International Journal of Research in Social Sciences
Vol. 7 Issue 3, March 2017,
ISSN: 2249-2496 Impact Factor: 7.081
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gage as well as in Cabell's Directories of Publishing Opportunities, U.S.A

SIGNIFICANCE OF LOCATION FACTORS OF FDI IN THE EMERGING SERVICES ECONOMY: A QUANTITETIVE STUDY EVIDENCE FOR TRANSITION COUNTRIES

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ABSTRACT

Foreign direct investment (FDI) has increasingly shifted toward the service sector. This change in the industrial composition of FDI and the non-tradable nature of services may have altered the importance of location factors for investment decisions. To capture potential changes in FDI determinants, a contrasting sectoral analysis is performed. Based on FDI stock data from eight new EU member states for the period 1998–2014, we implement a dynamic panel approach allowing the speed of adjustment to the equilibrium investment level to vary across sectors. Results support our assumption that investment into the service sector, which is characterized by low installation costs, adjusts much faster to its desired level than manufacturing FDI. Thus, government interventions to attract FDI are likely to boost the service sector immediately while having a slower impact on manufacturing FDI. Furthermore, as services are mostly non-tradable, FDI into this sector is largely based on market-seeking motives while FDI in the manufacturing sector is also driven by international price competitiveness measured by real unit labour costs.

Keywords: Foreign direct investment, transition economies, service sector, stock adjustment model, dynamic panel data model.

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1. INTRODUCTION

Foreign direct investment (FDI) has increasingly shifted towards the tertiary sector. This global trend is not only a result of the growing services economy but largely reflects the non-tradability of many services, which implies that local operations have to be established through FDI in order to serve the foreign market. While in 1990 the world global FDI inward stock in services accounted for 48 percent, it increased to roughly 60 percent in 2002 (UNCTAD, 2004) and 87 percent in 2014(UNCTAD,2015). Given this shift in the industrial composition of FDI and the specific (non-tradable) nature of service activities, the question arises of whether determinants of investment patterns have changed accordingly. In order to tackle this issue, service and manufacturing FDI have to be contrasted within one framework so as to reveal the relative importance of its location factors and hence to assess which determinants are likely to dominate future investment patterns.

Yet, empirical evidence on these matters is so far missing. Although there is a fast growing literature analysing FDI determinants empirically, most of these studies rely on FDI data aggregated over industries or on investment operations into the manufacturing sector.[2] Some papers focus on determinants of services FDI.[3] However, we are not aware of any study contrasting manufacturing and service industries by means of a single model framework. Thus, the available empirical results are not suited to assess whether investment decisions are based on the same determinants across the two major recipient sectors.

In particular, services FDI is likely to be primarily attracted by a large customer base as services mostly have to be produced where they are consumed. By contrast, the importance of international price competitiveness should be higher for multinational enterprises (MNEs) that re-export their goods outside the respective host country. Therefore, input cost factors, like the level of real unit labour costs, are likely to have a much lower impact on services FDI compared with manufacturing FDI as service products are far less tradable than manufactured goods.

Our analysis addresses this open issue by explaining the allocation of FDI in 20 manufacturing and service industries of eight new EU member states [4] (NMS-8) by means of host country location factors. The considered time period from 1998 to 2014 reflects very well the global

trend of increasing services FDI. Already in 1998, the stock of inward FDI in the tertiary sector was predominant in these countries and its share grew over the years as can be seen in Figure 1.
To account for the persistence of FDI stocks, the econometric specification is built on the partial adjustment model, where the desired level of investment stocks is assumed to adjust gradually rather than instantaneously. This approach enables us to distinguish the short- and long-run evolution of FDI, which is of particular interest as the speed of adjustment to the desired investment stock is likely to vary across sectors due to differences in capital intensities. Our estimation results indicate that services FDI indeed follows a different pattern concerning both the adjustment path and certain location factors. While FDI into the manufacturing sector needs around five years to adjust to its equilibrium level, services FDI converts already within two years. In terms of location factors, market size has a higher impact on services FDI in the short run but aligns to the elasticity of manufacturing FDI in the long run. Moreover, it is shown that labour cost differences across host countries only matter for investment activities in the manufacturing sector.

The paper is structured as follows. The next section provides the theoretical foundation for the econometric model and discusses the selection of location variables and their measurement. The econometric specification is outlined in Section 3, with an emphasis on the proper choice of the estimator. In Section 4 the results are presented. The final section concludes with some policy remarks.

