

Determinants of Outward FDI from European Transition economies into

EU-27: Market-Seeking Vs. Knowledge-seeking

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Abstract: The Location determinants of outward foreign direct investment (OFDI) have been given extensive attention in contemporary literature, largely from the perspective of developed countries firms, whereas a little attention has been given to developing or transition economies in particular to firms from transition economies of EU-27. Apart from traditional OFDI motives (e.g. market-seeking), there is also a growing debate considering knowledge-seeking as an important motive for OFDI, especially for firms from developing economies. Main objective of this study is to analyze location determinants for OFDI for firms of transition economies of EU-27. We examine national-level market-seeking and knowledge-seeking determinants of OFDI for firms of Central and Eastern Europe from 1995-2010 using a Conditional-Logit approach. We find that firms from CEEC follow traditional multinational firms' behavior when primary OFDI motive is to target new and large markets, whereas knowledge seeking OFDI motive of these firms also provide an empirical evidence to knowledge seeking behavior of firms from transition economies, that not only firms from technologically advanced countries go to other advanced countries for seeking knowledge, but also firms from developing and transition economies.

1. Introduction

Most of Central and East European Countries (CEEC) were part of socialist regimes. Their transition from socialist to market economy was challenging in many aspects due to a complete transformation of economic and institutional framework. This transformation, however, was rather quick and led to their integration into European Union (EU) subsequently. In CEEC, like other transition economies, inward FDI has been considered more important than outward FDI (OFDI) leading to a major concentration of available research on inward FDI determinants. Recently, outward foreign direct investment (OFDI) has also become one of the most effective ways for the European integration of CEEC firms. OFDI initiated from these countries by the end of socialist systems there in 1990's and increased its pace after 2000 due to increasing economic growth (Svetlicic and Jaklic, 2003). In the beginning, majority of OFDI was concentrated regionally due to strong cultural and historical ties among these countries (e.g. Yugoslavia). But, recently CEEC firms are increasingly becoming global players with their modest growth rates. However, EU and other transition economies of Europe constitute the main destinations for OFDI from CEEC. OFDI, for this matter, has become a necessary complementary strategy for CEEC firms to catch up and narrow down the development gap. It does not only provide CEEC firms with opportunities to explore the market potential of host countries, but also provides platforms for technological and management knowledge. In literature, the phenomenon of OFDI from CEEC is relatively new one and lacks considerable empirical investigations.

Global OFDI flows have been increasing to a dramatic level with an increase of 17 % from 2005 to 2011 (UNCTAD, 2008, 2012), as OFDI activities by multinational firms have been growing faster than other international transactions for targeting new markets and resources.

Dynamics of OFDI has led to a substantial focus by researchers on empirical investigations of the fundamental factors that drive OFDI. OFDI Location choice is one of the core concepts. Choosing potential location for OFDI is a crucial decision for firms and it has been given extensive importance in economic and management literature since 1960's. Several theoretical and empirical studies investigate the key location determinants of OFDI (see for review Agarwal, 1980; Dunning, 1993 and Caves, 1996), but predominantly focusing on the firms from developed economies. Given the fact that firms from emerging and developing economies have been growing rapidly in recent years (UNCTAD, 2006), a new stream of literature analyzes OFDI location determinants for these countries (see Asiedu, 2006; Botrić and Škuflić, 2006; Cleeve, 2008; Vijayakumar et al., 2010). However, only a handful of studies focus on OFDI from transition economies of EU (see Svetlicic, 2004 ;) partly because of the marginal share of OFDI from these countries in global FDI dynamics.

In this study, we analyze country-level location determinants of OFDI from CEEC firms considering specific factors that may affect the location choice subsidiaries. Existing literature capturing OFDI location determinants of firms from CEEC has two drawbacks in our opinion. First, it analyzes OFDI location determinants mostly from the perspective of only one country (see Svetlicic, 2004; Varblane et al., 2001; Kilvits and Purju, 2003; Vahter and Masso, 2005). Second, it does not compare potential differences between location determinants for East-East OFDI (investments from CEEC to other CEEC) and East-West OFDI (investments from CEEC to developed European countries). Additionally, in this paper, we try to contribute to the empirical literature not only by addressing the above mentioned drawbacks and analyzing traditional location determinants, but also by analyzing knowledge-base (national strength of country's innovativeness e.g. R&D spending, skilled labor) of host country as a potential location determinant for OFDI.

We examine the OFDI location determinants at host-country level for firms from transition economies of EU-27 (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia) for a period 1995-2010 using a conditional-logit approach. We find that market-seeking OFDI is an important and significant factor for investors from CEEC, whereas significance of knowledge-seeking factor is dependent on destination countries.

The rest of the paper proceeds as follows. In the next section, we provide a literature overview and derive our hypotheses. In Section 3, we discuss the data and variables used for our study. In the ensuing sections we explain econometric methodology employed for our analysis. In section 5 we report the results and discuss our results in section 6.

2. Literature overview and our hypotheses

2.2 Theory

A stylized fact about internationalization is that firms invest in other countries through OFDI rather than exporting and licensing, either pushed by home-specific factors (e.g., competitive pressure at home location, government policies) or pulled by location-specific factors (e.g. market size, competitive advantage). International business literature, in either cases, suggests that firms engage in OFDI is to exploit their firm specific advantages by expanding their international operations to gain access to new markets, resources and assets and new capabilities available at host locations (Kuemmerle, 1997; Cantwell, 1995; Cantwell and Piscitello, 2002). Decision making regarding target location is crucial in these activities.

Internationalization, especially through OFDI, led many researchers to focus on developing theories to explain such process and location choice. Earlier works, for instance, "international product life cycle theory" of Vernon

(1966) considers innovation capacity of a firm as a main cause of internationalization. Where, firms exploit their innovative advantages abroad initially through exporting and then through foreign direct investment due to either losing competitive advantage at home or gaining it at host locations. Firms, in this case, initially internationalize to developed countries and then to developing countries corresponding to the phases of firm's product life cycle.

