

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

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### Abstract:

This paper investigates the impact of Austrian foreign direct investment in Central and Eastern European countries (CEEC) on domestic employment. We estimate the determinants of relative labour demand between domestic and foreign employment using a panel of country-industry pairs for the period 1993-2003. In particular, we investigate the potential complementarity/substitutability relationship between foreign employment of foreign affiliates of Austrian multinationals and domestic employment in the most important partner countries for Austrian FDI as well as data aggregated to a regional level (EU15, CEEC5). Furthermore, two types of data were considered for domestic employment: (i) domestic employment by sectors and (ii) employment in the holding company. Finally, estimation was performed separately for the manufacturing and the services sector. Estimates obtained using the static fixed-effects model clearly show, that employment effects of foreign activities of Austrian firms depend on the sector and the partner-country (-region) considered and also differ between the short- and the long-run. Econometric analysis for the services sector results in a long-run complementary relationship between domestic employment and employment in the foreign affiliates in the CEEC5. For the short-run we find there is a small substitutive relationship. For the manufacturing sector a substitutive relationship between domestic and foreign employment prevails. The resulting substitution effects are very small, however.

## 1. Introduction

Since the beginning of the nineties, Austria has become as one of the most important foreign direct investors in Central and Eastern European Countries (CEEC)<sup>1</sup>. Employment in Austrian affiliates located in the East and Central European countries (CEEC) increased from 50.000 to 233.000 in the period 1993 to 2003. In 2003, the employment share of foreign affiliates of Austrian multinationals in the CEEC as a share of total foreign employment was about 71%, which is the highest share in the OECD area. While outward FDI has given an important drive to the internationalisation process of the Austrian firms from which many positive impulses to the Austrian economy have been supported empirically, the strong foreign involvement of Austrian firms has also given rise to fears that the relocation of labour intensive production to low-wage countries would “export jobs” and reduce employment at home. From theory as well as from many empirical studies on FDI we know that much of the effects on the home economy depend on the type of FDI. While positive effects can be expected from horizontal FDI, the impact of vertical FDI is not clear a priori (*Becker – Jäckle – Mündler, 2005*). Vertical FDI may lead to exports from the parent company to its foreign affiliates, increase productivity and international competitiveness but still substitute employment at home.

Following *Pfaffermayr (2001)* we re-estimate relative labour demand for Austria (employment in Austrian foreign affiliates relative to employment at home) for the period 1994-2003 as a function of relative wages, relative productivity, foreign demand, and other explanatory variables. However, apart from analysing a different period of time, our analysis extends prior work of *Pfaffermayr (2001)* in a number of ways. First, we perform separate estimations for the manufacturing and the services sector and in that way are able to single out important differences in the results as to the direct investing sectors. Second, to test for the robustness of our findings, we estimate two other specifications explaining the level of domestic employment rather than the ratio between foreign and domestic employment. Thirdly, as data availability at the individual partner country and sectoral level is limited to the ten most important Austrian FDI locations for reasons of secrecy, we further cross-check the results by re-estimating all specifications at the regional level (aggregating country level information) with increased data-availability at the sectoral level.

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

The empirical specification is derived from theoretical models of international trade which explicitly model internationalisation through FDI (as a substitute or as a complement to exports). Income and employment effects of FDI to a large part depend on the specific type of the relationship between FDI and exports. Relocation of production to low cost locations may substitute exports and thereby put downward pressure on wages or lead to unemployment as well as changes in the structure of labour demand and the income distribution (skilled vs. unskilled employees). On the other hand, FDI can generate additional exports of the parent company (for instance of inputs for foreign production of the affiliates, or due to investments in distribution networks, service functions or marketing). Relocation of production processes from Austria to East and Central Europe (outsourcing) can increase the competitiveness of the end product and thereby secure existing jobs or create additional jobs.

A first glance at the data shows, that employment in Austrian foreign affiliates has developed very dynamically over the ten year period examined. From 1993 to 2003 employment in Austrian affiliates located in the East and Central European countries (CEEC) has increased by an annual average rate of 16.6% keeping strong even in the more recent years. Thus, between 1999 and 2003, foreign employment of home based firms in the CEEC still expanded at a rate of 16.2%. Affiliate employment growth in the period 1993 to 2003 was also strong in other locations: in the EU15 it amounted to 7.2% per year; in the OECD-overseas to 14.3% and in the rest of the world (China, India and other emerging and developing countries outside Europe) to 12.4%. As a result of that development the regional structure of employment changed markedly. While the share of foreign employment in the EU15 shrank significantly, the CEEC share increased from 55% in 1993 to 70% of total employment of Austrian affiliates in 2003. A very high share indeed, even as judged from an international perspective. As a comparison, German multinationals employ a share of only 14.9% of total foreign employment in the CEEC (*Becker – Jäckle – Mündler, 2005*).