2. THEORETICAL FOUNDATION

To explain the patterns of multinational activity within the NMS-8 we follow Cheng and Kwan (2000) and adopt a stock adjustment model.[5] It is assumed that the flow of investment serves to adjust the actual FDI stock y_{t-1} to the equilibrium level of FDI stock y_t^* such that,

$$y_t - y_{t-1} = \theta\,(y_t^* - y_{t-1}) \quad \text{.....(1)}$$

or re-arranging terms

$$y_t = (1-\theta)\,y_{t-1} + \theta y_t^* \quad \text{.....(2)}$$

Following the contributions to the neoclassical investment theory by, for example, Eisner and Strotz (1963) and Lucas (1967) firms have to pay certain adjustment costs in order to increase their fixed capital stock. The idea is that new capital is fully effective after a learning or installation period. The resulting adjustment or installation costs increase with the level of investment. Therefore, it is not optimal for firms to raise the capital stock instantaneously but to converge to the targeted level. The parameter h, which is assumed to be in the range of (0, 1) indicates the speed of this adjustment process. As expenditures on fixed capital are much higher in manufacturing FDI (UNCTAD, 2004) the desired level of investment is likely to be achieved slower due to higher installation costs. Thus, given the difference in capital intensities across sectors, we would expect the speed of adjustment coefficient h to be higher for FDI into the service sector. This would imply that the determinants of services FDI exhibit a higher part of their overall impact at the beginning of the investment process while they would have a more lasting and smooth effect on manufacturing FDI.

While the speed of adjustment depends on internal adjustment costs, the distribution of the targeted capital stock y_t^* of MNEs across the NMS-8 is assumed to be determined by location factors comprising several transition-specific country characteristics (Dunning, 1988). These determinants of FDI are summarized in X_t, such that the complete model reads:

$$y_t = (1-\theta)\, y_{t-1} + \theta\omega\, X_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Location factors can be classified according to the motives of the MNE (Barba Navaretti and Venables, 2004). While the purpose of market-seeking FDI is to serve the domestic or regional market, efficiency-seeking FDI aims at exploiting cost advantages (such as labour costs differences) by splitting production processes according to factor intensities. Yet, the specific nature of services enables us to draw conclusions about investors' motives. As many services are neither tradable nor storable but must be produced where they are consumed, FDI activities in the service sector are expected to be primarily affected by market-seeking motives. By contrast, manufacturing FDI is likely to be driven by efficiency-seeking motives as well, as manufactured goods are not characterized by the uno actu principle and are therefore potentially exposed to international price competition. Thus, the relevance of input cost factors is higher for MNEs that

re-export their products or simply have to compete with internationally supplied goods in the respective host market. Moreover, a large share of inward FDI in transition economies stems from developed countries (WIIW, 2006) where factor prices are much higher, suggesting that efficiency-seeking motives play a non-negligible role. This is supported by various empirical studies dealing with determinants of manufacturing FDI into transition economies, which report significantly negative effects of wages on FDI (for example, Resmini, 2000; Walkenhorst, 2004; Pusterla and Resmini, 2007, amongst others).

Besides factor endowment differences and the proximity to large markets, agglomeration economies derived from New Economic Geography (NEG) models encourage firms to concentrate in industrial districts even when they operate in the same sector where they expose themselves to local competition (Fujita et al., 2000). Following the categorization of Baldwin (2005), agglomeration forces may work through production factors or through goods. The former arise because firms benefit from the accession to specialized input suppliers (forward linkages) and customers (backward linkages) associated with large local markets. The latter emerge due to knowledge spillovers that raise the productivity of labour and capital. Moreover, the possibility to share a skilled labour market motivates companies to locate in an area where their sector of activity is well developed. To capture the advantages for firms to agglomerate, a sector-specific variable is considered that reflects the concentration of a particular industry across countries.

Yet, whether agglomeration economies are more relevant for services FDI rather than for manufacturing FDI is a priori ambiguous. As the service sector is a relatively young industry where improvements in information and communication technology have caused a surge of product innovation, knowledge spillovers are likely to play a dominant part in this sector. Thus, one can assume that benefits from this kind of agglomeration force are lower in the manufacturing.

sector where the impact of new technologies has not been that high (Desmet and Rossi-Hansberg, 2009). On the other hand, backward and forward linkages are likely to be a major force of agglomeration in the manufacturing industry due to its high demand for specialized and

semi-finished products (for example, Pusterla and Resmini, 2007; Bekes, 2005). Thus, it the empirical question remains of whether the impact of this compound measure that reflects industry concentration differs across the two sectors.

