

The Location of German Multinationals in Eastern European Countries[★]

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Preliminary Version

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Abstract

This paper uses panel data methods at a firm level to examine the location of German multinationals in the ten Central and Eastern European countries that are to enter the European Union. I analyse the sectoral pattern of German FDI and find that the traditional determinants, such as market potential, low relative unit labor costs, a skilled workforce, trade and tariffs have significant and plausible effects. In addition, factors related to the transition status of a CEEC, such as the share of private businesses, the method of privatization, and country risk, play a considerable role in the location decision of German investors and help explain the different attractiveness for FDI of the individual countries.

Keywords: Transition economies, Multinationals, Panel estimation.

JEL classification: F21, F23, P33

1 Introduction

This paper examines the location of German multinationals in the ten Eastern European countries that are candidates for EU enlargement. I pay particular attention to their transition process by supplementing the traditional determinants of FDI that I derive from recent trade theories that incorporate multinational firms, with factors related to the transition status of a country receiving foreign direct investment (FDI). The impacts of these variables are estimated using a novel micro-dataset on the foreign direct investments of German firms, which has been recently made available by the Deutsche Bundesbank (Lipponer, 2002). In addition to the information on FDI, the dataset also provides information on other variables of interest such as the foreign sales or the foreign employment.

The German FDI position has risen dramatically during the last decade. However German FDI has been spread unevenly between Eastern European countries. This discrepancy cannot be fully explained by traditional determinants of multinational location. It has to be supplemented by transition-specific factors because they reflect the actual state of the transition process, the overall policy stance or even future prospects.

The paper makes four distinct contributions to the existing literature. First, I employ new data on FDI using all the information available in cross-section and time-series at a firm level. I use a fixed-effect panel-data approach to explore the bilateral relationship of a parent company located in Germany and its affiliates in Eastern Europe from 1996 to 1999. This yields an unbalanced panel of 4062 groups¹. Second, I apply the concept of market potential to multinational firms whereas most papers on Eastern Europe use GDP as a measure of local market size. The location of a multinational firm does not only depend on the local market, but also on the accessibility of the markets of the neighboring countries (Cieslik and Ryan, 2001; Head and Mayer, 2001; Altomonte, 2002). This is particularly important when regional integration improves market access. Third, by using both the traditional and transition-specific sets of variables, I follow Carstensen and Toubal (2003) and extend the work by Landsbury et al (1996), Holland and Pain (1998) and Bevan and Estrin (2000) who focus on the business environment and the privatization process as primary determinants of FDI in Eastern Europe. Finally, the use of firm level data allows me to determine the sectoral pattern of German FDI.

The paper is organized as follows. In section 2, some stylised facts are presented which guide the subsequent analysis. Then, in section 3, I review the theoretical literature from which the empirical specification is derived. The

¹ 2328 German parent companies investing in 3660 affiliates located in Eastern Europe. Some affiliates have more than one German parent.

econometric specification and the data sources are presented in section 4. The estimation strategy and the empirical results are laid out in sections 5, while section 6 concludes.

2 Stylized Facts

It is worth stressing the difference between German multinationals that are located in Eastern Europe and those that are not located in accession countries². Table 1 compares characteristics of firms in accession countries³ and non-accession countries⁴ and shows indeed quite significant differences.

— Insert Table 1 about here —

In terms of the total number of affiliates, the accession countries have shown the most significant increase during the past ten years. Whereas the number of affiliates increased from only around 100 in 1990 to more than 3500 in 2000 in the accession countries, affiliates in non-accession countries increased from 17,000 to a little over 23,000 in non-accession countries. Moreover, affiliates in accession countries have smaller FDI and sales on average but a larger number of employees as compared to the rest of the sample. Overall, these differences between the accession countries and the rest of the sample suggest that the pattern of investments within the two groups differs⁵.

According to Buch et al. (2003), smaller foreign affiliates are set up in countries with which Germany conducts a lot of foreign trade. This results can be interpreted as smaller affiliates being used for distribution rather than production. Since the dataset provides with information on the sector of the foreign affiliate, they checked if this hypothesis is confirmed by the data. Actually, only few affiliates in the accession countries report wholesale trade as their main line of business. One interpretation of this result is that production in the accession countries is relatively more important than distribution as seen in Table 2.

— Insert Table 2 about here —

² The Eastern european accession countries are Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia. The database provide more than 200 countries (See for more details: Lipponer; 2002).

³ Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia.

⁴ This comprises about 180 countries excluding the 10 preceding accession countries. (See Lipponer; 2002)

⁵ I would like to thank Claudia Buch who stressed this point.

The sectoral breakdown reveals that the manufacture of coke, refined petroleum products and nuclear fuel, the manufacture of other non-metallic mineral products (glass, ceramic, bricks, cement, etc.) and transport equipment are the main manufacturing sectors, whereas banking, electricity, gas and water supply are the main services sectors. The Central European countries, to a lesser extent the Slovak Republic and Slovenia, are the main recipients of FDI in those sectors⁶.

The growth of FDI flows in Eastern Europe has gone hand in hand with the integration of these countries into the European Union. Using aggregate FDI flows derived from the OECD International Direct Investment Statistics Yearbook., Bevan and Estrin (2000), find that Germany is a predominant partner. Table 3 presents the European and US FDI stock in some Central and Eastern European Countries (CEEC)⁷ and confirms this result.

— Insert Table 3 about here —

At first glance, the finding that geographical proximity and FDI are connected is not surprising, and might be expected from the large flows of German FDI to the neighbouring Eastern region. As seen in Table 3, the vast majority of German FDI goes to the Czech Republic, Hungary and Poland, three of the largest CEECs, but also the earliest member of the Central European Free Trade Area (CEFTA)⁸. Through the CEFTA, setting an affiliate in one of these countries guarantees access to all of their markets and to the nearby European Union. Table 4 presents a brief macroeconomic overview and the privatization process in some Eastern countries and compares the state of transition with Portugal, which is in some respect not so different from the Eastern European countries.

— Insert Table 4 about here —

The German stock of FDI accounts for more than half of the total stock of FDI⁹ in the Czech Republic and Hungary. These countries are characterized by a large market size but also a low relative wage compared to Portugal. Generally, the Central European countries¹⁰ are performing better than their

⁶ The sectoral and regional breakdown is not presented due to the confidential nature of the database.

⁷ Due to the confidentiality of the data, German FDI stocks in Eastern Europe are presented for few countries.

⁸ The CEFTA was created in 1992 by the former Czechoslovakia, Hungary and Poland. On March 1993, the CEFTA goes into effect, eliminating duties on approximately 40% of industrial goods. On January 1997, duties on industrial products were completely removed except for some "sensitive" sectors.

⁹ As percent of GDP

¹⁰ Czech Republic, Hungary, Poland, Slovak Republic and Slovenia.