Apart from exploiting product innovation advantages, literature suggests that minimizing transaction costs can be a main motivation of internationalization. In this regard, several authors (e.g. Buckley and Casson, 1976; Teece, 1977; Hennart, 1981) developed the internationalization theory based on theory of firms by Coase (1937, 1991), collectively "the transactional cost theory" (TCE). According to this theory, firms grow in order to minimize their transactional costs across different locations while reducing uncertainty at host locations through internalization. Firms establish subsidiaries abroad to keep the valuable knowledge and innovations within the organization while accessing new markets and generating new products. In this way, firms do not only reduce the costs involved in production, but also operational uncertainties at host markets. Most relevant and appropriate location choice, for establishing subsidiaries, becomes very important for firms.

More recently, based on above mentioned works, OLI (Ownership, location, internationalization) or the eclectic paradigm of Dunning (1988, 1993), has become somehow stylized approach for explaining the determinants of OFDI. Benefits of ownership (technology, management, production process skills and patents), location (protected markets, favorable taxation system, low transaction and production costs, lower risk) and internalization (quality control, lower risk of imitation) are the basis of the OLI paradigm. Main difference between TCE and OLI is that TCE explains

location choice based on investments seeking lower transaction costs abroad, whereas OLI explains (in more details and as a process) location choice based on investments seeking new markets and strategic-assets in addition to reducing transaction costs. OLI paradigm is not a theory, but a paradigm involving aspects of all major theories of internationalization of firms (Dunning, 2000a, 2000b). "Ownership" aspect of OLI paradigm suggests that which firms are likely to indulge in internationalization, especially based on their innovative advantage similar to Vernon (1966). "Location" aspect highlights the importance of optimum location choice for activities once a firm decides to internationalize. This aspect does not only incorporate the reduction of transaction costs as proposed by TNC, but also suggests that characteristics of host location (e.g. market size, availability of resources) are also important for internationalization decisions. Furthermore, "internalization" aspect explains under what circumstances a firm involves in OFDI rather than exporting or licensing at host locations.

OLI paradigm is basis of a large number of studies in international business literature, yet another significant approach, technological accumulation approach of Cantwell (1989, 2000) explains the internationalization and location choice of firms in slightly different perspective. According to this approach, internationalization motive is based on innovation and technological accumulation of firms. Firms enhance their innovation capabilities through learning at host locations to compete using their ownership advantages efficiently. The endogenous location factors (e.g. knowledge activities, technological spill-overs, presence of other firms) present at host location leads to technology creation and diffusion among different firms. In this case firms are likely to establish subsidiaries at locations offering such endogenous advantages. Investment in diverse locations provides firms with opportunities of diverse learning platforms.

In sum, TNC and OLI paradigm explain the exploitation capabilities of firms, whereas, technological accumulation approach suggests learning capabilities along with exploitation of ownership advantages at host locations. But, technological accumulation approach is different in several aspects from TNC and OLI: It is more dynamic and evolutionary in its essence. Cantwell's approach is not only a theoretical phenomenon, as it is extensively based on empirical studies performed on firms from manufacturing sectors of developed countries.

In OLI, OFDI motives related to host-location specific characteristics are well grouped under popular taxonomies of Dunning (1988, 1993) based on four motives:

- *market-seeking* investments are aimed at entering and exploiting new and large markets;
- *resource-seeking* investments are aimed at resources available at host locations for raw materials specific to specific regions or countries;
- *strategic asset-seeking* investments are aimed at augmenting the firms competences and resources at target locations by acquiring assets;
- *efficiency-seeking* investments are aimed at reducing the costs for the firm with the help of infrastructure available at host locations.

In addition to Dunning's OFDI motives, technological accumulation approach suggests that firms may indulge in OFDI in order to enhance their ownership and innovation capabilities offered by relevant endogenous factors at host locations. In this case, knowledge-seeking OFDI is driven by the desire of firms to increase their international competitiveness by exploiting their know-how and by tapping into pool of capabilities available at host location (Cantwell and Janne, 1999; De la Potterie and Lichtenberg, 2001).

2.2 Literature Review

Main OFDI motives of firms have been analyzed theoretically and empirically to a large extent from the perspective of developed countries for a long time (see Lunn, 1980, 1983; Scaperlanda and Balough, 1983; Barrell and Pain 1996; Papanastassiou and Pearce, 1990; Coughlin et al., 1991; Kogut and Chang, 1991; more recently Head et al., 2001, 2004; Navaretti et al., 2004) with comparatively little attention to the firms from emerging and developing economies. Most of the studies concerning OFDI motives of emerging and developing economies focus on emerging giants such as India, China, Russia and Brazil (e.g. Tolentino 1993; Yeung, 2000; Andreff, 2003; Deng, 2004), other East Asian economies (e.g. van Hoesel 1999) and Latin American economies (e.g. Chudnovsky and López, 2000), whereas very little attention has been given to the firms from CEEC (e.g. Kalotay, 2004).

Firms from emerging and transition countries, similar to the ones from developed countries, invest abroad either by utilizing already at hand firm-specific capabilities or by exploring capabilities not available at home locations (Cantwell, 1989; Chung and Alcacer, 2001). However these firms, due to several economic and political factors, are different in two aspects: These firms are latecomers in international business and are technologically laggard (Buckley et al., 2004; Child and Rodrigues, 2005; Deng, 2004). Moreover, firms from emerging economies are in process of catching up with firms from developed markets, especially in terms of knowledge and technological capabilities, for becoming more competitive globally by upgrading from low value added activities to higher level of value-added activities (Mudambi, 2008). Therefore, in addition to capture new markets and exploit knowledge at hand, these firms can also augment their already acquired technological capabilities with learning new and advanced technological know-how at more locations containing more advanced knowledge, and by absorbing available localized knowledge subsequently. If

the primary OFDI motive is to acquire new capabilities available at host location, firms will be concerned to know the level of technical activities, availabilities of skilled labor and knowledge related opportunities available at host location. Firms from CEEC also contain similar characteristics as of other emerging economies being latecomer in global competition and technologically laggard. However, since the CEEC are located in Europe and many are member of EU-27, these firms have certain advantages over other emerging economies (e.g., geographical proximity with developed economies of EU).

