2 Regional Determinants of MNE’s Location Choice in Post-Transition Economies

2.1 Introduction

The transition process from a socialist planned economy to a market economy was challenging for the affected countries since it involved the establishment of a new economic and institutional framework, market liberalization as well as industrial privatization and restructuring (Detscher 2006). Transition paths and economic development differed and still differ across CEE countries. East Germany, however, is a case on its own. As a consequence of the German reunification, East Germany received massive financial transfers from the western part of the country. These transfers along with the institutional adoption of a well-functioning market economy and democracy supported East Germany’s relatively strong and quick modernization process. Since the capital stock in all CEE countries reduced dramatically in the course of the economic crisis of the late 1980s, the transition process had to be accompanied by a vast amount of FDI.

The European Bank for Reconstruction and Development (EBRD) argues that institutional change has already finished in the NMS among the transition countries. There are, however, still functional weaknesses and economic differences, which correlate directly to the former political system and the transition period itself (EBRD 2009). According to the EBRD’s definition, post-transition countries make up a well-defined group and differ from developed or emerging economies with regard to their socialist and centrally-planned past.

This chapter contributes to empirical literature on location choice of MNEs by combining four related research characteristics. Firstly, it increases the explanatory power of post-transition economies by providing a multi-country study at a regional level, whereas the majority of former studies analyze location determinants on a macro level or at the regional level for merely a single country. Secondly, it focuses on the influence of regional and transition specific determinants - the effects of agglomeration and labor market factors in particular - on foreign investors’ location choice for FDI. Thirdly, it allows a cross-sectional comparison, because the heterogeneous character of foreign investments prompts an analysis of whether location choice in the manufacturing and service sector is driven by different regional factors and motivations (Galego, Vieira, and Vieira 2004). Most former analyses, however, solely
focus on manufacturing plants. Fourthly, it exploits a dataset of regional, sectoral and subsidiary-level data. The subsidiary-level data are drawn from a unique, very large and up-to-date dataset, the population of the *IWH FDI Micro Database*, which is combined with a vast set of region-specific and industry-specific variables.

To explain the regional location choice of MNEs in post-transition economies adequately, the two most important streams of literature are examined below. The first stream examines the *new economic geography* (NEG) developed by Krugman (1991) and Venables (1996) which emphasizes the importance of agglomeration economies in regional development and attraction of investment from abroad. According to Marshall (1920), agglomeration effects consist of three main factors: labor market specialization, supplier linkages and knowledge spillovers. In the context of regional attractiveness for FDI, agglomeration economies describe a positive correlation between a region’s ability to attract further investors and the number of firms already existing in a specific sector (Dunning and Lundan 2008). In contrast, Crozet, Mayer, and Mucchielli (2004) theoretically show that the agglomeration effect depends on a trade-off between the positive Marshallian externalities and the negative impact of competition. The former effect seems to dominate empirically as recent studies have shown. At a national level a significantly positive impact of agglomeration economies on the attractiveness for FDI in economically developed economies is shown by Disdier and Mayer (2004) and Basile, Castellani, and Zanfei (2008) in the case of Europe, and on regional level by Crozet, Mayer, and Mucchielli (2004) for France, Barrios, Görg, and Strobl (2006) for Ireland, and Guimarães, Figueiredo, and Woodward (2000) for Portugal. In terms of post-transition economies, regional agglomeration economies also turn out to be one of most important determinants for the spatial distribution of foreign investment as show Pusterla and Resmini (2007) for the CEE region, Chidlow, Salciuviene, and Young (2009) for Poland, Hilber and Voicu (2010) for Romania, and Boudier-Bensebaa (2005) for Hungary.

Drawing on NEG, this chapter tests three hypotheses on the impact of agglomeration economies on foreign multinational enterprises in terms of regional specialization, regional supplier linkages, and knowledge spillovers. Jacobs (1969) furthermore suggests that particularly large, diversified cities are attractive for inward FDI.

This leads to the first set of hypotheses, which deal with agglomeration economies. Firstly, the specialization of the regional workforce in the sector of investment positively impacts the location of FDI in post-transition economies (*Hypothesis 1a*). Secondly, the potential for supplier linkages positively impacts the location
of FDI in post-transition economies (H 1b). Thirdly, the potential for knowledge spillovers positively impacts the location of FDI in post-transition economies (H 1c).

The second stream of literature focuses on location factors in post-transition economies. From a theoretic perspective investment motives of MNEs can be classified in four groups according to Dunning and Lundan (2008): market seekers, efficiency seekers, strategic assets or capability seekers and natural resource seekers. Recent evidence shows that MNE investment in European post-transition economies is still dominated by market and efficiency seeking motives; the search for local knowledge is of secondary importance and natural resource seeking is least important (Gauselmann, Knell, and Stephan 2011). While market seeking investment motives are presumably important for foreign investment in general, it has been shown that FDI has especially been attracted to the post-transition economies by the presence of production factors, especially the availability of a skilled workforce at relatively low cost of labor (Gauselmann, Knell, and Stephan 2011; Chidlow, Salciuviene, and Young 2009; Resmini 2000; Bevan, Estrin, and Meyer 2004; Galego, Vieira, and Vieira 2004). Chidlow, Salciuviene, and Young (2009) find a strong positive impact of efficiency seeking local determinants on Poland, Galego, Vieira, and Vieira (2004) find evidence of this impact in all CEE countries.

This leads to the second set of hypotheses, which deal with investment motives referring to the regional labor market. In particular two hypotheses are tested. Firstly, a high regional wage rate in the sector of investment negatively impacts the location of FDI in post-transition economies (H 2a). Secondly, the availability of human capital in the region of investment is positively associated with the location of FDI in transition economies (H 2b).

Taking the differences in economic performance between transition and western industries into account, the results of the numerous FDI location studies on western countries might not apply to post-transition economies. With respect to the regional level of analysis, the NEG emphasizes the importance of regional-level industrial linkages in a firm’s decision-making process. Hence, it is straightforward to analyze the importance of agglomeration economies on a regional rather than on a national level. Therefore, in this study, MNEs are assumed to make their location decisions based on the level of the European Union’s regional statistical units (NUTS-2 regions). A mixed logit model is used to estimate location choice of FDI in the 33 NUTS-2 regions in East Germany, the Czech Republic and Poland.
This chapter is organized as follows: Section 2.2 provides the derivation of the economic model behind the location choice of MNEs and the econometric theory which underlies the empirical analysis. The data used in the regressions are described in Section 2.3, followed by a discussion of the empirical results in Section 2.4. Finally, the main empirical findings and their policy implications are discussed and summarized in Section 2.5.