The regional shares of the CEEC as measured by sales or imports of Austrian affiliates are somewhat lower. For instance, sales to employment ratio of CEEC5 affiliates amounts to less than half of that of the EU15 affiliates. For total CEEC countries sales employment ratio is even lower. This is indicative of a likewise labour-intensive production in the CEEC and leads to the question whether comparable production characterized by low capital intensity would even be profitable in the home-economy.

## **2. Prior empirical evidence**

So far, Pfaffermayr (2001) is the only empirical study on the employment effects of foreign direct investment in the Austrian economy. For the period 1990 to 1996, he shows that employment in

Austrian affiliates located in West-European countries are substitutes for employment at home while foreign employment in Central- and East Europe is independent from wage differences and thus complementary to domestic employment. Related studies on Austrian outsourcing (relocation of parts of production processes) to the CEEC (*Egger et al.* 2001; *Kratena – Wüger*, 2001) show that the international outsourcing of production processes significantly increases total factor productivity – and thus increases competitiveness of Austrian firms. However, these studies also show, that outsourcing changes relative employment demand in favour of the high-skilled and calls for actions in structural and allocative policy aspects.

Evidence for other countries yields no conclusive results. Empirical studies for the US show, that employment growth in foreign affiliates (including affiliates in low-wage countries) not necessarily leads to negative employment effects in the home-based firms (*Brainard - Riker*, 1997). Competition of locations and a substitutive relationship is more likely between employment of affiliates located in different low-wage countries.

On the basis of survey data on the international expansion of German and Austrian firms, *Marin* (2004) estimates that since the fall of the iron curtain, German multinationals have shed about 100.000 jobs in Germany in substitution for jobs in the CEEC. For Austria *Marin* (2004) calculates that 24.000 jobs were lost due to Austrian FDI in the CEEC in the same period of time. A recent study by *Becker et al.* (2005) also derives a substitutive relationship between employment at home and in foreign affiliates in the CEEC using individual data on German and Swedish multinationals and affiliates. According to this study, a drop in wages in foreign affiliates located in the CEEC of 10% - with constant wages in the home-economy - leads to a reduction in home-country employment in the amount of 0,5%. However, the authors additionally find that the relationship between home and foreign employment more strongly reacts to differences in relative wages within high-wage countries than between Germany and the CEEC. These results differ from an earlier study by *Konings - Murphy* (2001), which on the basis of panel data finds no evidence that FDI in the CEEC has caused job losses in the home-economy.

### 3. The empirical model of labour demand

Relative labour demand is estimated on the basis of the following equation<sup>2</sup>):

(1)

$$\ln(LA_{ijt} / LI_{it}) = \alpha_{ij} + \alpha_{1i} \ln(WI_{it} / WA_{ijt}) + \alpha_{2i} \ln(YA_{ijt} / YI_{it}) + \alpha_{2i} \ln(PRODA_{ijt} / PRODI_{it}) + \lambda_t + \varepsilon_{it}$$

with (i)=1...N partner countries; (t)=1993,...,2003 und (j)=1,...21 industries. Variables are defined in the following way:

$LA_{ijt}$ :	Employment in foreign affiliates
$LI_{it}$ :	Employment in the home-country or employment in the home-based firm
$WA_{ijt}$ :	Compensation per employee in the foreign partner country
$WI_{it}$ :	Compensation per employee at home
$YA_{ijt}$ :	Sales (real) of Austrian foreign affiliates in partner country
$YI_{it}$ :	Real sales at home
$PRODA_{ijt}$ :	Real sales of Austrian foreign affiliates/employment in foreign affiliates
$PRODI_{it}$ :	Real production at home/home employment

In a second specification we estimate labour demand for home employment (log-level specification):

$$(2) \quad \ln(LI_{it}) = \alpha_{ij} + \alpha_{1i} \ln(WI_{it}) + \alpha_{2i} (WA_{ijt}) + \alpha_{3i} \ln(YI_{it}) + \lambda_t + \varepsilon_{it}$$

Or alternatively, assuming that home employment may only be substituted in the long run and not the short-run, we formulate following specification of labour demand in log levels:

$$(3) \quad \ln(LI_{it}) = \alpha_{ij} + \alpha_{1i} \ln(WI_{it}) + \alpha_{2i} (LA_{ijt}) + \alpha_{3i} \ln(YI_{it}) + \lambda_t + \varepsilon_{it}$$

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<sup>2</sup>) In the empirical model estimated by Pfaffermayr (2001) home employment is weighted by the export share. We restrain from this to maintain comparability to other international studies. However, weighting has an impact on results.

Both model types (either the log level or the log ratio of foreign employment to domestic employment) allow for an estimation of the type and the intensity of the relationship between home-based and foreign employment due to FDI. To correct employment and sales data on Austrian foreign affiliates, we dropped data points resulting in growth rates of the respective variable of more than +250% or more than -50%. To correct for heteroscedasticity in the data, the White-correction method is applied to calculate corrected standard deviations.