Baltic and South Eastern neighbors¹¹. This may be due to their relative stable environment as shown by the country risk index and their relative fast transition process. Moreover, the Central European countries are characterised by a higher private sector share of their gross domestic product. They are also the first, with the exception of Poland and Slovenia to redirect their method of privatization toward direct sales in the early nineties.

The same determinants have developed much less favorably for the South Eastern European Countries and the Baltic countries. The slow progress toward a market economy could have impeded FDI inflows in Bulgaria and Romania, even if these economies have the lowest labor costs. Bulgaria's foreign oriented methods of privatization after 1996 does not seem to have offset the negative effect on German FDI related to the unstable environment.

Turning to the Baltic countries, their relative small markets, which are also distant from Germany, seem to have discouraged German investors. However, those countries are among the most advanced countries as shown by the high transition index.

3 Literature Review

This paper focuses on firm location in Eastern Europe. It stresses the important role of the transition toward a market economy but also aims at testing the explanatory power of the New Trade Theory¹². Basically, the growing theoretical literature on FDI has followed two directions: the Horizontal Model and the Knowledge-Capital Model.

The Horizontal Model integrates the key element of the ownership and location advantages of the "OLI framework"¹³ into imperfect competition mod-

¹¹ In the following paper, I often make the distinction between the Baltic countries (Estonia, Latvia Lithuania), the Central European Countries (Czech Republic, Hungary, Poland, Slovak Republic, Slovenia) and the South Eastern European Countries (Bulgaria Romania).

¹² For a survey of the literature on multinationals and the new trade theory see Markusen (1995).

¹³ In order to compensate the costs of operating abroad, a firm must incur significant advantages for going multinational. Dunning (1977, 1980) provides a taxonomy of micro- and macro-economic determinants that explain the firm willingness and ability to undertake FDI. He suggests in his framework of ownership, location and internalization (OLI) that distinction should be made between the reason for ownership, resources based and local market oriented investment (location) and internalization of knowledge within firms

els. Multinationals (MNEs) arise endogenously. The model is called Horizontal Model because multinationals are seen as companies that produce the same product in multiple plants, serving local markets by local production. Prominent theoretical papers include Horstmann and Markusen (1992), and Brainard (1993). The Horizontal Model considers identical countries and introduces transport costs. Horizontal multinationals arise if the trade-off between the proximity advantages and the concentration advantages is solved in favor of proximity. The proximity advantage stems from the advantage a company has by locating production close to consumers. The concentration advantage stems from the benefits of strong scale economies. Companies choose to export their goods and services if concentration advantages prevail.

Given the dominance of developed countries as source and as host countries, horizontal models received somewhat more attention than vertical models of FDI. These have their origin in Helpman (1984) and explain the existence of MNEs with large factor endowment differences between the two countries. The idea behind vertical multinationals is that different parts of the production process have different input requirements. Since input prices vary across countries, it may be profitable to split the production process according to their factor intensities. Specifically, the model allows for the separation of the knowledge generating activities from production. Markusen (1997) integrated both approaches into one, which he called the Knowledge-Capital Model. In this model, multinationals are allowed to be vertical as well as horizontal. Vertical MNEs arise when the countries have different factor endowments and when trade costs are low¹⁴. Horizontal MNEs arise when countries are similar and trade costs are high. The whole line of literature integrates MNEs into general equilibrium models (Markusen and Venables 1998, 2000; Markusen et al. 1996).

The complexity of those recent papers does not allow for analytical results. Generally, results are given through numerical simulations. Nevertheless, these models are a valuable guide for empirical work.

4 Data Source and Econometric Specification

Data for the estimation form a panel of parent-affiliate bilateral relationships over the period 1996-1999. There are 10 Eastern European countries¹⁵, for

¹⁴ However, tariffs and transport costs should both encourage vertical multinational activity by magnifying differences in factor prices and discourage it by making trade between the parent company and its affiliate more expensive.

¹⁵ hBulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia

which at least one year of complete data is available. The dependent variable used in the regression analysis is drawn from the micro-database International Capital Links of the Deutsche Bundesbank. The database provides a detailed breakdown of the foreign assets and liabilities of German firms. I focus on direct and indirect foreign direct investment of German firms' abroad. This variable gives the equity capital of the foreign affiliate, capital reserves, and retained earnings¹⁶. The data are end-of-period stocks of FDI converted to thousands of US dollars with exchange rates from the International Financial Statistics (IFS) of the International Monetary Fund.

Depending on the specifications, the set of explanatory variables comprises such variables as: Gross Domestic Product, Market Potential, Trade, Tariffs, Unit Labor Cost, Relative Unit Labor Cost, Skill Ratio, the Share of Private Businesses, Method of Privatization, and Country Risk.

Variables are listed and defined in Appendix 1¹⁷, while Table A2 in Appendix 2 summarizes the data sources for the explanatory variables.

The first explanatory variable is the market size of the host country captured by its GDP. I expect its coefficient to have a positive sign. Indeed, a large market size is needed to cover the costs of setting up a branch-plant abroad. However, the multinational's decision to invest in a country is not only related to its domestic market but also to the markets of all the neighboring countries. Even inside a country, the domestic market is limited by transportation costs between the subsidiary and the various regional markets. This concept is captured by the second explanatory variable: the market potential of the host country. I measure the market potential of a country as the average of the output of all countries in the sample weighted by an inverse distance measure which is derived on a region-to-region basis using transportation costs. I expect market potential to have a positive impact on FDI¹⁸.

The third independent variable is the bilateral trade between Germany and a given host country. The theoretical literature suggest that trade and FDI may either have a substitutive or a complementary relationship. I expect this coefficient to be either positive or negative¹⁹. The fourth variable is the host country's tariff revenue as a percentage of imports, this serves as a proxy for trade costs. To some extent, this variable should give us some information about the nature of FDI. From the preceding theoretical discussion, I expect this variable to be positive if FDI is horizontal or negative when it is vertical

¹⁶ See Lipponer (2002) for details of computation

¹⁷ Due to the lack of firm-level explanatory variables, the explanatory variables vary in the cross section with the partner country and in the time dimension t .

¹⁸ I would like to thank Johannes Bröcker who kindly provided me with these data.

¹⁹ Since only the investment of a particular German parent company is taken into account, the trade variable is not endogenous anymore

in nature.

The location decision of a multinational in Eastern Europe depends not only on the relatively low labor cost of those countries but also on their endowment of skilled labor. The fifth and the six variables are respectively the productivity adjusted labor cost and the relative skilled labor force of the host country. I expect the former variable to depress the stock of FDI in the host country and the relative abundance of skilled labor to have a positive impact on FDI²⁰.