Moreover, geographical proximity is an important factor for benefitting from knowledge and technological spillovers at host locations. Tacit nature of knowledge stimulates spatial proximity and firms tend to locate near knowledge sources. However, in order to benefit from available knowledge, firms' capabilities play an important role for the generation of new knowledge and to absorb external knowledge respectively (details will be included in next updated version). In this case, depending on the technological capabilities of firm, firms pursue Knowledge-seeking OFDI.

In this study, we argue that country-specific characteristics (e.g. market size, knowledge strength) of the host location which may be related to location-specific advantages, in terms of acquiring new markets and new knowledge, are very important in order to account for establishing new subsidiaries. We analyze market-seeking and knowledge-seeking aspects of OFDI. It can be argued that the firms seeking knowledge will invest at locations which offer such knowledge (in terms of higher level of technical activity, presence of knowledge spillovers and high skilled labor) and firms seeking markets will invest in locations with higher potential for exploiting their competences (by targeting bigger or new markets). Firms from CEEC are of our particular interest in this paper due to their geographical proximity within Eu-27. Such proximity offers CEEC firms access to mature markets

with high technological activity level on one hand, and rapidly growing emerging markets with similar level on the other hand.

2.3 Empirical evidence and Hypothesis development

2.3.1 Market-seeking OFDI

Market-seeking OFDI is considered to be the main driver of location choice, by several authors (e.g. Agarwal, 1980; Wheeler and Mody, 1992; Taylor, 2000; Chakrabarti, 2001). OFDI location choice is based on desire of multinational firms to save existing markets at local, national or regional level or to create new export markets (Culem, 1988; Dunning, 2002) or to target markets with high population density, per capita income and growth of the market at all levels (Wheeler and Mody, 1992; Billington, 1999; Ford and Strange, 1999). Market-size is particularly important in this regard. Several empirical studies find market-size a main determinant of market-seeking FDI (e.g. Wheeler and Mody, 1992; Tsai, 1994; and recently Mlambo, 2006; Zhang, 2008). Additionally, several factors account for the location choice driven by market-seeking FDI, for instance communication infrastructure of the location resulting in low transaction costs, presence of suppliers, support facilities, low level of competition, proximity to consumers, existing foreign markets and maximization of location familiarity (Dunning, 1993a; 1993b; 1998; Cheng and Kwan, 2000; Yeung and Strange, 2002).

Only few studies analyze outward FDI from CEEC. For instance, a survey conducted by Svetlicic and Jaklic (2003) on 180 multinational firms from Czech Republic, Estonia, Hungary, Poland and Slovenia revealed that the main determinants of OFDI location are considered to be related to market size and growth. This study states that main outward FDI activities are concentrated in Europe, and proximity, historical ties and knowledge of host location matter for the decisions to invest. A case study by Kilvits and Purju (2003) find geographical proximity to be an important determinant for

OFDI. Another study by Varblane et al. (2001) find market size to be a major determinant of outward FDI by analyzing Estonian banking sector. Svetličič and Burger (2007) also finds market-seeking to be a major motive for CEEC firms.

Accounting for the existing empirical evidence, we can assume that if market-seeking OFDI is important for investors from CEEC, they will establish their subsidiaries in countries with bigger market sizes and faster economic growth, hence our first hypothesis is:

“Other things remaining same, market size and market growth of a host country increase the location probability of CEEC firms with market-seeking investment motives”

2.3.2 Knowledge-Seeking OFDI

Knowledge is one of the core competences of firms, and it enables firms to be locally, regionally or globally competitive. Knowledge is argued to be a fundamental source of firm organization according to knowledge-based approach of firms (Grant, 1996). Empirical literature supports the argument that firms expand abroad in search of knowledge or to enhance already acquired skills (Cantwell and Jane, 1999; Bhagat et al., 2002; Chung and Alcacer, 2002). For transition economies, it might be of higher significance to overcome their latecomer disadvantages.

Contemporary literature find several knowledge related national characteristics of host countries important for firms e.g., availability of highly-skilled labor, number of education institutions, presence of related industrial and know-how intensive clusters, business parks (Crone and Ropers, 2001; Gorg and Ruane, 2001). According to Loewendahl (2001), advanced countries may offer these benefits (in contrast to developing or least developed countries) due to their advanced local innovation systems. Empirical evidence supporting this view is based on studies focusing on R&D

location and re-location determinants in countries containing advanced knowledge bases (e.g. countries with higher R&D spending, skilled labor), but empirical literature also suggest that firms from developing countries may only expand for acquiring valuable knowledge available abroad to overcome their knowledge gap with regard to their latecomer disadvantage and technical laggard status (Kogut and Chang, 1991; Mathews, 2006; Luo and Tung, 2007). Cantwell and Janne (1999) stress that firms from leading technical centers go to leading technical centers located abroad, not only to catch up but also to increase their knowledge diversity. It may be of more importance to firms from transition economies (Kedia et al., 2012).

Firms from emerging and developing countries may internationalize seeking knowledge (by embedding themselves in local knowledge bases) to developed countries providing the fact that developed countries are more R&D intensive, along with having more skilled and educated labor force, and with higher quality of infrastructure (Chung and Yeaple, 2008; Luo and Tung, 2007, Kedia et al.,2012). Moreover, emerging multinationals are more likely to seek knowledge than traditional firms from developed countries, to further develop their competences at home and at abroad (Kedia et al.,2012). Based on such findings, one can argue that firms from technical laggard countries (e.g., CEEC) like to locate their OFDI activities in countries richer in knowledge resources and innovativeness.

