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Estimating Regional Trade Agreement Effects on FDI in an Interdependent World

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Abstract:

Recent research on trade and multinationals highlights a novel issue with multinational firms. In particular, their integration strategies are complex and the degree of vertical integration varies in a multilateral world with many possible locations of activity. Multinationals may choose some plants to serve consumers locally only, whereas others engage in trade. Overall, this may explain the fact that a high percentage of world trade is actually controlled by multinational firms, although most of the foreign direct investment (FDI) occurs within the block of developed countries. The most important regional trade agreements (RTAs) are signed between members of the very same block of economies. This gives rise to the question asked in the present paper: what is the impact of RTAs on FDI in an interdependent world? The paper focuses on the role of the Europe Agreements between the member countries of the European Union and ten Central and Eastern European countries. In doing so, recent spatial HAC estimation techniques are applied to both estimation and testing.

JEL Code: C33; F14; F15

Keywords: Regional trade agreements; Multinational firms; Spatial econometrics; Generalized moments (GM) estimators

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1 Introduction

The second half of the last century was characterized by a surge of "bilateralism" in trade policy. The foundation of the European Union (EU, formerly referred to as European Community), the European Free Trade Area (EFTA), and the North American Free Trade Area (NAFTA) are some of the most sizeable regional trade agreements (RTAs) that were signed and implemented within this period. As observed by authorities in empirical research on trade issues, this process resulted in a significant increase in bilateral trade volumes among the member countries (see Baier and Bergstrand, 2007, or Glick and Rose, 2002). At the same time, foreign direct investment (FDI) increased much faster than trade, even within the OECD and among the members of the mentioned RTAs. While numerous studies on the impact of

RTAs on bilateral trade are now available, the question of how the bilateralism of trade policy affects FDI seems under-researched.

The theory of horizontal multinational firms (Markusen, 1984) assumes that the avoidance of trade impediments (including tariffs and other trade costs) is a major reason for setting up foreign plants that produce the same good in the parent and the host country. By way of contrast, vertical multinational firms (Helpman, 1984) split up the production process across borders to exploit gains from comparative advantage within the firm. For instance, the gains from "outsourcing" production stages to low-wage countries and the associated trade of intermediate goods within firms are important issues with vertical multinational firms. Since these firms engage in trade, we expect vertical FDI to increase through the implementation of RTAs. Hence, the sign and magnitude of the coefficient of the RTA variable (typically a dummy variable) in empirical FDI specifications is of interest for policy analysis. It also implicitly indicates the relative importance of horizontal versus vertical FDI.

However, more recent theory points to the complex integration strategies of multinational firms (Yeaple, 2003, Helpman, Melitz, and Yeaple, 2004, Raff, 2004, and Grossman, Helpman, and Szeidl, 2007). In particular, this literature avoids the restrictive features of models with simple horizontal or vertical multinationals. While it may be optimal to set up foreign subsidiaries in some host countries to serve only the local consumers (the horizontal motive), it may be optimal for the same firm to set up export platforms in other host countries that serve consumers there and elsewhere. Hence, this theory comes closer to the empirical stylized facts of mixed horizontal-vertical and complex integration strategies within multinationals. Two issues with complex multinational firms are of particular interest in the present paper. First, it is an empirical reality that foreign subsidiaries are set up in a multi-country world, and it is potentially insufficient to model bilateral FDI as a function of bilateral determinants only. Firms set up their foreign plants in accordance with the characteristics not only of a particular target market but also with the characteristics of other potential host countries. Second, the design of a multinational production and sales network likely entails strategic aspects of plant location in space.[1] Third, the role of RTAs will be nontrivial with complex FDI. Low trade barriers are an incentive to export not only for national but also for complex multinational firms (similar to vertical multinationals). However, high trade barriers foster the location of locally selling foreign subsidiaries (similar to horizontal multinationals). Overall, the net effect of a reduction in trade barriers is less clear-cut in complex than in simple forms of the multinational firm organization.

How does empirical work on the impact of RTAs relate to the theory of multinational firms? As mentioned above, only a few articles address this issue. Blomström and Kokko (1997) report on three case studies. They point out that the implementation of the U.S.-Canada Free Trade Agreement led to a reduction in intra-regional FDI to both the U.S. and Canada (i.e., a negative impact on bilateral FDI), while it increased extra-regional FDI into Canada (i.e., a positive third-country impact). Similarly, the establishment of

[1]Subsidiaries that produce intermediate goods for other downstream plants within the firm will be located such that the overall delivery costs (covering not only production costs but also trade costs) are minimized. Also, the location of foreign subsidiaries will not be independent of the location decisions of competing multinationals.

NAFTA has fostered extra-regional FDI into Mexico, as has Mercosur stimulated extra-regional FDI into the member countries. Levi Yeyati, Stein, and Daude (2002a,b) analyze the impact of RTAs on bilateral FDI stocks in a large sample of countries. They point out that pooling the effect of integration agreements on FDI may be harmful, since this depends on the prevailing mode of FDI (horizontal, local market seeking versus vertical, low-cost seeking). By way of contrast, they mention that FDI into RTA member countries is ceteris paribus more attractive than FDI to non-member countries. Their findings indicate a significantly positive average impact of regional integration agreements on bilateral FDI. However, Levi Yeyati, Stein, and Daude (2002a,b) do not consider interdependencies across host markets, which are at the heart of this paper's analysis.

Recent empirical research on the determinants of FDI support a significant impact of interdependencies across markets. Coughlin and Segev (2000), Blonigen, Davies, Waddell, Naughton (2005, 2007), and Baltagi, Egger, and Pfaffermayr (2007), using different data, and spatial cross-sectional as well as spatial panel data models, find that FDI between two countries is not independent of FDI in other economies. This is expected from a general equilibrium perspective (see Blonigen, 2005, for a survey). In a similar vein, Drukker and Millimet (2007) provide evidence on spatial dependence in inward FDI across US states.

This paper focuses on bilateral outward FDI stocks into Europe. The sample covers 28 host countries over the period 1989-2001. We allow for two types of spatial interaction. (i) Spatially weighted explanatory variables that are motivated by a three-factor knowledge-capital model (reflecting, e.g., third-country size and relative factor endowment effects on bilateral FDI; see Blonigen, Davies, Waddell, and Naughton, 2007). Also the Europe agreement dummy is spatially weighted to capture the third country effects of trade liberalization on FDI. (ii) The disturbances are allowed to be spatially correlated because of the regional interdependencies of stochastic shocks between the host countries. Accordingly, we calculate spatial HAC robust standard errors as proposed by Kelejian and Prucha (2007).

The estimation results illustrate that third-country effects are important and lend support to a complex impact of the Europe Agreements on FDI. The findings indicate that RTA membership of a European host country leads to a relocation of FDI from other countries to RTA members. This is consistent with models of export-platform FDI, where multinational firms (re-)locate their subsidiaries in countries from which consumers in a larger area can be served at lower trade costs (Raff, 2004; and Ekholm, Forslid, Markusen, 2007).

The remainder of the paper is organized as follows. The next section outlines the specification of bilateral FDI as supported by recent general equilibrium theory. Section 3 provides details on the adopted econometric approach. Section 4 reports the findings regarding the impact of the Europe Agreements on bilateral FDI. Section 5 provides our policy recommendations, and the last section concludes with a summary of the most important findings.

2 Determinants of bilateral FDI and the role of regional trade agreements

According to previous research, the most important empirical determinants of multinational firm location are country size, skilled labor endowments, trade and investment costs, and interaction terms thereof (Carr, Markusen, and Maskus, 2001; Markusen and Maskus, 2002; and Blonigen, Davies, and Head, 2003). While the actually estimated models are often in levels rather than in logs, the latter approach is typically preferable from an econometric point of view, as pointed out by Mutti and Grubert (2004). Taking this into account, the log of FDI from country i to country j, y_{ij}, may be formulated as a log-linear function of the following explanatory variables (see Markusen, 2002):[2] the sum of home and host country GDP, $SGDP_{ij} = \log(GDP_i + GDP_j)$, the relative size of the home and the host market in terms of GDP, $\log GDP_i - \log GDP_j$,[3] and the difference in exporter and importer skill endowment ratios (approximated by gross secondary school enrolment in percent), $DSK_{ij} = SK_i - SK_j$. The latter is also used in five interaction terms to account for the non-linear impact of skilled labor endowment differences on FDI: $INT1_{ij} = DSK_{ij} \times (\log GDP_i - \log GDP_j) \times \mathbf{I}(DSK_{ij} \leq 0)$, where $\mathbf{I}(DSK_{ij} \leq 0)$ is an indicator variable

[2] In the application, we consider a panel data set with fixed country-pair and time dummies. However, we skip the time index in the variable definition.

[3] We know from previous theoretical and empirical work that bilateral FDI stocks increase in parent-to-host country relative GDP (or the corresponding log-difference; see Bergstrand and Egger, 2007). Accordingly, we employ such a specification instead of the squared difference in GDPs as used by others.

that takes on the value 1 if the condition in parentheses holds and 0 otherwise; $INT2_{ij} = DSK_{ij} \times (\log GDP_i - \log GDP_j) \times \mathbf{I}(DSK_{ij} > 0)$; $INT3_{ij} = DSK_{ij} \times SGDP_{ij} \times \mathbf{I}(DSK_{ij} > 0)$; $INT4_{ij} = DSK_{ij} \times SGDP_{ij} \times \mathbf{I}(DSK_{ij} \leq 0)$; and $INT5_{ij} = DSK_{ij}^2 \times \log DIST_{ij}$, where $DIST_{ij}$ is the great circle distance between two countries' capitals, serving as a proxy for trade costs. Whereas horizontal FDI should rise if two markets grow larger and become more similar (i.e., if $SGDP_{ij}$ and $RGDP_{ij}$ increase), vertical FDI should rise if the parent country is small and well endowed with skilled labor, and trade costs between the two markets are low. Accordingly, we expect a positive sign for the coefficients of $SGDP_{ij}$ and $RGDP_{ij}$ but a negative one for the coefficients of all skilled labor endowment interaction terms. While there is no clear-cut hypothesis for the sign of the main effect of DSK_{ij}, we expect $INT1_{ij}$ and $INT4_{ij}$ to enter positively and the other interaction terms to exert a negative impact on FDI (see Carr, Markusen, and Maskus, 2001; and Markusen and Maskus, 2002).