2.2 Theoretical Background and Estimation Approach

A MNE bases its decision to invest abroad on at least three steps (see e.g. Basile, Castellani, and Zanfei 2008). Firstly, the MNE decides whether to serve a foreign market. Secondly, the MNE takes a decision on how to serve this market. This investment can be implemented through exports, joint ventures, licensing or foreign direct investment. Thirdly, the investing company chooses a region for its foreign investment. This chapter investigates the location choice of a MNE that has already decided to invest either in East Germany, the Czech Republic or Poland. It faces the decision of choosing one (or more) of the \( j \in J \) regions as the location for its foreign investment.

2.2.1 Economic Theory

The model used for the analysis of this investment decision is based on the framework of monopolistic competition developed by Dixit and Stiglitz (1977). This links the production cost function with a demand function of a representative utility-maximizing individual. The Dixit-Stiglitz model was expanded upon e.g. by Venables (1996) and Krugman (1991). On the basis of these contributions, Head and Mayer (2004) developed a theoretical framework for location choice analysis of foreign direct investments which has been frequently used in recent studies e.g. see Mayer, Méjean, and Nefussi (2010); Spies (2010); and Amiti and Javorcik (2008).

Dixit and Stiglitz (1977) assume a homothetic and concave utility function with two consumption goods, \( x_0 \) and \( X \). The market of good \( X \) is monopolistically competitive and consists of \( n \) product varieties, while \( x_0 \) describes the rest of the economy. Since the indirect utility of \( X \) equals the aggregate quantity of \( X \) and is driven by a constant elasticity of substitution (CES) function, the following utility function underlies the Dixit-Stiglitz model:
\[ U = U(x_0, X(x_1, x_2, \ldots, x_n)) = \\
U \left( x_0, \left( \sum_{i=1}^{n} x_i^{\rho} \right)^{\frac{1}{\rho}} \right) = U \left( x_0, \left( \sum_{i=1}^{n} x_i^{\frac{\sigma-1}{\sigma}} \right)^{\frac{1}{\sigma}} \right). \quad (2.1) \]

With respect to the concavity assumption, \( \rho \) is positive and may not exceed unity. Hence, the elasticity of substitution between individual variations of \( x_0 \) and \( X \), denoted by \( \sigma = \frac{1}{1-\rho} > 1 \), exceeds unity. Assuming that \( x_0 \) is a numéraire good and that a share \( a(P) \) of the total income \( Y \) is spent on good \( X \), the following budget constraint serves as the side condition for the utility maximization:

\[ Y = x_0 + a(P)Y \Rightarrow a(P)Y = \\
\sum_{i=1}^{n} p_i x_i = \left( \sum_{i=1}^{n} p_i^{1-\sigma} \right)^{\frac{1}{1-\sigma}} \cdot \left( \sum_{i=1}^{n} x_i^{\frac{\sigma-1}{\sigma}} \right)^{\frac{1}{\sigma}}, \quad (2.2) \]

where \( P \) is a price index.\(^1\) Dixit and Stiglitz (1977) apply a two-step maximization to derive the optimal demand for good \( x_i \). First, the optimal combination between \( x_0 \) and the aggregate good \( X \) is derived subject to the aggregate budget constraint on the right hand side of (2.2). Then the optimal quantity of variety \( i \), \( x_i \), is calculated subject to the more detailed budget constraint, \( Y = x_0 + \sum_{i=1}^{n} p_i x_i \). The insertion of the optimal choice of \( X \) leads to the optimal demand for \( x_i \). According to (2.2), \( X \) can be substituted by \( \frac{a(P)Y}{P} \), which leads to the following optimal demand for \( x_i \):

\[ x_i = \left( \frac{P}{p_i} \right)^{\sigma} X = \frac{a(P)Y \cdot P^{\sigma-1}}{p_i^{\sigma}}. \quad (2.3) \]

After having derived the optimal demand based on the CES function, the focus is on the profit maximization of the producer of variety \( i \). The producer’s optimal monopoly price \( p_{mp} \) can be denoted by \( p_{mp} = c/(1 - 1/|\epsilon_{x,p}|) \). By assuming that a single monopolist does not influence the price index \( P \), equation (2.4) shows that the price elasticity of a single producer is equal to the negative substitution elasticity \( \sigma \). Hence, the optimal price depends only on the marginal costs and the elasticity of

\(^1\) The derivation of the price index \( P \) can be found in e.g. Wied-Nebbeling and Schott (2001: 320pp.).
substitution.
\[ \epsilon_{x_i, p_i} = \frac{\partial \ln x_i}{\partial \ln p_i} = -\sigma \Rightarrow p_i^* = \frac{\sigma}{\sigma - 1} c \]  (2.4)

Since it is assumed that \( \sigma > 1 \), the equilibrium price exceeds the marginal costs. Furthermore, (2.4) shows that the equilibrium price negatively depends on the substitution elasticity. This result is the basis for the profit maximization of a MNE choosing a region \( j \) as a location for a subsidiary in sector \( k \) to serve \( m \in M \) markets. Furthermore, the distance between the production plant in region \( j \) and the market \( m \) produces transaction costs (such as transportation and communication costs). Hence, production costs are subject to the assumption of iceberg-type transaction costs, \( \phi_{jm} \), leading to the cost function, \( c_{jkm} = c_{jk}\phi_{jm} \). It is assumed that the MNE tries to maximize its profits over a finite time horizon.

\[ \pi_{jk} = (1 - t_j) \sum_{m=1}^{M} [(p_{jkm} - c_{jkm})x_{jkm}] = \]

\[ (1 - t_j) \sum_{m=1}^{M} \left[ \frac{1}{\sigma - 1} c_{jk}\phi_{jm} a_m(P_m)Y_mP_m^{\sigma - 1} \left( \frac{1}{\sigma - \gamma_j c_{jk}\phi_{jm}} \right)^{\gamma_j} \right] \]  (2.5)

