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Austrian FDI in Central-Eastern Europe and Employment in the Home Market

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This paper investigates the impact of Austrian foreign direct investment on domestic employment in five new EU member states from Central and Eastern Europe (NMS5). We estimate both a static and a dynamic labour demand model using sector data for the period 1993–2004 where domestic employment depends on value added, real wage, the net capital stock and time effects. In particular, we investigate the potential complementary/substitutive relationship between domestic and foreign affiliate employment of Austrian multinationals, disaggregated by two partner regions (that is, EU15 and NMS5). Estimates obtained using the static fixed-effects model show that domestic employment effects of foreign activities depend on the sector and the partner country (or region) considered. For the service sector we find a complementary relationship between domestic employment and employment in the foreign affiliates in Central and Eastern Europe, while for the manufacturing sector a substitutive relationship prevails. Estimates of the dynamic labour demand panel model indicate a substitutive relationship, but the effect is statistically insignificant. Overall, the resulting substitution effects are very small.

JEL Codes: F23, F21, J23.
Keywords: foreign direct investment, multinational firms, labour demand, labour substitution.

1 Introduction

Since the beginning of the nineties, Austria has become one of the most important foreign direct investors in the Central and Eastern European Countries (CEEC).[1] Employment in Austrian affiliates located in the CEEC increased from 50,000 to 266,000 in the period 1993–2004. In 2004, the employment share of foreign affiliates of Austrian multinationals in the CEEC as a share of total foreign employment was about 72 percent, which was the highest share among all OECD countries. Austrian FDI in the CEEC region has been strongest in the five new EU Member States

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1 The group of Central and Eastern European Countries comprises: Albania, Belarus, Bosnia-Herzegovina, Bulgaria, the Czech Republic, Croatia, Estonia, Hungary, Latvia, Lithuania, Macedonia, Moldavia, Poland, Serbia, Romania, Russia, the Slovak Republic, Slovenia, and the Ukraine.

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(NMS5), which include the Czech Republic, Hungary, Poland, the Slovak Republic, and Slovenia. While outward FDI has provided important impetus to the internationalisation process of Austrian firms and proven to be an important source of competitive gains, firm growth, and restructuring, the strong foreign involvement of Austrian firms in the CEEC has also given rise to fears that the relocation of labour-intensive production to low-wage countries could "export jobs" and reduce employment at home.

From theoretical as well as many empirical studies on FDI, we know that much of the effect on the home economy depends on the type of FDI and on the industry involved (HELPMAN and KRUGMAN 1995). The predictions derived from theoretical models of international trade that explicitly model internationalisation through FDI (as a substitute or as a complement to exports) are far from clear-cut. To a large extent, the income and employment effects of FDI in these models depend on the specific type of the relationship between FDI and exports. One major distinction is that between horizontal and vertical multinational activities. While most theories predict substitutive effects for horizontal FDI, the impact of vertical FDI often associated with cost savings is *a priori* even less clear. Relocation of production to low-cost locations may replace exports and thereby put downward pressure on wages; it may also lead to unemployment or to shifts in the structure of labour demand and income distribution (skilled vs. unskilled employees). On the other hand, FDI can generate additional exports for parent companies (for instance, input for affiliates' foreign production or due to investments in distribution networks, service functions, or marketing) and increase productivity and international competitiveness of the end product, thereby creating additional jobs or securing those already in existence.

In this paper, we estimate both a static and a dynamic labour demand model based on a panel of industries for Austria covering the period 1993–2004. Employment is a function of real wages, real value added, net capital stock, and foreign affiliate employment, disaggregated by two main partner regions (EU15 and NMS5). However, apart from analysing a different period of time, our analysis goes beyond previous work in a number of ways. First, we allow for separate effects in the manufacturing and service sectors and are thus able to single out important differences between industries. Second, to test for the robustness of our findings, we estimate a dynamic panel data model. To our knowledge, this is the first study to use a dynamic panel model to investigate the effects of foreign affiliate employment in the new Member States on domestic employment.

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A first glance at the data shows that employment in Austrian foreign affiliates has developed very dynamically over the 10-year period examined. From 1993 to 2004, employment in Austrian affiliates located in the CEEC increased by an annual average rate of 16.3 percent, keeping strong even in more recent years. Thus, between 1999 and 2004, foreign employment of domestically based firms in the CEEC still expanded at a rate of 15.8 percent. Affiliate employment growth in the period 1993–2004 was also strong in other locations: In the EU15, it amounted to 7.1 percent per year; in other OECD countries (for example, North America, Japan) 15.6 percent; and in the rest of the world (China, India, and other emerging and developing countries outside of Europe) 12.6 percent. As a result of this development, the regional structure of affiliate employment changed markedly. While the share of foreign employment in the EU15 shrank significantly, the Austrian affiliates' CEEC share of total employment increased from 55 percent in 1993 to 72 percent in 2004. A very high share indeed, even when judged from an international perspective. As a comparison, German multinationals account for only 17 percent of total foreign employment in the CEEC.

