

An Introduction to the IWH FDI Micro Database

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1. Motivation and Research Questions

With the integration of post-communist countries into the European and global economy after 1990, there was strong research interest into the role of multinational enterprises (MNEs) for economic restructuring and technological catching-up. Most of the existing empirical studies on locational determinants of FDI and host country effects did not take account of East Germany. This might be for different reasons: Firstly, theoretical and empirical difficulties derive from the fact that East Germany followed a distinct transition pattern as it became a region subsumed in a larger and more mature economy. Secondly, East Germany received private investment from foreign as well as West German firms. Only the first can be considered as a foreign direct investment (FDI). Finally, there had long been a lack of micro data to adequately analyse the activities of corresponding firms from a production as well as technological perspective.

So far, the existing empirical research on locational determinants of FDI in transition economies of Central East Europe (CEE) indicates that labour costs, market size, geographical proximity, as well as institutional factors do explain MNE investment in the region (see for example Bevan and Estrin 2004, Bevan et al. 2004). Existing studies are implemented at the country rather than regional level and, therefore, neglect the role of agglomeration economies in choice of location (*ibid.*). However, the new economic geography argues that the presence of increasing returns, local externalities and economic integration leads to the spatial concentration of economic activities (see for example Fujita/Thisse, 2002). Therefore, other recent studies switched to analysing at a regional level and suggest that various forms of intra and inter industry agglomeration effects have to be taken into consideration when analysing the relevance of locational determinants of MNEs (Basile, 2004; Basile et al., 2008; Barrios et al., 2006; Chung/Alcácer, 2002; Crozet et al., 2004; Guimarães et al., 2000).

The empirical research on host country effects in transition economies by and large focused on FDI induced productivity spillovers to domestic firms. This literature assumes there is a unidirectional technology transfer from the

foreign investor in the West to domestic firms in East without an active role of the local foreign affiliate. The resulting evidence is rather mixed which is mainly explained by the lack of absorptive capacity of domestic firms (see Jindra, 2005 or Meyer/Sinani, 2009 for an overview). Recent contributions in the field shifted the emphasis from a technology transfer perspective to viewing the MNE as an international network for the generation and diffusion of technology. This view would suggest that centrally and locally driven technological heterogeneity of MNEs is an important factor in explaining the incidence of spillovers to the host country (Castellani/Zanfei, 2006; Marin/Bell, 2006).

The theory of technological accumulation and firm internationalisation (Cantwell, 1989) proposes a dynamic relationship between spatially bounded technological externalities, the internationalisation of firms' R&D and innovation, as well as the potential for technological spillovers from MNEs to the domestic economy. This type of theorising was crucial for the design of a research project at the Halle Institute of Economic Research (IWH) which looks at the role of MNEs in selected transition economies as well as East Germany from a comparative perspective. The project currently addresses three inter-related research questions: What is the role of various agglomeration economies in the location of the MNEs? What is the nature of the technological activities of the multinational affiliates? Does the technological heterogeneity of the MNEs explain the incidence of technological spillovers to other firms? With the emerging internationalisation of domestic firms, another set of research questions became relevant that deals with the motives for and home country effects of outward FDI from transition economies as well as East Germany.

2. Micro Data Availability

Traditionally research on FDI location by MNEs uses bi-lateral country level aggregate data on FDI flows. Empirical studies on FDI spillover effects based on a production function approach by and large employ aggregate industry-level data on FDI stocks in combination with inter-sectoral linkage coefficients derived from national-level input-output tables. However, recent theoretical advances require micro data sets at the enterprise level in order to take account of firm heterogeneity.

In the case of Germany, the Microdatabase Direct Investment (Mikrodatenbank Direktinvestitionen, MiDi) maintained by the Bundesbank could serve as a potential initial choice. Companies with direct investment report their international capital links if their balance sheet total exceeds € 3 million (see Lipponer, 2009). Shares and voting rights held by affiliated investors from foreign economic territories are consolidated. Reports are submitted by German enterprises if a non-resident or several economically-linked non-residents hold a total of 10 per cent or more of the shares or voting rights in the enterprise on the date

the balance sheet is issued. Indirect participating interests must be reported if a dependent investment enterprise has a stake of 10 per cent or more in another enterprise. The database also includes German branches and permanent establishments of non-residents having operating assets totalling more than €3 million. Two or more resident branches and permanent establishments of any one non-resident are to be regarded as a unit (*ibid*). Thus, the MiDi is a full census of obligatory administrative information. The MiDi has been used for a regional analysis of MNE choice of location in Germany at NUTS-1 level ('Bundesländer') (Arndt et al., 2009; Spies, 2010). However, the registration of companies only above a certain threshold (total balance sheet/operating assets) introduces a bias towards large enterprises (Pflüger et al., 2010). In addition, the consolidation procedure of different units at the level of the German regional headquarter creates an unknown degree of distortion in terms of regional disaggregation (Arndt et al., 2009; Becker et al., 2009). As a result of size bias as well as the distorted regional disaggregation, the number and volume of foreign investment is underestimated for regions in East Germany (Günther, 2005; Voteler, 2001). By nature, the MIDI only contains information on foreign participation. However, West German investment played a crucial role in the transition process in East Germany (Belitz et al., 2000; Haas, 1996; Günther, 2005). Thus, the MiDi is only suitable to a limited extent as a micro data source for our research purposes.