2.1 Measurement of location variables

To reflect the sales capacity of a host country its gross domestic product ($lngdp$)is considered. This variable is commonly used in the empirical literature to measure market size, which appears to impact positively and significantly on aggregate and manufacturing FDI. [6] In order to exploit efficiency-seeking location factors we consider labour costs and corporate profit taxes. Labour costs are measured following Bellak et al. (2008) who propose using real unit labour costs (ulc) when investigating investment location decisions in transition economies. As this measure reflects the wage share in value added it directly focuses on the profitability pressures associated with the employment of labour. Moreover, as the former centrally planned countries are very heterogeneous concerning their infrastructure endowment and are lagging behind the EU-15 average, the considered measure also captures an internationally comparable productivity rate.[7]

To account for the tax burden incurred by MNEs we follow Devereux and Griffith (1998) and implement the effective average tax rate (*eatr*), which comprises information on the statutory tax rate and on certain rules specifying the extent of profits that are subject to taxation. As the *eatr* measures the extent to which the pretax profit is reduced by taxation it is the relevant decision variable for the location choice of MNEs. [8] Finally, to capture transportation costs, import tariffs (*tariff*) and adistance variable (dist) [9] are considered.

Agglomeration economies are measured by a sector-specific variable (*agglo*) which is calculated as the ratio of industry GDP to total sector GDP. This variable reflects the concentration of a particular industry within a country and varies considerably across the NMS-8.[10] The drawback of this measure is that it cannot fully capture forward and backward linkages within our sectoral framework. As input suppliers may engage in different industry activities than their customers, data on a more disaggregate level would be needed to fully identify potential interdependences between suppliers and producers. Unfortunately these data are not available.

Finally, transition-specific determinants are incorporated to control for the individual transition progress of the former centrally planned economies. Empirical studies mostly implement risk indicators and variables reflecting the level of privatization and the degree of openness, which generally seem to play an important role in explaining the distribution of FDI across transformation economies (for example, Resmini, 2000; Bevan and Estrin, 2004; Janicki and Wunnava, 2004; Merlevede and Schoors, 2004; Smarzynska, 2004; Holland and Pain, 1998). Therefore, variables reflecting economic stability (*infl)*, political risk (*risk*) and the level of privatization (*priv*) are considered as potential determinants of FDI. A detailed description of the variables and the respective sources are provided in Table A4 in the Appendix.

3. ECONOMETRIC SPECIFICATION

3.1 Data

To reflect foreign investment operations of MNEs, we follow Devereux and Griffith (2002) and rely on FDI inward stock data grouped according to the main economic activities of the host company. The data are obtained from the WIIW (2015) database on FDI in central, east and south-east Europe and are based on company surveys reporting FDI stocks to host countries' Central Banks. The data represent the value of assets held by a foreign investor at a specific reference date each year. The data constitute a panel dataset of eight countries[11] and cover the period of 1998– 2014. They are grouped according to the NACE classification at the one-digit level for the service sector and at the two-digit level for the manufacturing sector.[12] Overall, FDI stocks of 20 industries are available which account for 90 percent of total inward FDI into the NMS-8. This results in 160 country-industry groups, each observed within a 7-year period. Five of them are dropped because of some missing data points of FDI stocks[13] yielding a balanced panel dataset including overall 1,085 observations.

3.2 The model

Based on the theoretical model and the structure of the dataset, the empirical specification reads:

$$y_{ijt} = c + \alpha y_{ijt-1} + X_{it}\,\beta + \gamma z_{ijt} + \delta\, t_t + u_{ijt}\ , \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

where i denotes the country dimension $i = 1, 2,\ldots,8$; j reflects the industry $j = 1, 2,\ldots,20$ and t denotes the time dimension $t = 1, 2,\ldots,7$. The dependent variable y_{ijt} is the stock of FDI, y_{ijt-1} is the 1-year lagged FDI stock, X_{it} are the regressors varying over country and time (for instance, inflation), z_{ijt} is the agglomeration variable varying over all three dimensions and t_t are time dummies reflecting common unobservable time effects. While y_{ijt-1} is correlated with the disturbance term u_{ijt}, the remaining regressors are assumed to be exogenous. Moreover, we assume:

$$u_{ijt} = \mu_{ij} + v_{ijt} \quad ,\ldots\ldots(5)$$

Where μ_{ij} denotes the unobservable country-industry-specific effect and v_{ijt} is the remainder disturbance. Both error components are assumed to be independent of each other having a mean of zero and variances σ_{μ}^2 and σ_{v}^2, respectively. The model is a dynamic triple-indexed specification with time constant individual random effects that capture unobservable country and industry characteristics not included in the regressors. In specification (4) the coefficients α , β and γ are assumed to be equal across service and manufacturing FDI. This assumption will be relaxed for the sector comparison in Section 4, such that the unrestricted model will be of the form:

$$y_{ijt} = c + \alpha_k \; y_{ijt-1} + X_{it} \; \beta_k + \gamma_k \; z_{ijt} + \delta_k \; t_t + u_{ijt} \quad ,\ldots\ldots(6)$$

where $k = 1, 2$ indicates the sector.

3.3 Estimator selection

While in a static random and fixed effects panel setting generalized least squares and fixed effects estimators can be applied, respectively, they are both biased in a dynamic setting with a small time period (Hsiao, 2003). Independently of whether individual effects are treated as random or as fixed parameters, any lagged dependent variable is correlated with the error term, thus creating an endogeneity problem. Several approaches were developed to overcome this problem. Under the assumption of serially uncorrelated errors, Anderson and Hsiao (1981)

propose an instrumental variables estimator. Taking first differences of the basic equation – thereby wiping out the individual effects – and instrumenting $\Delta\ y_{ijt-1}$ with y_{ijt-2}, results in consistent estimates of the necessary coefficients, as y_{ijt-2} does not correlate with $\Delta\, v_{ijt}$. However, as the first-differenced error term follows a first-order moving average process the estimator is not asymptotically efficient.

By considering the differenced error structure and exploiting additional instruments, Arellano and Bond (1991) propose a generalized method of moments (GMM) procedure to obtain efficient results. The proposed estimator, hereafter difference GMM, exploits all available lags in levels as instruments for the differenced variables. Yet, Blundell and Bond (1998) showed that if y_{ijt} is close to a random walk, difference GMM performs poorly because past levels contain little information about future changes. Instead, they propose adding additional moment conditions by using past differences for endogenous variables in levels and show that it improves efficiency. The resulting estimator, hereafter system GMM, has the additional advantage that time-invariant regressors can be estimated, which would be wiped out in difference GMM. As in our model specification the distance variable is time constant and the panel unit root test developed by Levin *et al.* (2002) indicates a high lag parameter of 0.826, the system GMM estimator is the appropriate choice for estimating the models outlined in equations (4) and (6). Furthermore, the system GMM estimator exploits the variability between industry-country groups which is necessary to consider when investment decisions between various locations are modelled.[14]

To control for arbitrary patterns of heteroskedasticity the feasible system GMM estimator is applied (Blundell and Bond, 1998). This two-step estimator is asymptotically efficient because it models the error structure more accurately. As the standard errors of the two-step estimation are typically downward biased in smaller samples, the finite-sample correction developed by Windmeijer (2005) is applied. The robust estimates assume that the idiosyncratic disturbances did not correlate across individuals. This assumption is quite reasonable as time dummies are included in the model (Roodman, 2006).

3.4 Estimation

Prior to the estimation, an outlier inspection is performed via box plot analysis reporting no severe outliers. Furthermore, variance inflation factors (VIF) are calculated to identify potential multicollinearity (MC). All values are found to be lower than six, suggesting that no severe MC effects are present. This result is strengthened by an inspection of the pairwise correlation coefficients being all below 0.80. The pre-estimation results are reported in Tables A1 and A2 in the Appendix.

The estimation is performed by applying a general-to-specific strategy for the restricted model. First, the complete model is estimated and the most insignificant variable is dropped from the model. If time dummies are jointly insignificant they are removed from the model first. Following this procedure, re-estimation yields a model with significant variables only, at least at the 10 percent level. After obtaining the specification for the restricted model, the estimation is performed allowing for different slope coefficients for the manufacturing and service sector. This is done by adding each significant variable twice, multiplied by the respective sector dummy. After that, the location variables that are insignificant in the restricted model are also multiplied by a sector dummy and are added to the unrestricted model one at a time. If one of these location factors turns out to have an impact on FDI it enters the unrestricted model as well.[15] Again, the threshold level is set at 10 percent. Finally, long-run estimates are obtained by dividing the parameter estimates by 1)a. This value corresponds to h in equation (3), which reflects the speed of adjustment coefficient.[16]