The structure of this paper is as follows: Section 2 reviews previous empirical studies, while section 3 introduces the empirical model and the hypotheses. Section 4 presents the data and stylised facts, followed by a discussion of the empirical results in section 5. Some concluding remarks are provided in section 6.

2 Prior Empirical Evidence

There are a number of studies on the employment effects of outward FDI that yield no conclusive results. There is still much controversy about the sign and the magnitude of the effects. For Austria, ALTZINGER and BELLACK (1999) investigate the impact of both parent company sales and foreign affiliates sales in the CEEC on domestic employment. The authors find a negative impact of foreign sales on domestic employment, indicating that outward FDI reduces employment at home. In contrast, ALTZINGER (2002) reports that employment growth in Austrian multinationals with direct investments in the CEEC in the period 1989–1995 was about nine percentage points above the employment growth of a reference group of multinationals that had not directly invested in the CEEC. Based on industry data for manufacturing for the period 1990–1996, PFAFFERMAYR (2001) finds that employment in Austrian affiliates located in Western European countries substituted for employment at home, while foreign employment in Central and

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Eastern Europe was independent of wage differences and thus complementary to domestic employment.

Evidence for other industrialised countries also fails to provide a clear picture of the relationship between domestic employment and employment abroad. Empirical studies of the US show that parent company employment and foreign affiliate employment are substitutes, but the effects are quite small (BRAINARD and RIKER 1997). A recent study based on firm-level data on the manufacturing sector in Sweden and Germany finds a substitutive relationship between employment at home and in foreign affiliates in the CEEC (BECKER et al. 2005). However, the authors also find that the substitution effect is stronger within high-wage countries than between Germany and the CEEC. This is consistent with the results obtained by KONINGS and MURPHY (2006) based on the AMADEUS firm-level database for both manufacturing and non-manufacturing, which includes 13 EU countries for the period 1993–1998. BRACONIER and EKHOLM (2000) also find that labour substitution is more likely to occur with affiliates in high-income countries than in low-income countries. Using firm-level data for Austria and Germany, MARIN (2004) finds that affiliate employment in Central and Eastern Europe and employment in the parent company are substitutes. The authors estimate that increased FDI abroad has decreased the number of employees in Germany and Austria by 89,000 and 22,000, respectively. According to a study conducted for the European Commission using the AMADEUS firm-level database for the manufacturing sector in France and Belgium, employment between the parent and its affiliates in the EU15 is complementary (EC 2005). However, there is a substitutive relationship between employment in the parent company and its affiliates in the CEEC, but the magnitude of the elasticity is quite small.

3 The Empirical Model of Labour Demand

The empirical model is based on the standard labour demand model augmented by net capital stock and foreign affiliate employment (log-level specification):

$$l_{it} = \alpha_i + \alpha_1 y_{it} + \alpha_2 (w-p)_{it} + \alpha_3 k_{it} + \alpha_{4j} la_{itj} + \alpha_5 t + u_{it},$$

with (j)=1,2 partner regions; (t)=1993,..., 2004 und (i)=1,..., 20 industries. Variables are defined as follows:

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la_{ijt}: employment in foreign affiliates by partner region,
l_{it}: domestic employment,
$(w-p)_{it}$: compensation per employee divided by the value added deflator,
y_{it}: real value added in constant prices,
k_{it}: net capital stock in constant prices.

The parameters α_1 and α_2 are output and wage elasticities, respectively. The parameters α_3 and α_4 denote the impact of net capital stock and foreign affiliate employment. In order to allow for parameter heterogeneity across industries we add an interaction term between foreign affiliate employment and the dummy variable for services:

$$l_{it} = \alpha_i + \alpha_1 y_{it} + \alpha_2 (w-p)_{it} + \alpha_3 k_{it} + \alpha_{4j} la_{itj} + \alpha_{5j} la_{itj} \cdot Dser + \alpha_6 t + u_{it},$$

where *Dser* is a dummy variable equal to 1 if the industry is part of the service sector and zero otherwise. If the interaction term is not statistically significant, the interaction term can be dropped and the model re-run with just the main effect. However, if the interaction term is significant, there are different slopes for manufacturing and services. The labour demand model can be estimated by the two fixed effects models with heteroskedasticity-robust standard errors.