Note that the sample of 23 parent and 28 host countries covers only member countries of the European Economic Area (EEA) and the ten Central and East European countries (CEEC) that have successfully applied for EU membership (see the Appendix for a detailed list of economies). Since there was no change to the composition of the EEA within the sample period, its effect is captured by the country-pair dummies. However, ten Europe Agreements between the EU and a CEEC have been ratified within the period considered. These are the ones with Hungary and Poland in 1994; with Bulgaria, Czech Republic, Romania, and Slovak Republic in 1995; with Estonia, Latvia, and Lithuania in 1998; and with Slovenia in 1999 (see the Appendix for further details). We capture these agreements by the dummy variable EA_{ij} which takes the value 1 for two economies that ratified the Europe Agreement in a given year and afterwards. For all other country pairs and years this dummy variable is zero. Hence, this dummy variable exhibits time and country-pair variation. By controlling for country-pair and time effects, the corresponding parameter can be interpreted as a difference-in-difference direct effect of the Europe Agreements on bilateral FDI.

To simplify the exposition of our econometric approach, we collect all mentioned variables in the matrix $\mathbf{X}_n = [\mathbf{EA}_n, \mathbf{SGDP}_n, \mathbf{RGDP}_n, \mathbf{DSK}_n, \mathbf{INT1}_n, ..., \mathbf{INT5}_n]$, where $\mathbf{X}_n$ is an $n \times k$ matrix with n being the number of observations and $k = 9$ denoting the number of variables collected in $\mathbf{X}_n$. The Appendix gives details on the variable sources for both the dependent (log bilateral outbound FDI) and independent variables. Moreover, Tables $A.1$-$A.3$ in the Appendix provide descriptive statistics of the dependent and independent variables as well as partial correlation coefficients. We allow for spatial interdependence in $\mathbf{X}_n$ across host countries (since FDI location decisions depend not only on the parent and actual host country characteristics but also on the characteristics of the competing European host markets). The spatial weights matrix is defined in the following section, which serves to aggregate the characteristics of a host market's competitors. We do so to account for the possibility that the Europe Agreements not only affect FDI decisions directly in a particular new entrant but may indirectly affect FDI decisions in the other competing host markets.

3 Econometric approach

We consider the following econometric model:

$$\begin{aligned} \mathbf{y}_n &= \mathbf{X}_n\boldsymbol{\alpha}_n + \bar{\mathbf{X}}_n\boldsymbol{\beta}_n + \mathbf{D}_n\boldsymbol{\mu}_n + \mathbf{u}_n \qquad (1) \\ &= \mathbf{Z}_n\boldsymbol{\delta}_n + \mathbf{u}_n \end{aligned}$$

where $\mathbf{Z}_n = [\mathbf{X}_n, \bar{\mathbf{X}}_n, \mathbf{D}_n]$ and $\boldsymbol{\delta}_n = [\boldsymbol{\alpha}_n', \boldsymbol{\beta}_n', \boldsymbol{\mu}_n']'$. To simplify notation, let us refer to a specific country-pair ij in year t by p. The total number of observations is $n = \sum_{p=1}^{P} T_p$, where P denotes the number of unique country-pairs and T_p is number of observations when country-pair p is observed. $P = MN$, where M (N) denotes the number of unique parent (host) countries. $\mathbf{y}_n$ is an $n \times 1$ vector of observations of the dependent variable (with elements $y_{ijt} = \log FDI_{ijt}$), $\mathbf{X}_n$ is the $n \times k$ matrix of explanatory variables, including the Europe Agreements dummy variable $\mathbf{EA}_n$, and $\mathbf{D}_n$ is an $n \times l$ matrix of (country-pair and time) dummy variables, where $l = P + \max[T_p]$.

We refer to $\bar{\mathbf{X}}_n$ as the spatial lag of $\mathbf{X}_n$ (see below for further details). While the panel data-set is unbalanced due to missing elements in $\mathbf{y}_n$, $\bar{\mathbf{X}}_n$ is computed from the balanced data. If $\bar{\mathbf{X}}_n$ were based on spatially weighted averages in the unbalanced panel data-set, we would obtain biased and inconsistent estimates of the parameters and the disturbances, even with randomly missing elements in $\mathbf{y}_n$. The reason for the latter is that some missing observations with a non-zero spatial weight would not be accounted for in the spatial averages, leading to measurement error. To circumvent this problem, we define $\mathbf{X}_{PT}$ and $\bar{\mathbf{X}}_{PT} = \mathbf{W}_{PT}\mathbf{X}_{PT}$ as the balanced counterparts to $\mathbf{X}_n$ and $\bar{\mathbf{X}}_n$, respectively, where $PT > n$ and $\mathbf{W}_{PT}$ is a block-diagonal $PT \times PT$ spatial weighting matrix with MT blocks $\mathbf{W}_N$ of size $N \times N$. $\mathbf{X}_n$ and $\bar{\mathbf{X}}_n$

are derived by eliminating the rows corresponding to missing values in the dependent variable from $\mathbf{X}_{PT}$ and $\bar{\mathbf{X}}_{PT}$, respectively. $\boldsymbol{\delta}_n$ is a $(2k+l+1)\times 1$ vector of unknown parameters.

Each block $\mathbf{W}_N$ of $\mathbf{W}_{PT} = \mathbf{I}_{MT} \otimes \mathbf{W}_N$ refers to a specific parent country and year, and it includes the spatial weight among FDI-hosts. This weighting scheme implies that there is only spatial interdependence among the hosts of a specific parent country in a given year, while there is no such interdependence across parent countries or across time periods. The diagonal elements of $\mathbf{W}_N$ are 0. We define the off-diagonal elements of $\mathbf{W}_N$ as w_{jk}/w^*, for $j,k = 1,...,N$, i.e., j and k run over host countries. In our application, w_{jk} corresponds to the log 'natural' trade flow (exports of j to k plus exports of k to j) in nominal U.S. dollars averaged over the period 1990 to 2000. Log natural trade flows are defined as the predictions from a model of bilateral exports. These predictions are referred to as 'natural' trade because they reflect the systematic part of trade flows as suggested by economic theory. Interdependence is established via natural trade flows. The reasoning is that the multinational's outside option of serving consumers in that host country locally, via FDI there, is to supply goods to consumers in that country via exports from a third country (see Raff, 2004). Natural trade flows are used in $\mathbf{W}_N$ because they reflect the trade potential between two markets as predicted by a gravity model of bilateral trade, accounting not only for geographical distance and proximity, but also for market size and other country-specific determinants of trade.[4] This weighting scheme supports the

[4]In our application, log natural trade flows are based on the predictions from a cross-sectional gravity model of bilateral exports using trade data from the late 1980s and early 1990s (prior to the estimation period for the FDI model). We include exporter-

theoretical view that a given parent country's FDI in a given host country depends on this country's and the other host countries' characteristics.

In the case of row-normalization of $\mathbf{W}_N$, $w^* = \sum_{k=1}^{N} w_{jk}$ is the sum of the elements in the corresponding row of $\mathbf{W}$. Under maximum row-sum normalization, $w^* = max_j[\sum_{k=1}^{N} w_{jk}]$ corresponds to the maximum of these row-sums. In the former case, the spatial weighting matrix is row-normalized, and in the latter case it is normalized by the maximal row sum as suggested by Kelejian and Prucha (2005).

$\mathbf{u}_n = \mathbf{y}_n - \mathbf{Z}_n\boldsymbol{\delta}_n$ is a vector of disturbances. In the estimation, we guard against possible heteroskedasticity and correlation of the disturbances across space and, alternatively, across time. While the latter can be accomplished by applying a standard HAC estimator as proposed by Newey and West (1987), spatial HAC (SHAC) estimators have been proposed by Conley (1999) and, more recently, by Kelejian and Prucha (2007). We apply the SHAC procedure of Kelejian and Prucha, since it is robust to measurement error of the spatial distance metric (in our case, natural trade flows). Furthermore, the estimator

and importer-specific fixed effects and the following set of dyad-specific explanatory variables (we give the coefficients and standard errors in parentheses) in the model to predict trade flows: log distance (-0.8118, 0.0592), a common language dummy variable (0.5082, 0.0913), a common colonial relationship variable (3.2975, 0.2626), and a dummy variable indicating whether a dyad represents intranational exports (0.2240, 0.1528). This model implicitly accounts for multilateral trade resistance terms as indicated by Anderson and van Wincoop (2003) and Feenstra (2004). Model estimation rests upon a quasi-maximum likelihood poisson model to account for zero-inflated trade data (see Santos Silva and Tenreyro, 2007). Data on bilateral exports are taken from the United Nation's World Trade Database, distance is measured as the great circle distance between countries' capitals, and the dummy variables are gathered from the CIA's World Factbook.

of the variance-covariance matrix is based on a set of assumptions that is satisfied in a wide class of spatial models.

To compute the SHAC variance-covariance matrix of the estimated parameters, denote the rth and sth variables in the matrix $\mathbf{Z}$ for a specific country-pair and time t as $z_{or,n}$ and $z_{os,n}$, respectively. Similarly, the values $z_{o'r,n}$ and $z_{o's,n}$ refer to an alternative observation o'. Moreover, let us refer to the estimated elements of the disturbance vector for observations o and o' as $\hat{u}_{o,n}$ and $\hat{u}_{o',n}$. The SHAC estimator is based on a distance measure with entries $d^*_{oo',n} = (w_{oo',n}/w^*)^{-1}$.[5] Similar to $\overline{\mathbf{X}}_n$, we assume that spatial interdependence of the disturbances only occurs across host countries within a year for a given parent country. All elements $d^*_{oo',n}$ with different parent countries or years and all elements $d^*_{oo',n}$ where $o = o'$ are set to $d^*_{oo',n} = 0$. Additionally, let d_n be a critical value determining the radius of spatial interdependence. Hence, spatial interdependence is only assumed for those observations o and o', where $d^*_{oo',n} \leq d_n$. The SHAC estimator of Kelejian and Prucha (2007) involves the kernel function $K(d^*_{oo',n}/d_n)$. For the latter, we assume a Bartlett window which is given by

$$K(d^*_{oo',n}/d_n) = 1 - |d^*_{oo',n}/d_n| \quad \forall \quad |d^*_{oo',n}/d_n| < 1.$$

Kelejian and Prucha obtain a consistent estimate for the (r, s)th element of

[5] Kelejian and Prucha (2007) assume that $d^*_{oo',n} = d_{oo',n} + \upsilon_{oo',n}$, where $d_{oo',n}$ is the true measure of economic 'distance' (in our case the inverse natural trade flow) between observations o and o' and $\upsilon_{oo',n} = \upsilon_{o'ot,n}$ is a measurement error where $(\upsilon_{oo',n})$ is independent of $(\varepsilon_{o,n})$. For convenience, we define w^* in the same way as in $\mathbf{W}_{PT}$.

the variance-covariance matrix which is given by

$$\hat{\psi}_{rs,n} = \frac{1}{n}\sum_{o=1}^{n}\sum_{o'=1}^{n} z_{or,n} z_{o's,n} \hat{u}_{o,n} \hat{u}_{o',n} K(d^*_{oo',n}/d_n).$$

The SHAC-based variance-covariance matrix $\hat{\mathbf{\Psi}}_n = (\hat{\psi}_{rs,n})$ may then be used for hypotheses testing.[6] For instance, this is useful to test the hypothesis of the joint relevance of the spatial lags in the exogenous explanatory variables in the subsequent empirical analysis.