There are, of course, other variables with particular importance for transition economies. "Intangible assets" such as the business culture may have a potential impact on FDI inflows. The seventh and eighth variables are respectively the method and the level of privatization. Both variables can catch such an effect because they are closely related to the effectiveness of corporate governance. I follow Carstensen and Toubal (2003) by taking the private sector share of GDP as a proxy for the level of privatization and expect this variable to influence positively FDI. Moreover, the lag of the share-of-private-business variable should inform about the delay between the decision to invest and the effective investment.

To capture the impact of the method of privatization, several techniques have been used. The first follows Holland and Pain (1998), who include a method-of-privatization index that goes from one to five, five being the method that should most attract FDI. A similar index is used by Garibaldi et al. (2002). Since this index is only an ordinal variable, it may be more appropriate to split it into five dummy variables²¹ which capture the impact on FDI of each method of privatisation.

Moreover, since the quality of the business environment and the overall political climate is likely to influence FDI, I introduce a country-risk variable. It is defined as the risk of non-payment or non-servicing payments for goods or services, loans, trade-related finance and dividends and the non-repatriation of capital. This variable takes values from 10 (no risk of non-payment) to 0 (no repayment expected). Hence, this risk index has a higher score when country risk is small. Since lower risk should encourage FDI, the expected coefficient is positive. The expected signs of the impact of the explanatory variables on FDI are listed in Table 5.

— Insert Table 5 about here —

²⁰ The abundance of a cheap skilled labor force should be at least an incentive for the multinational's first investment in Eastern Europe.

²¹ See Carstensen and Toubal (2003).

5 Estimation Methodology and Results

I use a panel model with two cross section dimensions (the parent company i , $i = 1, \dots, N_i$ and the affiliate j , $j = 1, \dots, N_j$) and one time dimension t , $t = 1, \dots, T$ ²²:

$$y_{ijt} = x'_{ijt}\beta + \varepsilon_{ijt}, \quad (1)$$

$$\varepsilon_{ijt} = \mu_{ij} + \nu_{ijt}, \quad (2)$$

where y_{ijt} is the equity capital of parent i in the affiliate j at time t and x_{ijt} denotes a $1 \times K$ vector of exogenous variables.

The typical error component structure is given in (2) where μ_{ij} models the time-invariant Parent-Affiliate pair-specific effects and ν_{ijt} is a stochastic error term which is assumed to be uncorrelated over all i , j and t . Due to the heterogeneity of the idiosyncratic effects, the F -test rejects the ordinary least squares estimation (test statistic 17.78, p -value 0.000). Turning to the choice between fixed and random effects μ_{ij} , the fixed effects model is preferred for two reasons. First, if the reason why a firm leaves the panel is correlated with the idiosyncratic error, this can lead to a biased estimator using the random effect estimation (Wooldridge, 2002). In addition, the Hausman χ^2 -statistic rejects the random effects model (test statistic 144.38, p -value 0.000).

The residuals of the static FDI model exhibit autocorrelation indicating the presence of a sluggish adjustment process. The LM test for autocorrelation clearly rejects the null of no autocorrelation (test statistic 21.68, p -value 0.000). Serial correlation in the error process affects standard errors in fixed-effects models. The effect is larger the stronger the correlation and the longer the time horizon. Having short time-series, I used the Huber-White sandwich variance estimator²³, which is appropriate for use in analysis of clustered data (Stat-aCorp., 1999). This robust variance estimator is based on the work by Huber (1967) and White (1980). An advantage of this method is that it does not require definition of a parametric structure for the correlation of responses within each cluster (Rogers, 1993).

5.1 Traditional and Transition Determinants of German FDI

Results are presented in Tables 6 to 9. The coefficients presented in those tables have to be interpreted as the average percentage variation in the firm's stock of

²² $N_i = 2652$, $N_j = 5190$, $T = 4$.

²³ Programmed into the statistical software program STATA

foreign direct investment following a percentage variation in the explanatory variable.

Tables 6 and 7 are designed to catch respectively the traditional and transition factors that may have influenced the firm's stock of FDI in Eastern Europe. Table 8 and 9 present the results for each sector for two basic specifications, one including trade costs and the other including trade. In all tables, the signs of the coefficients are in accordance with the expected signs presented in Table 5.

The specifications (*S1*) to (*S4*) in Table 6 comprise such variables as GDP, market potential, trade, tariffs, unit labor cost and skilled labor force. The results are quite robust across the different specifications.

— Insert Table 6 about here —

The first specification (*S1*) assumes that markets are segmented and takes GDP as proxy for market size. The market size has a considerable impact on FDI. A one percent increase of the host country's GDP raises on average the firm's stock of FDI by about 1.5 percent. This impact is smaller when considering the market potential variable of specification (*S2*). However, the coefficient of the market potential variable is not significantly different from the GDP coefficient of the first specification (F -test= 1.05, p -value= 0.3058)²⁴.

A reduction of tariffs also has an impact on firms' direct investments behavior in the accession countries. A reduction of tariffs by one percent raises the stock of FDI by almost 0.38 percent in the second specification. This effect is a typical for vertical multinational activity but indicates also a complementary relationship between FDI and trade. This relationship appears more clearly in the specifications (*S3*) and (*S4*) where the trade coefficient is positive. A one percent increase of the bilateral trade between Germany and a panel member leads on average to a 0.58 percent increase in the stock of FDI in specification (*S4*).

The intuition behind the tariff effect is confirmed by the coefficient on the unit labor cost variable. In fact, vertical multinationals locate their labor intensive activities in countries with low unit labor costs. An increase of one percent of the unit labor costs decreases on average the stock of FDI by 6.8 to 10.4 percent depending on the specification²⁵. The integration of the trade variable

²⁴ This does not question the positive effect of the European enlargement on the intra-regional market access since transportation costs were not modelled explicitly (Altomonte C., 2002).

²⁵ Taking the relative labor cost as in specification (*S8*) does not change the main results. In (*S8*), an increase of the host unit labor cost relative to the average unit labor cost in Eastern Europe has also a negative impact on the firm's stock of FDI.

in specification (*S3*) raises the coefficient of the ULC_{jt} variable and stresses the fact that the process of integration may impede FDI in the long run by raising the unit labor cost²⁶.

Turning to the $Skill_{jt}$ variable, the availability of a relative high skilled labor force is a strong incentive for German FDI in Eastern Europe. A relative increase of one percent of the working force with tertiary education raises on average the FDI stock by 0.34 percent in the fourth specification. This result remains robust as shown in Table 7 where the full model is presented.

Table 7 introduces transition factors that have influenced German FDI. Specification (*S5*) presents the results using the Holland and Pain (1998) privatization methodology. The specifications (*S6*) to (*S9*) introduces the Carstensen and Toubal (2003) methodology and controls for country risk (*S7*), the relative unit labor cost (*S8*) and the lag of the share of private business (*S9*). Finally, specification (*S10*) relies on Garibaldi et al. (2002) methodology.