Testing this argument, however, is not easy empirically due to several reasons, such as measurement of knowledge at national level is cumbersome. Empirical support from European perspective is missing in this regard. Our paper is a first attempt (to our knowledge) to fill this gap. However, we may find studies based on the states of the U.S. relevant to our paper. For instance, a study by Chung and Alcacer (2002) investigate knowledge-seeking FDI inflows in the U.S. states for a period 1987-1993. They measure the technological strength of states with R&D intensity,

number of patents and qualified labor. In their study they find that firms use knowledge-seeking investments to source technical diversity, and it is particularly pronounced for investments from technically laggard nations. Countries with higher R&D intensity and highly skilled labor should be more innovation intensive, would produce more patents and would export more high technology products. By implementing such model on our research setting, we may assume that if firms from CEEC are interested in knowledge-seeking OFDI, knowledge strength of host country is of importance, and choose country with high R&D intensity and skilled labor, hence our second hypotheses are:

“Other things remaining same, R&D of a host country increases the location probability of CEEC firms with knowledge-seeking investment motives”

“Other things remaining same, availability of skilled labor of a host country increases the location probability of CEEC firms with knowledge-seeking investment motives”

3. Data and Variables

Several studies in international business literature use OFDI stock or flow in order to find out main location determinants of OFDI. However, OFDI stock/flows are not a good measure in this regard. More recently studies focus on firm level data for such purposes. According to Beugelsdijk (2011) OFDI stock/flows may be a good measure of the cumulative size of a country's capital flows, but it is not a good measure for subsidiary activities due to several reasons: Not all OFDI in host country is used to create value added. OFDI only measures part of what subsidiaries use to finance their activities, and it excludes financing through local financial institutions at host location, and OFDI is just a financial input leaving aside other aspects (e.g.

labor, decision making). In these cases, OFDI can either be overestimated or undervalued. Firm-level data, on the contrary, may be used to overcome these advantages, as location choice is purely a decision making process and OFDI flows/stocks can not reflect the individual decision making behavior of firms.

We use firm-level dataset of firms from CEEC. Our sample basically takes the total number of CEE owned firms in other EU-27 countries in the year 2010. Given the fact that our data contains a year of entry for each firm, it is possible to link this cross-section data to time series data for various host-country specific location determinants. In addition, we have no information on the magnitude of investments. However, the data allows us for a firm perspective and an econometric approach that has a long tradition in OFDI location choice.

Data has been structured by combining Halle institute of Economics (IWH) and Bureau van Dijk's AMADEUS database for our analysis. 1313 firms from CEEC have been identified to have subsidiaries in EU-27. 951 CEEC firms are from member states of EU-27 investing other member states of EU-27. Majority of the firms from CEEC, 58%, invest in other CEEC countries and remaining 42% firms invest in developed countries of EU-27. Around 45% firms are from manufacturing sectors according to NACE Rev.2 classification, 49% firms from service sectors, whereas 6% firms are from other sectors.

Due to several country level missing observations for our explanatory variables, our sample restricts to 10426 location decisions of 401 firms from CEEC over the period 1995-2010 in Europe. An 'investor' is defined in the database as either a direct shareholder with a minimum of 10 percent equity in the host-country affiliate or the ultimate owner of the home enterprise with a minimum of 25 percent indirect ownership. Other secondary data has been collected through EUROSTAT and WORLDBANK online data bases (see

Table 1 for details). For each firm (investor) from CEEC, we have 26 potential host countries. 15 countries are developed countries of the EU grouped as EU-15, and the remaining alternatives are 10 transition economies of EU-27 excluding Malta and Cyprus. Our dependent variable is “choice” that is the location choice by the CEEC firm for a foreign affiliate from a sub-set of 26 possible other host countries within the EU-27. We assume for our analysis that the investment decision was taken one year before the actual investment. It is because failure to do this would create an endogeneity problem, that is that the foreign affiliate’ investment potentially affects the independent variables through own activity. Our dependent dummy variable equals “1” for an investment in a preceding year, while “0” stands for no investment.

Our data contains both time-series and cross-sectional dimensions. The time series aspect of our data is important for our study for at least two reasons. First, the successful location choices based on past values of our explanatory variables can only be observed using time series data for OFDI. Second, during the time period of our analysis, most of the transition economies were recovering from post-communist effects and implementing new economic reforms for a better European integration and this transition can be better reflected by using time series data. Cross-sectional aspect of our data is also important as it allows us to compare location choice of several firms at same point of time.

4. Econometric Methodology

In order to test our theoretical model empirically, random utility maximization approach provides a reasonable basis for obtaining reliable empirical results (Guimarães et al.2004). Random utility maximization framework has been used as a basis for studying many firm-level discrete choice problems since McFadden (1973, 1981, and 1984). This framework

takes into consideration the assumption that the evaluation of a decision maker among available alternatives can be represented by a utility function and decision makers choose an alternative with highest utility. In our analysis, national level location choice is a discrete choice problem where profit (utility) maximizing firms choose locations from a distinct set of countries. Given that our analysis is based on choices between 26 European countries and we have a comparatively small set of alternatives, the most used technique for modeling such model econometrically is the Conditional-Logit model (CLM) proposed by McFadden (1984) provided that each location decision is a discrete choice made among different alternatives. Coefficients in CLM are estimated by maximum likelihood procedures. The reason to adopt this model for our analysis is due to number of advantages posed by the usage of functional CLM, especially in terms of stable computations with several numbers of alternatives.

We assume a simplified model for the decision making process of a firm with regard to location choice in light of existing literature (Devereux and Griffith, 1998; Basile et al., 2008; Jindra B., 2010a). This model is as follows: First, a firm (Investor) makes a decision about serving the foreign market. Second, the firm decides about the means of investment, that is, whether to serve foreign market through licensing, alliances, joint ventures or by foreign direct investment. Then, firm decides about the potential location for its future activities, for our analysis, it is OFDI. Our analysis is restricted to the final stage of this process, which is location choice for OFDI. Moreover, since most of the OFDI from CEEC goes to EU-27, we restrict our analysis to EU-27 level.

In our analysis, locations are “countries”, rather than regions or provinces within countries. Moreover, we assume that, country level determinants of FDI apply uniformly across all countries within EU-27 as most of the OFDI from CEEC firms is concentrated into EU.