4 Empirical analysis - the impact of the Europe Agreements on bilateral FDI in Europe

For robustness, we employ two different spatial weighting schemes described above. Both of them are based on natural trade flows among host countries, but they differ with respect to the normalization method. Most of the existing applications of spatial econometric models rely on row-normalized matrices $\mathbf{W}_{PT}$. However, Kelejian and Prucha (2005) point out that it is sufficient to normalize all entries of $\mathbf{W}_{PT}$ and, hence, of $\mathbf{W}_{PT}$, by the largest eigenvalue or, alternatively, by the largest row-sum of $\mathbf{W}_{PT}$. Row-normalization imposes strong restrictions on the spatial process, since each row of $\mathbf{W}_{PT}$ is normalized differently (hence, only relative economic distance matters but there is

[6] The estimate $\hat{\mathbf{\Psi}}_n$ is affected by the missing values in $\mathbf{u}_n$. However, after including spatial and eventually time lags of the exogenous variables, spatial or serial autocorrelation seems to constitute a minor problem with the data at hand.

no role to play for absolute economic distance). By way of contrast, the maximum row-sum normalization suggested by Kelejian and Prucha (2005) implies dividing the whole matrix $\mathbf{W}_{PT}$ by a single scalar which preserves the importance of absolute economic distance along with that of relative distance for interdependence. Overall, there are potential objections against row-normalization from a theoretical point of view, at least in the case of models of multinational firms and trade. For instance, FDI in not too economically distant host markets may be complementary in the case of vertically organized multinational networks, where plants are interrelated through intra-firm trade. The reason is that a larger absolute economic distance between host markets renders intra-firm trade in goods more costly. However, a row-normalized weighting scheme does not support any role for economic distance in absolute terms, since it only relies on relative economic distance to other host countries in the spatial weighting scheme. To see this, suppose that one parent country's host markets exhibit an economic distance which is ten times that of another parent country. If all economic distances are the same among the host markets for a parent country, the row-normalized weighting scheme exhibits identical entries, even though absolute distances differ by a factor of ten across parent countries. This is not the case for the alternative weighting scheme suggested by Kelejian and Prucha (2005), where the absolute role of economic distance is maintained, being in line with economic theory.

> Table 1 <

Table 1 summarizes our findings for the two least squares dummy variable specifications with fixed country-pair and time effects. Model 1 relies on maximum row-sum-normalized spatial weights, whereas Model 2 relies on row-normalized ones. In our application, there is no qualitative difference in the estimates between the two models. The parameter estimates are even quite similar in quantitative terms. In the discussion of the results, we focus on the results of Model 1 based on the maximum row-sum-normalized weighting scheme where the explanatory power is marginally higher than under Model 2. As mentioned before, we guard against possible spatial or, alternatively, serial correlation of the disturbances by applying Kelejian and Prucha's (2007) SHAC estimator and Newey and West's (1987) HAC estimator for the variance-covariance matrices. It turns out that the difference between these two estimators is only minor in our application.

The results indicate that parent and host country joint size and parent-to-host-market relative size are positively related to bilateral outward FDI as expected ($\widehat{\beta}_{SGDP}, \widehat{\beta}_{RGDP} > 0$). Of the variables involving relative factor endowments DSK (i.e., DSK and $INT1, ..., INT5$), only $INT2$ and $INT5$ enter significantly, using this European sample of countries. The finding for the former ($\widehat{\beta}_{INT2} < 0$) is in line with Markusen and Maskus (2002). The estimate for the latter ($\widehat{\beta}_{INT5} > 0$) is not supported by the theory of vertical multinational firms and is not in line with the findings in Carr, Markusen, and Maskus (2001). However, by using a formulation in levels rather than logs, Carr, et al. relied on different functional form assumptions, and did not control for country-pair and time effects in their panel. Also, their specification did not include DSK or $INT1$. This renders a comparison of their findings with ours difficult.

Our variable of major interest, the Europe Agreement indicator, is positive and significant, indicating that it affects bilateral outward FDI. The coefficient estimate can be interpreted as a difference-in-difference estimate which compares the change in FDI of country-pairs that ratified Europe Agreements in a given period to the control group of country-pairs that did not. The effect of implementing a Europe Agreement exhibits a direct impact on bilateral FDI of about $100(e^{0.890} - 1) \simeq 144$ percent. This effect is comparable to the previous evidence on RTA effects on FDI. For instance, Levi Yeyati, Stein, and Daude (2002a, p. 31) apply an LSDV model with time effects and estimate a somewhat lower effect of $100(e^{0.770} - 1) \simeq 116$ percent, using bilateral FDI stock data from the OECD.[7] However, there is also an indirect effect of the Europe Agreements through spatial interdependence triggered by natural trade flows among host countries. This effect is captured by the spatially weighted impact of the Europe Agreement dummy ($\overline{\mathbf{EA}}_n$ with a coefficient estimate $\widehat{\beta}_{\overline{EA}} \simeq -1.039$). The latter is negative and significant as expected from recent theoretical work on export-platform FDI and the threat of plant relocation associated with trade liberalization (Raff, 2004; and Ekholm, Forslid, Markusen, 2007). Note that the indirect effect of

[7] The estimated impact of the Europe Agreements on FDI also compares well with the fixed effects estimates of RTAs on bilateral trade. For instance, the data used in Glick and Rose (2002) support an effect of regional trade agreements all over the world on bilateral trade flows of about $100(e^{0.848} - 1) \simeq 133$ percent (when including time dummies as we do), and Baier and Bergstrand (2007, p. 20) report an effect of about 58 percent. Estimating a fixed country-pair and time effects model using our data and specification without any spatially weighted variables, one obtains an EA parameter of 0.789 and a (heteroskedasticity-robust) standard error of 0.111. This corresponds to an impact of the Europe Agreements on FDI of about $100(e^{0.789} - 1) \simeq 120$ percent.

the Europe Agreements depends also on a host country's economic distance from other host markets. Hence, the overall impact of Europe Agreement membership on inward FDI (from the average parent country in the sample) will differ across host countries.

In a multi-country world, the other explanatory variables also exhibit bilateral and third-country effects. For instance, not only do bilateral relative and absolute factor endowments (i.e., country size) matter, but endowments of all competing host markets are relevant (see also Head, Ries, and Swenson, 1995, and Blonigen, Davies, Waddell, and Naughton, 2007, for the inclusion of the impact of exogenous explanatory variables of adjacent/non-distant locations of FDI).[8] In our application, all elements of $\overline{\mathbf{X}}_n$ except the spatially weighted effect of $INT5$ enter significantly. This is reflected in a significant Wald statistic testing the joint significance of all elements of $\overline{\mathbf{X}}_n$.

Overall, the opposite signs of the bilateral and the spatially weighted effects of both EA and $SGDP$ support the hypotheses generated by models of export-platform FDI, where FDI decisions are substitutive across host markets (see Raff, 2004; and Ekholm, Forslid, and Markusen, 2007).[9] Even

[8] For instance, a host market's growth is not sufficient to stimulate bilateral inward FDI. What matters is whether it grows faster or slower than the rest of the competing host countries.

[9] In the sensitivity analysis summarized in the Appendix, we investigate the dynamics of the adjustment of bilateral FDI stocks to changes in the explanatory variables. We accomplish this by adding once time-lagged explanatory variables to the model. Note that it is not possible to add further lags without losing countries such as the Czech Republic or the Slovak Republic from the sample. However, the contemporaneous and the once-lagged determinants are highly correlated (see Table $A.2$ in the Appendix), rendering identification of the dynamic pattern difficult. For instance, the partial correlation coefficient between

though some of the coefficients of the spatially weighted variables are larger in absolute value than the corresponding ones for the unweighted variables, the impact of changes in a single third host country on bilateral FDI is rather small. The reason is that we need to multiply these estimates by the third country's spatial weight. The latter is much smaller than unity for all host countries due to row-normalization of $\mathbf{W}_N$. However, what happens in all third host countries together may be more important for bilateral FDI than what happens in the target country. Of course, traditional explanatory variables do not necessarily take this into account, because they do not capture directly third-country effects.

In Table 2, we compute the associated direct and indirect effects of the Europe Agreements on bilateral FDI of the WEC on both the WEC and the CEEC for each of the four ratification steps (**1994:** Hungary, Poland; **1995:** Bulgaria, Czech Republic, Romania, Slovak Republic; **1998:** Estonia, Latvia, Lithuania; **1999:** Slovenia). We use parent plus host country real GDP as weights to compute average predicted changes in inward FDI for each host country in the sample. For each of the ratification years, the direct and indirect effects on FDI are displayed in the first two columns. The third column displays the overall effect, $100(e^{\beta_{EA}EA_{ijt}+\beta_{\overline{EA}}\overline{EA}_{ijt}}-1)$. Therefore, the overall effect does not correspond exactly to the arithmetic sum of the direct and indirect effects.

> Table 2 <

within transformed EA_{ijt} and $EA_{ij,t-1}$ is 0.87 and that of their spatially weighted counterparts is 0.89 under row normalization and also under maximum row normalization (see Table $A.3$ in the Appendix for a summary of the results).

Of course, inward FDI of the WEC from WEC parents does not entertain any direct effect of a Europe Agreement ratification. Yet, these countries face a negative indirect impact from some of the CEEC ratifications. The largest indirect effects in Table 2 indicate the most important trading partners of the ratifying CEEC in the corresponding period. By and large, Table 2 indicates that the negative indirect impact on the average WEC host country's inward FDI from the WEC was largest in 1995 (when four agreements had been ratified with CEEC) and smallest in 1999 (when only one agreement had been ratified with Slovenia). In the same years, the CEEC had faced the largest and smallest average positive direct impact.

Note that the impact of EA ratification on an involved CEEC is much larger than that on a WEC. The reason is that the number of involved CEEC is small as compared to the number of WEC. Therefore, the overall impact on FDI into a CEEC is much larger than the one on FDI into a WEC. Also, there is no direct effect on intra-WEC bilateral outbound FDI in Table 2. In fact, the Europe Agreements did not involve any change in trade barriers within Western Europe. However, the WEC face negative indirect effects, since trade barriers have declined due to EA ratification of the WEC with the CEEC.