An alternative choice for micro data is the Establishment Panel of the Institute for Employment Research (IAB). It is an annual survey of establishments that is representative of industries and firm size for all of Germany and can also be analysed on a longitudinal basis (see for an overview Fischer et al., 2009). The panel currently contains information on about 16,000 establishments. The net sample has a stratification in which large establishments, small federal states, small industries and the manufacturing industry in East Germany are overrepresented. For descriptive analysis these are checked by cross-sectional weighting factors for each establishment in the sample. The panel also provides information on majority ownership (foreign, West German, East German, public). Therefore, Arndt et al. (2009), for example, use the IAB Establishment Panel for their study on the impact of foreign entry on employment, turnover, exports, and productivity. Lehmann and Günther (2007) use it to analyse the incidence of vertical productivity spillovers from foreign and West German affiliates. From our point of view, the IAB Establishment Panel is a possible micro data source for any research that looks at host country effects of foreign and West German owned affiliates that requires a control group of East German owned firms. However, ownership is not a criterion for survey stratification. Thus, we cannot tell whether the survey data is representative for the sub-group of foreign-owned or West German-owned establishments in East Germany. In addition, caution is required with regard to regional disaggregation of the survey data, which in the best case would be possible at the NUTS-1 level ('Bun-

desländer’). Thus, more regionally fine grained analysis on the effects of location choice requires an alternative micro data set that could serve as a source of information that draws from total population enterprises.

Peri/Urban (2002, 2006) use an unbalanced panel of manufacturing firms based in reunified Germany with ultimate foreign (or West German ownership in the case of East Germany) drawn from the Amadeus database. They estimate productivity spillovers at the NUTS-1 level (‘Bundesländer’). The data shows representativeness deficiencies with regard to East Germany as such, and several industries, which are partially corrected by weighting observation according to statistics drawn from the ‘Bundesbank’ (Peri/Urban, 2002). As described above, the Bundesbank data is only a limited guide for regional disaggregation of FDI. As a result, their regionalised dataset suffers from insufficient coverage of foreign-owned firms in East Germany. For example, they do not find any foreign firms in the East German federal state of Saxony (Peri/Urban, 2002).

The micro data availability is similarly limited for most other transition economies in CEE. The Vienna Institute for International Economic Studies (wiiw) publishes the *wiiw Database on Foreign Direct Investment in Central, East and Southeast Europe*. However, this database contains only aggregate data on FDI flows for 18 CEE countries. Damijan et al. (2003, 2008) provide by far the most comprehensive firm level studies on FDI productivity spillovers. They use balance sheets/financial statements as well as ownership information from about 91,000 firms in 10 transition economies from 1995 to 2005 taken from the Amadeus database (Bureau von Dijk). The country coverage and presumably also quality of the collected data differs considerably across countries.

3. IWH FDI Micro Database

Given the constraints described above on the availability of enterprise-level data for East Germany and other selected transition economies, the IWH opted for a novel collection of primary data. The IWH FDI Micro Database provides a total population drawn from the MARKUS data base, in the case of East Germany, and from the AMADEUS database in the case of the selected transition economies. Both commercial datasets are compatible and allow for a uniform identification of the population through complex ownership information. This serves as a basis for an annual survey in East Germany and a bi-annual survey in selected transition economies. After a pilot survey¹ in 2002, the project was fully launched in 2007 as part of a Strategic Targeted Research Project (*“Understanding the relationship between knowledge and competitiveness*

¹ The pilot survey was of an EU 5th Framework Programme RTD research project on the “Determinants of the productivity gap between EU and CEECs (ProdGap)” coordinated by the IWH.

within the enlarging EU” – Uknow 2006–2009) financed by the 6th EU Framework Programme (see Table 1 for an overview).

Table 1

Overview of IWH FDI Micro Database

	2002	2007	2008	2009	2010
Countries	Estonia Hungary Poland Slovakia Slovenia	East Germany Romania Croatia Poland Slovenia	East Germany	East Germany Romania Slovakia Czech Republic Hungary	East Germany
Industries	Manufacturing	Manufacturing	Manufacturing Other selected industries	Manufacturing Other selected industries	Manufacturing Other selected industries
Type of FDI	Inward	Inward	Inward Outward	Inward Outward	Inward Outward
Sample*	CEE: 434	CEE: 514 EG: 295	EG: 657	CEE: 651 EG: 654	EG: 679
Population	CEE: n.a.	CEE: 5.421 EG: 1.412	EG: 3.669	CEE: 7.894 EG: 3.905	EG: 3.672
Method**	Locally	Locally	Locally	Centrally	Locally
Thematic Focus	Technological Upgrading	Technology Transfer and spillovers	Performance Expectations	Investment motives and location factors	Performance Expectations

Note: * CEE = Central and East European countries; EG = East Germany, ** Locally implemented survey in each country; centrally implemented survey for all countries.