In order to allow for a more general specification, we introduce the lagged dependent variable into the labour demand model:

$$l_t = \alpha_0 + \lambda l_{it-1} + \tilde{\alpha}_1 y_{it-1} + \tilde{\alpha}_2 (w-p)_{it-1} + \tilde{\alpha}_3 k_{it} + \tilde{\alpha}_{4j} la_{ijt} + \tilde{\alpha}_5 t + u_t,$$

which can be specified alternatively as:

$$\Delta l_t = \alpha_0 - (1-\lambda) l_{it-1} + \tilde{\alpha}_1 y_{it-1} + \tilde{\alpha}_2 (w-p)_{it-1} + \tilde{\alpha}_3 k_{it} + \tilde{\alpha}_{4j} la_{ijt} + \tilde{\alpha}_5 t + u_t,$$

where $\tilde{\alpha}_1$, $\tilde{\alpha}_2$, $\tilde{\alpha}_3$ and $\tilde{\alpha}_4$ are the short-run elasticities. The long-run elasticities can be obtained by dividing the short-run coefficient by the adjustment coefficient. For instance, the long-run coefficient of foreign affiliate employment with respect to domestic employment can be obtained as $\tilde{\alpha}_4/(1-\lambda)$. The estimation equation and moment conditions can be estimated by first-differenced GMM (Generalised Method of Moments), which was developed by ARELLANO and BOND (1991). However, conventional GMM estimation, also developed by ARELLANO and BOND (1991), exhibits a major drawback if the explanatory variables display persistence over time – as is the case with variables such as employment. In this case, their lagged levels

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may be very poor instruments for their differences. BLUNDELL and BOND (1998) show that the first-differenced GMM panel estimator performs poorly when the time series are persistent and small in number, which is typically the case in empirical growth models. To reduce the potential bias and imprecision associated with the difference estimator, an alternative system GMM estimator is suggested by ARELLANO and BOVER (1995) and implemented by BLUNDELL and BOND (1998). The system GMM estimator combines the regression equation in first differences – instrumented with lagged levels of the regressors – with the regression equation in levels, instrumented with lagged differences of the regressors.

4 Data and Stylised Facts

In the empirical analysis, we combine data from the National Accounts with data on Austrian FDI from the Austrian foreign affiliate database of the AUSTRIAN NATIONAL BANK (OeNB).[2] For reasons of secrecy, however, information is only available for a limited number of countries/regions. Domestic employment, value added in constant prices, and real wages were drawn from the National Accounts database. The data on net capital stock is from the EUKLEMS database. Empirical estimation would ideally be performed on the basis of individual data from the FDI survey of the Austrian National Bank. To date, however, we do not have access to the firm-level database. Therefore, we must perform our estimations at the industry level. A detailed description of the data and the various data sources are summarised in Table 1.

Table 1: Summary statistics

	Mean	Std. dev.
ln compensation (constant prices) per employee	1.4	3.9
ln value added (constant prices)	2.2	5.0
ln net capital stock (constant prices)	1.1	2.1
ln foreign affiliate employment	12.2	29.0
ln foreign affiliate employment in EU15	6.9	39.2
ln foreign affiliate employment in NMS5	11.0	28.0

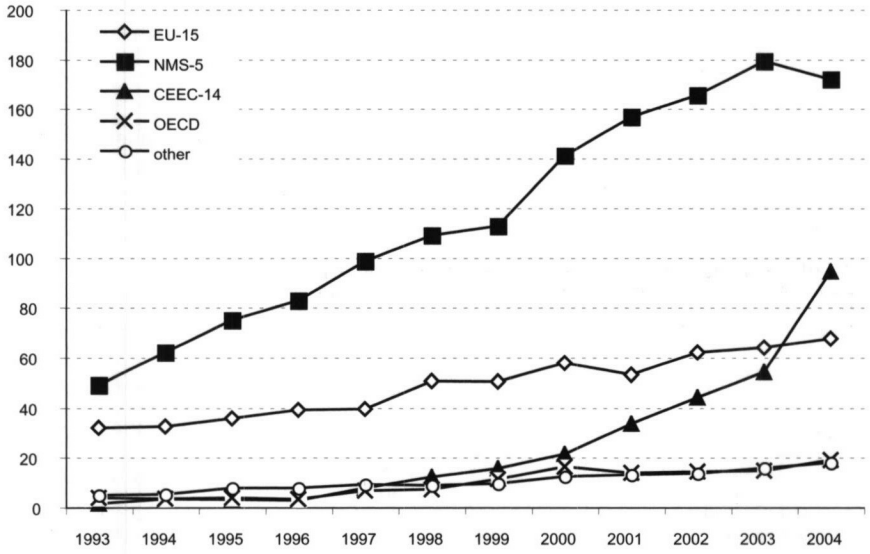
Source: OeNB and Statistic Austria.