The introduction of the transition factors does not affect the robustness of the results presented in table 6²⁷.

— Insert Table 7 about here—

The share of private businesses, the method of privatization and country risk appear important for German FDI in Eastern Europe. The privatization level is an indicator of the transition to a market economy. In the fifth specification (*S5*), an increase of one percent in the share of private businesses raises the stock of German FDI by 0.64 percent. This means that the countries that have made most progress in privatizing their economy have been most successful in attracting German multinationals. As noticed by Carstensen and Toubal (2003), the coefficient of the method of privatization presented in the fifth specification cannot be interpreted. It means that changing the method of privatization from voucher or MEBO ($M2_{jt}$) to voucher or MEBO and SOO ($M3_{jt}$) has the same positive impact on German FDI as the change from SOO and MEBO ($M4_{jt}$) to SOO ($M5_{jt}$) only. That is why I introduce five dummies in the specification (*S6*) and drop the voucher or MEBO variable ($M1_{jt}$) to avoid perfect collinearity. The parameters have to be interpreted relative to $M1_{jt}$. In specification (*S6*) to (*S9*), only the coefficient of $M3_{jt}$ and $M4_{jt}$ are significant. However, it is not possible to reject the imposition of equal

²⁶ A similar results has been derived in Carstensen and Toubal (2003)

²⁷ Introducing the trade variable in the specification (*S5*) to (*S9*) makes the coefficients of the tariff and the share of private businesses insignificant. This suggests that those variables are correlated. In fact, the privatization of the Eastern Economies has been going hand to hand with the reorientation of their trade toward Western Europe and in particular Germany, one of the major trade partner.

coefficients on $M3_{jt}$ and $M4_{jt}$ ²⁸.

The lag of the share of private businesses is also significant and positive, suggesting that the decision to invest in Eastern Europe not only depends on the current privatization level but also on past privatization efforts. Hence, the current privatization level is a signal for future investment. This effect seems to be more important since the coefficient is higher than in the other specifications. A one percent increase of the current share of private businesses leads to an increase of 0.93 percent in the future stock of German FDI²⁹.

Splitting the variable into five dummies has a considerable effect on the coefficient and the significance level of the market potential variable. This suggests that the market potential and the method of privatization variable are correlated. From specification (S10), only the $Insider_{jt}$ variable is significant. It has a negative impact on the German stock of FDI.

Turning to the risk variable, its coefficient is highly significant and positive, as expected. The higher is the country risk index, the less risky is the investment and the more attractive is a country for FDI.

5.2 The Sectoral Results

Tables 8 and 9 present the results at a sectoral level for two specifications, (S2) and (S3). In both specifications N denotes the number of parent-affiliate relationships.

— Insert 8 about here —

— Insert 9 about here —

In the two specifications, the signs of the estimated parameters are almost in accordance with the theoretical background presented above. The impact of market potential on the German FDI stock is rather large and positive except for the mining and quarrying sector and the banking sector where the coefficient is significant and negative. A one percent increase of the market potential reduces the average equity capital of the parent company by about two percent for the bank sector and seven percent for the mining and quarrying

²⁸ For example the Wald test statistics in the specification (S6) is F -test= 0.14 (p -value= 0.7055). It is equal to F -test= 0.04 (p -value= 0.8363) in (S7) and to F -test= 0.21 (p -value= 0.6450) in (S8).

²⁹ The same results can be derived by increasing the number of lags. For example, the introduction of the second lag of the share of private businesses, $Priv_{jt-2}$, leads to an over-proportional increase in the stock of German FDI (coefficient: 1,044***, t -value 5,35).

sector. One reason for this negative effect could be that in countries with a large market potential, German firm set more affiliates and invest then less per affiliate than in countries with a low market potential³⁰. To investigate this hypothesis, I consider both specifications presented above but use the size of the parent company, proxied by its total number of affiliates, as endogenous variable. The results are presented in Table 10 and 11

— Insert 10 about here —

— Insert 11 about here —

The coefficient on the market potential variable has the expected sign. It is large, positive and significant for banking and the mining and quarrying sectors. This suggests that in these sectors, German multinationals set up more affiliates the larger the market potential of the country. It is however negative for the paper industry, the wholesale and retail trade and the holding sector suggesting that fewer affiliates are set up in countries with a small market potential.

The trade cost coefficient in Table 8 indicates a complementarity relationship between trade and FDI that is confirmed by the coefficient of the trade variable in Table 9³¹. Since no sectoral variables were available, one has to be cautious considering the type of multinationals³² that are active in Eastern Europe. It seems from the two tables above that German multinationals are more of the vertical type. The impact of the trade cost on firm's stock of FDI is relatively large in the chemical sector, the transport equipment industry and the business services sector.

The impact of the unit labor cost is larger in the manufacturing sector than in the services industry³³. The coefficient on the unit labor cost variable is larger in the textile and plastic products industry indicating that German multinationals are more reactive to the change in the labor cost in labor intensive sectors. Obviously, the strategy of German multinationals is not only driven by the search for low costs. These multinationals also discriminate between a more or less skilled labor force as indicated by the skill ratio coefficient in the same sectors.

³⁰ In banking sector, the fact that firms does not want to reap economies of scales could explain this negative correlation while in the mining an quarrying sector, German multinationals have at most invested in Romania and Bulgaria, which have a rather small market potential.

³¹ As well as in Table 10 and Table 11

³² Horizontal or Vertical

³³ With the exception of the real estate activities and the construction sector, all the unit labor cost coefficients in the services industry remain insignificant.

6 Conclusion

This paper investigates the location determinants of German multinationals in Eastern Europe. I estimate a fixed effect panel model at a firm-level using a new database on German FDI. I find that the market potential has a large and positive impact on German firms' investment in the accession countries. However, market potential explains only partly the motivation of German firms to invest in Eastern Europe. A cheap and relatively skilled labor force exerts a positive influence on the firm level of investment. Moreover, a reduction in tariffs has also a positive impact on firms' direct investments in the accession countries. This effect is a characteristic of vertical multinational activity but also indicates a complementary relationship between FDI and trade. This relationship appears more clearly when controlling for trade. I find that the trade variable influences positively the firm's stock of FDI in Eastern Europe.

Introducing transition indicators, I find that the share of private business, the method of privatization, and the country's risk are also of importance for the investment decision in Eastern Europe. The privatization level is an indicator of the transition to a market economy, while the methods of privatization indicate the efficiency of corporate governance. Both influence positively German FDI. However, as shown by the country risk, the uncertainty linked to the legal and economic environment is an important deterrent of FDI.