The factor of demand \( a_m(P_m)Y_m \) and the price index \( P_m^{\sigma - 1} \) are defined as a region’s market access \( MA_m \). It is assumed that the marginal costs, \( c_{jk} \), depend on the sectoral wage rate, \( w_{jk} \), including a tax wedge on labor \( \tau_j \), capital costs (such as land prices), \( r_j \), and a productivity factor, \( A_{jk} \) (the educational background of, the workforce, \( E_j \), agglomeration economies measured by existing inter-industry linkages, \( S_{jk} \), the technological performance of the regional economy expressed by patent data, \( T_{jk} \), and the regional economic structure, \( H_j \)). The distance between the MNE’s home country and the region of investment, \( d_j \), is included in order to reflect transaction costs of production. By modifying the approach taken by Brühlhart, Jametti, and Schmidheiny (2012), it is assumed that marginal costs are derived through the product of the independent variables which influence the production costs by means of variable-specific elasticities. This leads to the following cost function:

\[ c_{jk} = ((1 + \tau_j)w_{jk})^{\gamma_1} r_j^{\gamma_2} d_j^{\gamma_3} A(S_{jk}, T_{jk}, H_j, E_j) = \]

\[ \phi_{jm} \] This implies that the delivery of \( x \) goods from the location of production \( j \) to market \( m \) requires the shipment of \( \phi_{jm}x \) goods. By definition, \( \phi_{jm} \) exceeds unity if \( m \) does not correspond to \( j \). If the goods do not cross region \( j \), \( \phi_{jm} \) equals one.
\[(1 + \tau_j)w_{jk})^{\gamma_1} r_j^{\gamma_2} d_j^{\gamma_3} S_{jk}^{\delta_1} T_j^{\delta_2} H_j^{\delta_3} E_j^{\delta_4}. \tag{2.6}\]

After inserting (2.6) and \(MA_m\) into (2.5), the profit function can be transformed into the following log-linear empirical function with the coefficient vector \(\beta\) and the error term \(e_{jk}\):

\[
\pi_{jk} = \beta_0 + \beta_1 \ln t_j + \beta_2 \ln \tau_j + \beta_3 \ln w_{jk} + \beta_4 \ln r_j + \beta_5 \ln d_j + \beta_6 \ln S_{jk} + \\
\beta_7 \ln T_j + \beta_8 \ln H_j + \beta_9 \ln E_j + \beta_{10} \ln \left(\sum_{m=1}^{M} \frac{MA_m}{\phi_{jm}}\right) + e_{jk}. \tag{2.7}\]

### 2.2.2 Econometric Approach

This analysis is based on a discrete choice model. In this approach, the location choice is based on a stochastic utility maximization process for a MNE which results from the choice of region \(j\) as a subsidiary location selected from \(J\) possible regions of the sample.\(^4\) Following Greene (2003) and Train (2009), the MNE chooses the region where it expects to make the largest profit, \(\pi_{ij}\).\(^5\) In this analysis, the deterministic part of the profit function is driven by two different kinds of regressors: on the one hand alternative specific regressors, \(x_{ij}\) (e.g. GDP or the industrial structure in a specific region), and on the other hand individual specific regressors, \(y_i\) (e.g. sector of the investing firm), which do not vary across alternatives. The stochastic and unobservable part of the equation is represented by the error term, \(e_{ij}\).

\[
\pi_{ij} = x_{ij}'\beta + y_i'\gamma_j + e_{ij}. \tag{2.8}\]

By definition, the MNE chooses the region \(j\) which exceeds the expected profits of all the other regions \(l \in J, \ l \neq j\). Thus, the location choice is the dependent variable of this analysis and equals one for the region chosen by the MNE, and

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\(^3\) See section A.2.1 of the appendix for a detailed specification of the coefficient vector \(\beta\).

\(^4\) For reasons of simplicity, the sectoral subscript \(k\) of the theoretical model is omitted in the following notation.

\(^5\) In this framework, each case represents the location decision for one subsidiary. This assumption does not exclude the possibility that a firm can choose several locations for its subsidiaries since different subsidiaries can have the same investor.

\(^6\) For reasons of simplicity the individual-specific regressors will be omitted in the following notation.
otherwise is zero. This assumption leads to the following estimation of the logit choice probabilities \( P_{ij} \) (see Train 2009):

\[
P_{ij} = \text{Prob}(\pi_{ij} > \pi_{il}, \forall l \neq j) = \text{Prob}(\epsilon_{ij} > x'_{il} \beta - x'_{ij} \beta + \epsilon_{il}, \forall l \neq j).
\] (2.9)

The unobserved part of the error term follows a Gumbel type I extreme value distribution \( F(e_{ij}) = \exp(-\exp(-e_{ij})) \), with independently distributed error terms among the alternatives. This assumption is defined as independence of irrelevant alternatives (IIA). Following McFadden (1973), a transformation of the distribution leads to the following probability equation:

\[
P_{ij} = \frac{\exp(x'_{ij} \beta)}{\sum_{l=1}^{J} \exp(x'_{il} \beta)},
\] (2.10)

which is defined as the conditional logit equation.\(^7\)

The conditional logit’s very strict IIA assumption is put to the Hausman test (see Hausman and McFadden 1984). The Hausman test compares parameter estimates of the unrestricted whole sample (including all alternatives \( j \in J \)) with the ones obtained from specified subsamples.\(^8\) The Hausman test suggests that the IIA assumption is violated in this sample since the Hausman test’s assumption of a systematic difference between the restricted and unrestricted model is rejected for any specified subset of \( J \).\(^9\)

The IIA assumption can be eased by using a mixed logit estimation which has been applied in recent location choice studies (see e.g. Basile, Castellani, and Zanfei 2008). Following Train (2009) and Basile, Castellani, and Zanfei (2008), equation (2.8) can be defined as

\[
\pi_{ij} = x'_{ij} \beta + x'_{ij} \delta_i + u_{ij}
\] (2.11)

where \( \delta_i \) is a vector of randomized parameters differing across individuals with respect to a density function \( g(\cdot) \) and an error term \( u_{ij} \) meets the iid (independent and identically distributed) conditions. If \( \delta_i \) was observable, the probability function for

\(^7\) By definition, the conditional logit framework includes only alternative-specific attributes (see e.g. Greene 2003). In order to include individual-specific variables in the regression, the individual-specific attributes will be interacted with country dummies.

\(^8\) In this case, the estimates of the unrestricted model are compared with 3 different subsamples, in which each country is excluded once.

\(^9\) The results of the conditional logit regression and of the corresponding Hausman tests are reported in Table A.4 of the Appendix.
the choice of region $j$ could be defined as

\begin{equation}
L_{ij} = \frac{\exp(x'_{ij}\beta + x'_{ij}\delta_i)}{\sum_{l=1}^J \exp(x'_{il}\beta + x'_{il}\delta_i)}.
\end{equation}

Since this is not the case, the probability of choosing region $j$ is obtained by integrating $L_{ij}$ over all possible variables of $\delta_i$ with respect to distribution $g(\cdot)$.

\begin{equation}
P_{ij}^{\text{mixl}} = \int \frac{\exp(x'_{ij}\beta + x'_{ij}\delta_i)}{\sum_{l=1}^J \exp(x'_{il}\beta + x'_{il}\delta_i)} g(\delta_i) d\delta_i.
\end{equation}

This equation is defined as the mixed logit equation. Since the distribution function $g(\cdot)$ is unknown, the integral of equation (2.13) does not have a closed form solution and needs to be estimated through simulation. In this chapter, the mixed logit estimation is implemented by a \textit{STATA} package developed by Hole (2007).

