0.001	0.058	0.106	0.003	0.092	0.085	0.286	0.036	1.000					
PRIVAT rev	0.251	0.093	0.112	0.072	0.144	0.128	0.021	0.378	0.286	0.326	0.118	0.224	1.000				
TRADE nont	0.418	0.062	0.468	0.064	0.219	-0.103	0.041	-0.111	-0.104	0.157	0.110	0.141	0.246	1.000			
EBRDi ss	0.177	0.400	-0.170	0.027	0.559	0.277	-0.038	0.426	0.423	0.065	0.123	0.022	0.190	-0.162	1.000		
EBRDi ls	0.077	0.460	-0.690	0.025	0.144	0.175	-0.005	0.679	0.682	0.341	0.170	0.381	0.512	0.208	0.326	1.000	
EBRDi ft	0.308	0.084	0.227	0.067	0.368	0.129	0.016	0.094	0.072	0.366	0.110	0.258	0.416	0.447	0.238	0.411	1.000

Source: Author.

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