In 2007 the survey was implemented in Slovenia, Croatia, Poland, Romania and East Germany. In 2009 the countries selected were Hungary, Czech Republic, Poland, Romania, Slovakia, and East Germany. This country set-up will remain fixed for all subsequent bi-annual surveys. In 2007 the survey covered only manufacturing industries (NACE Rev.1: 15–37). Since 2008 this has been extended to include mining and quarrying (NACE Rev.1: 10–14), electricity, gas, steam and hot water supply (NACE Rev.1: 40–45), wholesale (NACE Rev.1: 51), transport and financial services (NACE Rev.1: 60–67), computer, R&D and other business related services (NACE Rev.1: 72–74), as well as sewage and waste disposal, media, and other services (NACE Rev.1: 90–93). This sectoral selection will remain fixed for all subsequent surveys. Until 2007 the survey covered only inward FDI. Since 2008, this survey has been extended to also include enterprises with outward FDI. Since 2009 the bi-

annual survey has been implemented centrally by one provider for the CEE countries. Each survey has a standard set of questions on shareholder structure as well as technological capabilities. The survey implemented in even years (2008, 2010) only in East Germany has a set of questions on expectations for future employment, turnover, exports, and investment. Each bi-annual survey (2007, 2009, 2011) has a particular special thematic focus. The survey data can be used for cross-sectional analysis. Data from the population has a longitudinal dimension. The information provided below on basic population, survey implementation, and representativeness relates to the 2009 survey of the IWH FDI Micro Database.

3.1 The Basic Population

The population for East Germany is drawn from the MARKUS database provided by Verband der Vereine Creditreform e.V.² The information in the MARKUS database is drawn from public indexes, balance sheets, annual reports, the daily press and surveys. MARKUS contains about 1.1 million German enterprises. According to Verband der Vereine Creditreform e.V., 97% of all commercially registered and economically active German companies are listed in the database. For Germany, these figures seem to be reliable, since any commercial entity is obligated to register with its local chamber of commerce. The MARKUS database contains enterprise-level information such as name, legal form, date of registration, sector, address, ownership, balance sheet and financial information. The MARKUS database also forms the basis for the population underlying other established micro datasets such as the Mannheimer Innovation Panel (see Harhoff/Licht, 1993) or the KfW/ZEW Start-up Panel (Fryges et al., 2010) are both operated by Centre of European Economic Research (ZEW).

For the CEE countries the firm population is drawn from the AMADEUS database provided by Bureau von Dijk (BvD). In total AMADEUS contains data on 14 million European enterprises and covers 10 transition economies. Of those, we selected the data for Hungary, Czech Republic, Poland, Romania and Slovakia. This data is fully compatible with the information drawn from the MARKUS database. In fact the latter forms the basis (in a slightly reduced form) for the German part of the AMADEUS database. BvD describes its AMADEUS data set as robust against a coverage bias since ‘35 expert and local information providers assure’ the quality of the data (ibid.). Given the compatibility of the MARKUS and AMADEUS databases, we are able to gen-

² Until 2009 in case of East Germany data from the MARKUS database was supplemented by information from the European Investment Monitor, the EU-R&D Scoreboard and a list generated by the former Industrial Investment Council. In order to assure a uniform information format between the East German and the CEE firms this addition was given up in 2010.

erate the population of the IWH FDI Micro Database using the following uniform selection criteria for inward and outward FDI in all countries:

3.1.1 Enterprises with one or more foreign investor – INWARD FDI

The population of enterprises with one or more foreign investor is defined as all enterprises belonging to the selected sectors and countries in 2008, in which at least one foreign investor holds either a minimum of 10% direct shares/voting rights or a minimum of 25% indirect shares/voting rights. These enterprises are independent affiliates with own legal entity or branches without own legal entity but with their own commercial register entry. Shareholders or ultimate owners are not limited to foreign enterprises headquartered abroad but also include natural persons, donors, foundations and financial investors with headquarters outside their respective country.

In the case of East Germany, the basic population of enterprises with foreign participation has been supplemented by enterprises belonging to the selected sectors and countries in 2008, in which at least one West German multinational investor holds either a minimum of 10% direct shares or voting rights or a minimum of 25% indirect shares or voting rights. A West German multinational investor is defined as an entity that is headquartered in West Germany and has either a minimum of 10% direct shares/voting rights or at least 25% indirect shares/voting rights in one or more entities located abroad. The federal state of Berlin is considered as part of East Germany in line with other established micro datasets and official statistics.