2 We especially thank Dr. RENE DELL'MOUR for preparing the data for us.

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Figure 1 displays data on the development of employment in foreign affiliates across different foreign destinations, which were grouped into five different regions (EU15, NMS5, CEEC14, OECD, and other countries). As expected, employment in foreign affiliates located in the NMS5 developed very dynamically up until 2003 but has slowed down recently. In the CEE C14, however, growth of affiliate employment remains strong. Unreported results show that foreign affiliate employment in the period 1993–2004 has been higher for the services sector than for manufacturing.

Figure 1: Evolution of affiliate employment by area



Explanatory notes: NMS5: Czech Republic, Hungary, Poland, Slovak Republic, Slovenia; CEEC14: Albania, Belarus, Bosnia, Croatia, Estonia, Latvia, Lithuania, Macedonia, Moldavia, Romania, Russia, Serbia, Ukraine.

Source: OeNB.

In contrast to the dynamic development in foreign affiliates, employment at home has been shrinking in a number of industries, feeding public fears that further growth of outward FDI to the CEEC would lead to increased "job exporting". Very often, the increase in jobs in foreign affiliates is related to employment losses in the manufacturing sector at home: Over the period 1993–2004, we find a reduction of 74,000 manufacturing jobs. At the same time, manufacturing employment in foreign affiliates located in the NMS5

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increased by 44,000. Our own calculations, however, suggest that while employment at home and employment in foreign affiliates in the new Member States are positively correlated, the coefficient is not statistically significant. This is true for all industries (see figure A1 in the appendix). The increase of foreign affiliate employment in the NMS5 can be observed in all industries except the energy sector. The largest increase of foreign affiliate employment in the NMS, with growth rates of 10 percent or more, can be observed in the chemical industry, the electrical and optical equipment industry, transport and communications, financial intermediation, and the business services sector.

Table 2: Descriptive statistics: Average annual change of the variables in percent

	foreign affiliate employment			domestic employment	labour costs const. prices	value added const. prices	net capital stock
	total	EU15	NMS5				
Mining and quarrying	40.1	.	12.7	-1.5	0.8	1.5	-1.8
Food and beverages	4.3	12.6	0.1	-1.9	3.3	2.5	-0.4
Textiles, wearing apparel and leather	5.4	0.2	10.5	-4.8	2.4	-0.9	-2.1
Wood	10.5	1.9	20.4	-1.0	1.7	4.0	1.4
Pulp and paper, printing	6.6	2.4	7.0	-0.2	1.1	4.5	3.3
Chemicals, fuels, rubber and plastics	14.4	4.4	4.3	-0.5	1.6	4.1	0.3
Non-metallic minerals	12.6	16.4	5.1	-0.3	0.3	0.7	-0.1
Metal and metal products	6.4	1.7	8.8	0.0	-0.7	2.9	0.8
Machinery	8.7	13.7	6.6	0.6	1.9	3.4	1.1
Electrical and optical equipment	17.0	10.5	16.3	-2.0	3.3	2.5	2.4
Transport equipment	9.2	3.6	16.1	1.2	2.9	7.0	1.7
Manufacturing	26.6	-0.4	28.5	-1.8	1.0	2.1	1.3
Energy	5.0	-13.2	-8.7	-1.2	4.9	3.6	-0.8
Construction	6.5	13.6	-1.7	-0.4	0.5	2.0	0.2
Wholesale and retail trade	14.8	10.9	11.9	0.5	1.5	2.8	2.6
Hotels and restaurants	-1.7	-21.5	9.1	1.2	-1.4	1.4	1.9
Transport and communication	21.5	10.1	15.2	0.3	1.3	1.6	2.5
Financial intermediation	23.5	-10.8	25.8	-0.2	1.1	0.9	3.6
Business services	25.8	16.3	30.8	5.9	-2.7	3.7	3.9
Other services	10.1	5.2	6.3	1.4	-0.1	1.0	0.9
Mean	13.4	4.1	11.3	-0.2	1.2	2.6	1.1

Source: OeNB and Statistic Austria.