We assume that the selection of a particular country (choice) by a CEEC firm depends on the potential profits associated with host country compared to other alternatives. We assume that the profit of firm is affected by country-specific factors such as market size and knowledge base. Hence the focus of our analysis is on the effects of various market and knowledge related variables on the decision making process of investors from CEEC for their prospective choice of FDI location in available countries in European Union. We also control for number of exogenous variables in location choice theory as mentioned in previous section. Applying model specified by Guimarães et al.(2004) at country level, we assume the existence of J choices among European Union countries with $j=1, \dots, J$ and N investors with $i=1, \dots, N$, then the profit derived by investor i by locating in country j is given by

$$\pi_{ij} = \beta' z_{ij} + \epsilon_{ij} ,$$

Where β is a vector of unknown parameters, z_{ij} is a vector of observed explanatory variables, and ϵ_{ij} is a random term. Thus, the profit for the investor i of locating in country j is composed of a deterministic and a stochastic component. The investor will choose the country that will yield him the highest expected profit. If the ϵ_{ij} are independent and *iid* extreme value distributed, it can be shown that

$$P_{ij} = \frac{e^{\beta' z_{ij}}}{\sum_{j=1}^J e^{\beta' z_{ij}}}$$

where P_{ij} is the probability that the investor i locates at country j . If we let $d_{ij} = 1$ in case investor i picks choice j and $d_{ij} = 0$ otherwise, then we can write the log likelihood of the conditional logit model as

$$\log L_{cl} = \sum_{i=1}^N \sum_{j=1}^J d_{ij} \log P_{ij} ,$$

OFDI location choice by investors is related to “expected profitability” associated with investment locations. Expected profitability in our study is connected to specific characteristics of the host location (country) based on comparative advantages offered by these host locations. Apart from classical sources of comparative advantages e.g., market size and market growth; we also include knowledge-related country specific characteristics. Our explanatory and control variables to be tested are given in Table 1.

Market related variables:

We use GDP per capita and GDP growth as proxies for market size and market growth of host countries. These seem to be the most robust measure of market size and market growth in contemporary literature (Artige and Nicolini, 2005), as it has been established that locations with faster economic growth and bigger market size attract more FDI due to the potential of local market as being bigger market for investors containing a bigger demand (among others, see Coughlin et al., 1991; Head et al., 1999; Pusterla & Resimini, 2007). Also, according to new theory of trade market size and market growth have positive effect on FDI determinants (e.g., Asiedu, 2006; Cleeve, 2008, Vijayakumar et al., 2010). Firms are expected to have greater incentives to locate in countries with higher GDP per capita and faster economic growth hence we expect a positive sign when investors chose market-seeking OFDI.

Knowledge related variables:

Several studies refer to different characteristics depicting knowledge strength (base) of host location, and argue that firms may take benefits not only from internal knowledge capacity but also from the external knowledge available at host locations. Given our interest in country level determinants of OFDI, we focus on the measures of technical activities at country level to reflect

knowledge-base. Following Chung and Alcacer (2002), we use two variables to measure knowledge-bases of host countries: R&D intensity and skilled labor.

Higher spending on R&D by a country indicates the priority given to enhancing science and technology activities there. Higher R&D intensity is a major driver of innovation resulting in continuous generation of new knowledge for goods and services. R&D intensity is computed as percentage of spending in R&D to the national GDP. It includes total R&D spending consisting of government, private, higher education and other sectors.

Availability of skilled labor also depicts knowledge stock of a country. Country with more skilled labor has an increased level of technological innovation and productivity. Higher level of skilled labor also refer to strength of external knowledge sources (e.g. in form of more universities and research centers) available at host country enhancing technological and production knowledge there (Kline and Rosenberg, 1986; Rosenberg and Nelson, 1996; Nelson and Rosenberg, 1999; Breschi, 2000). Firms, then, may benefit from geographically localized knowledge linkages among different actors and knowledge spillovers (Jaffe et al. 1993; Audretsch and Feldman, 1996; Audretsch and Stephan, 1996; Anselin et al., 2000). International mobility of multinational firms enables them to tap into such knowledge pools present at host locations following knowledge-seeking OFDI. Several empirical findings state that availability of skilled labor has a positive effect on OFDI (e.g. Asiedu, 2006; Cleeve, 2008).

We use count of human resources in science and technology (S&T) as a proxy of skilled labor. Several empirical studies use primary or secondary school enrollments, number of graduates or doctoral students as a proxy of skilled labor. We use count of human resources in S&T as proxy of skilled labor due to two reasons. One, data availability limitations, and second; we

believe that number of school enrollments cannot truly represent the knowledge strength of the economy as not all students enrolled in primary or secondary school study until graduation, and graduates and doctorate degree holders are multi-disciplinary including arts and humanities related subjects as well. Hence, we use count of human resources in S&T with tertiary level education and active in science and technology sector as our proxy of skilled labor.

Table 1 Summary of Variables

Variables	Symbols	Measurements
<u>Dependent Variable</u> Choice	CHOICE	Investors choice to invest in Alternatives (1995-2010)
<u>Independent Variables</u>		
<u>Market-seeking</u>		
GDP	lnGDPPPP	GDP per capita (000s) (Worldbank 1995-2010)
Market Growth	GDPGROWTH	GDP growth %age (Worldbank 1995-2010)
<u>Knowledge-seeking</u>		
R&D Intensity	RnD_INT	Total R&D spending as %age of GDP (Worldbank1995-2010)
Skilled Labor	lnRES	Human resource in Science and Technology(000s) (EUROSTAT 1995-2010)
Population Density	POPDENS	People per sq. km of land area (00s) (Worldbank 1995-2010)
High-Technology Exports	HEXMFG	High-Tech exports as %age of manufactured exports in total (Worldbank 1995-2010)
FDI Inflows	FDIINF	Annual aggt. FDI inflows in Alternatives (Mio. \$) (Worldbank 1995-2010)
Infrastructure	ROADS	% of Paved roads in total Roads (Worldbank 1995-2010)
Proximity	lnDIST	Euclidean distance in km between capital of home region and the alternative's (own calculations)

A higher total R&D intensity and skilled labor at national level demonstrates a higher level of knowledge related activities and flows at host

location, thus attracting more knowledge oriented FDI there, and we expect a positive sign when investors choose knowledge-seeking FDI.