2.3 Data

The dataset consists of information on 33 NUTS-2 regions listed in Table A.1 of the appendix. It is constructed by combining the basic population of the \textit{IWH FDI Micro Database} with regional data from Eurostat, the European Patent Office (EPO) and the OECD databases. The dataset contains regional information on foreign subsidiary locations, which does not preclude MNEs taking more than one investment decision (i.e. subsidiary) in the selected region(s).

2.3.1 Enterprise Data

To gain insight into the importance of local factors in determining real decisions to invest in post-transition regions, the analysis uses micro data on foreign direct investment in East Germany, the Czech Republic and Poland from the population of the \textit{IWH FDI Micro Database}. The East German subsample of foreign investors is supplemented by information on West German multinational investors, since West German investment played a crucial role in the transition process in East Germany. Table 2.1 lists the available information obtained from the \textit{IWH FDI Micro Database}.

\begin{itemize}
  \item \textsuperscript{10} See Train (2009:p.138) for further details.
  \item \textsuperscript{11} See Basile, Castellani, and Zanfei (2008:p.331).
  \item \textsuperscript{12} See Günther, Gauselmann, et al. (2011:p.535) for more detailed information.
\end{itemize}
Table 2.1: Enterprise variables and their sources

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of investment</td>
<td>Date of registration of the subsidiary in the register of commerce</td>
<td>IWH</td>
</tr>
<tr>
<td>Location of investment</td>
<td>Site where the subsidiary is registered</td>
<td>IWH</td>
</tr>
<tr>
<td>Branch of industry</td>
<td>Branch of industry according to NACE-1.1 classification</td>
<td>IWH</td>
</tr>
<tr>
<td>Subsidiary’s size</td>
<td>Number of employees</td>
<td>IWH</td>
</tr>
<tr>
<td>MNE’s origin</td>
<td>Home country of the MNE</td>
<td>IWH</td>
</tr>
</tbody>
</table>

- Date of investment $t$: The date of investment is proxied by registration date of the subsidiary in the local register of commerce. Following Jindra (2011) and Spies (2010), it is assumed throughout the empirical analysis of this chapter that the investment decision was made the year before the subsidiary was entered in the register.

- Location of investment $j$: Each subsidiary of a MNE is allocated to a NUTS-2 region using the postal code of the subsidiary’s registered address.

- Branch of industry $k$: This describes the industrial sector of the subsidiary according to the European Union’s NACE 1.1. classification. This analysis is focused on the industrial production (NACE 1.1. Code 14-41), wholesale, retail trade, transport (NACE 1.1. Code 50,51,52,60-64), financial intermediation, real estate and business services (NACE 1.1. Code 65-74), as well as sewage and waste disposal, media, utilities and other services (NACE 1.1. Code 90-93).

- Subsidiary size: The size of the subsidiary is measured by the latest employment figure. This variable is grouped into four categories. Less than 10 employees, 10-49 employees, 50-249 employees and more than 249 employees.

- MNE origin: The country where the parent company of the subsidiary is registered.

For data availability reasons, which will be described in more detail in the following subsection, the analysis of investment decisions is restricted to a time period between 2000 and 2010. Hence, the sample contains 4,343 affiliates of MNEs: 1,710 in East Germany, 710 in the Czech Republic and 1,923 in Poland. The tendencies to agglomerate in each capital region, as shown in Figure 2.1 and Table A.1, are mostly...
Figure 2.1: Spatial distribution of FDI investments per NUTS-2 region (2000-2010)

Source: IWH FDI Micro Database

the result of a strong concentration of services FDI in the capital regions accounting for around half of the national services FDI flows in each country.

As shown in Table 2.2, around 40% of the number of investments goes to the industrial sector in each country. In terms of the regional distribution of industrial FDI, Figure 2.1 and Table A.1 show a more distributed pattern indicating agglomeration in traditional industrial and developing high-tech regions, such as the regions around the cities of Dresden and Wroclaw as well as in the federal states of Thuringia and Saxony-Anhalt. Furthermore, Figure 2.1 shows that FDI flows to Poland and the Czech Republic are characterized by a bias towards the West. Relatively little FDI
Table 2.2: Distribution of Enterprises per country, industry and origin of MNE

<table>
<thead>
<tr>
<th>Investment location</th>
<th>Total</th>
<th>Industry NACE (14-41)</th>
<th>Service NACE (51-74 &amp; 90-93)</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Germany</td>
<td>1,710</td>
<td>647</td>
<td>1,063</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>710</td>
<td>316</td>
<td>394</td>
</tr>
<tr>
<td>Poland</td>
<td>1,923</td>
<td>774</td>
<td>1,149</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4,343</td>
<td>1,737</td>
<td>2,606</td>
</tr>
</tbody>
</table>

Source: IWH FDI Micro Database.

is directed to the eastern border regions of the countries whereas the regions sharing borders with EU-15 countries attract more investment.

In order to check for additional firm-specific characteristics, the analysis includes firm-specific control variables such as subsidiary size and its sectoral classification with a distinction between service and industrial sector. These variables are interacted with country dummies (East Germany serves as the base category), since they do not differ across the alternatives. Since the estimated coefficients can only be interpreted with respect to the randomly chosen base category, they will not be reported in the regression output.

2.3.2 Regional Data

For the econometric analysis, regional information is added to the subsidiary-level data, which are listed in Table 2.3.\textsuperscript{13} As mentioned above, the sample was slightly reduced due to limited data availability. This reduction is mostly due to a limited availability of CEE regional statistics until the end of the 1990s. In order to maintain the quality of the regression results, all registrations before the year 2000 are omitted in this analysis. Furthermore, due to a restructuring of the NUTS-2 regions in East Germany in 2003, parts of the data for the regions Brandenburg-Nordost and Brandenburg-Südwest are not available for the period before 2003. As a workaround, the missing data is calculated on the basis of the relation between these two regions and the reference data of Brandenburg (NUTS-1).