#### 4. Data and stylized facts

For our empirical analysis data from the OECD STAN- databases were combined with data on Austrian FDI from the Austrian National Bank (OeNB). The Austrian National Bank also provided us with data on employment and sales of Austrian foreign affiliates<sup>3)</sup>. For reasons of secrecy however, information is only available for a limited number of countries. Data on home-market employment, production and wages were drawn from data sources of the WIFO, the wiiw and the OECD Stan databank. 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 these statistics, for secrecy reasons. Therefore, we have to perform our estimations at the industry level. A detailed description of the data and the various data-sources are summarized in Table 1.

*Table 1: Variables used in Estimation and Data Sources*

Variables	Source
Employment in foreign affiliates of Austrian multinationals	OeNB
Home-market employment	OECD STAN, wiiw
Sales of Austrian foreign affiliates by partner country	OeNB
Value added deflator (in some cases producer price indices)	OECD STAN, wiiw
Alternatively: Employment in the parent-company	OeNB
Compensation per employee at home	OECD STAN, wiiw
Compensation per employee by partner country	OECD STAN, wiiw
Real value added in the home- market	OECD STAN, wiiw
Real value added in the foreign market	OECD STAN, wiiw

Table 2 displays data on the development of employment in foreign affiliates across different foreign destinations, which were grouped into four different regions (EU15, CEEC5, CEEC14, OECD-Rest).

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<sup>3)</sup> We especially thank Dr. Rene Dell'mour for preparing the data for us.

A distinction is made between manufacturing industries and other (mostly service) industries. Furthermore, table 2 includes data on the growth of employment in the home-market (Austria) as well as the parent company.

As expected employment in foreign affiliates located in the CEEC5 has developed very dynamically. Growth rates in the period 1993 to 2003 have been higher for the services sector than for manufacturing. In addition, manufacturing employment growth of CEEC5 affiliates has slowed down recently even dropping below the rate of change of employment in the EU15 affiliates of Austrian multinationals. In the services sector as well as in the CEEC14, however, growth of affiliate employment continued unabatedly. In parallel to the expansion of foreign employment in the CEEC5 we also find strong growth in foreign affiliates' sales. This could be taken as an indication that a large part of employment growth in affiliates is accounted for by an increase in production volumes.

Home-employment of Austrian multinationals stagnated between 1993 and 2003. Over the period, reductions in employment in the mid-nineties were largely compensated by employment increases in the last years of the period considered (Table 2). Despite the strong expansion of employment in foreign affiliates therefore, home employment could apparently be held at a constant level. A fact which stands at cross with suggestions that increased internationalisation of Austrian firms via FDI has been an important cause of job losses at home. In fact, employment at home and employment in foreign affiliates are positively correlated (Figure A1 in the appendix). Figure A2 in the appendix shows a neutral relationship between employment in the parent company and in foreign affiliates located in the CEEC5.

A different picture emerges when analysis is focused on the manufacturing sector only. In contrast to the dynamic development in foreign affiliates, employment at home has been shrinking. Public fears, therefore, that a continuation of FDI growth would lead to an increased "export of jobs" are understandable under this light. Very often the increase in jobs in foreign affiliates are related to employment losses in the manufacturing sector at home: over the period 1993 to 2003 we find a reduction of 73.000 manufacturing jobs, or similarly a reduction of 22.000 jobs (or 1,8%) in the parent companies. At the same time employment in foreign affiliates located in the CEEC5 has increased by 60.000.

Table 2 also includes data on relative wages (compensation per employee in Austria relative to compensation per employee in the partner country/region). As expected the difference in wage levels between Austria and the CEEC5 has diminished markedly during the period considered, decreasing

from 800% in 1993 to 400% in 2003. This reduction in wage dispersion implies that labour has become more expensive in the partner countries, rising wages, however, should - ceteris paribus - lower demand for foreign workers. As a result foreign employment should have been substituted by home-employment. The opposite can be observed in the data, making it unlikely that a substituting effect between foreign- and home-market employment of multinationals may have high explanatory power as to the dynamic expansion of foreign employment in the foreign affiliates.