This empirical evidence provides some insight into the impact of the enlargement of the European on German FDI. The formation of a custom union with the European Union raises German presence in Eastern Europe through higher market potential, lower tariffs and higher trade. However, the convergence process of Eastern European economies, should reduce the competitiveness of those countries by increasing unit labor costs.

At a sectoral level, I find that German multinationals set up more foreign affiliates but invest less in countries with larger market potential. Moreover, the complementarity relationship between trade and FDI appears quite robust. However, one should be careful in interpreting the coefficient because of the lack of sectoral explanatory variables. Future research should concentrate on this relationship by estimating a SUR model that takes trade and FDI into account at a sectoral level.

Appendix 1: Construction of Variables

The subscript i refers to the home country while j refers to the host country, t is the period. All the data were converted in US dollars.

- (1) GDP_{jt} refers to the Gross Domestic Product of the partner country j .
- (2) MK_{jt} denotes the market potential of the host country. This market potential is not only related to the domestic market but also to the market of all the neighbouring countries. We measure MK_{jt} by taking into account the host internal transportation costs proxied by the distance in minutes and the transportation cost between the host and the home country.

- In a first step, we compute the weighted arithmetic distance d_{ijt} over all region-to-region distances $\delta_{kk'}$ between country j and i . R_i is defined as the set of all regions in country i and \widetilde{GDP}_{kt} the GDP of region k at time t .

$$d_{ijt} = \sum_{k \in R_j} \sum_{k' \in R_i} \frac{\widetilde{GDP}_{kt}}{GDP_{jt}} \frac{\widetilde{GDP}_{k't}}{GDP_{it}} \delta_{kk'}$$

- In a second step, we introduce the transportation costs in the calculation of market potentials for each year

$$MK_{jt} = \sum_i \frac{GDP_{it}}{d_{ijt}}$$

- (3) $Trade_{ijt}$ is the bilateral trade between Germany and the partner country j .
- (4) $Tariff_{jt}$ is the trade cost proxy for country j . We consider the tariff revenues as percentage of imports.
- (5) ULC_{jt} is the unit labor cost of Eastern European Countries. It is computed as $ULC_{jt} = \frac{W_{jt} * E_{jt}}{GDP_{jt}}$ with W_{jt} the average monthly gross wage, E_{jt} the total employment and GDP_{jt} the gross domestic product in millions US\$.
- (6) $Skill_{jt}$ denotes the percentage of the working force with tertiary education.
- (7) $Size_{it}$ is the total number of parent i 's affiliate for a given year.
- (8) $Priv_{jt}$ is the market share of private businesses in country j as percent of GDP.
- (9) $Method_{jt}$ indicates the method of privatization that has been used in Eastern Europe. I follow first Holland and Pain (1998)

and construct the $Method_{jt}$ variable as in Table A1. The abbreviations SOO and MEBO are used for Sales to Outside Owners and Managers and Employees Buy-Outs, respectively. Additionally, as in Carstensen and Toubal, I split the variable into 5 dummies: M_{jt}^1 to M_{jt}^5 each corresponding to the method used at time t .

Table A1: The Method of Privatization (From Holland and Pain, 1998)		
Ranking	Primary Method	Secondary Method
5	SOO	-
4	SOO	Voucher or MEBO
3	Voucher or MEBO	SOO
2	Voucher or MEBO	MEBO or Voucher
1	Voucher or MEBO	-

- (10) $Direct_{jt}$, $Voucher_{jt}$ and $Insider_{jt}$ are three method of privatization taken from Garibaldi et al.(2002). $Direct_{jt}$ refers to the method of privatization through direct sales. $Voucher_{jt}$ denotes the mass privatization method and $Insider_{jt}$ are significant concessions to Manager and Employees. Each Variable can take the value of: 1 if the method constituted the primary method of privatization. 0,5 if the method constituted the secondary method of privatization 0,25 if the method constituted the tertiary method of privatisation
- (11) $RISK_{jt}$ is the poltical risk index taken from various issues of Euromoney. It is defined as the risk of non-payment or non-servicing payments for goods or services, loans, trade-related finance and dividends and the non-repatriation of capital. This variable takes values from 10 (nil risk of non-payment) to 0 (no chance of payments). Countries were scored in comparison both with each other and with the previous year.

Appendix 2: Data Sources

Table A2: The Data Sources		
Variables Name	Label	Sources
Foreign Direct Investment	FDI_{ijt}	Deutsche Bundesbank.
Gross Domestic Product	GDP_{jt}	World Development Indicators, several editions.
Market Potential	MK_{jt}	Regional GDPs and distances were kindly provided by Prof. Johannes Bröcker (see Bröcker et al, 2001)
Trade	$Trade_{ijt}$	Statistische Bundesamt, several editions
Trade Costs	$Tarif_{jt}$	EBRD (2001), Transition Report
Unit Labor Costs	ULC_{jt}	European Economy (2002); the Vienna Institute of International Economic Studies; International Labor Office
Skill Ratio	$Skill_{jt}$	Key Indicators of the Labour Market (2001-2002). International labour Organization.
Private Market Share	$Priv_{jt}$	EBRD (2001), Transition Report
Methods of Privatization	$Meth_{jt}$	EBRD (1997), Transition Report; Holland and Pain (1998); Böhm A. Simoneti M., (1993-1995), Privatization in Central and Eastern Europe, CEEP. Garibaldi et al. (2002)
Country Risk	$Risk_{jt}$	Euromoney. Several Editions