\textsuperscript{13} The correlation between the regional attributes are listed in Table A.3 of the Appendix.
Table 2.3: Summary of regional variables, their sources and expected impact on dependent variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Source</th>
<th>Expected impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>spec</td>
<td>Proportion of employees in industry $k$</td>
<td>OECD, own calculation</td>
<td>+</td>
</tr>
<tr>
<td>herf</td>
<td>Herfindahl Index</td>
<td>OECD, own calculations</td>
<td>+</td>
</tr>
<tr>
<td>patent</td>
<td>Number of applied patents in region $j$</td>
<td>European Patent Office</td>
<td>+</td>
</tr>
<tr>
<td>capital</td>
<td>Dummy for capital region</td>
<td></td>
<td></td>
</tr>
<tr>
<td>wage</td>
<td>Compensation of Employees in industry $k$ in 1,000 €</td>
<td>Eurostat</td>
<td>-</td>
</tr>
<tr>
<td>hrdto</td>
<td>Share of employees with a technical-scientific occupation</td>
<td>Eurostat</td>
<td>+</td>
</tr>
<tr>
<td>unemp</td>
<td>Unemployment rate in %</td>
<td>Eurostat</td>
<td>+</td>
</tr>
<tr>
<td>gdp</td>
<td>Market access (regional GDP in Mio. €)</td>
<td>Eurostat</td>
<td>+</td>
</tr>
<tr>
<td>mp</td>
<td>Market Potential (distance-weighted GDP of European markets)</td>
<td>Eurostat, own calculation</td>
<td>+</td>
</tr>
<tr>
<td>inf</td>
<td>Infrastructure-Index</td>
<td>Eurostat/own calculations</td>
<td>+</td>
</tr>
<tr>
<td>popdens</td>
<td>Population density in inhabitants/km$^2$</td>
<td>Eurostat</td>
<td>-</td>
</tr>
<tr>
<td>corp</td>
<td>Effective corporate tax rate in %</td>
<td>OECD</td>
<td>-</td>
</tr>
<tr>
<td>tax</td>
<td>Effective tax wedge in %</td>
<td>OECD</td>
<td>-</td>
</tr>
<tr>
<td>dist_EU</td>
<td>Euclidean distance (km between capital of country of origin and major city in region $j$) for investors located in the EU (including Switzerland)</td>
<td>own calculation</td>
<td>-</td>
</tr>
<tr>
<td>dist_NEU</td>
<td>Euclidean distance (km between capital of country of origin and major city in region $j$) for investors located outside the EU</td>
<td>own calculation</td>
<td>o</td>
</tr>
</tbody>
</table>

Regional agglomeration factors

In order to analyze the impact of regional agglomeration on a MNE’s location choice, four measures are included in the regression. Firstly, the specialization, $spec_{jk}$, measured as the proportion of employees in sector $k$ to total regional employment, accounts for the existence of intra-industry linkages prior to investment. This measurement goes beyond the specialization of the regional labor market since the size of the sectoral employment figures also incorporates the importance of sector $k$ in region $j$.

Secondly, supplier linkages depend on a variety of inputs from suppliers. The regional economic diversity in region $j$ is calculated by means of the Herfindahl Index, $herf_j$,

$$herf_j = \sum_{k=1}^{K} \left( \frac{emp_{jk}}{\sum_{l=1}^{K} emp_{jl}} \right)^2,$$

(2.14)
using the OECD’s employment figures $emp_{jk}$ with $K = 31$ sectors specified by the NACE 1.1 Code.\textsuperscript{14} As can be seen from equation (2.14), a diversified economy in region $j$ coincides with a low value in the Herfindahl Index.

Thirdly, the regional patent activity captures the technological performance and potential knowledge spillovers in region $j$. The patent applications collected by the European Patent Office are the basis for the calculation of the patent measurement depending on the origin of the inventors of the registered patents. In order to avoid double counts of multi-investor patents, the patent measurement refers to a fractional counting.\textsuperscript{15} This implies that regional patent activity also depends on the number of inventors per patent. Since the data of the European Patent Office contains information on the technological areas following the WIPO IPC-Technology Concordance and not on the industrial sector, the patent measurement refers to the general patent activity in a region.\textsuperscript{16}

Finally, a dummy for capital regions, $capital$, checks for capital-specific characteristics, capturing the influence of omitted agglomeration factors on the location choice decision (e.g. institutions of bilateral relations, like chamber of foreign trade, embassies etc.).

**Regional labor market factors**

In order to analyze the impact of the regional labor market on a MNE’s location choice, three measures are included in the regression. Labor costs, $wage_{jk}$, in industry $k$ in region $j$ are measured by compensation per employee. Data from Eurostat’s Labour Cost Survey, which are only collected every four years, are not appropriate for the purposes of this analysis especially as the survey did not include regional wage data from the NMS until 2004. As outlined by López Rodríguez and Fajña (2007), this problem can be solved by calculating the regional wage level in different industries $w_{jk}$ by using national account data and industrial employment figures to get a proxy

\begin{itemize}
  \item See Mukim and Nunnenkamp (2010:p.11) among others.
  \item See Frietsch, Schmoch, et al. (2011).
  \item Using a concordance matrix, Schmoch, Laville, et al. (2003) have developed a procedure to transform the information of the technological areas into 22 manufacturing industries (NACE Rev 1.1, 2-digit-level). Since this transformation excludes the service sector, information on the sectoral patent activity is not incorporated in the analysis.
\end{itemize}
for the compensation per employee. This variable allows for a differentiation of the wage level across eight industrial sectors driven by the NACE 1.1 code.\textsuperscript{17}

In order to capture the regional access to human capital, the following two variables are included: the skill level of the regional workforce, which is measured by the proportion of employees with scientific-technical occupation, $hrst_j$, and the unemployment rate of a region, $unemp_j$.

**Other regional factors**

Regional GDP, market potential are also included as market seeking determinants and other regional factors such as infrastructure, population density\textsuperscript{18}, corporate tax and taxes on labor. These latter variables are standard determinants to be included in location choice analyses and mainly serve as control variables in the estimation. Furthermore, the geographical distance between the country of the MNE’s headquarter and the region of investment is included. This variable is split into two regressors depending on the investor’s origin; either the MNE headquarter is located in the European Union (including Switzerland) or the headquarter is located outside the EU. In the sample 86.4\% (3,754 investments) of the investors are located in the EU or Switzerland, whereas 589 investors are located in other countries. This distinction is driven by the impact of spatial proximity which is considered to be relatively important for investors closer to the area under investigation than for investors located outside Europe. In their European location choice study, Basile, Castellani, and Zanfei (2008) observed that proximity matters for European investors but not for Non-European investors.

**2.4 Empirical Results**

The mixed logit estimates for the whole sample and the sectoral subsamples are shown in Table 2.4. The first two columns of Table 2.4 contain the regression results for the complete sample, whereas the last four columns refer to the sample’s division into two sectors: the industrial sector (Nace 1.1 Code 14-41) and the service sector (Nace 1.1 Code 50-74 and 90-93). Secondly, Table 2.5 contains the regression estimates for

\textsuperscript{17} The Polish sectoral wage rates could not be calculated for the year 1999 since the Polish sectoral employment figures have only been available since 2000. Hence, for the Polish investment decisions in 2000, an all-sectoral wage rate is used in order to extend sample size.