Given the potential existence of reverse causation regarding the location factors and FDI, we address the problem of endogenous regressors. For example, it can be presumed that labour costs are positively influenced by FDI as MNEs are likely to pay higher wages to attract labour force. Moreover, it is possible that FDI boosts GDP in the host country by means of productivity spillovers. Therefore, we follow Sun *et al*. (2002) and estimate an additional specification where the regressors enter in their one-period lags. The resulting coefficient estimates will be reliable given that the current endogenous regressors did not correlate with the future realization of the error term. If these coefficients do not differ substantially from the previous result we can infer that a potential bias due to reverse causality is negligible in our specification.

The feasible and robust system GMM estimator is implemented by using the xtabond2 command of the Stata software with the options *two-step robust*. The endogeneity of the lagged dependent variable is considered by including it in the GMM option, whereas the remaining exogenous regressors enter the IV option.

4. EMPIRICAL FINDINGS

The estimation results for the restricted model are reported in Table 1, specification (1). As the moment conditions are set up under the assumption of no serial correlation across disturbances, the differenced residuals should be correlated of order one but not of order two. This is supported by the Arellano–Bond tests reported at the bottom of Table 1. Moreover, as there are more instruments available than regressors, a Hansen test of overidentifying restrictions is reported as well, accepting the null hypothesis of valid instruments. This specification is robust to the exclusion of industries with respect to all variables except $risk_{it}$.[17] Therefore, we will drop $risk_{it}$ from the equation when estimating the unrestricted model. Specification (2) in Table 1 deviates from specification (1) in that it includes only one-period lagged regressors. Interestingly, the coefficient values of both specifications are quite similar indicating that the coefficient estimates of current period variables do not suffer from endogeneity problems.

Table 1. FDI stocks (in log): restricted specifications

Variable	**(1)**		**(2)**	
	Coefficient	**(SE)**	**Coefficient**	**(SE)**
lnstock $_{ijt-1}$	1 0.850***	(0.060)	0.872***	(0.053)
lngdp $_{it}$	0.166**	(0.069)		
ulc $_{it}$	0.377***	(0.091)		
risk $_{it}$	0.011**	(0.005)		
agglo $_{ijt}$	0.008**	(0.003)		
Intercept	0.423*	(0.245)		
lngdp *it*			1 0.129**	(0.069)
ulc $_{it-1}$			0.426***	(0.114)
risk $_{it-1}$			0.011*	(0.006)

agglo $_{ijt\text{-}1}$		0.007**	(0.003)
Intercept		0.296	(0.199)
N	(930)		(930)
Time dummies $\boldsymbol{x}^2_{(5)}$	36.91***		40.49***
Hansen test $\boldsymbol{x}^2_{(19)}$	17.39		17.10
Arellano-Bond AR(1) z	-2.85***		-2.82***
Arellano-Bond AR(2) z	1.14		1.06

Note: Significance levels: *10 percent, **5 percent, ***1 percent.

Based on specification (1) we can summarize the results as follows: The coefficient of the lagged dependent variable is significant and high with an elasticity of 0.85. It seems that FDI is highly persistent and adjusts rather slowly to the desired level. The lag parameter of 0.85 lies slightly above the upper bound of the results found in Kinoshita and Campos (2006). Based on aggregate FDI stock data for 24 transition economies they report significant lag coefficients ranging from 0.73 to 0.80.[18]

As expected, market-seeking factors seem to affect the location decisions of FDI into the NMS-8. An increase in GDP by 1 percent results in an increase of investment by 0.17 percent, which corresponds to €1.17m of FDI stocks.[19] In terms of efficiency-seeking variables, real unit labour costs are a relevant location factor too. A rise in ulc by one percentage point leads to a decrease in FDI by 0.38 percent. The negative response of investment decisions on labour costs is in line with several other studies investigating determinants of FDI into central and eastern European countries (for example, Bevan and Estrin, 2004; Carstensen and Toubal, 2004; Bellak et al., 2008). While corporate tax rates are found to deteriorate FDI in some studies, they are not significant in our specification. This can be due to the fact that bilateral tax regulations are not captured by the considered tax variable as our dataset does not reveal the home country of investment (Bellak and Leibrecht, 2008).

