ZA5076

IWH FDI Micro Database –
Survey of multinational affiliates in East Germany and selected Transition Economies
(2007)

- Methodological Report -

Institut für Wirtschaftsforschung Halle
Halle Institute for Economic Research



The IWH is member of the Leibniz-Gemeinschaft

IWH-FDI-Micro-Database

Methodological Note

Survey 2007

In Croatia, Poland, Romania, Slovenia

and East Germany (including Berlin)

Halle Institute for Economic Research (IWH)
Kleine Märkerstraße 8
06108 Halle (Saale) · Germany

Authors: J. Günther, A. Gauselmann, G. Hardt, P. Marek, B. Jindra

Contact: Philipp Marek
Research Area „Knowledge and Innovation“
Phone: +49-(0)-345-7753-862
Fax: +49-(0)-345-7753-779
E-mail: pmk@iwh-halle.de

Content

1. Motivation and research questions 3

2. Micro data availability 4

3. IWH FDI Micro Database 6

3.1 The basic population 2007 ..... *7*

3.2 Survey sampling and implementation 2007 ..... *8*

4. Survey representativeness 2007 9

4.1 Survey Representativeness 2007 East Germany 9

4.2 Survey Representativeness 2007 Central Eastern European Countries 11

5. Survey questionnaire 2007 12

6. Data Access 12

References 13

Annex 16

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 and 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 and 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 and 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 and Zanfei 2006, Marin and 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, Votteler 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 ('Bundesländer'). 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 and 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 and 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 and 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 survey[1] in 2002, the project was fully launched in 2007 as part of a Strategic Targeted Research Project *("Understanding the relationship between knowledge and competitiveness 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 Services	Manufacturing, Other selected Services	Manufacturing, Other selected Services
Type of FDI	Inward FDI	Inward FDI	Inward FDI Outward FDI	Inward FDI Outward FDI	Inward FDI Outward FDI
Sample*	434	CEE: 514 EG: 295	638 Inward 43 Outward	Inward: 632 EG, 616 CEE Outward: 46 EG, 48 CEE	614 Inward 94 Outward
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	Pilot Survey-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-

[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.

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 2007 survey of the IWH FDI Micro Database.

3.1 The basic population 2007

For survey wave of 2007, the original total population was drawn from four partially overlapping firm level data sources: Creditreform, European Investment Monitor, Industrial Investment Council, and R&D Scoreboard. Creditreform (Verband der Vereine Creditreform e.V.) is a German credit-rating agency that maintains the Markus database, which contains about 97 per cent of all German firms that have a business registry entry and are economically active. This includes firms of the following legal forms: AG, GmbH, KG, OHG, GmbH & Co.KG, and one-man company[2]. Amongst other information, the Markus database includes name and address of the company, contact person, industry classification, region, and number of employees. The firm level information stems from the German business registry, is self reported, or researched. Crucially, the Markus database forms part of the international firm level Amadeus database (Bureau van Dijk) that offers elaborate and unique information on related firms and ownership structure.

The Markus list of East German firms drawn was cross-checked and complemented with three other information sources. A list drawn in 2006 from the European Investment Monitor (EMI) which is jointly operated by Ernst & Young and Oxford Intelligence served as a second source. In addition, the 2005 European Union industrial R&D investment scoreboard was used. Here the list of non-German manufacturing companies was searched for any affiliates or subsidiaries based in East Germany using company information available on the internet. Correspondingly, the list of German based manufacturing companies was searched for West German multinationals with affiliates or subsidiaries based in East Germany. The third and final source of information to build the total population was a hand selected list of foreign investors in East Germany that employed services of the Industrial Investment Council (IIC)[3], which was the responsible investment promotion agency for East Germany from 1994 until 2006. The IIC list also includes foreign investment projects linked

[2] The also the MIP draws its information on the population of German firms from this source.

3 In 2007 the Industrial investment Council (IIC) joined forces with the investment promotion agency in charge of West German and was named Invest in Germany (IIG). In 2009, Invest in Germany (IIG) was merged with the German Office for Foreign Trade and formed Germany Trade and Invest.

to the 'Treuhandanstalt' as former privatisation agency in East Germany which was dissolved in 1994. The resulting list from the four sources described above was cleaned from entries that encountered a change in ownership, insolvency, and closure.