Control variables:

We also control for number of other variables in our analysis. For instance, geographical proximity is an important factor in this regard, as firms are primarily concerned with minimizing costs, especially transaction costs, and knowledge is mainly tacit and requires frequent contacts among different entities. Available literature also supports the tacit nature of knowledge and stresses that distance might affect the transmission and diffusion of knowledge and technical activities across firms in host locations (Kogut and Zander, 1992; Caniels, 2000; Verspagen and Schoenmakers, 2000). We control for distance between host location and home location using euclidean distance between capitals of each location, as proximity to host location is also considered to be one of the traditional determinants of OFDI.

It may happen that countries have a bigger stock of skilled labor and higher R&D spending and yet idle or slow in knowledge creation. In this matter, frequency or speed of knowledge creation can be a good control. Some studies use number of patent applicants as a control variable; however, due to a very high correlation between number of patents and R&D intensity in our data, we cannot employ this control measure. In order to control the pace of knowledge creation we use percentage of high-tech exports in total export manufactured in a country instead.

We also use population density as one of our control variables due to its potential of being proxy of land prices of host location. Higher population density potentially corresponds to a smaller land size resulting into higher land prices at host locations (Guimarães et al., 2000; Barrios et al., 2006) or deficit of land availability in countries with higher population and land area (e.g. Germany, Great Britain). Since investors are primarily concerned with

cost minimization, a higher population density discourages firms' investment decisions. We also partly control for foreign firm agglomeration at host locations (as a result of the openness of the economy (e.g. Asiedu, 2006; Botrić and Škuflić, 2006; Cleeve, 2008; Vijayakumar et al., 2010)) by using FDI inflows as a proxy. A large volume of FDI inflows at host location due to openness of economy there would result in to presence of more firms from other countries leading to the presence of agglomeration economies. Moreover, firms from CEEC may follow Bandwagon effect with the presence of large FDI inflows at host location triggered by rush amongst rivals (Knickerbocker, 1973; Sethi et al., 2003).

We control for infrastructure of host country as well. We use percentage of paved roads in a country to account for it. Empirical evidence state that countries with good infrastructure attract more FDI (e.g. Biswas, 2002; Asiedu, 2006; Vijayakumar et al., 2010). Moreover, good infrastructure also provide access to adjacent markets. Infrastructure in developed countries (e.g. EU-15) may not be important for investors due to similar and well established infrastructure there, however, it may be of importance in case of investments are made in other transition economies(e.g. CEEC).

Based on our variables in our estimation, the expected profit derived by investor i if he locates at country j is given by following specification:

$$\begin{aligned} \pi_{ij} = & \beta_1 \ln GDPPP_{jt_{i-1}} + \beta_2 GDPGROWTH_{jt_{i-1}} + \beta_3 RnD_INT_{jt_{i-1}} + \beta_4 \ln RES_{jt_{i-1}} \\ & + \beta_5 POPDENS_{jt_{i-1}} + \beta_6 HEXMFG_{jt_{i-1}} + \beta_7 FDIINF_{jt_{i-1}} + \beta_8 ROADS_{jt_{i-1}} \\ & + \beta_9 \ln DIST_j + \epsilon_{ij} \end{aligned}$$

,where $\beta_1 \ln GDPPP_{jt_{i-1}}$ is the GDP per capita of country j at t_{-1} as entry of investor i , $\beta_2 GDPGROWTH_{jt_{i-1}}$ is the annual GDP growth of country j at t_{-1} as entry of investor i , $\beta_3 RnD_INT_{jt_{i-1}}$ is the total R&D intensity of country j at t_{-1} as entry of investor i , $\beta_4 \ln RES_{jt_{i-1}}$ is the number of people employed in

science and technology sector at country j at t_{-1} as entry of investor i , $\beta_5 POPDENS_{jt_{i-1}}$ is the number of inhabitants per square kilometer in country j at t_{-1} as entry of investor i , $\beta_6 HEXMFG_{jt_{i-1}}$ is the total number of high-tech exports in total manufactured exports of country j at t_{-1} as entry of investor i , $\beta_7 FDIINF_{jt_{i-1}}$ is total FDI inflows in of country j at t_{-1} as entry of investor i , $\beta_8 ROADS_{jt_{i-1}}$ is the percentage of paved roads in total roads of country j at t_{-1} as entry of investor i , $\beta_9 DIST_j$ is the geographical distance between capital city of country j and the capital city of the country of investor i , and ϵ_{ij} is a random term.

In this basic specification, the parameters β_1 to β_4 constitute the explanatory variables related to our hypotheses and β_5 to β_9 constitute control variables in country-specific location choice. Apart from β_9 , all explanatory variables are measured at t_{-1} as the year preceding the entry of investor i . By lagging the respective variables we try to reduce a possible endogeneity problem between the investment of firms and the country specific effects. We also restrict our analysis to intra-country effects in order to lower the chances of multicollinearity.

5. Results and Discussion (To be completed)

The regression results presented in Table 2 are divided into two (sub) samples. The first column shows the result for a regression run for all sample (EU27) countries, while the second column (II) shows the results for EU-15 titled as "East-West", as it takes into account investment choices from CEEC firms to EU-15 countries. The third column (III) shows the results of the regression for remaining 12 alternatives titled as "East-East", as it takes into account investment choice from CEEC firms to other CEEC countries (alternatives). All continuous variables are in logs for computations except

FDI Inflows (FDIINF), due to presence of large number of negative values in this variable data. Summary statistics and correlations of the variables are given in appendix. The variance inflation factor (VIF) is less than 2.54 for each variable, whereas the mean VIF is 2.03. These values suggest that there is no serious multicollinearity issue.