*Table 2: Descriptive statistics for foreign affiliates of Austrian multinationals*

	1993	1999	2003	Average annual change 1993/2003 in %	Average annual change 1999/2003 in %
	Total				
Foreign employees EU15 – persons	31,850	50,360	64,000	7.2	6.2
Foreign employees CEEC5 – persons	48,814	112,569	179,228	13.9	12.3
Foreign employees CEEC14 – persons	1,516	15,539	54,131	43.0	36.6
Foreign employees OECD – persons	3,840	11,676	14,648	14.3	5.8
Foreign employees Rest – persons	4,861	9,465	15,689	12.4	13.5
Foreign employees total – persons	90,881	199,609	327,696	13.7	13.2
Home employees – persons	3,255,10	3,517,90	3,607,60	1.0	0.6
Employment holding company – persons	295,999	258,258	296,509	0.0	3.5
	Manufacturing				
Foreign employees EU15 – persons	13,467	23,421	30,363	8.5	6.7
Foreign employees CEEC5 – persons	27,973	58,339	71,765	9.9	5.3
Foreign employees CEEC14 – persons		9,433	15,931	0.0	14.0
Foreign employees OECD+Rest – persons		8,340	15,070	0.0	15.9
Home employees – persons	721,600	670,900	648,600	-1.1	-0.8
Employment holding company – persons	133,920	121,370	111,719	-1.8	-2.1
Relative wages Austria/CEEC5	7.8	5.0	4.0	-6.6	-5.5
Real sales of foreign affiliates in the CEEC 5	100	145	222	8.3	11.2
	Services, Mining, Construction, energy and water				
Foreign employees EU15 – persons	18,055	24,897	33,318	6.3	7.6
Foreign employees CEEC5 – persons	20,517	54,162	107,445	18.0	18.7
Foreign employees CEEC14 – persons	625	4,645	31,368	47.9	61.2
Foreign employees OECD+Rest – persons	3,328	9,044	13,282	14.8	10.1
		2,847,00	2,959,00		
Home employees – persons	2,533,500	0	0	1.6	1.0
Relative wages Austria/CEEC5	6.3	5.8	4.8	-2.8	-4.5
Real sales of foreign affiliates in the CEEC 5	100	322	421	15.5	7.0

Explanatory notes: The structural break in the employment data of the parent company for the telecommunication industry in the year 1995/1996 has been corrected. CEEC5: Czech Republic, Hungary, Poland, Slovak Republic, Slovenia; CEEC14: Albania, Belarus, Bosnia, Croatia, Estonia, Latvia, Lithuania, Macedonia, Moldavia, Romania, Russia, Serbia, Ukraine.

## 5. Estimation results

### 5.1 Estimation of the relative labour demand function

Table 3 summarizes the fixed-effects results for the relative labour demand function specified earlier. The estimates were done separately for manufacturing industries and services industries and for various groups of partner regions (Austria vs. CEEC5 and Austria vs. the CEEC5 and three of the most important FDI-partner countries: Germany, United Kingdom and the USA<sup>4</sup>). As to the manufacturing sector, the results point to a substitutive relationship between employment in foreign affiliates and home-based employment. This holds true for foreign employment in all partner countries considered (CEEC5, Germany, UK and USA) as well as for the subgroup of the CEEC5. This implies, that a drop in wages in the partner country, or alternatively, a rise in wages in the home-market of the multinational firm would lead to a reduction of employment in Austria. The estimated elasticity of substitution amounts to 0.5 implying, that a 1% increase in wages of home-based workers at constant foreign wages results in a 0.5% increase in foreign employment. Since the elasticity of substitution is below one, substitution between home and foreign employment is limited. In addition, the substitution effect cannot explain the observed shift of relative labour demand toward foreign employment since relative wages in the CEEC5 have been increasing relative to Austrian wages over the period considered. Therefore, substitution effects should have worked in the opposite direction: increases in labour costs in CEEC5 should have lead to a substitution of foreign employment by home-based employment.

Relative labour demand is rather determined by the development of sales. The elasticity of employment to output changes (i.e. the increase of employment due to a 1% increase in sales) is estimated at 0.6 for the CEEC5 and 0.7 for the CEEC5 plus the three most important Austrian FDI-locations. The importance of sales in the foreign market can be exemplified by the following calculation. In the period 1993 to 2003 employment growth in Austrian foreign affiliates in the CEEC5 has been 11 percentage points higher than in Austria or the holding companies in Austria, respectively. The difference with respect to sales is 6 percentage points. If we take as given an output elasticity of employment of 0.6, then a little less than half of the relative increase in foreign employment can be explained by the growth in sales.

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<sup>4</sup>) We dropped the relative productivity term from the regression because it had the wrong sign. Pfaffermayr (2001) also finds, that an increase in the relative productivity of the foreign location leads to relatively less employment in the foreign location than in the home-country. Home-country production was excluded because it was insignificant.

The estimation results for the relative labour demand for the service sector show that relative labour costs do not have a significant impact on employment ratio between CEEC5 and home-based employment. Indeed, results for the total sample of considered countries even point to a complementary relationship. Again, it is development in sales that is the most important driving force of foreign employment. An increase of real sales by 1% increases foreign employment in almost the same amount. Thus, almost all of the observed increase in relative employment can be explained by increase in sales.