For the CCE countries, the populations of foreign owned firms for Poland, Romania was 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. 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 (Bureau van Dijk 2010). The Polish population were supplemented with data from the foreign investment agency, Invest in Poland – PAIZ. The Croatian population was compiled using information provided by the Institute for Business Intelligence (Zagreb/Croatia). In the Slovenian case the population was drawn from statistics provided by the Bank of Slovenia. The total population across the five countries consist of 6.833 firms with about 1.1 mio employees. The large share of Romanian firms in the population is related to differences in the completeness and quality of country datasets drawn from the Amadeus database. In principal no restriction in terms of firms' size was introduced, yet, the Croatian and Romanian participants decided to include only foreign owned firms with a minimum of 10 employees into their population.

Given the compatibility of the MARKUS and AMADEUS databases, we are able to draw upon the population underlying the IWH FDI Micro Database using the following uniform selection criteria for inward FDI in all countries:

A) 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 2006, in which at least one foreign investor holds either a minimum of 10% direct shares/voting rights. These enterprises are independent affiliates with their own legal or they are branches without a 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 2006, in which at least one West German multinational investor holds either a minimum of 10% direct 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 a part of East Germany in line with other established micro datasets and official statistics.

3.2 Survey sampling and implementation 2007

The survey questionnaire was centrally designed in 2006, whereas the survey implementation was decentrally organized during 2007. The survey was implemented by the following partners: *Zentrum für Sozialforschung Halle* (zsh) in East Germany, *Institute for Economic Research* in Slovenia, *University of Zagreb* in Croatia, *Group of Applied Economists* in Romania and *EMAR Marketing Research* in Poland. All firms from the population were approached in written form or by phone and invited to participate in the survey. Firms received the questionnaire by post, fax, or as an electronic version. In Romania due to the large size of the population a random sample was drawn from the population. All firms in the sample received the questionnaire by post, yet, the interviews were realised face-to-face. In East Germany all firms from the population were contacted by phone and invited to take part in the survey. Most interviews were realised directly by phone, only few companies prefer to fill in the questionnaire in written form. The project deliberately allowed the country teams to choose the most appropriate method and timing individually. The survey implementation was concluded in June 2007.

4. Survey representativeness 2007

In 2007, the total population (inward FDI) of the IWH FDI Micro Database for East Germany and the CEE countries included 1,412 and 5,421 enterprises, respectively. Altogether 295 East German and 541 CEE companies could be contacted during the survey. In East Germany, the sample corresponds to a response rate of 20.89%, while in the other CEE countries the response rate was around 10%. Thus, a total of 808 enterprises participated in the 2007 survey for the IWH FDI Micro Database. This generates an overall response rate of 11.84%.

4.1 East Germany

In East Germany, the overall response rate of 20.9 per cent in terms of number of firms corresponds to response rates of 20.4 per cent and 22.7 per cent for the sub-groups of firms with either foreign or West German multinational ownership, respectively. In terms of employment, firms in the sample account for 39.946 employees which represent 15 per cent of employment in the total population. The shares of sample employment to total employment for the sub-groups of firms with either foreign or West German multinational ownership are 16.4 per cent and 11.1 per cent respectively.

According to the Chi-square test result, the distribution of firms in the sample across sectors at 2 digit level (NACE Rev. 1.1) (see Annex Table A1) does not differ significantly from the distribution in the total population4 (see Annex Table A1.1). The average size of firms in the total population measured in terms of number of employees is 200. The average number of employees in the sample is 135 (see Annex Table A2). The Mann-Whitney test shows that this is a significantly smaller average size compared to the population (see Annex Table A2.1). If we take a look at the distribution of firms across four different classes of firm size (1 to 9, 10 to 49, 50 to 249, and above 250 employees) (see Annex Table A3), we realize that

[4] The chi-square test statistic should be carefully interpreted as in three industries we expect less than five observations. Therefore, I repeated the test using a higher sectoral aggregation as used by the IAB and found the results confirmed. Therefore, it seems reasonable to the authors to assume that the sectoral distribution of the sample does not differ significantly from the population.

the sample has fewer firms in the category of micro firms (1 to 9 employees) as well as large firms (above 249 employees). Yet, the distribution of firms does not differ significantly from the population[5] (see Annex Table A3.1). In terms of regional distribution of firms across the six federal states (NUTS 1) in East Germany, the sample does differ significantly from the total population (see Annex Tables A4 and A4.1). Whereas 15.5 per cent of firms in the population are located in Berlin, this share amounts only to 7.1 per cent in the sample. Thus, firms from Berlin are underrepresented in the sample. Also, at a lower level of regional disaggregation of 'Raumordnungsregionen'[6] (ROR) the result is unchanged (see Annex Tables A5 and A5.1).