3.1.2 Enterprises investing in an enterprise abroad – OUTWARD FDI

The population of enterprises holding shares in an entity abroad is defined as enterprises belonging to the selected sectors and countries in 2008, which hold either a minimum of 10% direct shares/voting rights or a minimum of 25% indirect shares/voting rights in one enterprise located abroad. The enterprises could be independent affiliates (de jure independent person) or an independent branch (no de jure independent person) with their own commercial register entry.

3.2 Survey Sampling and Implementation

The sample stratification for the survey in East Germany was proportionally differentiated for ownership (FDI inward, WG MNE inward³, FDI outward).

³ WG MNE inward stands for East German affiliates that have a participation of West German multinational investors

For FDI inward and WG MNE inward the sample was further stratified by differentiating between producing industries (NACE REV.1: 10 to 37) and all other industries (NACE Rev.1: 40–45; 51; 60–67; 72–74; 90–93). Subsequently each of the two sectors was further stratified according to enterprise size in terms of number of employees (up to 9, 10–49, 50–249, more than 250). FDI outward was only divided by sector into producing industries (NACE REV.1: 10 to 37) and all other industries (NACE Rev.1: 40–45; 51; 60–67; 72–74; 90–93). The sample stratification for the survey in the CEE countries based on the AMADEUS data was broken down by country and by ownership (FDI inward, FDI outward). Both ownership groups were further broken down by differentiating between producing industries (NACE REV.1: 10 to 37) and all other industries (NACE Rev.1: 40–45; 51; 60–67; 72–74; 90–93). Subsequently only the FDI inward group was further broken down by enterprise size in terms of number of employees (up to 9, 10–49, 50–249, more than 250). Thus, each country sample has a total of 19 segments for stratification.

The contact addresses and the sample stratification were transferred to *infas Institute for Applied Social Sciences* (infas) and the *Zentrum für Sozialforschung Halle* (zsh). The survey was implemented by means of computer assisted telephone interviews (CATI). CATI was chosen as the appropriate method because the survey of the IWH FDI Micro Database requires a special design for highly standardised surveys, involves complex target groups, and has substantial filtering in the questionnaire. CATI are fast, relatively inexpensive and generate high response rates. In order to further increase the response rate, the enterprise received information about the IWH, the IWH FDI Micro Database, survey and data confidentiality per fax and/or e-mail in advance upon request. The questionnaire was first programmed and internally tested for coherency before being submitted to at least five pre-tests per country between 6 August and 3 September 2009. The pre-test necessitated minor changes and resulted in a questionnaire which required 15 minutes on average for completion. The interviewers at both providers received intensive training by researchers from the IWH. The interviews only were conducted by native speakers from each country under observation. Between 22 September and 21 December 2009 *infas Institute for Applied Social Sciences* as the provider for the transition economies and *Zentrum für Sozialforschung Halle* responsible for East Germany, completed the required interviews in line with the respective sample stratification.

In 2009, the total population (inward and outward FDI) of the IWH FDI Micro Database for East Germany and the CEE countries included 3,905 and 7,894 enterprises respectively. Altogether 2,815 East German and 6,801 CEE companies could be contacted during the survey. About 28% of East German enterprises and 14% of CEE enterprises could not be contacted due to reasons such as wrong contact numbers, insolvency or incorrect information (see An-

nex Table A1 for a complete list). For East Germany, a total sample of 654 interviews could be conducted, which corresponds to a response rate of 23.07% (see Annex Table A2). In the case of CEE countries, 651 interviews could be realised, which corresponds to a response rate of 9.57%. Thus, a total of 1,305 enterprises participated in the 2009 survey for the IWH FDI Micro Database. This generates an overall response rate of 13.57%.

3.3 Survey Representativeness

The following section summarises the results of various tests for representativeness of the East German and the CEE samples in comparison to the underlying respective populations. For a more detailed description, please see the corresponding methodological notes (IWH, 2009a; IWH, 2009b). For the sample of multinational investors in East Germany (FDI inward and WG MNE inward), we find a distribution that does not differ significantly from the underlying population with regard to sectors (producing industries and all other industries) and ownership structure (full, majority or minority multinational-owned) (see Table 2). In contrast, we find significant differences for the regional distribution (at the level of the federal states as well as at the level of ‘Raumordnungsregionen’), industries (NACE 2 digit level), and firm size (up to 9, 10–49, 50–249, more than 250 employees).