5 Estimation Results

Table 3 summarises the fixed-effects results of the labour demand equation specified earlier. Specification (i) includes total foreign affiliate employment as the measure of outward FDI, whereas specifications (ii) and (iii) include foreign affiliate employment in the EU15 and the NMS5 countries, respectively. We also examine parameter heterogeneity across industries by adding an interaction term between the dummy variable for services and

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the foreign affiliate employment variable (see table 4). In all specifications, we find that the wage and output elasticities have the expected sign and are significant at the one-percent level. The wage elasticities range between −0.57 and −0.66, while the output elasticities range between 0.42 and 0.47.

Table 3: Fixed-effects results of the static labour demand model

	(i)			(ii)			(iii)		
	Coeff.		t	Coeff.		t	Coeff.		t
ln value added (constant prices)	0.442	***	7.58	0.469	***	7.05	0.465	***	7.85
ln compensation (constant prices) per employee	-0.570	***	-7.29	-0.613	***	-7.48	-0.660	***	-8.87
ln net capital stock (constant prices)	0.433	***	6.45	0.390	***	4.72	0.460	***	5.43
ln foreign affiliate employment	0.001		0.07						
ln foreign affiliate employment in EU15				0.003		0.48			
ln foreign affiliate employment in NMS5							0.003		0.16
Year dummy 1994	-0.012		-0.52	-0.012		-0.47	-0.004		-0.15
Year dummy 1995	-0.025		-1.09	-0.020		-0.86	-0.012		-0.52
Year dummy 1996	-0.048	**	-2.22	-0.042	*	-1.87	-0.036		-1.62
Year dummy 1997	-0.058	***	-2.73	-0.053	**	-2.33	-0.050	**	-2.09
Year dummy 1998	-0.055	***	-2.61	-0.048	**	-2.19	-0.048	**	-1.99
Year dummy 1999	-0.067	***	-3.00	-0.060	**	-2.55	-0.062	**	-2.54
Year dummy 2000	-0.088	***	-3.48	-0.083	***	-3.08	-0.085	***	-3.12
Year dummy 2001	-0.104	***	-3.81	-0.091	***	-3.09	-0.100	***	-3.45
Year dummy 2002	-0.119	***	-4.12	-0.106	***	-3.49	-0.115	***	-3.83
Year dummy 2003	-0.126	***	-3.99	-0.110	***	-3.52	-0.121	***	-3.73
Year dummy 2004	-0.129	***	-4.12	-0.116	***	-3.62	-0.123	***	-3.92
constant	-1.229		-1.50	-0.905		-0.90	-1.373	*	-1.67
R^2	0.839			0.857			0.852		
# of obs / # of industries	240/20			218/20			231/20		

Notes: *, ** and ***, statistically significant at the 10%, 5%, and 1% level, respectively. The table reports fixed-effects estimates, including year dummy variables and heteroskedasticity-robust standard errors. The dependent variable is log domestic employment by industry.

Net capital stock is also significant and positive, indicating that employment benefits from capital accumulation. The negative impact of the year dummies becomes stronger and highly significant over the course of the years, indicating that – holding constant production levels and labour costs – jobs are reduced year by year. The different measures of foreign affiliate employment are statistically insignificant. However, as shown in table 4, including the interaction between foreign affiliate employment and a dummy variable for service industries leads to a significant negative coefficient for total foreign affiliate employment, as well as for foreign affiliate employment in the NMS5. This result points to a substitutive relationship between employment in foreign affiliates and domestic employment. In contrast, the coefficient of the interaction term between foreign affiliate employment in the NMS5 and the dummy variable for service industries is positive (+0.12) and significantly different from zero, resulting in an elasticity of 0.07. For manufacturing, the estimated elasticity amounts to −0.05, implying that a one-

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percent increase in foreign affiliate employment results in a 0.05 percent decrease in domestic employment. Since the elasticity of substitution is close to zero, substitution between domestic and foreign employment is limited. In order to provide an idea of the size of the effect, one can compute the change in domestic employment that is due to the increase in foreign affiliate employment in the NMS5. Given the elasticity of -0.053 for the manufacturing sector and an average increase of foreign affiliate employment in manufacturing of 13.4 percent per year, the cumulated effect on parent company employment is –0.71 percent, or a reduction of 9,600 jobs for the period 1993–2004. This is considerably lower than the effect reported by MARIN (2004) who finds that outward FDI in Central and Eastern Europe has decreased the number of employees in Austria by 22,000.