The survey results show that from the total population of firms about 12 per cent could not be contacted by interviewers by means of telephone. In most cases this was related to an incorrect telephone number (see Table A6). About 67 per cent of firms refused to participate in the survey and can be classed as non-respondents. Non-response was motivated by explanations such as no interest, time constraints, refusal to be interviewed by means of telephone, and postponement of a possible interview to a later stage. Finally, about 21 per cent of firms agreed to participate in the survey (this includes the interviews during the pre-test). The latter group of firms can be classed as respondents. I repeated the tests for significant differences in the distribution of firms across sectors, regions, and firm size categories comparing respondents to non-respondents. This gives us an indication to what extent the survey suffers from a non-respondent bias.

In terms of sectoral distribution, the group of respondents differs significantly from non-respondents[7] (see Annex Tables A7 and A7.1). Responding firms are more frequent in chemicals and chemical products (NACE 24), non-metallic-mineral products (NACE 26), and basic metal (NACE 27) (see Annex Table A7). In contrast there are fewer than expected respondents from fabricated metal products (NACE 28), electrical machinery (NACE 31), and motor vehicles (NACE 34). The group of non-respondents shows a higher average number of employees (216) in contrast group of respondents (135) (see Annex Table A8) however, the difference is not significant (see Annex Table A8.1, p. 221). The distribution across size categories also differs significantly due to fewer than expected respondents in the micro (1 to 9 employees) as well as large (above 249 employees) category of firm size (see Annex Tables A9 A9.1). In terms of regional distribution, there are fewer than expected observations among respondents in compared to non-respondent for firms from the federal state of Berlin (see Annex Tables A10 and A10.1) as well as significant deviation in the distribution across the lower level 'ROR' regional units (see Annex Tables A11 and A11.1).

Beyond sectoral, regional, and size distribution the sample is characterised by firms that entered between 1990 and 2005 (see Annex Table A12). In the distribution over this period,

[5] The chi-square test statistic is not significant only at the 10 per cent not at the 1 per cent level.

[6] From the level of federal states (NUTS 1) the next lower level of disaggregation is 'Regierungsbezirke' (NUTS 2). However, this is a purely administrative unit. The next lower level is 'Kreise' (NUTS 3). However, at this level we have too few observations in order to assess representativeness. In between NUTS 2 and NUTS 3 there are 23 'Raumordnungsregionen' (ROR) within East Germany. They are constructed as administrative-functional units that take into account the commuting movements of workers' between residence and work. Each ROR consist of two to six counties ('Kreise'). Therefore, my choice for an appropriate regional unit to assess representativeness was ROR.

[7] Chi-square test statistic is significant at 5 per cent level.

there is a higher entry rate of firms in the sample during the privatisation period until 1994. After a decline in the second half of the 1990s, the entry rate only picks up again from 2000 onwards. At the time of the survey implementation (2006), about 70 per cent of the affiliates are fully, about 23 per cent are majority, and only about 7 per cent are minority foreign or West German owned (see Annex Table A13). The survey offers also information on the type of owner. From this we learn, that about 67 per cent of affiliates belong to multinational enterprise group, about 10 per cent belong to a national enterprise group located abroad, about 12 per cent are part of a foreign enterprise (single entity), and 11 per cent have foreign individual or family ownership (see Annex Table A14). These ownership structures represent various stages or forms of firm internationalisation into East Germany. The sample supplies also information on the mode of entry. From this it becomes clear that 39 per cent entered East Germany by setting up a completely new enterprise (Greenfield), whereas the majority of 61 per cent chose a form of acquisitions (see Annex Table A15). The latter group contains acquisitions of a stated owned enterprise as part of the privatisation process (17 per cent), acquisitions of a domestic privately owned enterprise (28 per cent), as well as acquisitions of an enterprise from another foreign investors (16 per cent).