Table 2

Significant differences in the distribution between the basic population and sample in East Germany

	Response Rate*	Federal States	Regional Level – ROR	Sectors	Industries (NACE)	Size of Employment	Ownership Structure**
East German enterprises with a multinational investor							
Total	17.0%	yes	yes	no	yes	yes	no
Foreign	16.4%	yes	yes	no	yes	yes	no
West German	18.5%	no	no	no	no	no	no
East German enterprises investing abroad							
	12.3%	no	no	no	no	no	no

* Ratio between the number of enterprises in the population and sample; ** Ownership structure in the case of inward FDI refers to full, majority, or minority. In the case of outward FDI it refers to a differentiation between East German ownership or foreign / West German ownership of the enterprise.

These significant differences are caused by the sample of foreign-owned firms in East Germany while the sample of West German owned firms is repre-

sentative with respect to all dimensions tested. Among East German enterprises with a foreign investor, the regional sample deviation is mostly driven by the strong underrepresentation of enterprises located in Berlin. It is worthwhile pointing out that the regional distribution was not part of the sample stratification. Furthermore, there is an underrepresentation in the sample of companies with more than 250 employees. The sample of East German firms with outward FDI does not show significant differences in its regional, sectoral, size or ownership distribution in comparison to the underlying population.

As for the inward FDI sample from the CEE economies, we find significant differences in the distribution across the five countries due to underrepresentation of Czech and Polish firms and corresponding overrepresentation of Hungarian, Slovakian and Romanian firms (see Table 3).

Table 3
Significant differences in the distribution between the basic population and sample in CEE countries

	Response Rate*	Country Level	Sectors	Industries (NACE)	Size of Employment	Ownership Structure**
CEE enterprises with a foreign investor						
Czech Republic	6.9%	—	no	no	no	—
Hungary	16.0%	—	no	yes	no	—
Poland	6.7%	—	no	no	no	—
Romania	13.4%	—	no	no	no	—
Slovakia	19.9%	—	no	no	no	—
Total	8.4%	yes	no	no	no	—
CEE enterprises investing abroad						
Czech Republic	6.0%	—	no	no	no	no
Hungary	19.6%	—	no	no	no	no
Poland	5.1%	—	no	no	no	no
Romania	7.7%	—	no	no	no	no
Slovakia	27.6%	—	no	no	no	no
Total	9.5%	yes	no	no	no	no

* Ratio between the number of enterprises in the population and sample; ** Ownership structure refers only to FDI outward with a differentiation of whether the investing enterprise itself is (partly) owned by a foreign investor.

For each individual country sample we find no significant deviation in the sectoral distribution (producing industries and all other industries) between population and sample. This also applies to the industry distribution (at NACE 2-

digit level). The only exception here is the Hungarian sample. In addition, we cannot detect significant differences in the firm size distribution between population and sample for the transition economies. For outward FDI from transition economies, the country composition again significantly deviates from the population. This is explained by an underrepresentation of Czech and Polish firms and overrepresentation of Hungarian and Slovakian firms. The distribution of firm size, sectors, industries and ownership is representative for each outward FDI country set.

In general, the results suggest that the population and its corresponding samples generate a reliable micro database. The survey is representative with regard to various indicators; therefore, it meets the relevant criteria for scientific research within this field. Deficiencies with regard to regional deviation (inward FDI in the case of East Germany, inward/outward FDI sample for CEE countries) need to be taken into account when processing the data.

3.4 Survey Questionnaire

In 2009 the thematic focus of the survey was investment motives and the evaluation of locational factors. The corresponding 2009 questionnaire includes 38 questions⁴ and is divided into five sections.

The first section (questions 1–5) mainly covers the evaluation of locational factors. These are broken down into traditional factors such as quantitative labour supply, the availability of government grants and subsidies, as well as the potential for technological cooperation. In addition, “soft” locational factors including culture, image, health care and availability of housing have been evaluated by the participating firms. The first part of the questionnaire also covers standard questions about the shareholder structure of enterprises with foreign/ West German ownership (questions 6–12). This includes questions on the type of investor, headquarter location, date of entry, mode of entry, investment motive, as well as the autonomy over particular business functions. The second part (questions 13–20) is answered by enterprises with outward FDI. This includes questions on time, mode of entry, investment motives, vertical vs. horizontal FDI and corresponding location. The third part of the questionnaire deals with questions about research and development (R&D) (questions 21–26) including changes to R&D employment through internationalisation and R&D co-operation. All R&D indicators are in line with the international standards as codified in the Frascati Manual (OECD, 2002). Part four of the questionnaire (questions 27–30) deals with product innovations including their

⁴ The questionnaire for East German enterprises has 3 additional questions. Since the principal content is the same for both questionnaires, a differentiation is omitted in the following description.

intensity and changes to product innovation intensity through the internationalisation processes. All innovation-related indicators are in line with the international standards as codified in the Oslo Manual (OECD, 2005). The final part of the questionnaire includes questions on employment, turnover, intermediate inputs, exports as well as changes to selected performance indicators through the internationalisation processes.