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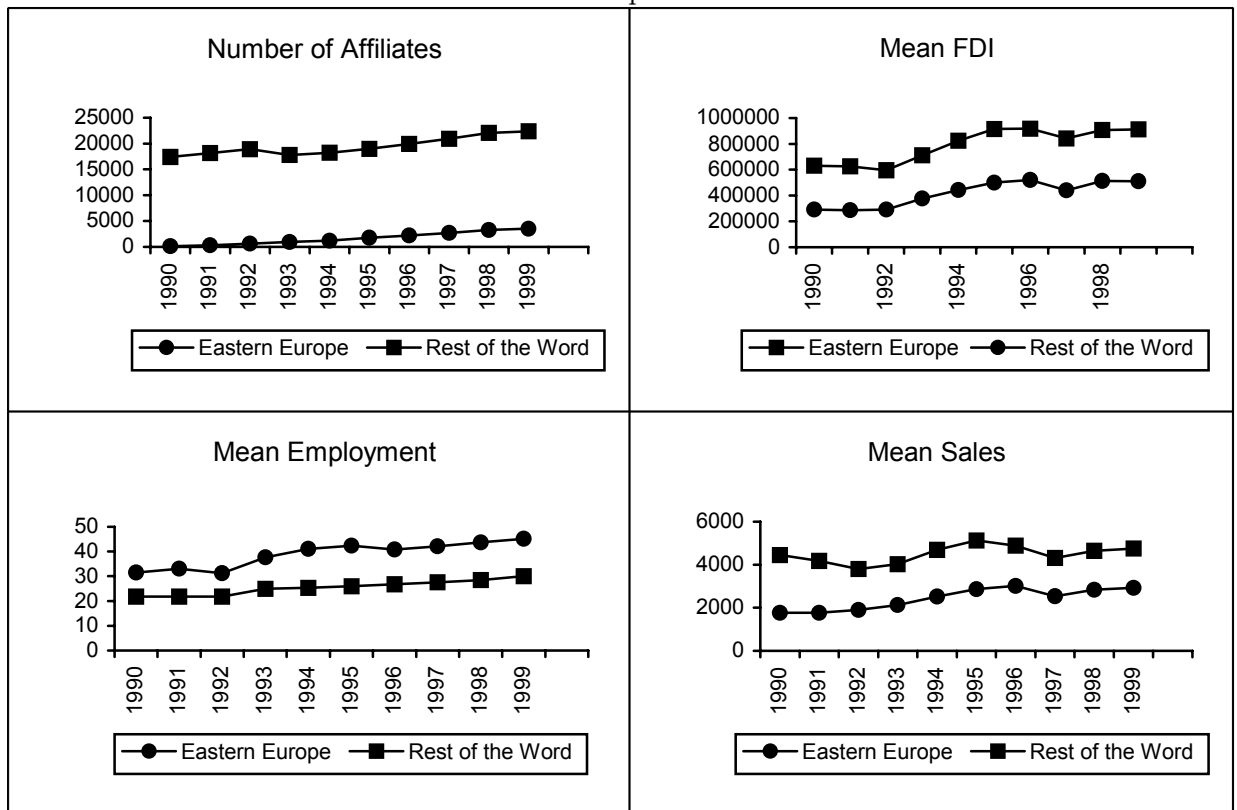
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Table 1
 Characteristics of German firms in Eastern European countries



Source: International Capital Links, Bundesbank. Mean Sales and Mean FDI in 1000 US\$

Table 2
Sectoral characteristics of German firms in Eastern Europe

<i>NACE</i> Sector	Mean FDI	Mean Sales	Mean Em- ployment
Mining and Quarrying	4857	166	13
Food Product and Beverage; Tobacco Products	4015	112	20
Textiles and Textile Products	2418	203	11
Pulp, Paper and Paper Product	3939	112	15
Chemical and Chemical Products	3617	62	19
Rubber and Plastic Products	4676	143	26
Manufacture of coke, refined petroleum products and nuclear fuel	33164	41	67
Basic Metal	2455	83	10
Other Non-Metallic Mineral Products	14392	276	21
Machinery and Equipment	3669	79	13
Electrical and Optical Equipment	4431	188	27
Transport Equipment	38164	585	247
Furniture; Recycling	2395	198	15
Construction	1182	129	20
Wholesale Trade	1767	78	15
Retail Trade	5909	235	54
Transport, Storage and Communication	3646	145	52
Bank	43869	231	9
Financial Intermediation	3936	81	33
Real Estate Activities	2931	12	8
Other Business Activities	5138	105	17
Electricity, Gas and Water Supply	40653	763	180
Activity of Housholds	1296	77	11
Holding	7492	174	37

Mean FDI and Mean Sales in 1000 US \$

Table 3
FDI stock by countries (as of December 1999, share in percent)

Countries	Czech Republic	Hungary	Poland	Slovak Republic	Slovenia	Bulgaria	Romania
EU	82.7	76.9	63.8	74.5	81.2	60.2	56.8
Austria	11.5	11.7	2.3	16.9	37.5	4.5	5.1
France	4.7	6.1	11.0	4.2	12.8	3.0	7.1
Germany	29.6	28.0	17.3	22.0	12.3	15.3	10.2
Italy	0.9	3.2	9.1	1.6	6.6	1.2	7.6
Netherlands	27.1	15.5	9.2	15.0	3.8	6.0	11.6
UK	4.7	6.4	5.9	9.1	4.8	5.7	5.1
Others	4.2	6.0	9	5.7	3.4	24.5	10.1
USA	8.2	12.2	14.7	13.0	4.4	7.1	7.7

Source: UNCTAD (2001).

Table 4
A macroeconomic overview (1999)

Countries	German FDI Stocks	German FDI Stocks	FDI Stock	Gross Domestic Product	Monthly Gross Wage	Private Market Share	Method of Privatization	Country Risk*	<i>TRI</i> **
Estonia	-	-	-	5.12	285.31	70	Direct Sales	54.38	3.52
Latvia	-	-	-	6.66	227.46	65	Direct Sales	50.67	3.12
Lithuania	-	-	-	10.66	246.75	70	Voucher	50.14	3.09
Baltics	165.33	-	-						
Czech Republic	4583.65	8.40	15.77	133.80	297.78	80	Voucher	61.96	3.49
Hungary	4985.02	10.38	17.26	115.08	320.90	80	Direct Sales	65.75	3.69
Poland	4391.13	2.83	11.17	326.63	418.67	65	Direct Sales	62.06	3.48
Slovak Republic	799.47	4.06	8.56	57.15	264.48	75	Direct Sales	48.33	3.33
Slovenia	280.63	1.40	9.14	31.72	792.82	55	Insider	37.87	3.20
Bulgaria	64.18	0.52	8.17	41.62	111.69	70	Direct Sales		2.86
Romania	331.75	0.94	4.75	135.68	111.70	60	Insider	36.28	2.80
								70.06	
Portugal	3736.70	2.41	20.68	113.72	718.00	94		82.84	-

* The higher is the index the less risky is the country

***TRI*: Transition Index. This index is taken as a simple average of the progress in transition indicators proposed by the EBRD.

Source: German Stock of FDI (million US\$ and percent of GDP) from the European Union Direct Investment Yearbook (2000). FDI stock as percent of GDP from UNCTAD (2001). Gross Domestic Product (Billion US\$) from World Development Indicator (2001). Monthly Gross Wage (US\$) from Countries in Transition (2001) and ILO (2001). Share of Private Businesses as percent of GDP from EBRD (2001). Method of privatization (primary privatization method) from the EBRD (2001). Country Risk index from Euromoney (1999). Transition Index from EBRD (2001).

Table 5
Variables Expected Sign

Variables Name	Expected Sign
Gross Domestic Product	+
Market Potential	+
Trade	-/+
Trade Costs	- /+
Unit Labor Costs	-
Skill Ratio	+
Private Market Share	+
Methods of Privatization	+
Country Risk	+

Table 6
Basic Estimation Results: the Traditional Determinants.