Table 4: Fixed-effects results of the labour demand model including interaction terms for services

	(i)		(ii)		(iii)	
	Coeff.	t	Coeff.	t	Coeff.	t
ln value added (constant prices)	0.580 ***	10.17	0.470 ***	6.99	0.538 ***	10.37
ln compensation (constant prices) per employee	-0.552 ***	-10.73	-0.606 ***	-7.67	-0.519 ***	-9.24
ln net capital stock (constant prices)	0.141 *	1.97	0.390 ***	4.72	0.212 ***	2.68
ln foreign affiliate employment	-0.048 ***	-4.48				
ln foreign affiliate employment * dummy for services	0.115 ***	8.30				
ln foreign affiliate employment in EU15			-0.001	-0.05		
ln foreign aff. emp. in EU15 * dummy for services			0.005	0.31		
ln foreign affiliate employment in NMS5					-0.053 ***	-5.13
ln foreign aff. emp. in NMS5 * dummy for services					0.122 ***	9.28
Year dummy variables	yes		yes		yes	
R^2	0.84		0.85		0.84	
# of obs /# of industries	240/20		218/20		231/20	

Notes: * ,** and ***, statistically significant at the 10%, 5%, and 1% level, respectively. Fixed-effects estimates including year dummy variables. The dependent variable is log domestic employment by industry.

To test the robustness of the findings, we also present the estimation results of the dynamic labour demand model. Table 5 presents system GMM estimation results, while table 6 presents the system GMM estimation results for the labour demand equation that includes the interaction term between foreign affiliate employment and the dummy variable for services.

Output and wages are once again the most important determinants of domestic employment. An increase of value added by one percent increases employment by 1.4 percent. Wage elasticity is close to –1. Foreign affiliate employment in the NMS5 is negative, but not statistically significant. Table 6 shows that the interaction terms for foreign affiliate employment in the

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new Member States and services is negative and highly significant. This finding stands in contrast to the results obtained from the static fixed model, where we found no substitutability between domestic labour and foreign labour in the service sector. Since the dynamic labour demand model is more general than the static fixed effects model, the interpretation should focus on the dynamic panel data model. However, the substitution effects found for the service sector are negligible. An increase in foreign employment in the NMS5 by 10 percent results in a 0.3 percent reduction in employment at home.

Table 5: Dynamic panel data results of the labour demand model

	(i)		(ii)		(iii)	
	Coeff.	t	Coeff.	t	Coeff.	t
ln employment lagged	-0.057 ***	-2.98	-0.054 ***	-2.94	-0.058 ***	-3.42
ln value added (constant prices)	0.074 **	2.74	0.066 **	2.69	0.076 ***	3.04
ln compensation (constant prices) per employee	-0.061 ***	-3.98	-0.053 ***	-3.44	-0.058 ***	-4.11
ln net capital stock (constant prices)	-0.006	-0.81	-0.001	-0.14	-0.005	-0.75
ln foreign affiliate employment	-0.003	-0.98				
ln foreign affiliate employment in EU15			0.000	-0.22		
ln foreign affiliate employment in NMS5					-0.003	-1.15
Year dummy variables	yes		yes		yes	
Constant	-0.095 **	-2.49	-0.139 **	-2.57	-0.126 ***	-2.84
Long-run elasticities:						
ln value added (constant prices)	1.29 ***		1.15 ***		1.33 ***	
ln compensation (constant prices) per employee	-1.07 ***		-0.93 ***		-1.02 ***	
ln net capital stock(constant prices)	-0.10		-0.02		-0.09	
ln foreign affiliate employment	-0.05		-0.01		-0.06	
Arellano-Bond test for AR(1) (p-value)	0.02		0.03		0.01	
Arellano-Bond test for AR(2) (p-value)	0.83		0.67		0.32	
Sargan test (p-value)	0.41		0.43		0.43	
# of obs /# of industries	240/20		218/20		231/20	

Notes: * ,** and ***, statistically significant at the 10%, 5%, and 1% level, respectively. The table provides the results of the (one-step) system GMM estimator. t-values are based on the small sample correction of the variance estimates proposed by WINDMEIJER (2005) and are robust to heteroskedasticity. The dependent variable is the change in log domestic employment by industry.