In terms of transition-specific country characteristics only political risk seems to be a relevant determinant of FDI, whereas inflation and the privatization level are insignificant. As inflation has already been at a low level in the NMS-8 for the considered period and the privatization

process has almost ended, these variables could no longer exert any influence on investment decisions. By contrast, political risk was quite unequally dispersed between countries and has improved much during the last years within all countries. Thus, the development in political stability, which is reflected by lower values of the risk indicator, influenced FDI significantly for the considered period. However, as this variable shows a high convergence within the NMS-8, it is not assumed to play a decisive role in future. Indeed, if the year 2004 is excluded from the sample, the risk parameter becomes robust to the exclusion of industries.

The degree of industrial concentration within a country appears to be a significant location factor as well. If the variable reflecting agglomeration economies rises by one percentage point the stock of FDI increases by about 1.0 percent. Surprisingly, both variables reflecting transportation costs do not enter the econometric model significantly. This might be due to measurement problems of transportation expenditures. As tariffs are only a fraction thereof and were already brought down to a very low level, they might be a poor indicator, in general. While distance appears to deter investment flows in gravity-type models, it cannot explain the variance in FDI stocks in our specification. The reason for this is probably the low number of observations. Distance is not only time invariant as in typical gravity type models, but it cannot be observed bilaterally as data on the investor country are not available.

4.1Sector comparison

In order to investigate whether the relevant location factors differ across sectors, specification (1) in Table 1 is re-estimated allowing for different slope parameters between manufacturing and services FDI. Additionally, we check whether the location factors excluded in the first step turn out significant in the unrestricted model. The results are reported in Table 2. First, the location factors that have no impact on FDI according to the restricted model (that is, specification (1) in Table 1) are also insignificant in the unrestricted model. Second, the reported chi-squared statistic on the equality of slope parameters indicates that two of four variables – lnstock $_{ijt\text{-}1}$ and lngdp $_{it}$ – differ significantly across the two sectors. Third, ulc $_{it}$ are not significant for services FDI. The corresponding tests at the bottom of the table again support the validity of the moment conditions.

In line with our expectations, the parameter reflecting the speed of adjustment to the desired investment level lnstock $_{ijt\text{-}1}$ is significantly lower in the service sector. While investment in manufacturing industries takes around five years to converge to the targeted level, service sector FDI already reaches its equilibrium level within two years.[20] As investment into the manufacturing sector exhibits a considerable proportion of fixed capital, higher installation costs

Table 2. FDI Stocks (in log): sector comparison

Variable	**Short run**			**Long run**		
	Manuf.	**Service**	$\boldsymbol{x_1^2}$	**Manuf.**	**Service**	$\boldsymbol{x_1^2}$
lnstock $_{ijt\text{-}1}$	0.839***	0.628***	9.40***			
	(0.089)	(0.092)				
lngdp $_{it}$	0.227**	0.355***	10.47***	1.408***	0.954***	2.31
	(0.099)	(0.101)		(0.253)	(0.131)	
ulc $_{it}$	-0.243***	-0.271	0.01	-1.504*	-0.729	0.44
	(0.095)	(0.364)		(0.853)	(1.032)	
agglo $_{ijt}$	0.008*	0.014***	1.23	0.052***	0.037***	1.47
	(0.005)	(0.005)		(0.008)	(0.009)	
intercept	0.584*	-0.584*	—	-3.618***	-1.570***	4.49**
	(0.301)	(0.301)		(0.848)	(0.580)	
N	930					
Time d, $\boldsymbol{x^2_{(5)}}$	17.99***			3.73	10.17*	
Hansen $\boldsymbol{x^2_{(38)}}$	41.27					
A.-B. AR (1) z	-3.20***					
A.-B. AR (2) z	0.92					

Note: Standard errors in parentheses. Significance levels: *10 percent, **5 percent, ***1 percent.

are likely to be responsible for the long adjustment path. By contrast, service firms have their competitiveadvantage in intangible assets that are less capital intensive [21] (UNCTAD, 2004) and may therefore reach their desired investment stock much faster.

Moreover, the estimated coefficients for ulc $_{it}$ confirm that labour cost advantages across countries do matter only for FDI into the manufacturing sector, which is, in contrast to the service sector, mainly characterized by the tradability of produced goods. For service firms that basically sell their products on the local market, this parameter is insignificant. Accordingly, services FDI is significantly more attracted by a large market size. However, this applies only if we look at the short-run effects. Dividing the coefficient estimates on market size by the respective speed of adjustment parameters (1- α_k)creates a reversed picture. Although not significantly different, manufacturing FDI exhibits a higher elasticity with respect to lngdp $_{it}$ compared with services FDI. This diverse long-run pattern emerges due to the much longer adjustment period of manufacturing FDI, where the addition of the single elasticities in each period results in an alignment of the market size effects across sectors.