From the distribution of home countries in the sample, we see that about 25 per cent of affiliates belong to multinationals headquartered in West Germany the rest are part of enterprises located abroad (see Annex Table A16). The set of foreign home countries in the sample is fairly dispersed. The highest share of foreign firms stem from the Netherlands (11 per cent), Austria (11 per cent), the United States (8 per cent), and Switzerland (8 per cent). In principal, from foreign firms in the sample about 80 per cent originate from EU-27 (plus Norway, Lichtenstein, and Switzerland) and about 20 per cent from overseas.

In sum, the sample is representative at the sectoral level but differs significantly from the total population with regard to regional and size distribution. The regional deviations are mainly related to an underrepresentation of firms from Berlin and firms with 10 to 249 employees are overrepresented. Moreover, there are indications for a non-response bias. An additional limitation applies as representativeness was evaluated looking at each criterion (sector, region, size) separately and not jointly. Beyond these criteria, the sample is characterised by affiliates that entered throughout the period between 1990 and 2005. It is dominated by multinational enterprise groups as owners, full ownership as well as acquisition as mode of entry. On the one hand, empirical results using the 1st spell of the IWH FDI micro database should be interpreted having in mind the above limitations. On the other hand, the substantial sample available is drawn from a comprehensive population that allows us to assess representativeness for the first time so thoroughly.

4.2 Central Eastern European countries

The resulting sample of foreign owned firms holds information from 809 enterprises that account for an employment of about 214.000 people across the five countries surveyed. In terms of number of firms that constitutes 11.84 per cent of the total population, and in terms of employment respectively 19.05 per cent. The deviations of the sample from the distribution of the population across sectors are up to 3 per cent, if we consider the number of firms. If we take the employment per sector it varies up to 5 per cent. The sample response rates vary across countries (see Annex Table A17). In terms of number of firms it

ranges from 6.62 per cent in Poland to 65.45 per cent in Croatia. In terms of employment it ranges from 11.12 per cent of the sample of West German multinational owned firms in East Germany to 65.97 per cent in Croatia. Such differences in response rates are mainly explained by the difference in the size of the respective population. The larger populations of Romania, Poland and East Germany tend to show response rates. Yet, if we look at share of each country in the resulting sample, the distributions follows the respective size of populations across countries (see Annex Table A18). In terms of distribution of firms across size classes (in terms of employees), the sample is underrepresented for micro (1-9) and small enterprise (10-49), and consequently overrepresents medium seized (50 - 249) and large (above 250) firms.

5. Survey questionnaire 2007

In 2007 the thematic focus of the survey was investment motives and the evaluation of locational factors. The corresponding 2007 questionnaire includes 23 questions[8] and is divided into four sections.

The first part of the questionnaire (questions 1-8) 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, and investment motives. The second part of the questionnaire (questions 9-13) includes questions on employment, turnover, intermediate inputs, exports as well as changes to selected performance indicators through the internationalisation processes. The third part (questions 14-17) is answered deals with the relations between the enterprise and the investor such as the autonomy over particular business functions. The last part of the questionnaire deals with questions about research and development (R&D) (questions 18-23) 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).

6. Data Access

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.

[8] 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.

References

Arndt, C., Mattes, A., Spies, J. and C. Buch (2009), Struktur, Determinanten und Auswirkungen ausländischer Direktinvestitionen in deutschen Bundesländern, IAW-Policy Reports, Institut für angewandte Wirtschaftsforschung e.V., Tübingen.

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., and A. Zanfei, A. (2008), Location choice of multinational firms in Europe: The role of EU cohesion policy, Journal of International Economics 74, 328-340.

Barrios, S., Gorg, H. and Strobl, E. (2006), Multinationals' location choice, agglomeration economies and public incentives, International Regional Science Review 29, 81–107.

Becker, S.O., Egger, P.H. and V. Merlo (2009), How Low Business Tax Rates Attract Multinational Headquarters: Municipality-Level Evidence from Germany, CESifo Working Paper no. 2517.

Belitz, H., Brenke, K. and Fleischer, F. (2000), Der Beitrag ausländischer Investoren zum Aufbau wettbewerbsfähiger Wirtschaftsstrukturen in den neuen Bundesländern, DIW Sonderheft 169, Duncker und Humblot, Berlin.

Bevan, A. and Estrin, S. (2004), The determinants of foreign direct investment into European transition economies, Journal of Comparative Economics 32, 775–787.