In the whole sample, GDP per capita is significant and positive (at 5% level), and market growth is significant and positive (at 0.1% level). R&D intensity is significant (at 0.1% level) and has a negative sign. Skilled labor is significant and positive (at 0.1% level). Population density is not significant but has a positive sign. High-tech exports are significant and positive (at 0.1% level). Moreover, FDI inflows are positive and significant (at 0.1% level). Infrastructure is not significant and distance is significant and negative (at 0.1% level).

In case of East-West, reported in column II of Table 2, we find GDP per capita significant and positive (at 1% level) and we find market growth positive but not significant. R&D intensity is significant (at 1% level) but negative. Skilled labor is significant and positive (at 0.1% level), whereas population density has positive sign but not significant. High-tech exports are significant and positive (at 0.1% level). FDI inflows are significant and positive at (0.1% level), whereas Infrastructure is not significant and proximity is significant and negative at (0.1% level).

In case of East-East, reported in column III of Table 2, we find GDP per capita significant and positive (at 1% level) and market growth significant (at 1% level) and positive. R&D intensity is significant (at 0.1% level) and has a positive sign. Also, skilled labor is significant and positive (at 0.1% level). Both Population density and high-tech exports are significant (at 0.1% levels) and negative. FDI inflows are positive but not significant,

infrastructure is positive and significant (at 0.1% level), whereas proximity is significant and negative (at 0.1% level).

Table 2 Conditional Logit for the whole sample and sub-samples

		(I) EU27 (choice)	(II) East-West (choice)	(III) East-East (choice)
<u>Market-Seeking</u>				
GDP/capita	lnGDPPP	0.361* (2.30)	3.484** (2.91)	1.403** (2.77)
Market Growth	GDPGROWTH	0.386*** (10.21)	0.132 (1.60)	0.135** (2.92)
<u>Market-Seeking</u>				
R&D Intensity	RnD_INT	-0.671*** (-5.01)	-0.737** (-3.22)	2.134*** (4.22)
Skilled Labor	lnRES	0.679*** (7.62)	0.943*** (5.40)	2.919*** (8.81)
Population Density	POPDENS	0.000374 (0.54)	0.000263 (0.23)	-0.0693*** (-8.41)
High-Tech Exports	HEXMFG	0.0450*** (5.60)	0.0680*** (4.06)	-0.134*** (-6.36)
FDI Inflows	FDIINF	0.0000173*** (12.06)	0.0000100*** (4.43)	0.0000141 (1.03)
Infrastructure	ROADS	-0.00612 (-1.56)	-0.0132 (-1.48)	0.0615*** (6.06)
Proximity	lnDIST	-1.630*** (-17.32)	-1.326*** (-6.50)	-2.785*** (-12.71)
<i>N</i>		10426	3225	2717
<i>AIC</i>		1890.6	708.7	654.0
Log lik		-936.3	-345.4	-318.0
chi-sq		541.4	300.1	199.6

Conditional Logit Estimation. Dependent Variable: Location Choice for country j.
t- statistics in parentheses. Significance level: * p < 0.05(5% level), ** p < 0.01 (1% level), *** p < 0.001 (0.1% level)

In order to further analyze investment motives at scrotal level, Table 3 reports the regression for both East-West and East-East directions for CEEC firms from manufacturing and service sectors.

<Insert Table 3 here>

As a whole, these results do not reflect any significant difference, apart from market size being significant for manufacturing firms and not significant for services sector firms.

The objective of this paper was to analyze the impact of market seeking and knowledge-seeking location-specific factors on the location choice of investors. Various variables under these categories were analyzed. For marketing seeking FDI choice in whole sample, different determinants have expected signs comparable to existing studies using CLM for location choice (e.g. Head et al., 1999; Guimarães et al., 2000). However, for knowledge-seeking choice we have somewhat mixed results, but to some extent in line with existing studies (e.g. Chung and Alcacer, 2002). On the basis of estimation results, investors are attracted to location with bigger market size, faster market growth, lower R&D intensity, availability of skilled labor, more FDI inflows, large high-tech exports and locations which are closer to home location.

Results of the whole sample do not necessarily reflect the investment motives of investors from CEEC to a full extent. This was the reason, we had divided our sample in East-West and East-East subsamples. Countries from EU-15 and transition economies are different in several aspects, and one must be careful in interpreting results side by side. Overall, the findings provide support for the basic assumptions underlying this paper.

For market seeking motives, we see that investors from CEEC are interested in larger markets for both directions (East-West and East-East) of investments following traditional multinationals' behavior. However, market growth is not an important factor for investors in Eu-15, but an important factor in other transition economies. Western European countries are most developed economies with slow economic growths, whereas growth rates in transition economies are matter of interest for investors, as these are still developing economies. In this case, faster economic growth means more opportunities of having bigger market demand, and this might explain the importance of market growth among investors for their location choice in transition economies.

For knowledge seeking motives, we see that presence of higher R&D intensity in EU-15 refrains investors but in other transition economies higher R&D intensity attracts investors. It does not reflect that investors are not interested in knowledge strength of host location, as presence of high quality labor is equally important for investors no matter which location. But, the negative impact of R&D intensity on investors' choice to locate in EU-15 is due to two reasons in our opinion. One, chances of stronger competition there as these countries are among the highest recipient of FDI in EU-27 and investors might think of losing their competitive advantage compared to locating in other transition economies. Second, R&D intensity might not be a good measure of national knowledge, since it incorporates R&D spending from both government and private sources. One might think of disaggregating these spending on ground of data availability.

For other variables we used, we see that higher level of population density discourages investment choice in countries in CEEC, partly because of relative smaller sizes of most of countries, such as Slovenia resulting into higher land prices. We also see that infrastructure quality has a positive impact on the location choice, again only in CEEC. Firms want to access

adjacent markets in CEEC and its matter of importance to have well established road network. Whereas, it is not an important factor while investing in EU-15, as infrastructure in these countries is very well developed and connected. We also see that, investors are attracted to locations with higher level of FDI inflows, and are more relevant to investments in EU-15, as more investments to a location means presence of more multinational companies and firms can take benefit of possible knowledge spillovers there.