Table 3: Estimation results for relative labour demand (Model 1)

	Dependent variable: Ln(employment in Austrian foreign affiliate/ domestic employment)							
	Manufacturing				Services			
	CEEC5		Total <sup>1)</sup>		CEEC5		Total <sup>1)</sup>	
	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value
Ln(relative labour compensation per employee: Austria/partner country)	0.54	1.88	0.45	2.57	0.11	0.41	-0.75	-3.04
Ln(real sales of Austrian foreign affiliates in partner country)	0.61	9.66	0.67	11.23	0.90	8.80	0.81	10.52
year dummy 1995 (ref. cat. 1994)	-0.09	-0.79	-0.05	-0.62	0.16	0.86	0.30	2.03
year dummy 1996	-0.07	-0.67	-0.04	-0.56	-0.01	-0.04	0.11	0.74
year dummy 1997	-0.06	-0.51	-0.11	-1.41	-0.2	-1.04	-0.11	-0.70
year dummy 1998	0.03	0.26	-0.06	-0.70	-0.20	-0.97	-0.08	-0.52
year dummy 1999	-0.07	-0.60	-0.13	-1.64	-0.28	-1.35	-0.09	-0.59
year dummy 2000	-0.12	-0.80	-0.24	-2.44	-0.40	-1.85	-0.31	-1.61
year dummy 2001	-0.14	-0.80	-0.24	-2.23	-0.22	-0.97	-0.26	-1.55
year dummy 2002	-0.04	-0.24	-0.16	-1.46	-0.13	-0.54	-0.19	-1.00
year dummy 2003	0.10	0.49	-0.01	-0.08	0.19	0.77	0.08	0.46
Constant	-7.31	-11.69	-7.42	-24.59	-9.74	-11.98	-8.85	-16.76
Number of observations	223		347		149		222	
Number of sector/country groups	33		52		21		31	
R <sup>2</sup>	0.53		0.59		0.58		0.23	

Explanatory notes: Fixed effects estimates including year dummy variables. t-values are based on heteroscedasticity robust standard errors – <sup>1)</sup> CEEC5 plus the three most important partner countries for Austrian FDI: Germany, United Kingdom, US.

## 5.2 Estimation of labour demand for domestic employment

To test the robustness of the findings, we also estimate two other model variants explaining labour demand for home-based employment specified as log levels. Table 4 presents results with respect to the labour demand specified in log levels for the manufacturing sector, while table 5 summarizes estimation results for the other industries.

In the manufacturing sector we find insignificant cross-price effects between domestic and foreign employment (Model 2). Thus, there is no substitutive relationship between the two. The same picture emerges, if foreign employment is taken as given (fixed factor) and therefore invariable over the short run (model 3). Employment in foreign affiliates has no impact on home-based employment.

The most important drivers for domestic employment are wages and value added in the home-market of the multinational firm as well as technological change. As expected, domestic labour costs have a negative impact and value added in the home market a positive impact on employment. Increases in production, however, are too small to stabilise employment. The negative impact of year dummies become 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.

To check for the robustness of the results with respect to our choice of data aggregation, we re-estimate the model 3 specification at the regional level. That is, all partner-country level information is aggregated to the regional level. A positive side-effect of the aggregated approach is that more data is available than at the individual country level. The results are summarised in table A2 in the appendix. We estimate a substitutive relationship between employment in foreign affiliates in the CEEC5-region and domestic employment in the long run. However, the cross-effects are negligible. An increase in foreign employment by 10% results in a 0,3% reduction in employment at home. To the contrary, employment growth in Austrian affiliates located in the EU15-region is complementary to employment at home.

Estimation of the labour demand in log levels for the service sector leads to similar results (table 4). Domestic wages and value added as well as technological change are the most important determinants. However, the results on the substitution possibilities between home-based and foreign employment differ between the short- and the long-run. While the relationship is substitutive in the short run (model 2), it is complementary in the long run (model 3).

Table 5: Estimation results for labour demand for domestic employees in the service sectors

	Model 2				Model 3			
	CEEC5		Total <sup>1)</sup>		CEEC5		Total <sup>1)</sup>	
	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value
Compensation (real) per employee in Austria	-0.677	-3.97	-0.945	-7.71	-0.631	-5.78	-0.842	-8.62
Value added in Austria (real)	0.985	6.88	1.145	11.64	0.812	9.50	0.958	13.05
Compensation (real) per employee in the partner country	0.079	2.80	0.102	3.93				
Employment in foreign affiliates					0.045	7.16	0.029	6.15
year dummy 1995	0.024	0.78	0.015	0.67	0.002	0.08	-0.002	-0.09
year dummy 1996	-0.020	-0.65	-0.024	-1.14	-0.042	-2.17	-0.033	-2.10
year dummy 1997	-0.004	-0.14	-0.017	-0.91	-0.037	-1.99	-0.026	-1.78
year dummy 1998	-0.013	-0.48	-0.022	-1.21	-0.046	-2.78	-0.031	-2.31
year dummy 1999	0.000	0.01	-0.008	-0.39	-0.037	-2.01	-0.015	-0.97
year dummy 2000	-0.028	-0.96	-0.040	-1.81	-0.063	-3.20	-0.042	-2.46
year dummy 2001	-0.022	-0.77	-0.035	-1.57	-0.063	-3.21	-0.034	-2.00
year dummy 2002	-0.041	-1.39	-0.054	-2.37	-0.081	-3.90	-0.052	-3.04
year dummy 2003	-0.037	-1.11	-0.056	-2.19	-0.087	-3.92	-0.058	-3.12
Constant	-4.205	-1.55	-5.530	-2.70	-0.245	-0.15	-1.441	-0.97
Number of observations	183		279		229		361	
Number of sector/partner country groups	25		38		25		48	
R <sup>2</sup>	0.55		0.66		0.65		0.68	