Bevan, A., Estrin, S. and K. Meyer (2004), Foreign investment location and institu-tional 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. Blackwell, Oxford.

Castellani, D. und Zanfei, A. (2006), Multinational Firms, Innovation, and Productivity. Edward Elgar, Cheltenham.

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.

Chung, W. and J. Alcácer (2002) Knowledge seeking and location choice of foreign direct investment in the United States, Management Science 48(12), 1535-1554.

Damijan, J.P., Knell M., Majcen B. and M. Rojec (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. and M. Knell (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: University of Leuven.

Driffield, N. and Love, J.H. (2007), Linking FDI Motivation and host economy prod-uctivity effects: Conceptual and Emprical Evidence, Journal of International Business Studies 38(3), 460-473.

Fischer, G., Janik, F., Müller, D. and A. Schmucker (2009), The IAB Establishment Panel – Things users should know, Schmollers Jahrbuch – Journal of Applied Social Sciences Studies 129 (1), 133-148.

Fujita, M. and J.F. Thisse (2002), Economics of agglomeration: Cities, industrial locations, and regional growth, Cambridge University Press, Cambridge.

Fritsch, M., Görzig, B., Hennchen, O. and A. Stephan (2004), Cost structure survey in Germany, Schmollers Jahrbuch – Journal of Applied Social Sciences Studies 124 (4), 557-566.

Fryges, H., Gottschalk, S., and K. Kohn (2010), The KfW/ZEW Start-up Panel: Design and Research Potential, Schmollers Jahrbuch – Journal of Applied Social Sciences Studies 130 (1), 117-131.

Gauselmann, A., Marek, P. and J. Angenendt (2011), The role of Labor markets in multinational firms' regional location choice in transition economies, IWH-Discussion Paper-Series, forthcoming.

Guimaraes, P., Figueiredo, O., and D. Woodward (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. and 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, Peter Lang Verlag, Frankfurt.

Harhoff, D. and Licht, G. (1993), Das Mannheimer Innovations Panel, ZEW Discussion Paper 93-21, Mannheim.

IWH (2009), IWH FDI Micro Database – Note on Survey Representativeness 2009, 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 Stephan, J. (ed.): Technology Transfer via Foreign Direct Investment in Central and Eastern Europe, Palgrave Macmillan, 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. and M. Bell (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. and 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 (2005), Oslo Manual-Guidelines for collecting and interpreting innovation data, 3-rd edition, Paris: OECD and Eurostat.

OECD (2002), Frascati Manual – Proposed standard practise for survey on research and experimental development, OECD, Paris.

Peri, G. and D. Urban (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. and D. Urban (2006), Catching-up to foreign technology? Evidence on the Veblen-Gerschenkron effect of foreign investments, Regional Science and Urban Economics 36(1), 72-98.

Pflüger, M., Blien, U., Möller, J. and M. Moritz (2010), Labor market effects of trade and FDI: Reecent 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 Gerstenberger, W. (ed.), Wirtschaftliche Problemstellungen im Vorfeld des EU-Beitritts, Dresden, pp. 141-151.

Wagner, J. (2010), The Research Potential of New Types of Enterprise Daat based on Surveys from Official Statistics in Germany, Schmollers Jahrbuch – Journal of Applied Social Sciences Studies 130 (1), 133-142.

Annex

Table A1 Sectoral distribution in population and sample 2007

	Population		Sample	
NACE Rev 1.1	No. of firms	In %	No. of firms	In %
15	91	6,44	20	9,01
16	3	0,21	0	0,00
17	33	2,34	8	3,60
18	5	0,35	2	0,90
19	2	0,14	1	0,45
20	33	2,34	9	4,05
21	46	3,26	11	4,95
22	60	4,25	9	4,05
23	8	0,57	2	0,90
24	109	7,72	32	14,41
25	75	5,31	14	6,31
26	129	9,14	31	13,96
27	44	3,12	13	5,86
28	150	10,62	27	12,16
29	170	12,04	41	18,47
30	24	1,70	1	0,45
31	72	5,10	8	3,60
32	73	5,17	15	6,76
33	103	7,29	16	7,21
34	72	5,10	10	4,50
35	38	2,69	6	2,70
36	48	3,40	11	4,95
37	24	1,70	8	3,60
Sum	1.412	100	295	100

Source: IWH FDI micro database.