Independent variables	Label	(S1)	(S2)	(S3)	(S4)
Market Potential	MK_{jt}		1,300*** (4, 81)	1,141*** (4, 71)	1,355*** (5, 09)
Gross Domestic Product	GDP_{jt}	1,544*** (8, 85)			
Trade Costs	$Tarif_{jt}$	-0,209*** (-8, 46)	-0,382*** (-11, 95)		-0,127** (-2, 06)
Trade	$Trade_{ijt}$			0,727*** (13, 14)	0,527*** (4, 97)
Unit Labor Cost	ULC_{jt}	-0,068*** (-3, 15)	-0,061*** (-2, 78)	-0,104*** (-4, 63)	-0,095*** (-4, 09)
Skill Ratio	$Skill_{jt}$	0,505*** (11, 60)	0,392*** (9, 63)	0,321*** (7, 77)	0,341*** (7, 99)
R^2		7,07	5,88	6,19	6,30
Number of Groups		4062	4062	4062	4062

Heteroskedastic consistent t- statistics into brackets. Level of significance: * (10%), ** (5%) and *** (1%). Standard errors have been adjusted for clustering around the parent-affiliate's identity

Table 7
The Full Estimation Model: Traditional Determinants and Transition Factors

Independent variables	Label	(S5)	(S6)	(S7)	(S8)	(S9)	(S10)
Market Potential	MK_{jt}	1,238*** (4, 55)	0,571* (1, 63)	0,814** (2, 16)	1,023*** (2, 68)	0,831** (2, 20)	1,355*** (4, 12)
Trade Costs	$Tarif_{jt}$	-0,273*** (-5, 93)	-0,229*** (-4, 32)	-0,241*** (-4, 42)	-0,160*** (-2, 86)	-0,241*** (-4, 39)	-0,297*** (-6, 08)
Unit Labor Cost	ULC_{jt}	-0,080*** (-3, 61)	-0,079*** (-3, 51)	-0,058** (-2, 41)	-0,059** (-2, 46)		-0,110*** (-3, 55)
Relative Unit Labor Cost	$RULC_{jt}$					-0,040* (-1, 83)	
Skill Ratio	$Skill_{jt}$	0,475*** (11, 00)	0,411*** (7, 85)	0,432*** (8, 08)	0,448*** (8, 24)	0,444*** (8, 15)	0,458*** (10, 65)
Share of Private Businesses	$Priv_{jt}$	0,639** (2, 47)	0,463* (1, 63)	0,594** (2, 11)		0,598** (2, 11)	0,467* (1, 84)
Lag Share of Private Businesses	$Priv_{jt-1}$				0,929*** (4, 34)		
Method of Privatization	$Method_{jt}$	0,176*** (3, 98)					
Voucher or MEBO	$M2_{jt}$		0,033 (0, 30)	0,027 (0, 24)	0,102 (0, 94)	0,031 (0, 28)	
Voucher or MEBO and SOO	$M3_{jt}$		0,186* (1, 74)	0,207* (1, 93)	0,335** (3, 07)	0,207* (1, 93)	
SOO and MEBO	$M4_{jt}$		0,193* (1, 77)	0,195* (1, 78)	0,271** (2, 48)	0,194* (1, 77)	
SOO	$M5_{jt}$		0,115 (1, 02)	0,169 (0, 99)	0,183 (1, 60)	0,112 (0, 98)	
Other Methods	$Voucher_{jt}$						-0,007 (-0, 18)
	$Insider_{jt}$						-0,226*** (-3, 65)
	$Direct_{jt}$						0,056 (0, 99)
Country Risk	$Risk_{jt}$			0,169** (2, 43)	0,288*** (4, 31)	0,233*** (3, 50)	0,157** (2, 00)
R^2		6,27	6,49	6,58	6,68	6,55	6,58
Number of Groups		4062	4062	4062	4062	4062	4062

Heteroskedastic consistent t- statistics into brackets. Level of significance: * (10%), ** (5%) and *** (1%). Standard errors have been adjusted for clustering around the parent-affiliate's identity.

Table 8
Sectoral Results I: Basis Estimation with Trade Costs

<i>NACE</i> Sector	MK_{jt}	$Tarif_{jt}$	ULC_{jt}	$Skill_{jt}$	N	R^2
Mining and Quarrying	-7,867*	0,247	0,483	0,200	32	19,31
Food Product and Beverage; Tobacco Products	2,104*	-0,367**	0,045	0,497**	114	4,22
Textiles and Textile Products	3,148	-0,384	-0,143**	0,394*	106	3,49
Pulp, Paper and Paper Product	2,323	-0,411*	0,019*	0,697	77	3,80
Chemical and Chemical Products	3,476***	-0,762***	-0,023	0,267**	148	18,44
Rubber and Plastic Products	0,318	-0,525***	-0,103*	0,506***	91	22,21
Other Non-Metallic Mineral Products	1,060	-0,365**	0,035	0,322**	88	8,03
Basic Metal	0,158	-0,470***	0,080	0,539***	146	15,30
Machinery and Equipment	1,023	-0,484***	-0,037	0,267*	227	11,80
Electrical and Optical Equipment	0,402	-0,395***	-0,026	0,343*	227	7,03
Transport Equipment	2,010	-0,707***	-0,146	0,382*	100	13,79
Furniture; Recycling	0,471	-0,203	1,400	0,198	53	6,74
Construction	3,441***	-0,162	-0,284**	0,259	97	6,12
Wholesale Trade	2,194**	-0,376***	-0,062	0,327**	475	2,96
Retail Trade	-0,781	0,244	0,108	0,538*	74	5,79
Transport, Storage and Communication	-0,951	-0,099	0,021	0,300	69	5,75
Bank	-1,861**	-0,203**	0,019	0,161	67	16,41
Financial Intermediation	0,857	-0,137	-0,340	-0,151	48	8,98
Real Estate Activities	0,873	-0,559***	-0,426***	0,084	135	8,81
Other Business Activities	1,334	-0,748***	-0,169*	0,468*	139	13,11
Electricity, Gas and Water Supply	-2,550	-0,023	1,607	1,170*	41	26,33
Activity of Housholds	1,470	-0,267**	0,019	0,696***	290	6,50
Holding	1,337***	0,341***	-0,075*	0,427***	1213	5,79

Heteroskedastic consistent t- statistics into brackets. Level of significance: * (10%), ** (5%) and *** (1%). Standard errors have been adjusted for clustering around the parent-affiliate's identity

Table 9
Sectoral Results II: Basis Estimation with Bilateral Trade.