The same pattern applies to agglomeration economies, where services FDI seems to respond more heavily compared with manufacturing FDI in the short run but reacts contrary in the long run. However, neither difference is statistically significant, indicating that the concentration of industries is equally important for both sectors. As our measure does not discriminate between different agglomeration forces this result may be driven by the predominance of knowledge spillovers in the service sector on the one hand, and backward and forward linkages in the manufacturing sector on the other hand. However, to verify this presumption would require information based on a more disaggregated level, which is beyond the scope of this paper.

Table 3. FDI Stocks (in log): sample split into sub-periods

Variable	**Short run**		**Long run**	
	1998–2001	**2002–2004**	**1998–2001**	**2002–2004**
lnstockijt)	1 0.722***	0.860***		
	(0.145)	(0.110)		
Lngdpit	0.306**	0.157	1.103***	1.127***
	(0.148)	(0.132)	(0.193)	(0.138)
ulcit	-0.542***	-0.349**	-1.953**	-2.499
	(0.213)	(0.151)	(0.899)	(1.655)
riskijt	0.016	0.016***	0.058	0.114

	(0.013)	(0.009)	(0.036)	(0.071)
aggloijt	0.016**	0.007	0.059***	0.051***
	(0.008)	(0.006)	(0.009)	(0.009)
Intercept	-0.927*	-0.541	-3.337***	-3.872***
	(0.517)	(0.432)	(0.696)	(0.678)
N	465	465	465	465
Time d, $x^2_{(3)}$	6.45*	21.83***	1.44	1.57
Hansen, $x^2_{(4)}$	6.25	41.27		
A.–B. AR(1) z	-2.75***	-2.78***		
A.–B. AR(2) z	1.12	1.21		

Note: Standard errors in parentheses. Significance levels: *10 percent, **5 percent, ***1 percent

Summing up, services FDI seems to be driven by different determinants compared with FDI in the manufacturing sector. Hence, controlling for sectoral differences might be important for analysing location factors at the aggregate level. In particular, as the share of FDI into the service sector is growing it is presumable that the identification of location factors at the aggregate level might neglect the importance of labour costs for the distribution of manufacturing FDI across Eastern European countries. This presumption can be illustrated by means of our sample, which we therefore split into two sub-periods. The first sub-period (1998–2001) is characterized by a lower share of FDI into the service sector while the second sub-period (2002–2004) to last sub-period (2012-2014) exhibits a higher share of services FDI. Based on these two samples, we re-estimate specification (1) outlined in Table 1 and report the respective results in Table 3. While the coefficients on the lagged FDI stock variable are not significantly different across the two sub-samples, [22] the results with respect to the labour costs variable clearly support our prediction. In the period from 1998 to 2001 where the share of services FDI was lower, unit labour costs had a strong long-run impact on FDI. This impact is not observable for the period from 2002 to 2004 and from 2005 to 2014 where this share became higher.

5. CONCLUDING REMARKS

The observed global shift of FDI towards services is recently reflected by the investment activities into the NMS-8, where FDI inward stocks in the service sector have been predominant

since 1998. A large and growing literature analyses the determinants of FDI into these countries, including several firm-level studies focusing on the manufacturing sector. In this paper we also observe the service sector and investigate whether service and manufacturing FDI respond differently with respect to host country location factors. To control for the persistence of FDI stocks we follow Cheng and Kwan (2000) and apply a partial stock adjustment model, which provides an insight into the dynamics of FDI into both sectors.

Our findings support the hypothesis that services FDI adjusts much faster to its desired stock level than FDI into the manufacturing sector. As the service sector is less capital intensive lower installation costs are likely to be responsible for the observed investment behaviour. This short adjustment period implies that location factors exhibit a much higher part of their long-term impact on services FDI already within one year. Accordingly, government interventions to attract FDI are likely to boost the service sector immediately and to impact rather slowly but effectively on the manufacturing sector in the long run. The observed difference in the adjustment period corresponds to the findings of Kinoshita and Campos (2006) who observe a higher persistence of FDI for a subgroup of transition economies receiving FDI predominantly in the manufacturing sector.