Notes: Fixed effects estimates including year dummy variables. The dependent variables is log domestic employment by industry. <sup>1)</sup> CEEC5 plus the three most important partner countries for Austrian FDI: Germany, United Kingdom and the US.

## 6. Summary and Outlook

This paper tried to assess the impact of foreign direct investment on domestic employment. In specific, we asked, whether employment in Austrian foreign affiliates in the CEEC5 is substituting employment in the home economy. We estimated determinants of relative labour demand between domestic and foreign employment. In the estimations we considered data on foreign employment of foreign affiliates of Austrian multinationals in the most important partner countries for Austrian FDI (Germany, UK, USA, Czech Republic, Slovak Republic, Hungary, Slovenia and Poland) as well as aggregated to a regional level (EU15, CEEC5). Furthermore, two types of data were considered for domestic employment: (i) domestic employment by sectors and (ii) employment in the holding company. Finally, estimation was performed separately for the manufacturing and the services sector.

The results clearly show, that employment effects of foreign activities of Austrian firms depend on the sector and the partner-country (-region) considered and also differ between the short- and the long-run. Econometric analysis for the services sector results in a long-run complementary relationship between

domestic employment and employment in the foreign affiliates in the CEEC5. Ten newly created jobs in the CEEC5 result in a half new job in Austria. Indirect effects are likely to be much higher. Thus, according to these results, foreign activities in the services sector have a positive impact on domestic employment. In the short-run, there is a small substitutive relationship and domestic employment may to a small extent be substituted by employees in the foreign affiliates.

The picture for the manufacturing sector is not clear cut. Overall, a substitutive relationship between domestic and foreign employment prevails. The resulting substitution effects are very small, however, thus a determinant of only minor relevance to domestic employment. Domestic employment is mainly driven by home country wages, value added and technological progress. In the manufacturing sector we found an output elasticity of employment clearly below 1. Thus, development of production has partly uncoupled from the development in employment. In the service sector we still find a much closer relationship between production and employment.

In general, our results are similar to those found in comparable studies for other countries. The majority of empirical works, however, does not find negative employment effects (see *Braconier - Ekholm*, 2000 for Sweden and *Konings - Murphy*, 2001 for a sample of European large-scale enterprises).

The empirical analysis presented is incomplete in a number of ways. It totally lacks a distinction of employment by skills. One should expect that the relocation of production especially hurts the low skilled. In the data, we find that the reduction of employment of low-skilled workers has accelerated since 1994 (from a rate of -4% per year in the period 1983 -1993 to a rate of 6.5% per year in the period 1994-2000) in parallel to an extraordinary expansion of active FDI in the CEEC has expanded. At the same time changes in the structure of labour supply point to an increase of average skill levels leading to the conclusion that the structure of labour demand has shifted in favour of the high skilled. Clearly, further empirical studies are necessary on that issue.

Most importantly, future studies should be done at the individual firm-level. Thereby it is not enough to analyse, if firms which increased production in foreign countries, expanded or reduced employment at home. It is also important to quantify, how employment would have developed, if firm had not been active via foreign direct investment. Of course, so far, there is a lack of available data.

## Appendix

Figure A1: The relationship between employment at home and employment in foreign affiliates located in the CEEC5, 1993 - 2003