4. Data Access and Research Potential

The Halle Institute for Economic Research (IWH) has been offering on-site access to the IWH FDI Micro Database as part of research co-operation between external and IWH researchers. So far, this mode of access has been chosen by foreign research teams in particular. In addition, the IWH welcomes external users and visiting researchers such as doctoral and other graduate students. In any case external users only have access to the IWH FDI Micro Database in a safe-room working environment. In the near future, the IWH is going to also provide external online access to the survey data of the IWH FDI Micro Database in the form of a Scientific-Use-File kept at the Archive of Social Sciences at the Leibniz Institute for Social Sciences. In order to secure anonymity of survey respondents, the IWH can only provide a limited version of the full data set.

The IWH FDI Micro Database has already generated a substantial body of publication in internationally renowned journals⁵, however, its research potential can be enhanced by matching it with other external data. So far, we can envisage three options: (1) region and sector specific secondary data, (2) official firm level data and (3) other firm level survey data. Research exploiting the first option is already underway. Any publicly available region and sector specific secondary data can be matched to the population of the IWH FDI Micro Database. For example, region and sector specific employment and patent statistics have been linked to the population of multinational firms in East German manufacturing drawn from the IWH FDI Micro Database (2007) in order to assess the impact of various types of agglomeration economies on the regional location choice between 1995 and 2005. This choice of location model has been further developed by Gauselmann et al. (2011) to be applied to the regional location choice of multinational firms in East Germany, Poland, and the Czech Republic using firm region and sector specific data and corresponding firm-level data drawn from the population of the IWH FDI Micro Database (2009). The focus of this study is on the effect of wages and human capital on regional location choice in regions with transition economies. However, region

⁵ A full list can be accessed at the IWH homepage: <http://www.iwh-halle.de/projects/2010/fdi/d/start.asp>.

and firm specific secondary data cannot only be matched to information drawn from the population of the IWH FDI Micro Database but also to the corresponding survey data. For example, Günther et al. (2008) scrutinised the effect of various region and sector specific variables in determining the propensity of multinational firms to establish technological links with various players from the East German regional innovation system. The related firm level information was drawn from the 2007 survey of multinational affiliates in East German manufacturing. It should be noted that the procedure of matching secondary region and sector specific data to information from the IWH FDI Micro Database is only possible within the IWH in order to secure anonymity of survey participants.

The second option for increasing the research potential would be to match information from the population of the IWH FDI Micro Database with different firm level data sources provided by official statistics. For example, one possible source could be the annual cost structure survey that contains important information such as value added per employee, research and development, as well as profitability (see Fritsch et al., 2004). In this way a micro panel data set could be developed that links ownership information to performance indicators. This type of matching could be technically implemented by using the trade registry number as a common identifier in both data sets. Note that this procedure is legal according to § 13a BstatG (Bundestatistikgesetz or federal statistics law) provided the data from external sources are public (see also Wagner, 2010). This is the case with firm specific information on the population of multinational affiliates in East Germany as well as East German firms with direct/indirect ownership of an foreign affiliate, because this information is available (though not free of charge) from the commercial Markus database (see above). This matching could be implemented within the premises of one of the official Research Data Centres (FDZ) in Germany.

The third option would be to match IWH FDI Micro Database survey data with other firm level data sources supplied by official statistics. However, in Germany the merging of confidential firm-level data across institutions is still in its infancy due to technical and legal obstacles (see Wagner, 2010). According to the law governing cross-institutional merging of firm-level data, this is only allowed if the firms gave prior consent to do so. In an ongoing pilot project between the Research Data Centre FDZ of the Federal Employment Agency at the Institute for Employment Research (FDZ) and the IWH, multinational affiliates in East Germany have been asked to give their consent for matching the survey data (2010) with information based on the social security records held at the Federal Employment Agency. About 50 per cent of the survey participants approved this data matching, which will be technically implemented at the premises of the FDZ. This procedure would generate a unique data set that links cross-sectional information to panel data for a number of employment related variables. One possibility of exploiting this novel data

set would be an analysis that scrutinises the effect foreign ownership has on the structure of employment in East German affiliates, taking into consideration heterogeneity of the foreign investor including his investment motive. The combined data from this pilot study will be available for joint research at the FDZ and IWH. If this pilot project is successful, this approach could also be adopted in future survey rounds and data could be available for joint research.

5. Conclusion

The IWH FDI Micro Database provides high-quality micro data for research into the internationalisation of transition economies in Central East Europe including East Germany. Since the pilot project in 2002 the project has been advancing substantially, however, certain limitations remain and need to be addressed in the future. The current research potential of the IWH FDI Micro Database is documented by the fact that the data is analysed in cooperation with an international network of Eastern and Western European researchers. Yet, this article has also tried to provide possible avenues for enhancing research potential mainly by combining different micro datasets in Germany. The IWH FDI Micro Database also tries to make a potential contribution to the international standardization and harmonization of survey activities in the field of economic analysis of MNEs. So far, the research using the IWH FDI Micro Database generated policy advice at various levels in areas such as investment, R&D and innovation policy. For example, the IWH jointly hosts a workshop series with Germany Trade and Invest, the federal agency in charge of FDI promotion in Germany. At an international level, research findings served as an input for DG Regional Policy and DG Research of the European Commission as well as UNCTAD and the OECD.