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Table 6: Dynamic panel data results of the labour demand model

	(i)			(ii)			(iii)		
	Coeff.		t	Coeff.		t	Coeff.		t
ln employment lagged	-0.070	***	-4.31	-0.074	***	-4.04	-0.071	***	-3.81
ln value added (constant prices)	0.098	***	3.87	0.101	***	3.77	0.100	***	3.55
ln compensation (constant prices) per employee	-0.070	***	-4.83	-0.077	***	-4.65	-0.076	***	-4.76
ln net capital stock (constant prices)	-0.009		-1.27	-0.007		-1.07	-0.010		-1.38
ln foreign affiliate employment	-0.005		-1.51						
ln foreign affiliate employment * dummy for services	-0.002	**	-2.42						
ln foreign affiliate employment in EU15				-0.001		-0.47			
ln foreign affiliate emp. in EU15 * dummy for services				-0.003	**	-2.78			
ln foreign affiliate employment in NMS5							-0.005		-1.46
ln foreign affiliate emp. in NMS5 * dummy for services							-0.002	**	-2.42
Year dummy variables	yes			yes			yes		
Constant	-0.175	***	-3.53	-0.199	***	-3.05	-0.143	***	-3.05
Long-run elasticities:									
ln value added (constant prices)	1.41			1.37			1.41		
ln compensation (constant prices) per employee	-1.00			-1.04			-1.07		
ln net capital stock (constant prices)	-0.12			-0.09			-0.14		
ln foreign affiliate employment	-0.07								
ln foreign affiliate employment * dummy for services	-0.03								
ln foreign affiliate employment in EU15 countries				-0.01					
ln foreign affiliate emp. in EU15 * dummy for services				-0.04					
ln foreign affiliate employment in NMS5							-0.07		
ln foreign affiliate emp. in NMS5 * dummy for services							-0.03		
Arellano-Bond test for AR(1) (p-value)	0.02			0.03			0.01		
Arellano-Bond test for AR(2) (p-value)	0.82			0.62			0.45		
Sargan test (p-value)	0.42			0.44			0.45		
# of obs / # of industries	240/20			218/20			231/20		

Notes: See table 5.

6 Summary and Outlook

This paper attempts to assess the impact of outward foreign direct investment on domestic employment. In particular, we posed the question of whether employment in Austrian foreign affiliates in the NMS5 and in the EU15 is substituting for domestic employment. We estimated the determinants of a static and a dynamic labour demand model, allowing for heterogeneity in the foreign affiliate parameter between the service and manufacturing sector. Based on the static labour demand model, we do not find a significantly negative impact of foreign affiliate employment on domestic employment. This holds for foreign affiliate employment in both the NMS5 and the EU15. However, adding interaction terms between the service sector and foreign affiliate employment in the NMS5 to the regression model reveals that the impact of foreign affiliate employment on domestic employment is significantly positive for services but significantly negative for the manufacturing sector. This indicates a complementary relationship between domestic employment and employment in foreign affiliates in services and a substitutive relationship in manufacturing in the NMS5. According to the elasticity, a 10 percent increase in foreign affiliate employment in the NMS leads to a 0.5 percent decrease in the number of jobs at home. For services, we find that a 10 percent increase in foreign affiliate employment

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in the NMS leads to increase in employment of 0.7 percent. A somewhat different picture emerges when a dynamic labour demand equation is estimated: We find that the coefficient of foreign affiliate employment in the NMS5 is negative for both services and manufacturing, but statistically insignificant. The resulting substitution effects are again very small, however, representing a determinant of only minor relevance to domestic employment. The main finding of the dynamic specification is that domestic employment is mainly driven by wages and output, with long-run elasticities of −1.0 and 1.4, respectively.

The empirical analysis presented can be extended in a number of ways. Most importantly, future studies should be performed at the individual firm-level. In doing so, it will not be enough to analyse whether firms that increased production in foreign countries expanded or reduced employment at home. Quantifying how employment would have developed if the firms had not been active in foreign direct investment will also be important. Of course, it has not been possible so far to obtain access to firm-level data. Another aspect is the use of a static or a dynamic labour demand model. Our results indicate that the effects of foreign affiliate employment are sensitive when a dynamic panel data model is used.

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References

ARELLANO, MANUEL and STEPHEN BOND (1991), Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations, *Review of Economic Studies*, 58(2), pp. 277–297.

ARELLANO, MANUEL and OLYMPIA BOVER (1995), Another look at the instrumental variable estimation of error-components models, *Journal of Econometrics*, Elsevier, vol. 68(1), pp. 29–51.

ALTZINGER, WILFRIED (2002), Direktinvestitionen, Handel und Beschäftigung – Empirische Evidenz zur Österreichischen Internationalisierung in Mittel- und Osteuripa, in: BMWA(2002), *Österreichs Außenwirtschaft*, Das Jahrbuch 2001/2002, Wien.