Notice that even Hungary and Poland experienced a positive direct impact in 1995. The EU grew that year with the addition of Austria, Finland, and Sweden, which cast a large 'shadow' on the aspirations to the memberships of Hungary and Poland.[10] The weighted negative indirect impact on the CEEC had in all years been far too small to outweigh the positive direct one, on average. The positive overall effect in the CEEC had been several times larger than the negative one on the WEC in absolute terms.

Altogether, the Europe Agreements lead to relocation of FDI to the ratifying CEEC countries. The associated negative impact had been largest for those host economies exhibiting large natural trade flows with these CEEC. This holds in particular for Austria, Germany and the Scandinavian countries in several of the years considered.

$>$ Figures 1-4 $<$

Figures 1-4 graphically illustrate the effects summarized in Table 2. This exercise confirms that a small economic distance (associated with a high level of natural bilateral trade flows) is associated with a small geographical distance and/or a large market size in terms of GDP. Accordingly, the negative indirect effects of the Europe Agreements are strongest for large and/or adjacent countries. Due to their relatively small market size, interdependence among the CEEC ceteris paribus tends to be weaker than between a CEEC and a WEC.

Ignoring spatial interdependence by excluding the indirect effects on FDI seems harmful. For instance, a naïve LSDV estimator based only on the direct effects (through $\mathbf{X}_n$) leads to an estimate of the Europe Agreement effects on bilateral FDI from the WEC in the CEEC of $100(e^{0.789} - 1) \approx 120$

[10] Since Hungary and Poland implicitly ratified an agreement with only three economies in 1995, they face a smaller direct positive effect than Bulgaria, Czech Republic, Romania, and Slovak Republic, who ratified their agreements with 15 countries in 1995.

percent for each and every ratifying economy. Clearly, these estimates are rejected at one percent by the corresponding Wald tests of Table 2.

5 Discussion and policy recommendations

The limited availability of resources – such as factor endowments – naturally establishes interdependence in the allocation decisions about these resources. We provide empirical evidence that this is true for a parent country's outbound foreign direct investment (FDI) across a set of host countries. Hence, economic policy aimed at attracting FDI in a particular subset of host countries will cause effects not only there but also in other host countries. This can happen even in the absence of any change in the economic environment in the other host countries.

This paper's focus is on the consequences of preferential trade liberalization, i.e., the partial or full elimination of tariffs among a subset of the world economies. We argue that preferential trade liberalization causes effects on the involved countries but also on other host countries. And it not only affects trade (see Anderson and van Wincoop, 2002) but it extends to FDI as well. One reason for the latter is the importance of export platforms in multinational networks. If tariffs are reduced or fully eliminated in a subset of economies, it becomes cheaper for multinationals to deliver goods to consumers inside the liberalizing area from export platforms within this area. Hence, we would expect preferential trade liberalization to lead to a redirection of FDI into the liberalizing area. On the one hand, this increases bilateral FDI of parent countries into the free trade area. On the other hand, it reduces FDI in countries outside this area. An assessment of the consequences of preferential trade liberalization on FDI ought to take into account both effects. At least, such an analysis might help in understanding the reasons and strengths of repercussions against such liberalizations from outside a free trade area. Moreover, this delivers estimates of the net effects on a parent country's total outbound FDI, which consists of both preferential trade liberalization-induced FDI creation and diversion effects.

The ratification of the Europe Agreements entails a preferential trade liberalization scenario along the lines described before. We identified direct positive effects on bilateral FDI between the Western and the involved Central and Eastern European countries. The estimated direct effects of Europe Agreement ratification in the preferred models are similar to those obtained from models that ignore any indirect effects. They amount to about 120-135 percent of FDI of the Western European parent countries in the involved Central and Eastern European economies. This depends upon the participant and the year considered. In comparison, the negative indirect effects on third host countries are small but ubiquitous in Europe. They amount to about -2 to -9 percent for the whole block of Western European host countries, and they are similar in size for the non-participating Central and Eastern European countries. Although the positive direct effects on Western Europe's FDI in Central and Eastern Europe are large percentage-wise, they are rather small in absolute terms. By way of contrast, within Western Europe the negative indirect effects on FDI are small percentage-wise but large in absolute terms. Hence, preferential trade liberalization between Western and Central and Eastern Europe has caused a reasonably strong reallocation of FDI from Western Europe into Central and Eastern Europe.

Our results seem relevant from various standpoints. First, they suggest that welfare analysis of trade liberalization should not attribute effects to goods trade alone but should also consider the associated consequences for factor movements. Second, our findings indicate that a sizable stimulus of investment in one country or region eventually causes a reduction of investment in other countries or regions. Third, enlargements of existing free trade areas typically involve strong percentage-wise direct effects on FDI in the new participant economies but smaller indirect ones in the incumbent countries. As a consequence, welfare gains tend to be strongly concentrated in new member countries. Fourth, our results suggest that there was a moderate percentage-wise reduction in inbound FDI within Western Europe in response to the ratification of the Europe Agreements in the 1990s. This reduction was fairly unevenly distributed across host countries, depending on their geographical location and economic integration with the other European economies. Hence, redistributive measures aimed at a more equal allocation of gains and losses from economic integration should pay attention to a country's geographical and economic environment. Econometric methods taking interdependence across macro-economic units into account can help identify which units are (favorably or unfavorably) exposed to the consequences of preferential trade liberalization.

6 Conclusions

This paper analyzes the role of the Europe Agreements on bilateral FDI within Europe. These agreements were designed to liberalize trade between the EU member countries on the one hand and the Central and Eastern European countries that had applied for EU membership on the other hand. Our analysis indicates that regional trade agreements are important for bilateral FDI. General equilibrium theory points to the interdependence of economies. By and large we would expect FDI activities across adjacent host markets to be complementary, if local foreign market seeking motives dominate (i.e., if horizontal FDI prevails and the multi-plant economies of scale are huge). By way of contrast, if low-cost seeking motives are the driving force behind FDI (i.e., vertical motives or export-platform FDI dominate), we would expect the activities to be substitutive across adjacent host markets since multinational firms will tend to supply their goods not only to consumers in that host market.

In general, the interdependence across markets will depend on the economic proximity across the host markets, which can be measured by natural bilateral trade flows among the host markets. We hypothesize that a large amount of natural (or predicted) trade flows between two host countries indicates that consumers in one of the two markets could be served cheaply from the other one. In that case, a given parent country's FDI in one of the two host countries should substitute FDI in the other. The empirical analysis of bilateral FDI needs to account for third market influences that decline in economic proximity. Accordingly, it seems natural to apply recently developed methods for spatially dependent data. In this paper, we applied a spatial

HAC estimator of the variance-covariance matrix developed by Kelejian and Prucha (2007) for estimation and testing.

In our sample of bilateral outbound FDI stocks within Europe, we find strong evidence for the impact of regional trade agreements on FDI. Also, our results indicate that spatial dependence is present in the data. This leads to non-trivial effects of the Europe Agreements on bilateral FDI. Computing the effect for all of the agreement ratification events on 28 host countries' inward FDI from Western European countries, we obtain the following results. First, there was a negative impact on Western Europe, which was strongest in 1995 (when four agreements had been ratified) and smallest in 1999 (when only a single one had been ratified). Second, in the same years, the CEEC faced the strongest positive effects on average. Third, the negative effects on FDI into Western Europe had always been much smaller than the positive ones on FDI into Central and Eastern Europe. Altogether, the estimation results point to a relocation of FDI from Western European host countries to Eastern European host countries flowing from the Europe Agreements. This is consistent with the prevalence of export-platform FDI, where foreign subsidiaries are located in host markets from which large consumer bases can be served cheaply.

For economic policy, our results confirm the strong link between trade and foreign direct investment. In particular, we find that trade policy as reflected in RTA has an impact not only on trade but also on FDI. Trade liberalization of a set of parent countries with some host markets leads to a relocation of FDI from other hosts into the liberalizing ones. This suggests that trade regionalism (i.e., liberalization with a subset of countries in the world economy) for a given parent country exerts positive direct effects on FDI flows in some host markets and indirect negative ones on others. However, the indirect negative effects in percent, at least for trade liberalization in Europe, tend to be small as compared to the direct positive ones. These results are timely given the ongoing enlargement of regional trade agreements.

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Appendix: Data and descriptive statistics

1. Data on foreign direct investment

We use data on bilateral outward FDI stock into Europe as published by UNCTAD (FDI Country profiles), covering the period 1989-2001.

Parent country coverage:

Our sample contains a total of 24 parent economies. WEC: Austria, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Sweden, Switzerland, United Kingdom. CEEC: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic, Slovenia.

Host country coverage:

There are 28 host countries in the sample. WEC: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom. CEEC: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia.

2. Data on country size and factor endowments

Real GDP figures at constant U.S. dollars (base year is 2000) are available from the World Bank's World Development Indicators. A country's skilled labor endowment is measured by the gross secondary school enrolment from the same source.

3. Signing and ratification of the Europe Agreements

The Europe Agreements between the members of the European Union and Central and Eastern European countries have been signed/ratified in the following years: Bulgaria (1993/1995), Czech Republic (1993/1995), Estonia (1995/1998), Hungary (1991/1994), Latvia (1995/1998), Lithuania (1995/1998), Poland (1991/1994), Romania (1993/1995), Slovak Republic (1993/1995), Slovenia (1996/1999).

4. Descriptive statistics

Tables A.1-A.3 summarize the descriptive statistics of the untransformed variables and the correlation matrices of the within transformed variables under maximum row normalization (Table A.2) and row normalization (Table A.3).

> Table A.1 - Descriptives <

> Tables A.2 and A.3 - Correlation matrices <

The correlation matrix also contains once time-lagged exogenous variables which are used in the sensitivity analysis below.

5. Sensitivity analysis: adding once-lagged explanatory variables to the model

Table A.4 summarizes our findings from a sensitivity analysis, in which we added once time-lagged exogenous variables to the model. The results indicate that many of the estimated coefficients are insignificant. The reasons for this are the high partial correlation coefficients among the contemporaneous and the once-lagged within transformed determinants (see Tables A.2 and A.3).