Concluding, we find that firms from CEEC follow traditional firms' behavior when their primary OFDI motive is market-seeking (targeting large markets), whereas knowledge seeking OFDI from these firms also provide an empirical evidence for knowledge seeking behavior of firms from transition economies (e.g. Kedia et al., 2012). Not only firms from technologically advanced countries go to other advanced countries for seeking knowledge, but also firms from developing and transition economies. However, this study was just an attempt to find out whether knowledge-seeking FDI has an importance for firms or not, and our results confirm it, but a more detailed analyses is warranted. Researchers should incorporate firms' heterogeneity and carry out region-level research to analyze this concept in depth. Disaggregation of variable interpreting national knowledge base is important in this regard.

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Appendix:

Table 3 Conditional Logit for manufacturing and service sector

		(I) Manufacturing (choice)	(I) Services (choice)
GDP/capita	lnGDPPPP	0.505* (1.96)	0.288 (1.20)
Market Growth	GDPGROWTH	0.368*** (6.10)	0.390*** (6.71)
R&D Intensity	RnD_INT	-0.713** (-3.29)	-0.776*** (-3.75)
Skilled Labor	lnRES	1.043*** (6.72)	0.534*** (3.82)
Population Density	POPDENS	0.000474 (0.44)	-0.000552 (-0.45)
High-Tech Exports	HEXMFG	0.0516*** (3.85)	0.0498*** (4.56)
FDI Inflows	FDIINF	0.0000122*** (5.62)	0.0000227*** (10.40)
Infrastructure	ROADS	-0.00317 (-0.42)	-0.00145 (-0.28)
Proximity	lnDIST	-1.313*** (-8.22)	-1.911*** (-13.58)
	<i>N</i>	4446	5096
	<i>n</i>	171	196

Table 4 Descriptive statistics

Variables	Symbols	Obs	Mean	Std. Dev	Min	Max
Population Density	POPDENS(000/sq.km)	24122	170.33	235.30	16.77	1300
GDP/capita	lnGDPPP(Mio.)	24752	11.53	1.77	7.92	14.72
Market Growth	GDPGROWTH(%age)	24752	3.63	2.850244	-17.95	12.23
Proximity	lnDIST(Km. 000s)	24752	6.86	.6471907	4.02	8.10
R&D Intensity	RnD_INT(%age)	22990	1.36	.8716708	.22	4.13
Skilled Labor	lnRES (000s)	22314	7.26	1.430043	3.71	9.942
High-Tech Exports	HEXMFG(%age)	24178	15.40	13.0081	1.21	71.74
FDI Inflows	FDIINF (Mio.)	24173	17986.83	32854.65	-42283.45	210085.4
Infrastructure	ROADS(%age)	24752	52.29118	26.75338	17.62	175.93

Table 5 Collinearity Statistics

Variable	VIF	SQRT VIF	Tolerance	R-Squared
lnGDPPP	2.43	1.56	0.4122	0.5878
RnD_INT	2.52	1.59	0.3970	0.6030
lnRES	2.54	1.59	0.3934	0.6066
GDPGROWTH	1.35	1.16	0.7419	0.2581
POPDENS	1.95	1.40	0.5127	0.4873
HEXMFG	2.11	1.45	0.4736	0.5264
FDIINF	1.61	1.27	0.6220	0.3780
ROADS	2.44	1.56	0.4092	0.5908
LnDIST	1.31	1.14	0.7658	0.2342
Mean VIF	2.03			

Data Imputations:

In order to cope with missing observation issues, we have imputed data for missing observations in our explanatory variables. The data has been imputed using STATA software in following ways:

First, if there is a missing value between two observations, we imputed the missing value by taking the mean between the following and subsequent

period. Second, if the time series ends at a certain period (e.g. before 2010), we imputed the missing values by multiplying the last observation with the observation between that period and the year before. Third, since our analysis starts 1995 onwards, the same step was applied for time series starting after 1995. After the implication of imputations, we can observe investment behavior of 951 firms. Table. 6 and 7 report the results with imputed data.

Table 6 Conditional Logit for the whole sample and sub-samples (Imputed Data)

	(1) EU27 choice	(II) East-West choice	(III) East-East choice
lnGDPPPP	-0.526*** (-6.85)	1.903** (3.10)	-0.376 (-1.52)
GDPGROWT H	0.102*** (6.37)	0.194*** (3.41)	0.0685** (2.72)
RnD_INT	-0.538*** (-6.05)	-0.514** (-3.08)	2.276*** (6.50)
lnRES	0.445*** (9.35)	0.955*** (7.41)	1.717*** (8.63)
POPDENS	0.000291 (0.86)	0.00109 (1.38)	-0.0362*** (-7.45)
HEXMFG	0.0292*** (5.86)	0.0764*** (6.18)	-0.121*** (-8.67)
FDIINF	0.0000155*** (15.48)	0.00000772*** (4.79)	0.00000833 (0.72)
ROADS	-0.00652* (-2.39)	-0.0173* (-2.46)	0.0511*** (7.56)
lnDIST	-1.559*** (-28.23)	-1.078*** (-7.26)	-2.799*** (-20.84)
<i>N</i>	24726 951	5985 399	6072 552

Table 3 Conditional Logit for manufacturing and service sector (Imputed data)

	(1) Manufacturing choice	(II) Services choice
lnGDPPPP	-0.498*** (-4.28)	-0.549*** (-4.95)
GDPGROWTH	0.107*** (4.23)	0.0770*** (3.49)
RnD_INT	-0.518*** (-3.83)	-0.671*** (-5.00)
lnRES	0.673*** (8.61)	0.275*** (4.07)
POPDENS	0.000313 (0.59)	-0.0000600 (-0.12)
HEXMFG	0.0371*** (4.74)	0.0256*** (3.67)
FDIINF	0.0000138*** (9.01)	0.0000184*** (12.52)
ROADS	-0.00743 (-1.60)	-0.00356 (-0.99)
lnDIST	-1.330*** (-15.66)	-1.768*** (-21.91)
<i>N</i>	11076 426	12090 465