References

- Arndt, C./Mattes, A./Spies, J./Buch, C. (2009): Struktur, Determinanten und Auswirkungen ausländischer Direktinvestitionen in deutschen Bundesländern, IAW-Policy Reports, Institut für angewandte Wirtschaftsforschung e.V., Tübingen.
- Barrios, S./Gorg, H./Strobl, E. (2006): Multinationals' location choice, agglomeration economies and public incentives, *International Regional Science Review* 29, 81–107.
- Basile, R. (2004): Acquisition versus greenfield investment: the location of foreign manufacturers in Italy, *Regional Science and Urban Economics* 34, 3–25.
- Basile, R./Castellani, D./Zanfei, A. (2008): Location choice of multinational firms in Europe: The role of EU cohesion policy, *Journal of International Economics* 74, 328–340.

- Becker, S. O./Egger, P. H./Merlo, V. (2009): How Low Business Tax Rates Attract Multi-national Headquarters: Municipality-Level Evidence from Germany, CESifo Working Paper no. 2517.
- Belitz, H./Brenke, K./Fleischer, F. (2000): Der Beitrag ausländischer Investoren zum Aufbau wettbewerbsfähiger Wirtschaftsstrukturen in den neuen Bundesländern, DIW Sonderheft 169, Berlin.
- Bevan, A./Estrin, S. (2004): The determinants of foreign direct investment into European transition economies, *Journal of Comparative Economics* 32, 775–787.
- Bevan, A./Estrin, S./Meyer, K. (2004): Foreign investment location and institutional Development in transition economies, *International Business Review* 13, 43–64.
- Bureau van Dijk (2010): Amadeus – A database of comparable financial information for public and private companies across Europe, Online Brochure, URL: <http://www.bvdinfo.com/getattachment/da04b736-b71a-4c6f-acc6-ba2a9e423bf9/Amadeus.aspx> (Date: 02-11-2011).
- Cantwell, J. (1989): *Technological innovations in multinational corporations*, Oxford.
- Castellani, D./Zanfei, A. (2006): *Multinational Firms, Innovation, and Productivity*, Cheltenham.
- Chung, W./Alcácer, J. (2002): Knowledge seeking and location choice of foreign direct investment in the United States, *Management Science* 48 (12), 1535–1554.
- Crozet, M./Mayer, T./Mucchielli, J. L. (2004): How do firms agglomerate? A study of FDI in France. *Regional Science and Urban Economics* 34 (1), 27–54.
- Damijan, J. P./Knell, M./Majcen, B./Rojec, M. (2003): The role of FDI, R&D accumulation and trade in transferring technology to transition countries: evidence from firm panel data for eight transition countries, *Economic Systems* 27 (2), 189–204.
- Damijan, J. P./Rojec, M./Majcen, B./Knell, M. (2008): Impact of firm heterogeneity on direct and spillover effects of FDI: Micro evidence from ten transition countries, LIOS Discussion Paper Series, no. 218/2008, Leuven.
- Driffield, N./Love, J. H. (2007): Linking FDI Motivation and host economy productivity effects: Conceptual and Empirical Evidence, *Journal of International Business Studies* 38 (3), 460–473.
- Fischer, G./Janik, F./Müller, D./Schmucker, A. (2009): The IAB Establishment Panel – Things users should know, *Schmollers Jahrbuch – Journal of Applied Social Sciences Studies* 129 (1), 133–148.
- Fritsch, M./Görzig, B./Hennchen, O./Stephan, A. (2004): Cost structure survey in Germany, *Schmollers Jahrbuch – Journal of Applied Social Sciences Studies* 124 (4), 557–566.
- Fryges, H./Gottschalk, S./Kohn, K. (2010): The KfW/ZEW Start-up Panel: Design and Research Potential, *Schmollers Jahrbuch – Journal of Applied Social Sciences Studies* 130 (1), 117–131.
- Fujita, M./Thisse, J. F. (2002): *Economics of agglomeration: Cities, industrial locations, and regional growth*, Cambridge.