> Table A.4 - Adjustment dynamics <

Table 1: The impact of the Europe Agreements on bilateral FDI in Europe; LSDV - estimates

	Model 1			Model 2		
	NORMALIZED BY LARGEST ROW SUM			ROW NORMALIZED		
	β	Std.		β	Std.	
Explanatory variables		SHAC	Newey-West		SHAC	Newey-West
Unweighted exogenous variables						
EA_{ijt}: Dummy variable for Europe Agreements	0.8904	0.1259	0.1287 ***	1.0221	0.1250	0.1281 ***
$SGDP_{ijt}$: $\log(GDP_{it}+GDP_{jt})$	1.7316	0.9240	0.9758 *	2.5240	1.1055	1.1657 **
$RGDP_{ijt}$: $(\log GDP_{it} - \log GDP_{jt})$	1.7582	0.4282	0.4372 ***	1.3538	0.4650	0.4723 ***
DSK_{ijt}: $(SK_{it} - SK_{jt})$	-0.0497	0.0552	0.0565	-0.0661	0.0585	0.0606
$INT1_{ijt}$: $DSK_{ijt}\times RGDP_{ijt}\times \mathbf{I}(SK_{it}\leq SK_{jt})$	-0.0012	0.0010	0.0011	-0.0011	0.0010	0.0011
$INT2_{ijt}$: $DSK_{ijt}\times RGDP_{ijt}\times \mathbf{I}(SK_{it}>SK_{jt})$	-0.0034	0.0012	0.0012 ***	-0.0035	0.0013	0.0013 ***
$INT3_{ijt}$: $DSK_{ijt}\times SGDP_{ijt}\times \mathbf{I}(SK_{it}>SK_{jt})$	0.0017	0.0020	0.0020	0.0022	0.0021	0.0022
$INT4_{ijt}$: $DSK_{ijt}\times SGDP_{ijt}\times \mathbf{I}(Skit\leq SK_{jt})$	-0.0020	0.0020	0.0020	-0.0026	0.0021	0.0022
$INT5_{ijt}$: $DSK_{ijt}^2\times(\log DIST_{ij})$	0.0000	0.0000	0.0000 ***	0.0000	0.0000	0.0000 **
Spatially weighted variables						
EA_{ijt}	-1.0386	0.3685	0.3670 ***	-0.9601	0.3056	0.2940 ***
$SGDP_{ijt}$	-11.2784	1.6825	1.6050 ***	-12.2715	2.9676	3.0436 ***
$RGDP_{ijt}$	7.6752	1.2496	1.2478 ***	7.6099	1.7404	1.7670 ***
DSK_{ijt}	-0.6590	0.3095	0.3407 **	-0.8217	0.2934	0.3238 ***
$INT1_{ijt}$	0.0181	0.0094	0.0106 *	0.0038	0.0076	0.0086
$INT2_{ijt}$	-0.0310	0.0097	0.0104 ***	-0.0319	0.0092	0.0099 ***
$INT3_{ijt}$	0.0255	0.0118	0.0130 **	0.0316	0.0112	0.0123 ***
$INT4_{ijt}$	-0.0237	0.0116	0.0127 **	-0.0299	0.0110	0.0121 ***
$INT5_{ijt}$	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
σ^2	0.5346			0.5459		
R^2	0.9887			0.9884		
	p-values of χ^2-tests			p-values of χ^2-tests		
Fixed country-pair effects	0.000			0.000		
Fixed time effects	0.000			0.000		
Spatially weighted **X**	0.000			0.000		

Note: The estimation is based on 3373 observations. To calculate the SHAC-standard errors we use the Bartlett-window with cut-off 0.2 which implies that 75% of the observations get the non-zero weight by the Bartlett window. The Newey-West estimates of the standard errors use one time-lag. *** significant at 1%; ** significant at 5%; * significant at 10%.

Table 2: Dissecting the overall impact of the Europe Agreements on western Europe's bilateral outbound FDI into Europe (figures are percentage changes)

	Percentage changes in FDI due to the following effects											
	1994[a]			1995[b]			1998[c]			1999[d]		
Host countries	Direct	Indirect	Overall	Direct	Indirect	Overall	Direct	Indirect	Overall	Direct	Indirect	Overall
Austria	0.00	-5.14	-5.14	0.00	-9.89	-9.89	0.00	-4.77	-4.77	0.00	-2.50	-2.50
Belgium	0.00	-4.51	-4.51	0.00	-9.08	-9.08	0.00	-5.04	-5.04	0.00	-2.23	-2.23
Denmark	0.00	-4.31	-4.31	0.00	-8.17	-8.17	0.00	-4.85	-4.85	0.00	-1.93	-1.93
Finland	0.00	-4.45	-4.45	0.00	-7.96	-7.96	0.00	-6.08	-6.08	0.00	-1.88	-1.88
France	0.00	-4.47	-4.47	0.00	-10.23	-10.23	0.00	-5.71	-5.71	0.00	-2.46	-2.46
Germany	0.00	-5.11	-5.11	0.00	-11.94	-11.94	0.00	-6.99	-6.99	0.00	-2.80	-2.80
Greece	0.00	-3.99	-3.99	0.00	-8.07	-8.07	0.00	-3.72	-3.72	0.00	-1.83	-1.83
Iceland	0.00	-2.36	-2.36	0.00	-3.66	-3.66	0.00	-1.42	-1.42	0.00	-0.83	-0.83
Ireland	0.00	-4.14	-4.14	0.00	-7.74	-7.74	0.00	-4.28	-4.28	0.00	-1.88	-1.88
Italy	0.00	-4.71	-4.71	0.00	-10.84	-10.84	0.00	-5.84	-5.84	0.00	-2.72	-2.72
Luxembourg	0.00	-3.36	-3.36	0.00	-5.95	-5.95	0.00	-2.60	-2.60	0.00	-1.49	-1.49
Netherlands	0.00	-4.65	-4.65	0.00	-9.62	-9.62	0.00	-5.48	-5.48	0.00	-2.33	-2.33
Norway	0.00	-4.41	-4.41	0.00	-8.40	-8.40	0.00	-5.24	-5.24	0.00	-1.99	-1.99
Portugal	0.00	-4.01	-4.01	0.00	-7.68	-7.68	0.00	-3.99	-3.99	0.00	-1.87	-1.87
Spain	0.00	-4.38	-4.38	0.00	-9.41	-9.41	0.00	-5.15	-5.15	0.00	-2.27	-2.27
Sweden	0.00	-4.84	-4.84	0.00	-8.82	-8.82	0.00	-6.11	-6.11	0.00	-2.12	-2.12
Switzerland	0.00	-4.44	-4.44	0.00	-8.95	-8.95	0.00	-4.59	-4.59	0.00	-2.29	-2.29
United Kingdom	0.00	-4.32	-4.32	0.00	-9.85	-9.85	0.00	-5.55	-5.55	0.00	-2.34	-2.34
Western European Countries (WEC)[e]	0.00	-4.46	-4.46	0.00	-9.42	-9.42	0.00	-5.54	-5.54	0.00	-2.27	-2.27
Bulgaria	0.00	-3.21	-3.21	135.65	-4.82	123.89	0.00	-2.10	-2.10	0.00	-1.32	-1.32
Czech Republic	0.00	-4.42	-4.42	134.29	-5.91	119.90	0.00	-4.03	-4.03	0.00	-2.09	-2.09
Estonia	0.00	-2.79	-2.79	0.00	-4.28	-4.28	135.89	-4.44	125.08	0.00	-0.93	-0.93
Hungary	124.27	-2.28	118.72	10.47	-8.85	0.40	0.00	-3.98	-3.98	0.00	-2.15	-2.15
Latvia	0.00	-3.20	-3.20	0.00	-4.77	-4.77	135.67	-4.44	124.84	0.00	-1.03	-1.03
Lithuania	0.00	-2.66	-2.66	0.00	-3.87	-3.87	135.82	-4.48	124.91	0.00	-0.82	-0.82
Poland	119.65	-2.19	114.31	12.77	-8.21	3.15	0.00	-5.03	-5.03	0.00	-1.94	-1.94
Romania	0.00	-3.89	-3.89	134.68	-5.60	121.03	0.00	-3.07	-3.07	0.00	-1.55	-1.55
Slovak Republic	0.00	-4.43	-4.43	135.51	-5.69	121.65	0.00	-3.08	-3.08	0.00	-1.91	-1.91
Slovenia	0.00	-3.82	-3.82	0.00	-6.99	-6.99	0.00	-2.74	-2.74	135.51	0.00	135.51
Central and Eastern European Countries (CEEC)[e]	27.14	-3.27	23.15	56.38	-5.98	46.94	38.30	-3.78	32.72	13.03	-1.41	11.63

Notes:

The overall effect is the geometric sum of the direct effect, the indirect effect, and the spatial multiplier effect.

[a] Europe Agreement ratification with Hungary and Poland.

[b] Europe Agreement ratification with Bulgaria, Czech Republic, Romania, and Slovak Republic.

[c] Europe Agreement ratification with Estonia, Latvia, and Lithuania.

[d] Europe Agreement ratification with Slovenia.

[e] Numbers reflect unweighted averages.

Table A.1: Descriptive statistics

Variable	Mean	Std.	Minimum	Maximum
Unweighted bilateral FDI stocks	5.249	3.594	-7.497	12.517
Unweighted exogenous variables				
EA_{ijt}: Dummy variable for Europe Agreements	0.205	0.404	0.000	1.000
$SGDP_{ijt}$: $\log(GDP_{it}+GDP_{jt})$	26.990	1.166	23.098	28.859
$RGDP_{ijt}$: $(\log GDP_{it} - \log GDP_{jt})$	-0.002	2.202	-5.715	5.883
DSK_{ijt}: $(SK_{it} - SK_{jt})$	1.777	27.348	-125.494	125.494
$INT1_{ijt}$: $DSK_{ijt}\times RGDP_{ijt}\times \mathbf{I}(SK_{it}\leq SK_{jt})$	9.889	46.886	-129.651	641.722
$INT2_{ijt}$: $DSK_{ijt}\times RGDP_{ijt}\times \mathbf{I}(SK_{it}>SK_{jt})$	9.865	39.625	-129.651	533.792
$INT3_{ijt}$: $DSK_{ijt}\times SGDP_{ijt}\times \mathbf{I}(DSK_{ijt}>0)$	297.946	453.503	0.000	3539.557
$INT4_{ijt}$: $DSK_{ijt}\times SGDP_{ijt}\times \mathbf{I}(DSK_{ijt}\leq 0)$	251.526	454.574	0.000	3539.557
$INT5_{ijt}$: $DSK_{ijt}^{2}\times(\log DIST_{ij})$	4758.966	9351.549	0.000	95937.200

Note: GDP refers to real gross domestic product in US dollars (base year is 2000), SK is gross secondary school enrolment in percent, and DIST is the great circle distance between two countries' capitals.