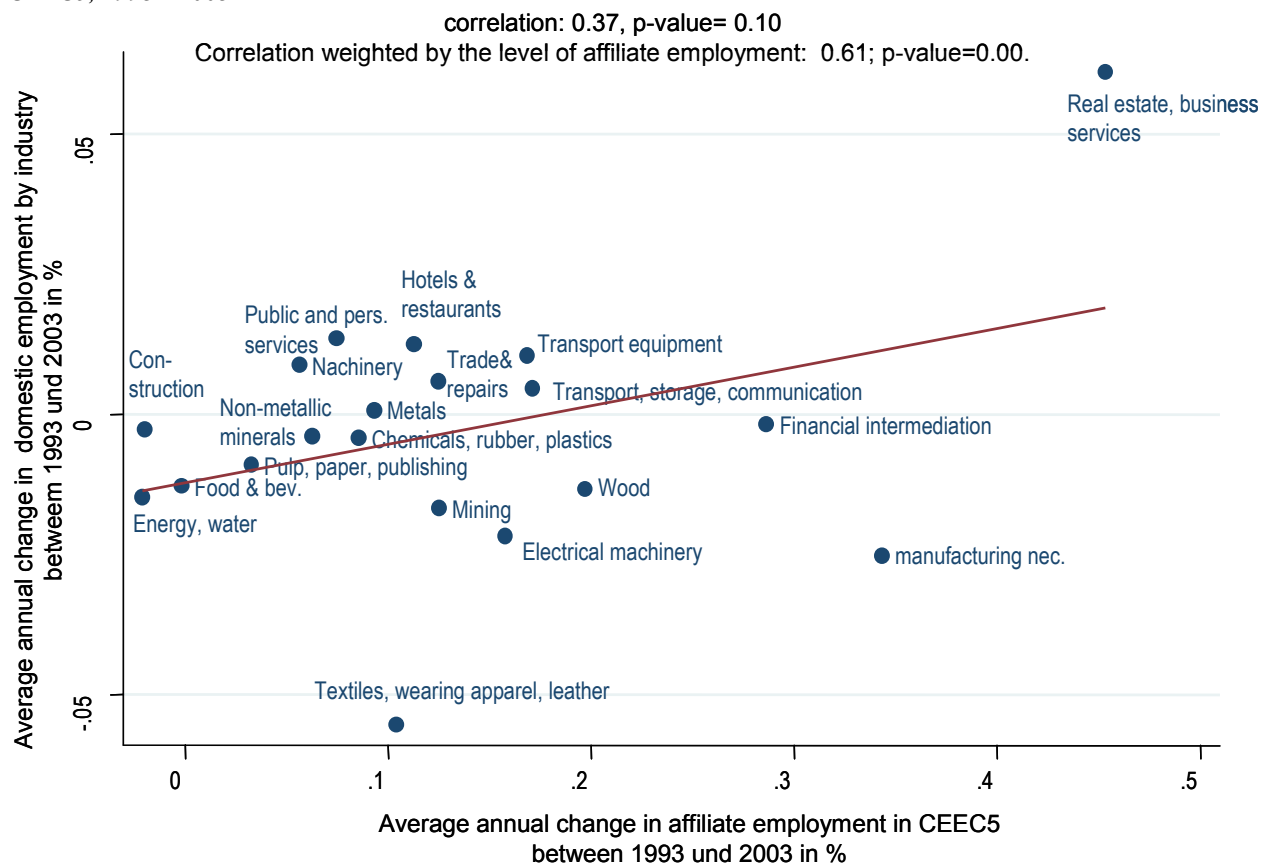
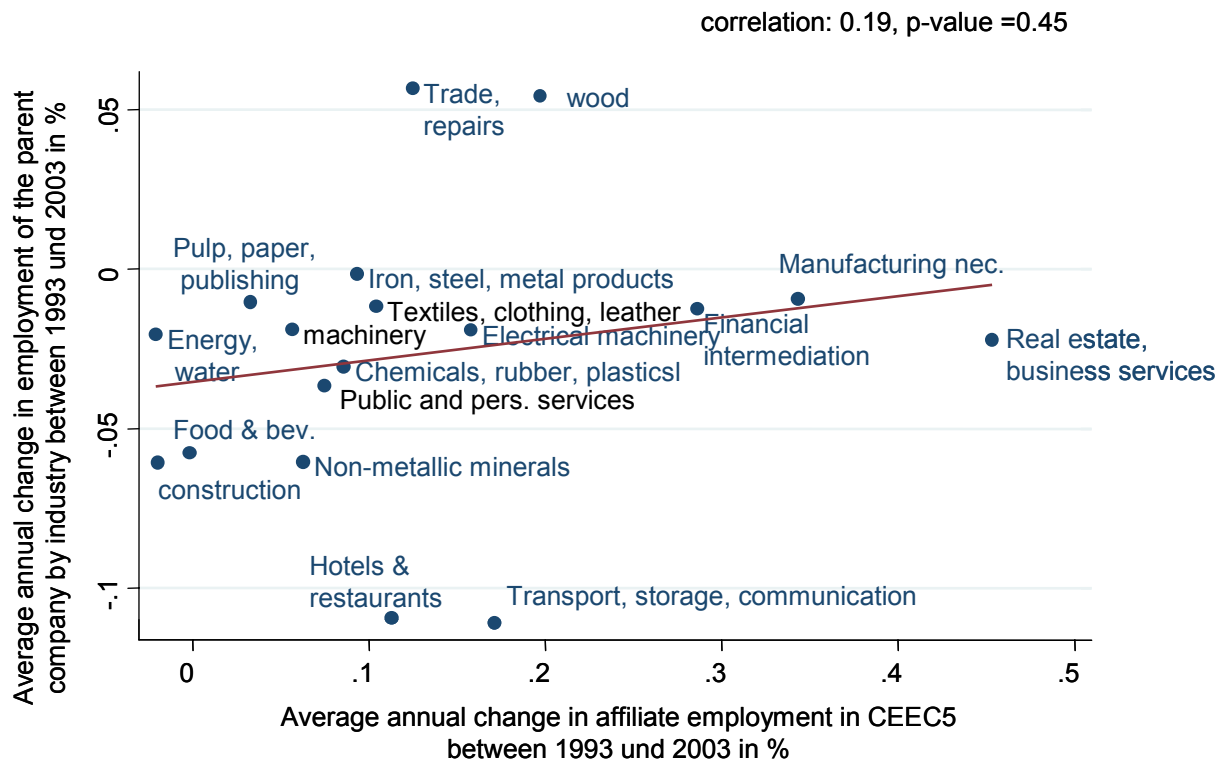