- Gauselmann, A./Marek, P./Angenendt, J.* (2011): The role of Labor markets in multinational firms' regional location choice in transition economies, IWH-Discussion Paper-Series, forthcoming.
- Guimaraes, P./Figueiredo, O./Woodward, D.* (2000): Agglomeration and the location of foreign direct investment in Portugal, *Journal of Urban Economics* 47, 115–135.
- Günther, J.* (2005): Investment of foreign companies significantly higher in East Germany than in Central Eastern Europe, *Wirtschaft im Wandel* 11(2), 44–50.
- Günther, J./Stephan, J./Jindra, B.* (2008): Foreign Subsidiaries in the East German innovation system – Evidence from manufacturing industries, *Applied Economics Quarterly Supplement* 59, 137–165.
- Haas, B.* (1996): *Ausländische Unternehmen in Ostdeutschland. Analyse ihres Markteintritts im Lichte der Theorie der Direktinvestition*, Frankfurt.
- Harhoff, D./Licht, G.* (1993): Das Mannheimer Innovations Panel, ZEW Discussion Paper 93-21, Mannheim.
- IWH* (2009a): IWH FDI Micro Database – Methodological Note Survey in Transition countries, online publication, Halle Institute of Economic Research, Halle.
- IWH* (2009b): IWH FDI Micro Database – Methodological Note Survey in East Germany, online publication, Halle Institute of Economic Research, Halle.
- Jindra, B.* (2005): Theory and Review of latest research on the Effects of FDI into CEE, in: J. Stephan (ed.): *Technology Transfer via Foreign Direct Investment in Central and Eastern Europe*, Basingstoke.
- Jindra, B.* (2010): Firms' internationalisation and the technological accumulation theory – Evidence from multinational affiliates in East Germany, unpublished doctoral thesis, University of Sussex.
- Lipponer, A.* (2009): Microdatabase Direct Investment (MiDi) – A brief guide, Technical Documentation, Deutsche Bundesbank.
- Marin, A./Bell, M.* (2006): Technology Spillovers from foreign direct investment: an exploration of the active role of MNE subsidiaries in the case of Argentina in the 1990s, *Journal of Development Studies* 42 (4), 678–697.
- Meyer, K./Sinani, E.* (2009): When and where does foreign direct investment generate positive spillovers? A meta-analysis, *Journal of International Business Studies* 40 (7), 1075–1094.
- OECD* (2002): *Frascati Manual – Proposed standard practise for survey on research and experimental development*, OECD, Paris.
- OECD* (2005): *Oslo Manual-Guidelines for collecting and interpreting innovation data*, 3-rd edition, Paris.
- Peri, G./Urban, D.* (2002): The Veblen-Gerschenkron effect of FDI in Mezzogiorno and East Germany, *Development Studies Working Paper*, no. 164, Centro Studi Luca D'Agliano.

- Peri, G./Urban, D.* (2006): Catching-up to foreign technology? Evidence on the Veblen-Gerschenkron effect of foreign investments, *Regional Science and Urban Economics* 36 (1), 72–98.
- Pfänger, M./Blien, U./Möller, J./Moritz, M.* (2010): Labor market effects of trade and FDI: Recent advances and research gaps, IZA-Discussion paper no. 5385, Institute for the Study of Labor.
- Spies, J.* (2010): Network and border effects: Where do foreign multinationals locate in Germany?, *Regional Science and Urban Economics* 40, 20–32.
- Votteler, M.* (2001): Messung der Position von Regionen bei ausländischen Direktinvestitionen, in: W. Gerstenberger (ed.): *Wirtschaftliche Problemstellungen im Vorfeld des EU-Beitritts*, Dresden, 141–151.
- Wagner, J.* (2010): The Research Potential of New Types of Enterprise Data based on Surveys from Official Statistics in Germany, *Schmollers Jahrbuch – Journal of Applied Social Sciences Studies* 130 (1), 133–142.

Annex

Annex Table A1

Distribution of the total population, IWH FDI Micro Database

	East German	In %	CEE	In %
Total population	3,905	100	7,894	100
Number not available	–361	9.24	–772	9.78
Called enterprise not relevant to the survey	–32	0.82	–41	0.52
Enterprise in insolvency	–56	1.43	–43	0.54
Contact persons could not be contacted	–60	1.54	–170	2.15
Busy signal	–7	0.18	–3	0.04
Contact persons wanted to be contacted later	–192	4.92	–5	0.06
Incorrect information in the population	–65	1.66	–36	0.46
Difficulties with understanding (foreign language)	–9	0.23	0	0.00
Other deficiencies (e.g. doubled in the population)	–288	7.38	–23	0.29
Addresses used for the survey	2,815	72.09	6,801	86.15

Source: IWH 2009.

Annex Table A2

Distribution of enterprises in the random sample,
IWH FDI Micro Database

	East German	In %	CEE	In %
Addresses used for the survey	2,835	100	6,801	100
No response	–2,169	76.51	–6,134	90.19
Interview prematurely finished	–12	0.42	–16	0.24
Sample (realized interviews)	654	23.07	651	9.57
Enterprises with a foreign / West German investor (INWARD)	633		616	
Enterprises investing abroad (OUTWARD)	43		48	
Only INWARD	612		603	
Only OUTWARD	22		35	
OUTWARD and INWARD	21		13	

Source: IWH 2009.