Table A.2: Correlations of within transformed explanatory variables; maximum row normalization

																			Time lags																	
	Unweighted									Spatially weighted									Unweighted									Spatially weighted								
	EA_{ijt}	$SGDP_{ijt}$	$RGDP_{ijt}$	DSK_{ijt}	$INT1_{ijt}$	$INT2_{ijt}$	$INT3_{ijt}$	$INT4_{ijt}$	$INT5_{ijt}$	EA_{ijt}	$SGDP_{ijt}$	$RGDP_{ijt}$	DSK_{ijt}	$INT1_{ijt}$	$INT2_{ijt}$	$INT3_{ijt}$	$INT4_{ijt}$	$INT5_{ijt}$	EA_{ijt-1}	$SGDP_{ijt-1}$	$RGDP_{ijt-1}$	DSK_{ijt-1}	$INT1_{ijt-1}$	$INT2_{ijt-1}$	$INT3_{ijt-1}$	$INT4_{ijt-1}$	$INT5_{ijt-1}$	EA_{ijt-1}	$SGDP_{ijt-1}$	$RGDP_{ijt-1}$	DSK_{ijt-1}	$INT1_{ijt-1}$	$INT2_{ijt-1}$	$INT3_{ijt-1}$	$INT4_{ijt-1}$	$INT5_{ijt-1}$
Unweighted																																				
EA_{ijt}	1.00																																			
$SGDP_{ijt}$	0.50	1.00																																		
$RGDP_{ijt}$	0.00	0.00	1.00																																	
DSK_{ijt}	0.00	0.00	0.18	1.00																																
$INT1_{ijt}$	0.10	0.09	-0.14	-0.44	1.00																															
$INT2_{ijt}$	0.10	0.09	0.14	0.44	0.10	1.00																														
$INT3_{ijt}$	0.07	0.09	0.13	0.76	0.00	0.68	1.00																													
$INT4_{ijt}$	0.07	0.09	-0.13	-0.76	0.68	0.00	-0.14	1.00																												
$INT5_{ijt}$	0.14	0.18	0.00	0.00	0.54	0.54	0.58	0.58	1.00																											
Spatially weighted																																				
EA_{ijt}	0.63	0.63	-0.07	-0.01	0.11	0.06	0.09	0.11	0.17	1.00																										
$SGDP_{ijt}$	-0.38	-0.43	-0.11	-0.07	-0.09	-0.22	-0.18	-0.07	-0.15	-0.46	1.00																									
$RGDP_{ijt}$	0.03	0.08	0.04	-0.09	0.04	-0.13	-0.12	0.01	-0.07	0.17	-0.22	1.00																								
DSK_{ijt}	0.00	0.03	0.11	0.64	-0.10	0.37	0.66	-0.32	0.30	0.03	0.01	-0.02	1.00	1.00																						
$INT1_{ijt}$	0.08	0.03	-0.28	-0.18	0.27	0.12	0.01	0.26	0.13	0.10	-0.12	-0.09	-0.37	0.22																						
$INT2_{ijt}$	0.03	0.07	0.01	0.46	0.08	0.50	0.66	-0.07	0.48	0.08	-0.10	0.03	0.63	-0.03	1.00																					
$INT3_{ijt}$	-0.01	0.04	0.01	0.60	-0.01	0.44	0.74	-0.17	0.46	0.03	0.07	-0.10	0.88	0.67	0.81	1.00																				
$INT4_{ijt}$	-0.02	0.00	-0.21	-0.45	0.17	-0.14	-0.28	0.38	0.01	-0.02	0.09	-0.09	-0.76	0.31	-0.15	-0.37	1.00																			
$INT5_{ijt}$	0.13	0.25	-0.07	0.37	0.08	0.45	0.63	0.05	0.57	0.21	-0.14	-0.07	0.44	0.06	0.80	0.76	0.16	1.00																		
Timelags																																				
Unweighted																																				
EA_{ijt-1}	0.87	0.51	0.00	0.00	0.09	0.09	0.06	0.06	0.13	0.57	-0.33	0.02	0.01	0.04	0.02	0.00	-0.02	0.13	1.00																	
$SGDP_{ijt-1}$	0.45	0.97	0.00	0.00	0.08	0.08	0.09	0.09	0.17	0.55	-0.31	-0.04	0.01	-0.27	0.06	0.05	0.04	0.25	0.48	1.00																
$RGDP_{ijt-1}$	0.00	0.00	0.93	0.18	-0.14	0.14	0.13	-0.13	0.00	-0.12	-0.15	-0.04	0.09	-0.18	-0.01	-0.01	-0.20	-0.08	0.00	0.00	1.00															
DSK_{ijt-1}	0.00	0.00	0.24	0.89	-0.39	0.39	0.67	-0.67	0.00	-0.04	-0.11	-0.13	0.55	0.27	0.36	0.48	-0.42	0.28	0.00	0.00	0.27	1.00														
$INT1_{ijt-1}$	0.16	0.14	-0.16	-0.38	0.89	0.11	0.01	0.60	0.47	0.17	-0.14	0.06	-0.09	0.12	0.08	-0.01	0.15	0.09	0.14	0.11	-0.18	-0.42	1.00													
$INT2_{ijt-1}$	0.16	0.14	0.16	0.38	0.11	0.89	0.60	0.01	0.47	0.09	-0.32	-0.16	0.27	0.00	0.39	0.32	-0.12	0.37	0.14	0.11	0.18	0.42	0.13	1.00												
$INT3_{ijt-1}$	0.10	0.11	0.18	0.69	-0.02	0.59	0.89	-0.15	0.50	0.09	-0.24	-0.15	0.53	0.26	0.51	0.58	-0.25	0.51	0.09	0.10	0.20	0.77	0.00	0.64	1.00											
$INT4_{ijt-1}$	0.10	0.11	-0.18	-0.69	0.59	-0.02	-0.15	0.89	0.50	0.16	-0.07	0.05	-0.32	0.14	-0.07	-0.17	0.38	0.05	0.09	0.10	-0.20	-0.77	0.64	0.00	-0.18	1.00										
$INT5_{ijt-1}$	0.19	0.20	0.00	0.00	0.49	0.49	0.55	0.55	0.90	0.21	-0.21	-0.07	0.23	0.07	0.39	0.37	0.04	0.49	0.17	0.18	0.00	0.00	0.52	0.52	0.58	0.58	1.00									
Spatially weighted																																				
EA_{ijt-1}	0.57	0.65	-0.07	-0.01	0.09	0.05	0.08	0.10	0.16	0.89	-0.40	0.15	0.03	0.07	0.06	0.03	-0.02	0.21	0.63	0.59	-0.10	-0.03	0.15	0.07	0.08	0.14	0.19	1.00								
$SGDP_{ijt-1}$	-0.44	-0.54	-0.08	-0.05	-0.07	-0.17	-0.14	-0.06	-0.14	-0.54	0.85	-0.19	0.00	-0.08	-0.07	0.05	0.07	-0.15	-0.39	-0.41	-0.13	-0.09	-0.13	-0.28	-0.22	-0.07	-0.20	-0.47	1.00							
$RGDP_{ijt-1}$	0.02	0.13	0.09	-0.05	0.01	-0.11	-0.10	-0.02	-0.08	0.19	-0.17	0.82	0.00	-0.13	0.02	-0.09	-0.13	-0.10	0.02	0.03	0.03	-0.09	0.03	-0.15	-0.13	0.02	-0.08	0.16	-0.21	1.00						
DSK_{ijt-1}	-0.02	0.03	0.16	0.59	-0.12	0.31	0.57	-0.31	0.24	0.00	0.04	-0.14	0.85	-0.34	0.49	0.72	-0.68	0.33	-0.01	0.04	0.17	0.65	-0.14	0.30	0.60	-0.39	0.22	0.00	0.02	-0.04	1.00					
$INT1_{ijt-1}$	0.15	0.07	-0.31	-0.17	0.28	0.12	0.02	0.26	0.15	0.20	-0.32	0.17	-0.27	0.77	0.21	-0.03	0.49	0.28	0.12	0.03	-0.35	-0.24	0.37	0.15	0.00	0.33	0.20	0.16	-0.18	-0.05	-0.41	1.00				
$INT2_{ijt-1}$	0.07	0.13	0.00	0.41	0.09	0.47	0.60	-0.04	0.44	0.15	-0.25	0.02	0.52	0.24	0.87	0.68	-0.12	0.71	0.06	0.11	-0.02	0.39	0.12	0.45	0.57	-0.05	0.43	0.13	-0.17	0.05	0.53	0.30	1.00			
$INT3_{ijt-1}$	-0.03	0.03	0.04	0.54	-0.02	0.39	0.67	-0.16	0.39	0.02	0.02	-0.16	0.76	-0.05	0.67	0.84	-0.34	0.63	-0.02	0.04	0.04	0.58	-0.03	0.36	0.69	-0.21	0.40	0.02	0.08	-0.11	0.87	-0.06	0.73	1.00		
$INT4_{ijt-1}$	0.00	-0.02	-0.24	-0.43	0.18	-0.13	-0.27	0.37	0.02	0.02	-0.05	0.08	-0.66	0.55	-0.13	-0.34	0.83	0.13	0.00	-0.02	-0.26	-0.51	0.22	-0.13	-0.30	0.46	0.06	0.02	0.06	-0.06	-0.81	0.66	-0.12	-0.40	1.00	
$INT5_{ijt-1}$	0.15	0.24	-0.10	0.30	0.10	0.39	0.56	0.09	0.52	0.25	-0.23	-0.03	0.35	0.31	0.67	0.64	0.18	0.88	0.14	0.23	-0.12	0.27	0.14	0.38	0.55	0.12	0.55	0.24	-0.17	-0.08	0.31	0.41	0.73	0.70	0.24	1.00

Table A.3: Correlations of within transformed explanatory variables, row normalization