\textsuperscript{18} Following Barrios, Görg, and Strobl (2006) and Bartik (1985), population density can be used as a proxy for land prices.
the national subsamples. Since the error component coefficients capture potential biases related to the sample selection (see Basile, Castellani, and Zanfei 2008:p.332), the interpretation of the regression results is focused on the mean coefficients, which reflect the regressors’ impact on the location decision.

Table 2.4: Mixed Logit regression for the whole sample and sectors.

<table>
<thead>
<tr>
<th>Explanatory Variables</th>
<th>Whole sample mean</th>
<th>Industry mean</th>
<th>Services mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>sd</td>
<td>mean</td>
<td>sd</td>
</tr>
<tr>
<td>lnspcc</td>
<td>0.503*** (0.042)</td>
<td>0.327*** (0.054)</td>
<td>0.290** (0.125)</td>
</tr>
<tr>
<td>lnherf</td>
<td>0.105 (0.327)</td>
<td>-0.556* (0.288)</td>
<td>1.472*** (0.666)</td>
</tr>
<tr>
<td>lnpatent</td>
<td>0.084*** (0.029)</td>
<td>0.097** (0.081)</td>
<td>0.007 (0.081)</td>
</tr>
<tr>
<td>capital</td>
<td>0.512*** (0.102)</td>
<td>0.0664 (0.164)</td>
<td>0.582 (0.296)</td>
</tr>
<tr>
<td>lnwage</td>
<td>0.580*** (0.097)</td>
<td>0.229 (0.259)</td>
<td>1.064*** (0.398)</td>
</tr>
<tr>
<td>lnhrsto</td>
<td>0.551** (0.246)</td>
<td>-0.556* (0.351)</td>
<td>1.472*** (0.532)</td>
</tr>
<tr>
<td>lnunemp</td>
<td>0.221*** (0.102)</td>
<td>0.034 (0.165)</td>
<td>0.613 (0.379)</td>
</tr>
<tr>
<td>lngdp</td>
<td>1.022*** (0.067)</td>
<td>1.166*** (0.098)</td>
<td>1.346*** (0.165)</td>
</tr>
<tr>
<td>lnmp</td>
<td>-0.217*** (0.216)</td>
<td>-0.331 (0.324)</td>
<td>0.801** (0.481)</td>
</tr>
<tr>
<td>lninf</td>
<td>0.454*** (0.145)</td>
<td>0.487** (0.227)</td>
<td>0.0815 (0.192)</td>
</tr>
<tr>
<td>lnipopdends</td>
<td>-0.294*** (0.050)</td>
<td>-0.549*** (0.103)</td>
<td>0.0625 (0.071)</td>
</tr>
<tr>
<td>lnincp</td>
<td>3.120*** (1.105)</td>
<td>1.966* (1.099)</td>
<td>10.82*** (2.749)</td>
</tr>
<tr>
<td>lnintax</td>
<td>-7.044 (4.357)</td>
<td>2.166 (6.030)</td>
<td>31.18*** (6.883)</td>
</tr>
<tr>
<td>lnspcc</td>
<td>-1.209*** (0.115)</td>
<td>-1.251*** (0.162)</td>
<td>0.221 (0.280)</td>
</tr>
<tr>
<td>lnmp</td>
<td>-0.693 (1.187)</td>
<td>-2.448 (1.744)</td>
<td>5.436*** (2.026)</td>
</tr>
<tr>
<td>lnintax</td>
<td>-12,802.5</td>
<td>-5,573.9</td>
<td>2,606</td>
</tr>
</tbody>
</table>

Investments 4,343 1,737 2,606
Log-Likelihood -12,802.5 -5,573.9 2,606

Regional agglomeration factors

In the complete sample, the significantly positive specialization coefficient, which indicates intra-industry linkages, is in line with Krugman’s new economic geography, implying that a region becomes more attractive the more economic activities in the same sector there are in the target sector of investment. In all national and sectoral subsamples the sectoral employment share of the total workforce is also significantly positive. These results suggest that indeed a specialization of the regional
workforce in the sector of investment is positively associated with the location of FDI in post-transition countries (H 1a).

The coefficients for the inter-industry linkages represented by the Herfindahl Index are predominantly insignificant. Only in the manufacturing sector is the effect of the Herfindahl Index significantly negative.\(^{19}\) These results do not confirm that economic diversification is beneficial for a region’s competitiveness to attract FDI (H 1b).

The third agglomeration variable – potential for knowledge spillovers measured as the number of patents applied for in region \(j\) – is positively significant for the whole sample as well as in the manufacturing subsample. Among all national subsamples and for the service sector the effect of the regional patent activity becomes insignificant. These results suggest that the potential for knowledge spillover is one of the driving forces behind an FDI location decision in post-transition economies (H 1c), however, it seems to be more relevant for investments in the manufacturing sector.

The last variable concerning agglomeration effects, the dummy for capital regions, is significantly positive for the regression including the whole sample, and for the subsample including investments in the service sector. This implies that additional, unobserved characteristics for capital regions seem to influence the MNE’s decision, whereby they seem to be more important for investments in the service sector.

**Regional labor market factors**

In the whole sample, the wage rate proves to have a significantly positive impact on FDI attraction. A deeper consideration is necessary when discussing the significantly positive influence of the wage rate level. Intuitively, a cost seeking investment is deterred by a high sectoral wage rate. However, the results from recent studies on the impact of the wage rate on the location choice are ambiguous.\(^{20}\) Guimaraes, Figueiredo, and Woodward (2000) stress that the impact of the wages should be examined for other variables such as labor productivity, skill level and the educational background of the workforce. Looking at the wage rates of the countries in the sample, Table A.2 of the Appendix shows that, on average, the wage rate in East Germany is three times higher than the corresponding wages in the Czech Republic or Poland. This difference can hardly be explained by differences in the qualification of the

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\(^{19}\) A high diversification does not necessarily exclude potential inter-industry linkages.

\(^{20}\) On the one hand, Basile, Castellani, and Zanfei (2008) found a negative impact of the wage rate, which was not significant among all models, while on the other hand Barrios, Görg, and Strobl (2006) actually observed a positive influence of wage.
regional labor force, represented by the share of employees with a scientific-technical occupation, since the proportions in East German and the Czech Republic are nearly identical. A possible explanation may be found by looking at differences in productivity and the endowment of capital; however, obtaining reliable information on a regional level is rather difficult compared to the availability of national data. Paqué (2010) points out that labor productivity in Poland and the Czech Republic has so far only reached 35% and 38% of German levels respectively, while the productivity of the East German economy is between 75% and 84% of the average German labor productivity.\textsuperscript{21} In the case of the East German sample in the estimation, a higher regional wage rate turns out to be significantly negative as expected in hypothesis H 2a. This indicates that, to some extent FDI in East Germany is relatively cost sensitive, which can partly be explained by the comparatively high wage level in East Germany. Furthermore, FDI in the service sector proves to be more cost-sensitive than in the manufacturing sector. This explains that even in post-transition economies a higher regional wage rate in the sector of investment is not always negatively associated with the location of FDI (H 2a can not be verified).