Table A1.1 Sectoral representativeness of foreign firm sample

Chi-square-test- statistic	21,60
Degrees of freedom	21
Asymptotic significance	0,423

Source: Author's calculations.

Table A2 Average number of employees in population and sample 2007

	Population	Sample
Mean (standard deviation)	199,70 (584,93)	135,49 (287,69)
Skewedness (standard error)	9,32 (0,07)	6,09 (0,14)
Kurtosis (standard error)	110,93 (0,13)	46,68 (0,28)

Source: Author's calculations.

Table A2.1 Differences in means of employees in population and sample

Mann-Whitney-test statistic	187.284
Z-statistic	-1,297
Asymptotic significance	0,195

Source: Author's calculations.

Table A3 Distribution of firms across size classes in population and sample 2007

	Population		Sample	
Size classes (employees)	No. of firms	In %	No. of firms	In %
Micro (1-9)	206	15,44	34	11,53
Small (10-49)	383	28,71	106	35,93
Medium (50-249)	515	38,61	119	40,34
Large (250 - over)	230	17,24	36	12,20
Sum	1.334	100	295	100
Missing values*	78		0	

*For 78 firms the database has no information on the number of employees.

Source: IWH FDI micro database.

Table A3.1 Size class representativeness of sample

Chi-square-test- statistic	12,99
Degrees of freedom	3
Asymptotic significance	0,005

Source: Author's calculations.

Table A4 Regional distribution across federal states in population and sample 2007

	Population		Sample	
Federal States	No. of firms	In %	No. of firms	In %
Berlin	219	15,5	21	7,1
Brandenburg	167	11,8	35	11,9
Mecklenburg-VP	107	7,6	22	7,5
Sachsen-Anhalt	208	14,7	65	22,0
Sachsen	443	31,4	86	29,2
Thüringen	268	19,0	66	22,4
Sum	1.412	100	295	100

Source: IWH FDI micro database.

Table A4.1 Regional representativeness sample at federal state level

Chi-square-test- statistic	18,82
Degrees of freedom	5
Asymptotic significance	0,002

Source: Author's calculations.

Table A5 Regional distribution across 'ROR' in population and sample 2007

	Population		Sample	
ROR	No. of firms	In %	No. of firms	In %
Westmecklenburg	38	2,7	7	2,4
Mittleres Mecklenburg/Rostock	29	2,1	7	2,4
Vorpommern	19	1,3	7	2,4
Mecklenburgische Seenplatte	22	1,6	1	0,3
Prignitz-Oberhavel	28	2,0	4	1,4
Uckermark-Barnim	14	1,0	6	2,0
Oderland-Spree	33	2,3	7	2,4
Lausitz-Spreewald	33	2,3	6	2,0
Havelland-Fläming	59	4,2	12	4,1
Berlin	219	15,5	21	7,1
Altmark	10	0,7	3	1,0
Magdeburg	74	5,2	14	4,7
Dessau	56	4,0	16	5,4
Halle/S.	67	4,7	22	7,5
Nordthüringen	29	2,1	10	3,4
Mittelthüringen	71	5,0	21	7,1
Südthüringen	75	5,3	10	3,4
Ostthüringen	93	6,6	25	8,5
Westsachsen	93	6,6	20	6,8
Oberes Elbtal/Osterzgebirge	134	9,5	33	11,2
Oberlausitz-Niederschlesien	65	4,6	13	4,4
Chemnitz-Erzgebirge	88	6,2	15	5,1
Südwestsachsen	63	4,5	15	5,1
Sum	1.412	100	295	100

Source: IWH FDI micro database.

Table A5.1 Regional representativeness of sample at 'ROR' level

Chi-square-test- statistic	40,65
Degrees of freedom	22
Asymptotic significance	0,009

Source: Author's calculations.

Table A6 Structure of non-respondents and respondents

Disposition	Frequency	In %
Respondents		
prematurely finished interview	10	0,71
interview completed by fax	9	0,64
completed telephone interview	276	19,54
pretesting	3	0,21
	298	21,10
Non-respondents		
Firm not relevant acc. to interviewed person	114	9,72
no interest in survey	377	2,70
no telephone survey	103	7,29
no time to participate	142	10,06
hung up without answer	2	0,14
appointment for interview made	173	12,25
Other unclassified reasons	38	2,69
	949	67,21
Not-categorised		
wrong number	88	6,23
busy	2	0,14
no contact/answering machine	65	4,60
private line	3	0,21
fax machine	6	0,42
firm does not exist anymore	1	0,07
	165	11,68
Sum	1.412	100

Source: IWH FDI micro database.