																			Time lags																	
	Unweighted									Spatially weighted									Unweighted									Spatially weighted								
	EA_{ijt}	$SGDP_{ijt}$	$RGDP_{ijt}$	DSK_{ijt}	$INT1_{ijt}$	$INT2_{ijt}$	$INT3_{ijt}$	$INT4_{ijt}$	$INT5_{ijt}$	EA_{ijt}	$SGDP_{ijt}$	$RGDP_{ijt}$	DSK_{ijt}	$INT1_{ijt}$	$INT2_{ijt}$	$INT3_{ijt}$	$INT4_{ijt}$	$INT5_{ijt}$	EA_{ijt-1}	$SGDP_{ijt-1}$	$RGDP_{ijt-1}$	DSK_{ijt-1}	$INT1_{ijt-1}$	$INT2_{ijt-1}$	$INT3_{ijt-1}$	$INT4_{ijt-1}$	$INT5_{ijt-1}$	EA_{ijt-1}	$SGDP_{ijt-1}$	$RGDP_{ijt-1}$	DSK_{ijt-1}	$INT1_{ijt-1}$	$INT2_{ijt-1}$	$INT3_{ijt-1}$	$INT4_{ijt-1}$	$INT5_{ijt-1}$
Unweighted																																				
EA_{ijt}	1.00																																			
$SGDP_{ijt}$	0.50	1.00																																		
$RGDP_{ijt}$	0.00	0.00	1.00																																	
DSK_{ijt}	0.00	0.00	0.18	1.00																																
$INT1_{ijt}$	0.10	0.09	-0.14	-0.44	1.00																															
$INT2_{ijt}$	0.10	0.09	0.14	0.44	0.10	1.00																														
$INT3_{ijt}$	0.07	0.09	0.13	0.76	0.00	0.68	1.00																													
$INT4_{ijt}$	0.07	0.09	-0.13	-0.76	0.68	0.00	-0.14	1.00																												
$INT5_{ijt}$	0.14	0.18	0.00	0.00	0.54	0.54	0.58	0.58	1.00																											
Spatially weighted																																				
EA_{ijt}	0.62	0.64	-0.05	0.00	0.09	0.07	0.08	0.09	0.15	1.00																										
$SGDP_{ijt}$	0.50	0.90	0.19	0.04	0.05	0.10	0.13	0.08	0.20	0.72	1.00																									
$RGDP_{ijt}$	-0.04	0.25	0.71	0.13	-0.16	0.04	0.06	-0.13	-0.04	-0.10	0.23	1.00																								
DSK_{ijt}	0.00	0.04	0.13	0.68	-0.09	0.52	0.74	-0.29	0.38	-0.02	0.03	0.19	1.00																							
$INT1_{ijt}$	0.15	0.09	-0.29	-0.19	0.26	0.10	-0.01	0.26	0.12	0.26	0.14	-0.45	-0.37	1.00																						
$INT2_{ijt}$	0.08	0.12	0.04	0.50	0.07	0.66	0.72	-0.07	0.54	0.10	0.14	0.03	0.68	0.18	1.00																					
$INT3_{ijt}$	0.09	0.15	0.06	0.63	0.01	0.63	0.83	-0.14	0.55	0.10	0.17	0.07	0.89	-0.02	0.86	1.00																				
$INT4_{ijt}$	0.15	0.17	-0.18	-0.44	0.19	-0.12	-0.27	0.38	0.03	0.22	0.21	-0.29	-0.71	0.72	-0.12	-0.31	1.00																			
$INT5_{ijt}$	0.20	0.31	-0.05	0.39	0.07	0.57	0.66	0.04	0.60	0.27	0.35	-0.08	0.50	0.31	0.82	0.81	0.20	1.00																		
Timelags																																				
Unweighted																																				
EA_{ijt-1}	0.87	0.51	0.00	0.00	0.09	0.09	0.06	0.06	0.13	0.55	0.52	-0.04	0.00	0.12	0.06	0.09	0.13	0.19	1.00																	
$SGDP_{ijt-1}$	0.45	0.97	0.00	0.00	0.08	0.08	0.09	0.09	0.17	0.54	0.85	0.28	0.05	0.03	0.11	0.15	0.13	0.29	0.48	1.00																
$RGDP_{ijt-1}$	0.00	0.00	0.93	0.18	-0.14	0.14	0.13	-0.13	0.00	-0.09	0.17	0.66	0.13	-0.30	0.04	0.07	-0.17	-0.04	0.00	0.00	1.00															
DSK_{ijt-1}	0.00	0.00	0.24	0.89	-0.39	0.39	0.67	-0.67	0.00	-0.02	0.04	0.17	0.61	-0.21	0.42	0.56	-0.42	0.32	0.00	0.00	0.27	1.00														
$INT1_{ijt-1}$	0.16	0.14	-0.16	-0.38	0.89	0.11	0.01	0.60	0.47	0.15	0.09	-0.19	-0.09	0.29	0.08	0.02	0.19	0.10	0.14	0.11	-0.18	-0.42	1.00													
$INT2_{ijt-1}$	0.16	0.14	0.16	0.38	0.11	0.89	0.60	0.01	0.47	0.11	0.15	0.03	0.44	0.10	0.56	0.55	-0.08	0.50	0.14	0.11	0.18	0.42	0.13	1.00												
$INT3_{ijt-1}$	0.10	0.11	0.18	0.69	-0.02	0.59	0.89	-0.15	0.50	0.10	0.16	0.08	0.64	-0.03	0.60	0.72	-0.23	0.56	0.09	0.10	0.20	0.77	0.00	0.64	1.00											
$INT4_{ijt-1}$	0.10	0.11	-0.18	-0.69	0.59	-0.02	-0.15	0.89	0.50	0.13	0.09	-0.18	-0.31	0.28	-0.07	-0.15	0.40	0.05	0.09	0.10	-0.20	-0.77	0.64	0.00	-0.18	1.00										
$INT5_{ijt-1}$	0.19	0.20	0.00	0.00	0.49	0.49	0.55	0.55	0.90	0.19	0.22	-0.06	0.32	0.14	0.46	0.49	0.07	0.54	0.17	0.18	0.00	0.00	0.52	0.52	0.58	0.58	1.00									
Spatially weighted																																				
EA_{ijt-1}	0.55	0.66	-0.05	0.00	0.07	0.06	0.08	0.08	0.15	0.89	0.74	-0.10	-0.02	0.21	0.08	0.10	0.20	0.27	0.62	0.59	-0.07	-0.01	0.13	0.09	0.09	0.11	0.18	1.00								
$SGDP_{ijt-1}$	0.46	0.89	0.21	0.04	0.03	0.10	0.13	0.07	0.19	0.65	0.98	0.27	0.04	0.08	0.13	0.17	0.18	0.34	0.49	0.87	0.22	0.06	0.05	0.14	0.16	0.07	0.20	0.69	1.00							
$RGDP_{ijt-1}$	-0.08	0.20	0.66	0.13	-0.17	0.03	0.06	-0.13	-0.04	-0.18	0.18	0.93	0.18	-0.46	0.03	0.07	-0.27	-0.08	-0.07	0.27	0.71	0.19	-0.23	0.03	0.10	-0.19	-0.06	-0.15	0.25	1.00						
DSK_{ijt-1}	-0.02	0.04	0.18	0.61	-0.10	0.43	0.64	-0.28	0.31	-0.07	0.03	0.25	0.89	-0.39	0.57	0.77	-0.67	0.39	-0.01	0.06	0.19	0.69	-0.13	0.43	0.69	-0.36	0.30	-0.05	0.05	0.27	1.00					
$INT1_{ijt-1}$	0.21	0.15	-0.30	-0.16	0.25	0.09	0.00	0.23	0.12	0.36	0.20	-0.46	-0.31	0.88	0.16	0.00	0.63	0.29	0.18	0.05	-0.34	-0.24	0.34	0.12	-0.03	0.32	0.18	0.30	0.12	-0.54	-0.42	1.00				
$INT2_{ijt-1}$	0.12	0.18	0.04	0.45	0.08	0.60	0.67	-0.04	0.51	0.17	0.21	0.02	0.61	0.20	0.92	0.80	-0.06	0.77	0.11	0.16	0.04	0.45	0.11	0.61	0.65	-0.06	0.50	0.14	0.19	0.02	0.59	0.24	1.00			
$INT3_{ijt-1}$	0.11	0.18	0.08	0.57	0.00	0.55	0.75	-0.13	0.48	0.12	0.20	0.10	0.80	-0.04	0.75	0.90	-0.29	0.71	0.10	0.17	0.10	0.62	0.00	0.57	0.79	-0.18	0.51	0.11	0.19	0.12	0.87	-0.04	0.81	1.00		
$INT4_{ijt-1}$	0.18	0.18	-0.22	-0.41	0.18	-0.12	-0.25	0.35	0.03	0.29	0.22	-0.34	-0.65	0.67	-0.12	-0.29	0.90	0.17	0.16	0.12	-0.23	-0.48	0.25	-0.09	-0.27	0.45	0.09	0.25	0.17	-0.36	-0.76	0.74	-0.09	-0.34	1.00	
$INT5_{ijt-1}$	0.25	0.34	-0.07	0.33	0.09	0.50	0.60	0.07	0.55	0.35	0.39	-0.12	0.41	0.35	0.72	0.73	0.25	0.91	0.23	0.30	-0.06	0.31	0.14	0.51	0.60	0.10	0.59	0.32	0.36	-0.13	0.37	0.40	0.77	0.76	0.28	1.00

Table A4: The impact of the Europe Agreements on bilateral FDI in Europe; LSDV - estimates; adjustment dynamics