<i>NACE</i> Sector	MK_{jt}	$Trade_{jt}$	ULC_{jt}	$Skill_{jt}$	N	R^2
Mining and Quarrying	-6,829**	-0,227	0,158	0,258	32	18,68
Food Product and Beverage; Tobacco Products	1,927	0,541**	-0,001	0,444*	114	3,74
Textiles and Textile Products	3,120	0,711	-0,176*	0,301	106	3,47
Pulp, Paper and Paper Product	2,493	0,881**	0,317	-0,036	77	4,65
Chemical and Chemical Products	2,813***	1,237***	-0,094	0,133	148	14,78
Rubber and Plastic Products	-0,037	0,830***	-0,160**	0,418***	91	19,48
Other Non-Metallic Mineral Products	2,030**	0,846***	-0,412	0,256	88	8,66
Basic Metal	-0,702	0,743***	0,042	0,456**	146	14,64
Machinery and Equipment	0,450	0,802***	-0,080**	0,192	227	10,68
Electrical and Optical Equipment	0,842	0,957***	-0,121*	0,254	227	9,67
Transport Equipment	1,556	1,282***	-0,238	0,226	100	14,12
Furniture; Recycling	0,757	0,496	1,529*	0,158	53	7,57
Construction	3,047***	0,203	-0,296**	0,241	97	5,72
Wholesale Trade	1,602*	0,552***	-0,081	0,276**	475	2,30
Retail Trade	-0,622	0,556	0,060	0,483	74	6,26
Transport, Storage and Communication	-0,285	0,391	-0,004	0,263	69	7,23
Bank	-1,806**	0,412**	0,003	0,124	67	17,08
Financial Intermediation	0,633	0,192	-0,349	-0,176	48	8,77
Real Estate Activities	1,000	1,151***	-0,396***	0,274	435	9,79
Other Business Activities	0,587	1,201***	-0,182	0,360	138	11,56
Electricity, Gas and Water Supply	-2,168	0,164	0,671	1,232**	41	26,52
Activities of Households	1,293	0,515**	-0,002	0,648**	290	6,84
Holding	1,201***	0,692***	-0,118***	0,355***	1213	6,47

Heteroskedastic consistent t- statistics into brackets. Level of significance: * (10%), ** (5%) and *** (1%). Standard errors have been adjusted for clustering around the parent-affiliate's identity

Table 10
Sectoral Results III: Basis Estimation with Trade Costs (Endogenous Variable: Size of the Parent Company).

<i>NACE</i> Sector	MK_{jt}	$Tariffs_{jt}$	ULC_{jt}	$Skill_{jt}$	N	R^2
Mining and Quarrying	1,221*	-0,585***	-0,288	-0,109	38	49,89
Food Product and Beverage; Tobacco Products	-0,162	-0,038	-0,086	0,024	147	1,16
Textiles and Textile Products	0,077	-0,17	-0,008	-0,027	122	0,28
Pulp, Paper and Paper Product	-2,026***	0,037	0,132***	-0,139*	110	15,97
Chemical and Chemical Products	0,079	-0,173***	0,003	0,126	230	11,95
Rubber and Plastic Products	0,144	-0,141**	0,011	0,095	114	5,03
Other Non-Metallic Mineral Products	0,123	-0,145***	0,021	-0,071	115	8,32
Basic Metal	0,134	-0,120***	0,035	0,87*	169	9,38
Machinery and Equipment	-0,207	-0,039	0,057*	0,049	282	2,35
Electrical and Optical Equipment	0,163	-0,106**	-0,016	0,112*	286	5,94
Transport Equipment	1,004*	-0,127	-0,001	-0,001	122	1,71
Furniture; Recycling	0,333	-0,091	-0,332	-0,025	62	2,71
Construction	-0,656	0,064	0,037	-0,111	142	1,91
Wholesale Trade	-0,485*	-0,066	0,052**	-0,008	592	2,78
Retail Trade	-1,047*	0,003	-0,022	0,256	108	6,16
Transport, Storage and Communication	0,269	-0,098	-0,007	0,035	85	2,25
Bank	1,123***	-0,291***	-0,012	0,180*	116	25,24
Financial Intermediation	-1,037	-0,122	0,001	-0,054	53	10,75
Real Estate Activities	-0,794	-0,197***	0,087	0,104	161	13,98
Other Business Activities	0,623	-0,232***	0,037	0,042	174	8,50
Electricity, Gas and Water Supply	2,991*	-0,635**	-1,141**	0,447***	45	33,38
Activities of Households	0,154	-0,061**	-0,026	0,133**	342	3,37
Holding	-0,354**	-0,130***	0,001	0,044	1549	5,90

Heteroskedastic consistent t- statistics into brackets. Level of significance: * (10%), ** (5%) and *** (1%). Standard errors have been adjusted for clustering around the parent-affiliate's identity

Table 11
Sectoral Results IV: Basis Estimation with Bilateral Trade (Endogenous Variable: Size of the Parent Company).

<i>NACE</i> Sector	MK_{jt}	$Trade_{jt}$	ULC_{jt}	$Skill_{jt}$	N	R^2
Mining and Quarrying	0,508	1,046***	0,257	-0,262*	38	51,47
Food Product and Beverage; Tobacco Products	-0,213	0,058	-0,089	0,017	147	1,54
Textiles and Textile Products	-0,077	-0,013	-0,005	-0,028	122	0,21
Pulp, Paper and Paper Product	-1,590***	0,066	0,115***	-0,150**	110	15,95
Chemical and Chemical Products	0,062	0,329***	-0,017	0,088	230	12,24
Rubber and Plastic Products	0,041	0,225	-0,001	0,072	114	4,44
Other Non-Metallic Mineral Products	-0,146	0,191**	0,013	-0,085	115	5,65
Basic Metal	-0,034	0,209***	0,020	0,063	169	9,44
Machinery and Equipment	-0,281	0,058	0,055*	0,043	282	2,26
Electrical and Optical Equipment	0,181	0,238***	-0,036	0,086	286	7,36
Transport Equipment	0,454	0,088	0,001	0,012	122	0,35
Furniture; Recycling	0,137	0,131	-0,210	-0,048	62	2,27
Construction	-0,477	-0,066	0,039	-0,108	142	1,53
Wholesale Trade	-0,297	0,198**	0,035	-0,030	592	3,66
Retail Trade	-0,950	0,018	-0,025	0,255	108	6,17
Transport, Storage and Communication	0,182	0,174	-0,008	0,019	85	2,22
Bank	0,890***	0,502***	-0,246	0,137	116	26,01
Financial Intermediation	-0,707	0,328**	-0,303	-0,103	53	13,16
Real Estate Activities	-0,755	0,415***	0,105	0,079	161	14,97
Other Business Activities	0,689*	0,465***	0,015	0,005	174	9,85
Electricity, Gas and Water Supply	1,629	1,093***	-1,751**	0,349**	45	36,80
Activities of Households	0,068	0,106**	-0,031	0,120**	342	3,32
Holding	-0,218	0,311***	-0,021	0,014	1549	7,53

Heteroskedastic consistent t- statistics into brackets. Level of significance: * (10%), ** (5%) and *** (1%). Standard errors have been adjusted for clustering around the parent-affiliate's identity