ALTZINGER, WILFRIED and CHRISTIAN BELLAK (1999), *Direct versus Indirect FDI: Impact on Home Country Exports and Employment. Empirical Evidence for Austrian FDI in CEECs*, in: MICHAEL STIERLE (ed.), *Globalisation: Effects on Enterprises, Employment and Government*, IN-FER Research Edition 1, VWF, pp. 131–154, Berlin.

BECKER SASCHA O., KAROLINA EKHOLM, ROBERT JÄCKLE and MARC-ANDREAS MÜNDLER (2005), Location Choice and Employment Decisions: A Comparison of Swedish and German Multinationals, *Review of World Economics*, 127(4), pp. 693–731.

BLUNDELL, RICHARD and STEPHEN BOND (1998), Initial Conditions and Moment Restrictions in Dynamic Panel Data Models, *Journal of Econometrics*, 87(1), pp. 115–143.

BRACONIER, HENRIK and KAROLINA EKHOLM (2000), Swedish Multinationals and Competition from High- and Low-Wage Locations, *Review of International Economics*, 8(3), pp. 448–461.

BRAINARD, LAEL S. and DAVID A. RIKER (1997), *Are US Multinationals Exporting US Jobs?*, NBER Working Paper, (5958).

EC (2005), *The EU Economy 2005 Review: Rising international Economic Integration. Opportunities and Challenges*, European Commission.

HELPMAN ELHANAN and PAUL R. KRUGMAN (1985), *Market Structure and Foreign Trade*, Cambridge, MA, MIT Press.

KONINGS JOZEF and ALAN PATRICK MURPHY (2006), Do Multinational Enterprises Relocate Employment to Low-Wage Regions? Evidence from European Multinationals, *The Review of World Economics*, 142(1), pp. 1–20.

MARIN, DALIA (2004), *A Nation of Poets and Thinkers – Less so with Eastern Enlargement? Austria and Germany*, Centre for Economic Policy Research, Discussion Papers, (4358).

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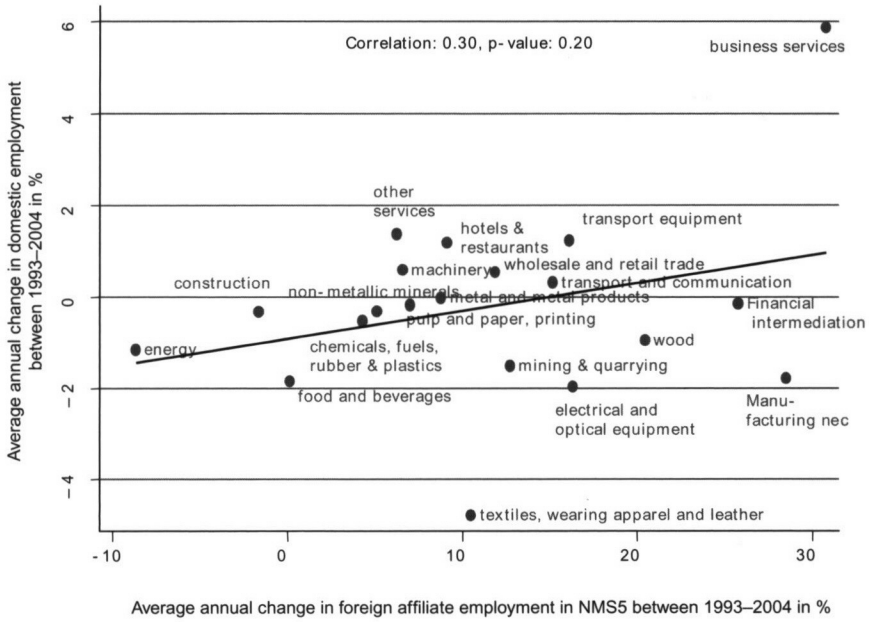
PFAFFERMAYR, MICHAEL (2001), Employment in Domestic Plants and Foreign Affiliates: A Note on the Elasticity of Substitution, *Weltwirtschaftliches Archiv,* 137(2), pp. 347–364.

WINDMEIJER, FRANK (2005), A Finite Sample Correction for the Variance of Linear Efficient Two-Step GMM Estimators, *Journal of Econometrics,* 126(1), pp. 25–51.

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Appendix

Figure A1: The relationship between employment at home and employment in foreign affiliates located in the CEEC5, 1993–2004



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