The OECD (2008) maintains that wages in subsidiaries of MNEs are often higher than in domestic firms because of MNE’s higher productivity as a result of its greater technological know-how. The wage effect seems larger for developing countries, where the technology gap between foreign and domestic firm is especially pronounced. Firm-level studies (such as e.g. Girma and Görg 2007; Lipsey and Sjöholm 2006) have indeed shown that wages in foreign subsidiaries are higher for the manufacturing and the service sector. This could imply wage spillover effects between MNEs’ subsidiaries and the domestic enterprises, which would generate an endogeneity problem. An increasing number of studies at the employee level have challenged these results however. They find, that there is a very small, if any, positive effect on the income of individual workers (see e.g. Andrews, Bellmann, et al. 2007). One explanation for the higher wages paid by MNE subsidiaries can be found in the higher productivity and greater technological know-how compared to domestic enterprises, which usually requires a better educated personnel. When taking the individual employees level of education into account, however, there seems to be no difference in pay between MNE subsidiaries and local enterprises. Hence, endogeneity is not a problem in the context of this analysis.

\textsuperscript{21} See Paqué (2010:9pp.).
Examining labor skills by means of the aggregate share of employees with a scientific-technical occupation is predominantly positive. The coefficients are significantly positive for the whole sample, for investments in the service sector and for the German subsample. Despite its predominantly positive impact, it appears to be insufficient in capturing differences in productivity. Nevertheless, the results indicate that the educational qualifications of the regional workforce raises the location probability of FDI. Furthermore, the effect of the unemployment rate is ambiguous across subsamples. The significantly positive coefficient in the complete sample shows that the availability of human capital in the region of investment is positively associated with the location of FDI in post-transition economies. (H 2b can only be partly verified).

Other regional factors

In the entire sample, market access has a significantly positive impact and increases the location probability of FDI. GDP also has a positive impact for all subsamples. Compared to direct market access, the effect of market potential to other European economies is either insignificant or even negative. This result leads us to conclude that access to the immediate region seems to be more important for the location decision than exporting possibilities from the chosen location to the major European markets.

The population density as third market variable, has a negative coefficient throughout the samples and is, at times, highly significant. In contrast to the majority of location choice studies\(^\text{22}\) the impact of the population density is predominantly negative; there is a significantly negative impact on the entire sample and for the industrial subsample. Nevertheless, the choice of the population density as a proxy for land prices has to be interpreted carefully.

The infrastructure coefficient is significantly positive for the whole sample, whereas the infrastructure’s impact within each country is insignificant except in the Polish case. This result indicates that regional infrastructure investments can increase the attractiveness of the region itself and that of its direct neighboring regions at the same time. Hence, the impact of infrastructure investments on the attraction of FDI appears to be on a national level rather than on a regional level.

\(^{22}\) See e.g. Basile, Castellani, and Zanfei (2008) or Spies (2010), who have found an insignificant or even positive impact of population density on the location choice.
Table 2.5: Mixed Logit regression for each country

<table>
<thead>
<tr>
<th>Explanatory Variables</th>
<th>DE</th>
<th></th>
<th>CZ</th>
<th></th>
<th>PL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mean</td>
<td>sd</td>
<td>mean</td>
<td>sd</td>
<td>mean</td>
<td>sd</td>
</tr>
<tr>
<td>lnspec</td>
<td>0.546*** 0.079</td>
<td>0.906*** 0.999***</td>
<td>0.178*** 0.0139</td>
<td>(0.063) (0.301)</td>
<td>(0.173) (0.301)</td>
<td>(0.042) (0.185)</td>
</tr>
<tr>
<td>lnherf</td>
<td>0.394 0.111</td>
<td>1.598 0.222</td>
<td>-0.436 0.087</td>
<td>(0.259) (0.658)</td>
<td>(1.094) (0.484)</td>
<td>(0.388) (0.991)</td>
</tr>
<tr>
<td>lnpatent</td>
<td>0.211* 0.328*</td>
<td>-0.120 0.087</td>
<td>0.0515 0.017</td>
<td>(0.115) (0.185)</td>
<td>(0.109) (0.185)</td>
<td>(0.039) (0.075)</td>
</tr>
<tr>
<td>capital</td>
<td>-0.299 0.051</td>
<td>3.270 0.032</td>
<td>0.423* 0.193</td>
<td>(0.643) (0.282)</td>
<td>(2.615) (0.309)</td>
<td>(0.242) (0.399)</td>
</tr>
<tr>
<td>lnwage</td>
<td>-0.524** 0.372</td>
<td>1.987*** 0.652</td>
<td>1.236*** 1.219***</td>
<td>(0.218) (0.766)</td>
<td>(0.438) (0.858)</td>
<td>(0.194) (0.459)</td>
</tr>
<tr>
<td>lnhrsto</td>
<td>1.196* 0.094</td>
<td>-0.675 0.026</td>
<td>0.395 2.724***</td>
<td>(0.680) (0.810)</td>
<td>(0.977) (0.605)</td>
<td>(0.525) (0.997)</td>
</tr>
<tr>
<td>lnunemp</td>
<td>0.683* 0.077</td>
<td>0.655 0.597</td>
<td>-0.403* 0.164</td>
<td>(0.403) (1.887)</td>
<td>(0.542) (0.496)</td>
<td>(0.236) (0.695)</td>
</tr>
<tr>
<td>lngdp</td>
<td>1.315*** 0.286</td>
<td>2.783*** 0.466</td>
<td>1.061*** 0.025</td>
<td>(0.260) (0.516)</td>
<td>(0.861) (0.415)</td>
<td>(0.118) (0.121)</td>
</tr>
<tr>
<td>lump</td>
<td>-0.894* 0.498</td>
<td>-1.841 2.655</td>
<td>0.263 1.567</td>
<td>(0.484) (1.094)</td>
<td>(1.675) (3.194)</td>
<td>(0.552) (1.393)</td>
</tr>
<tr>
<td>lninfra</td>
<td>0.579 0.174</td>
<td>0.690 0.013</td>
<td>0.848** 0.004</td>
<td>(0.519) (0.383)</td>
<td>(0.912) (0.571)</td>
<td>(0.404) (0.231)</td>
</tr>
<tr>
<td>lnpopdens</td>
<td>-0.192 0.001</td>
<td>-1.212* 0.020</td>
<td>-0.654*** 0.064</td>
<td>(0.200) (0.105)</td>
<td>(0.707) (0.100)</td>
<td>(0.232) (0.114)</td>
</tr>
<tr>
<td>lndist_EU</td>
<td>-1.084*** 0.094</td>
<td>-0.672*** 1.551*</td>
<td>-2.289*** 0.656</td>
<td>(0.187) (0.483)</td>
<td>(0.326) (0.921)</td>
<td>(0.234) (0.744)</td>
</tr>
<tr>
<td>Investments</td>
<td>1,710</td>
<td>1,923</td>
<td>710</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log-Likelihood</td>
<td>-3,261.02</td>
<td>-4,013.34</td>
<td>-1,191.95</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mixed Logit Estimation. Dependent Variable: Location choice for Region $j$. Standard errors in parentheses: ***$p \leq 0.01$, **$p \leq 0.05$, *$p \leq 0.1$. Country dummies, sectoral dummies and company size included in each regression. In each regression the error component includes all explanatory variables. The determinants are reported in the left column of each regression. The error component coefficients are reported in the right column.