Table A7 Sectoral distribution of respondents and non-respondents 2007

	Non-Respondents		Respondents	
NACE Rev 1.1	No. of firms	In %	No. of firms	In %
15	64	6,74	20	6,71
16	3	0,32	0	0,00
17	20	2,11	9	3,02
18	3	0,32	2	0,67
19	1	0,11	1	0,34
20	23	2,42	9	3,02
21	31	3,27	11	3,69
22	46	4,85	9	3,02
23	4	0,42	2	0,67
24	66	6,95	32	10,74
25	55	5,80	14	4,70
26	79	8,32	32	10,74
27	23	2,42	13	4,36
28	108	11,38	27	9,06
29	112	11,80	41	13,76
30	14	1,48	1	0,34
31	47	4,95	8	2,68
32	46	4,85	15	5,03
33	78	8,22	17	5,70
34	51	5,37	10	3,36
35	29	3,06	6	2,01
36	32	3,37	11	3,69
37	14	1,48	8	2,68
Sum	949	100	298	100

Source: IWH FDI micro database.

Table A7.1 Significant deviations in sectoral distribution of respondents

Chi-square-test- statistic	36,36
Degrees of freedom	21
Asymptotic significance	0,020

Source: Author's calculations.

Table A8 Average number of respondents and non-respondents 2007

	Non-Respondents	Respondents
Mean (standard deviation)	215,72 (614,82)	134,81 (286,38)
Skewedness (standard error)	8,91 (0,08)	6,11 (0,14)
Kurtosis (standard error)	102,02 (0,16)	41,13 (0,28)

Source: Author's calculations.

Table A8.1 Differences in means of employees of respondents

Mann-Whitney-test statistic	124.825
Z-statistic	-1,819
Asymptotic significance	0,069

Source: Author's calculations.

Table A9 Distribution of firms across size classes for respondents and non-respondents 2007

	Non-Respondents		Respondents	
Size classes (employees)	No. of firms	In %	No. of firms	In %
Micro (1-9)	146	16,20	35	11,74
Small (10-49)	240	26,64	106	35,57
Medium (50-249)	343	38,07	121	40,60
Large (250 - over)	172	19,09	36	12,08
Sum	901		298	
Missing values*	48		0	

*For 48 firms the database has no information on the number of employees.

Source: IWH FDI micro database, Author's calculations.

Table A9.1 Significant deviations in size distribution respondents

Chi-square-test- statistic	20,98
Degrees of freedom	3
Asymptotic significance	0,000

Source: Author's calculations.

Table A10 Regional distribution of respondents and non-respondents at federal state level

	Non-Respondents		Respondents	
Federal States	No. of firms	In %	No. of firms	In %
Berlin	166	17,5	21	7,0
Brandenburg	114	12,0	36	12,1
Mecklenburg-VP	69	7,3	22	7,4
Sachsen-Anhalt	130	13,7	65	21,8
Sachsen	297	31,3	88	29,5
Thüringen	173	18,2	66	22,1
Sum	949	100	298	100

Source: IWH FDI micro database, Author's calculations.

Table A10.1 Significant deviations in regional distribution respondents at federal state level

Chi-square-test- statistic	26,20
Degrees of freedom	5
Asymptotic significance	0,000

Source: Author's calculations.