In terms of host country location factors our results favour the assumption that due to the limited tradability of many services unit labour costs are not a relevant parameter for deciding in which of the transition countries services FDI is undertaken. As services are mainly sold where they are produced, investors in this sector are not that exposed to international price competition as they are in the manufacturing industry. The observed importance of labour costs for manufacturing FDI into the NMS-8 is supported by various studies that focus on FDI determinants into this sector (e.g., Pusterla and Resmini, 2007; Bekes, 2005). However, the ongoing development in telecommunication technologies is likely to improve the tradability of services such that labour cost differences across host countries are likely to become relevant in this sector as well.

As expected, market size measured by GDP exhibits a significantly higher influence on services FDI compared with to FDI in the manufacturing sector. This, however, applies only to the short run. Due to the long adjustment period of manufacturing FDI to its desired level, the total impact

of market size aligns across sectors. Accordingly, an increase in GDP exerts a much higher part of its total impact on services FDI within the first period while it affects manufacturing FDI rather smoothly. Furthermore, agglomeration economies measured by industry concentration are found to impact equally on services and manufacturing FDI.

Foot Notes:

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2. For a broad literature review on FDI determinants see, for example, Bloningen (2005).

3. These include Kolstad and Villanger (2008) who perform a panel analysis of the whole service sector at the industry level and Yamori (1998) who focuses on the financial sector.

4. Czech Republic (CZ), Estonia (EE), Hungary (HU), Latvia (LV), Lithuania (LT), Poland (PL), Slovakia (SK) and Slovenia (SI).

5. Kinoshita and Campos (2006) take a similar approach to investigating FDI determinants at the aggregate level for a panel of transition economies. For econometric details, see Verbeek (2004) or Hendry (1995).

6. For studies investigating FDI determinants in transition economies at the aggregate level, see, for example, Bevan and Estrin (2004) and Carstensen and Toubal (2004) and for firm-level studies on manufacturing FDI, refer to Walkenhorst (2004), Bekes (2005), Pusterla and Resmini (2007) and Resmini (2000).

7. For a detailed discussion on the appropriate measurement of labour costs and a comprehensive survey on FDI and labour costs into the CEECs, see Bellak et al. (2008).

8. For a survey on the taxation effects on FDI flows, see DeMooij and Ederveen (2003) and for a special focus on transition economies Bellak and Leibrecht (2008).

9. As the underlying sectoral database does not reveal the home country of FDI, the integration of a variable reflecting transportation costs is non-trivial. In gravity-type models the distance between the home and the host country is used to proxy transportation costs, which appear to be an important determinant of FDI (e.g., Demekas et al., 2007; Bevan and Estrin, 2004). We will therefore measure transportation costs by the time a lorry needs to drive from the capital city of the respective host country to Brussels, the centre of western Europe (IRPUD, 2000), to capture relative distances.

10. While in Hungary, for example, the concentration of the electrical and optical equipment industry (dl) equals 26.2 percent it accounts only for 7.4 percent in Poland.

11. HU, SL, SI, CZ, LT, LV, EE and PL.

12. A detailed list of industries is provided in Table A3 in the Appendix.

13. The country–industry groups that are dropped are cz-dc, pl-dc, pl-de, pl-di and sl-f.

14. For a discussion on difference and system GMM, see Baltagi (2005).

15. Note that we do not apply a general-to-specific strategy for estimating the unrestricted model as this could result in fairly non-robust results due to potential multicollinearity problems. These may arise as country-specific location factors do not vary over sectors.

16. See Gujarati (2003) for a discussion on auto-regressive models.

17. If the industries dm, e, f and j are removed from the sample, the risk parameter becomes insignificant

18. Carstensen and Toubal (2004) also employ a dynamic model of aggregate FDI into transition economies. However, their results are not comparable with ours as they investigate FDI flows instead of stocks. Thus, the parameter of the lagged variable does not reflect the speed of adjustment to an equilibrium capital stock level but at best indicates that investors mimic location decisions of previous investment operations. Accordingly, the corresponding estimates in their study are much lower, ranging between 0.19 and 0.35.

19. This is calculated by taking the overall mean of the FDI stock, which is €704.48 million

20. The average period of adjustment is expressed by the mean lag following Hendry (1995) which is a/(1)a). This yields an adjustment period of 5.2 years for manufacturing FDI and 1.7 years for services FDI.

21. The bulk of services FDI into the NMS-8 goes to financial intermediaries, wholesale, retail trade and real estate (WIIW, 2006).

22. The 95 percent confidence intervals of the respective coefficients overlap.

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