The regional proximity to the MNE’s headquarter seems to matter for investors whose headquarter are located in Europe. Previous studies on single countries suggest that most investments occur in countries close to the MNE’s headquarter and that the geographical proximity to the MNE’s headquarter has a positive impact on the location choice (see e.g. Crozet, Mayer, and Mucchielli 2004). The distinction between the European and Non-European investors confirm these results, since the impact of distance for Non-European investors is insignificant among all specifications and subsamples.

The impact of fiscal policy variables in Table 2.4 does not meet the expectations. The results create an ambiguous picture since the impact of the corporate tax rate is significantly positive, whereas the impact of the tax wedge on labor is insignificant. These results are in line with several other studies (see e.g. Basile, Castellani, and Zanfei 2008), which stress the importance of the provision of public goods for location...
decisions by foreign investors. This explanation serves only in part for this sample, since the corporate tax rate accounts for only a small share of the federal tax revenue in the sample countries. If and only if business promotion and/or business-related public services were directly financed by corporate taxes, the significantly positive effect of this taxation can be partly explained. This would be an awkward assumption.

2.5 Discussion and Summary

This chapter analyses the impact of regional determinants - agglomeration and labor market factors in particular - on the location choice of MNEs in post-transition economies. By means of a mixed logit model on a sample of 4,343 subsidiaries over the 2000-2010 time period, data from 33 regions in East Germany, the Czech Republic and Poland are compared.

The results on agglomeration economies show a predominantly positive and significant impact of sectoral specialization and the potential for knowledge spillovers on the location decision in post-transition regions. Furthermore, the significantly positive impact of the capital dummy for service FDI and the positive impact of the regional patent activity on manufacturing FDI reveal that there are additional sector specific agglomeration factors which drive the FDI location decision. This supports the well-established results for developed countries - such as Basile, Castellani, and Zanfei (2008), who analyzed the impact of agglomeration on 50 NUTS-1 regions in France, Germany, Ireland, Italy, Spain, Portugal, Sweden and the UK, and Crozet, Mayer, and Mucchielli (2004) in their study on 92 départements in France. For the post-transition economies Hilber and Voicu (2010) analyzed 1,540 foreign-owned subsidiaries in Romanian regions between 1990 and 1997 and find that industry-specific and service agglomerations have a positive impact on location choice of MNEs, whereas the authors do not find any evidence for a positive impact of economic diversity on the regional attractiveness for FDI. They limit their analysis to greenfield investments, however. Furthermore, Pusterla and Resmini (2007), who use information on 4,103 subsidiaries in Bulgaria, Hungary, Poland and Romania on the NUTS-2 level during the 1990s find a positive impact of agglomeration economies on FDI. However, like many other studies, they focus their analysis on the manufacturing sector. For agglomeration economies this analysis does not show any distinct differences in the impact on MNE location choice for post-transition regions. The results suggest that
sectoral specialization and the technological performance of the target region are among the most important location factors for investors in post-transition regions.

In addition, labor market factors prove to have an impact on the location of FDI in post-transition economies. In contrast to most existing studies on location choice in CEE countries (see e.g. Cieslik 2005; Pusterla and Resmini 2007) - but in line with Hilber and Voicu (2010) - the estimates in this analysis show that higher wages do not distract investors *per se*. They can even have a positive impact as long as higher wages are combined with offsetting factors such as high endowment of capital and higher productivity of the workforce, as found in this study for Poland and the Czech Republic. This underlines the importance of education for attracting FDI, especially regarding the economically more sustainable FDI in more advanced sectors of the economy. The positive result for East Germany in this category suggests that East Germany’s present and future could lie in the exploitation of competitive advantages and a highly educated and specialized workforce rather than in acting as the extended workbench for other, more industrialized countries. These results suggest that FDI in post-transition regions is (no longer) only dominated by efficiency seeking behavior, but - in addition to market seeking motives - also by strategic assets which seems especially true for East Germany and for the service sector, where well-qualified labor is an important location factor. These results are in line with Chidlow, Salciuviene, and Young (2009) who, in a regional sample of 91 foreign subsidiaries in 2005, find that knowledge seeking factors are among the most important drivers for FDI in Poland. Pusterla and Resmini (2007), however, find that skills have no effect on the probability of attracting FDI for the CEE region.

Finally, it seems that a country’s position in the transition to industrialization is important not only for the quantity but also for the structure of incoming FDI. Keeping in mind factors reflecting the allocation of public goods, the educational background and productivity of the workforce, it seems that countries finding themselves in different stages of the transition process, are exposed to different structure of FDI-attracting pull factors.

Since this analysis is based on a three-country dataset, there is a potential for extending research into FDI pull factors to further regions, such as additional post-transition countries. And since the enterprise data contain information about the MNEs’ headquarter and their subsidiaries, there is research potential in examining the location decision of a MNE for additional bilateral factors. Empirically, the estimation could be enhanced by bilateral data as well as further investor-specific
variables to gain further insight into the interaction between firm level and regional characteristics.

The finding that for the service sector well-qualified labor is an important location factor provides a compelling motivation to further investigate the distribution of FDI in knowledge-intensive business services (KIBS). KIBS have become crucial for the regional innovation performance in knowledge-based economies. As the global distribution of innovation is highly concentrated, Florida (2005) summarizes that 'innovation, economic growth, and prosperity occur in places that attract a critical mass of talents.' Thus, FDI in science-based sectors can be considered as a driving force behind the spiky economic structure that puts capital and large metropolitan areas at the forefront of globalization.