Table A11 Regional distribution across 'ROR' for respondents and non-respondents

	Non-Respondents		Respondents	
ROR	No. of firms	In %	No. of firms	In %
Westmecklenburg	28	3,0	7	2,3
Mittleres Mecklenburg/Rostock	16	1,7	7	2,3
Vorpommern	9	0,9	7	2,3
Mecklenburgische Seenplatte	16	1,7	1	0,3
Prignitz-Oberhavel	21	2,2	4	1,3
Uckermark-Barnim	7	0,7	6	2,0
Oderland-Spree	22	2,3	7	2,3
Lausitz-Spreewald	23	2,4	7	2,3
Havelland-Fläming	41	4,3	12	4,0
Berlin	166	17,5	21	7,0
Altmark	7	0,7	3	1,0
Magdeburg	54	5,7	14	4,7
Dessau	37	3,9	16	5,4
Halle/S.	32	3,4	22	7,4
Nordthüringen	16	1,7	10	3,4
Mittelthüringen	42	4,4	21	7,0
Südthüringen	54	5,7	10	3,4
Ostthüringen	61	6,4	25	8,4
Westsachsen	64	6,7	20	6,7
Oberes Elbtal/Osterzgebirge	85	9,0	33	11,1
Oberlausitz-Niederschlesien	39	4,1	13	4,4
Chemnitz-Erzgebirge	67	7,1	15	5,0
Südwestsachsen	42	4,4	17	5,7
Sum	949	100	298	100

Source: IWH FDI micro database, Author's calculations.

Table A11.1 – Significant deviations of respondents at 'ROR' level

Chi-square-test- statistic	73,48
Degrees of freedom	22
Asymptotic significance	0,000

Source: Author's calculations.

Table A12 – Year of entry of multinational affiliates in the sample

Year of entry	Frequency	Sample in %
1990	30	10,17
1991	30	10,17
1992	23	7,80
1993	14	4,75
1994	15	5,08
1995	13	4,41
1996	8	2,71
1997	10	3,39
1998	18	6,10
1999	15	2,08
2000	15	5,08
2001	18	6,10
2002	21	7,12
2003	20	6,78
2004	23	7,80
2005	22	7,46
Total	295	100

Source: IWH FDI micro database (2007), Author's calculations.

Table A13 – Share of ownership held by multinational investors in the sample

Share of ownership (in %)	Frequency	Sample in %
10-49	23	7,80
50-99	67	22,70
100	205	69,50
Total	295	100

Source: IWH FDI micro database (2007), Author's calculations.

Table A14 –Type of foreign/West German owner in the sample

Share of ownership (in %)	Frequency	Sample in %
Multinational enterprise group	198	67,10
National enterprise group	29	9,80
Foreign enterprise	35	11,90
Foreign individual or family	33	11,20
Total	295	100

Source: IWH FDI micro database (2007), Author's calculations.

Table A15 – Initial entry mode of investor in the sample

Type of initial entry mode	Sample Frequency	in %
Acquisition as part of the privatisation	51	17,40
Acquisition of a domestic privately owned firm	81	27,50
Acquisition from another foreign investor	47	16,10
Ownership in a completely new enterprise	116	39,00
Total	295	100

Source: IWH FDI micro database (2007), Author's calculations.

Table A16 – Home countries of multinational affiliates in the sample

Home country	Sample Frequency	in %
West Germany (FGR)	73	24,75
Netherlands	33	11,19
Austria	31	10,51
United States	25	8,47
Switzerland	24	8,14
France	14	4,75
Italy	14	4,75
Belgium	13	4,41
Denmark	10	3,39
Sweden	9	3,05
United Kingdom	8	2,71
Canada	5	1,69
Luxemburg	5	1,69
Japan	4	1,36
Spain	3	1,02
Finland	3	1,02
Ireland	3	1,02
Norway	3	1,02
China	2	0,68
Poland	2	0,68
Korea	2	0,38
Bahrain	1	0,34
Czech republic	1	0,34
Israel	1	0,34
India	1	0,34
Lithuania	1	0,34
Mexico	1	0,34
Slovenia	1	0,34
Slovakia	1	0,34
Turkey	1	0,34
Total	295	100

Source: IWH FDI micro database (2007), Author's calculations.

Table A17- IWH FDI Microdatabase – Sample response rates per country

	Number of firms	Employment
Croatia	65,45%	65,97%
Slovenia	10,96%	23,75%
Poland	7,28%	18,20%
Romania	6,62%	16,22%
East Germany	20,37%	16,40%
EG - WG MNEs	22,67%	11,12%
Total	11,84%	19,05%

Table A18 - IWH FDI Microdatabase – Country composition of sample

	no. Firms	in %	Employment	in %
Croatia	144	17,80	36.963	17,25
Slovenia	40	4,94	9.686	4,52
Poland	110	13,60	38.408	17,92
Romania	220	27,19	89.292	41,67
East Germany	222	27,44	32.058	14,96
EG - WG MNEs	73	9,02	7.888	3,68
Total	809		214.295	