	Model 3			Model 4		
	NORMALIZED BY LARGEST ROW SUM			ROW NORMALIZED		
	β	Std.		β	Std.	
Explanatory variables		SHAC	Newey-West		SHAC	Newey-West
Unweighted exogenous variables						
EA_{ijt}: Dummy variable for Europe Agreements	0.5064	0.1277	0.1434 ***	0.4141	0.1281	0.1418 ***
$SGDP_{ijt}$: $\log(GDP_{it}+GDP_{jt})$	-8.1240	1.8866	2.1921 ***	-10.5776	2.2425	2.6150 ***
$RGDP_{ijt}$: $(\log GDP_{it} - \log GDP_{jt})$	-3.0775	0.8873	1.0452 ***	-4.9002	0.9780	1.1399 ***
DSK_{ijt}: $(SK_{it} - SK_{jt})$	-0.0603	0.0922	0.1014	-0.0989	0.0986	0.1086
$INT1_{ijt}$: $DSK_{ijt}\times RGDP_{ijt}\times \mathbf{I}(SK_{it}\leq SK_{jt})$	-0.0022	0.0016	0.0017	-0.0031	0.0016	0.0018 *
$INT2_{ijt}$: $DSK_{ijt}\times RGDP_{ijt}\times \mathbf{I}(SK_{it}>SK_{jt})$	-0.0050	0.0021	0.0023 **	-0.0052	0.0023	0.0026 **
$INT3_{ijt}$: $DSK_{ijt}\times SGDP_{ijt}\times \mathbf{I}(SK_{it}>SK_{jt})$	0.0020	0.0034	0.0037	0.0033	0.0036	0.0039
$INT4_{ijt}$: $DSK_{ijt}\times SGDP_{ijt}\times \mathbf{I}(Skit\leq SK_{jt})$	-0.0025	0.0033	0.0037	-0.0039	0.0035	0.0039
$INT5_{ijt}$: $DSK_{ijt}^2\times(\log DIST_{ij})$	0.0000	0.0000	0.0000 **	0.0000	0.0000	0.0000 *
Spatially weighted variables						
EA_{ijt}	-0.6904	0.3808	0.4211 *	-0.4909	0.2883	0.3250 *
$SGDP_{ijt}$	7.0764	5.6445	6.2394	5.2922	5.3097	5.8902
$RGDP_{ijt}$	9.8295	3.3153	3.6855 ***	9.9885	2.9392	3.2931 ***
DSK_{ijt}	-0.3985	0.5433	0.6212	-0.4076	0.4510	0.5208
$INT1_{ijt}$	0.0046	0.0124	0.0141	-0.0085	0.0101	0.0117
$INT2_{ijt}$	-0.0192	0.0166	0.0189	-0.0169	0.0138	0.0158
$INT3_{ijt}$	0.0143	0.0208	0.0238	0.0152	0.0172	0.0199
$INT4_{ijt}$	-0.0158	0.0203	0.0231	-0.0158	0.0168	0.0194
$INT5_{ijt}$	0.0001	0.0000	0.0000 **	0.0000	0.0000	0.0000
Time lags						
Unweighted exogenous variables						
EA_{ijt-1}	0.4095	0.1149	0.1257 ***	0.5038	0.1140	0.1246 ***
$SGDP_{ijt-1}$	9.6723	1.8404	2.1598 ***	12.1970	2.1634	2.5423 ***
$RGDP_{ijt-1}$	4.7644	0.8701	1.0118 ***	5.9608	0.9486	1.0984 ***
DSK_{ijt-1}	0.0556	0.0917	0.1012	0.0500	0.0975	0.1083
$INT1_{ijt-1}$	0.0015	0.0017	0.0018	0.0024	0.0017	0.0018
$INT2_{ijt-1}$	0.0041	0.0021	0.0022 *	0.0034	0.0022	0.0023 *
$INT3_{ijt-1}$	-0.0020	0.0033	0.0037	-0.0018	0.0035	0.0039
$INT4_{ijt-1}$	0.0022	0.0033	0.0037	0.0019	0.0035	0.0039
$INT5_{ijt-1}$	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Spatially weighted variables						
EA_{ijt-1}	0.5005	0.3486	0.3865	0.2364	0.2599	0.2914
$SGDP_{ijt-1}$	-18.2981	5.4719	6.0444 ***	-22.2343	4.8351	5.3768 ***
$RGDP_{ijt-1}$	-1.2356	3.1315	3.5099	1.0845	2.7077	3.0072
DSK_{ijt-1}	0.0743	0.5418	0.6006	-0.5325	0.4471	0.4943
$INT1_{ijt-1}$	0.0214	0.0126	0.0143 *	0.0114	0.0092	0.0105
$INT2_{ijt-1}$	-0.0021	0.0162	0.0181	-0.0174	0.0132	0.0149
$INT3_{ijt-1}$	-0.0007	0.0206	0.0229	0.0216	0.0169	0.0188
$INT4_{ijt-1}$	0.0059	0.0203	0.0225	-0.0177	0.0168	0.0185
$INT5_{ijt-1}$	-0.0001	0.0000	0.0000 ***	-0.0001	0.0000	0.0000 **
σ^2	0.5159			0.5152		
R^2	0.9891			0.9891		
	p-values of χ^2-tests			p-values of χ^2-tests		
Fixed country-pair effects	0.000			0.000		
Fixed time effects	0.000			0.000		
Spatially weighted **X**	0.000			0.000		
First order time-lagged variables	0.000			0.000		
Long run effect: EA_{ijt}	0.000			0.000		
Long run effect: spatially weighted EA_{ijt}	0.587			0.346		
Long run effect: unweighted and spat. weighted EA_{ijt}	0.000			0.000		

Note: The estimation is based on 3373 observations. To calculate the SHAC-standard errors we use the Bartlett-window with cut-off 0.2 which implies that 75% of the observations get the non-zero weight by the Bartlett window. The Newey-West estimates of the standard errors use one time-lag. *** significant at 1%; ** significant at 5%; * significant at 10%.

Figure 1: The overall spatial effect of the Europe Agreements on average European outbound FDI in 1994

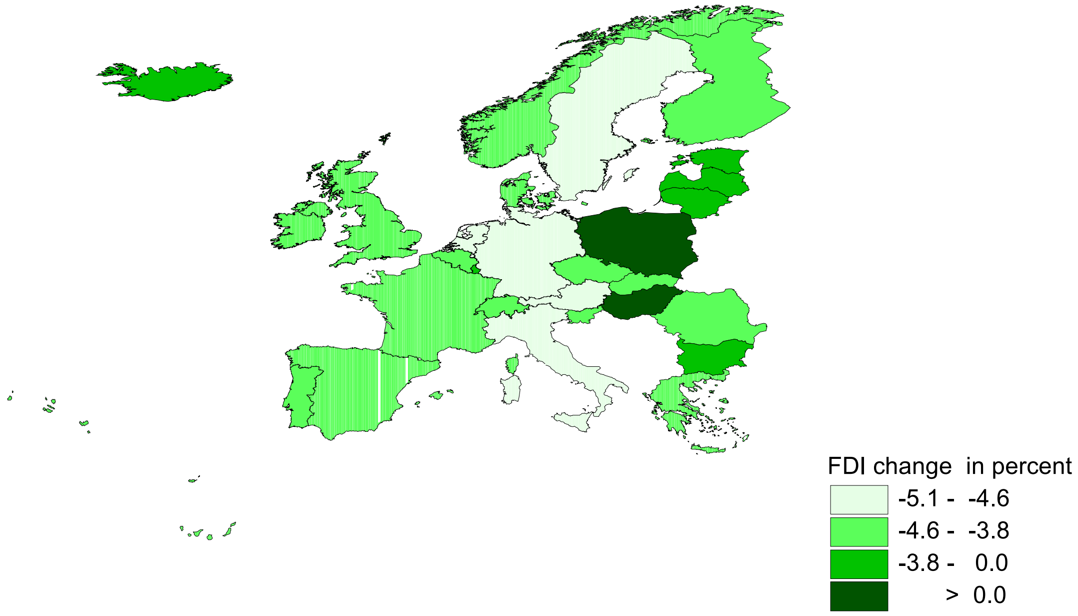

Figure 2: The overall spatial effect of the Europe Agreements on average European outbound FDI in 1995

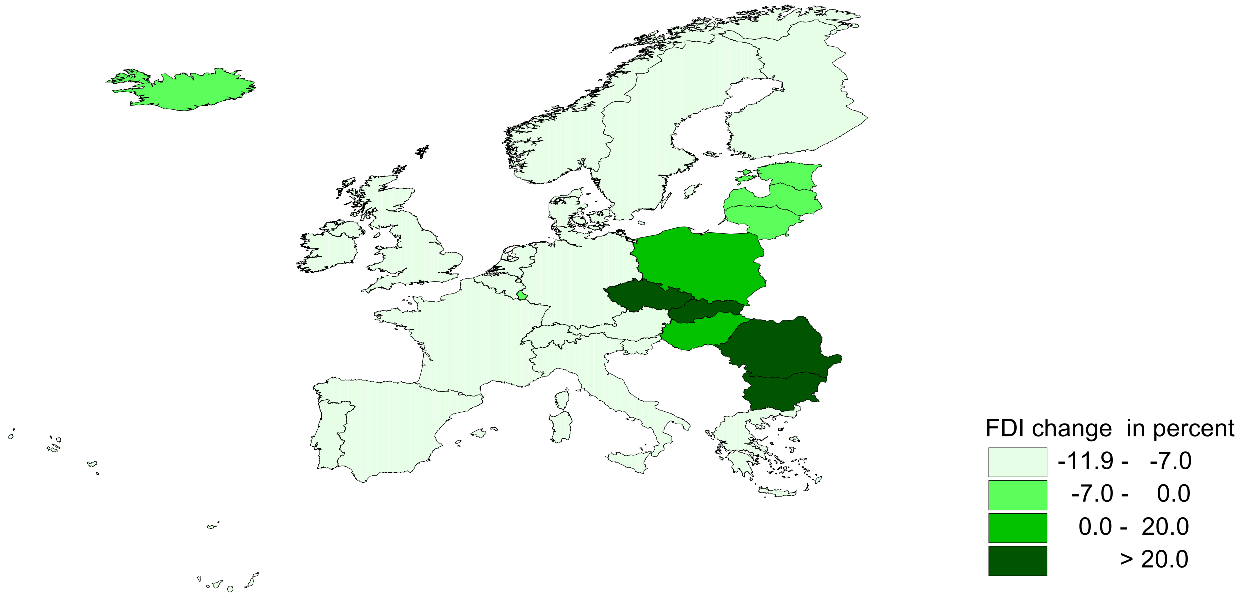

Figure 3: The overall spatial effect of the Europe Agreements on average European outbound FDI in 1998

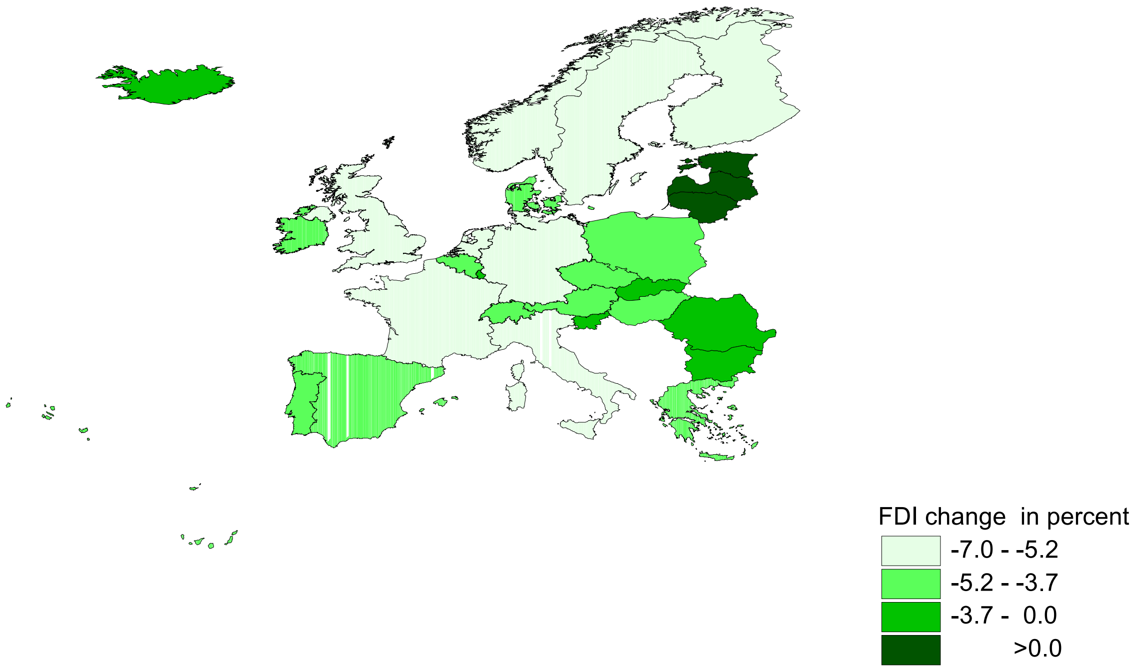

Figure 4: The overall spatial effect of the Europe Agreements on average European outbound FDI in 1999