Figure A6.2: The relationship between employment in the parent company and employment in affiliates located in the CEEC5, 1993 - 2003



*Table A1: Domestic labour demand in the manufacturing sector by region (Model 2)*

	Employment in Austria				Employment in the holding company			
	Specification 1		Specification 2		Specification 1		Specification 2	
	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value
Compensation (real) per employee in Austria	-0.446	-3.55	-0.256	-2.29	-0.718	-1.25	-1.502	-3.72
Value added in Austria (real)	0.517	4.53	0.533	5.25	1.217	3.15	0.522	2.51
Real export of the holding company					0.178	2.44	0.248	3.12
Employment in foreign affiliates EU15	0.059	3.03			-0.129	-1.73		
Employment in foreign affiliates CEECS			-0.034	-2.16			-0.015	-0.34
year dummy 1995 (ref cat. 1994)	-0.036	-1.36	-0.007	-0.27	0.076	1.03	0.038	0.73
year dummy 1996	-0.066	-2.42	-0.042	-1.67	0.062	0.91	-0.016	-0.32
year dummy 1997	-0.110	-3.57	-0.067	-2.33	-0.046	-0.66	-0.123	-2.23
year dummy 1998	-0.114	-3.49	-0.058	-1.81	-0.095	-1.30	-0.163	-2.51
year dummy 1999	-0.137	-3.63	-0.088	-2.58	-0.213	-3.09	-0.223	-3.03
year dummy 2000	-0.174	-3.92	-0.118	-2.99	-0.322	-4.46	-0.314	-5.01
year dummy 2001	-0.192	-4.08	-0.140	-3.25	-0.368	-4.99	-0.365	-5.53
year dummy 2002	-0.211	-4.47	-0.166	-3.55	-0.379	-4.29	-0.336	-4.25
year dummy 2003	-0.217	-4.21	-0.176	-3.68	-0.344	-4.31	-0.283	-3.49
Constant	3.971	1.36	2.264	0.97	-10.011	-0.80	11.859	2.06
Number of observations	103		114		96		102	
Number of sectors	11		12		11		12	
R <sup>2</sup>	0.56		0.49		0.52		0.53	

Notes: Fixed effects estimates including year dummy variables. The dependent variables are log employment by industry and log employment of the parent company by industry, respectively.

## 7. References

- Becker, S. O., Ekholm, K., Jäckle, R., Mündler, M., "Location Choice and Employment Decisions: A Comparison of German and Swedish Multinationals," CEPR Discussion Papers, 2005, (4887).
- Becker, S. O., Jäckle, R., Mündler, M., "Kehren deutsche Firmen ihrer Heimat den Rücken?; Ausländische Direktinvestitionen deutscher Unternehmen", Ifo-Schnelldienst, 2005, 58(1), pp. 23-33.
- Braconier, H., Ekholm, K., "Swedish Multinationals and Competition from High- and Low-Wage Locations", Review of International Economics, 2000, 8(3), pp. 448-461.
- Brainard, L. S., Riker, D. A., "Are U.S. multinationals exporting US Jobs?", NBER Working Paper, 1997, (5958).
- Egger, P., Pfaffermayr, M., Wolfmayr-Schnitzer, Y., "The International Fragmentation of the Value Added Chain: The Effects of Outsourcing to Eastern Europe on Productivity and Wages in Austrian Manufacturing", The North American Journal of Economics and Finance, 2001, (12), pp. 257-272.
- Kratena, K., Wüger, M., "Outsourcing, Wettbewerbsfähigkeit und Beschäftigung", WIFO-Monatsberichte, 2001, 74(4).
- Konings, J., Murphy, A., "Do Multinational Enterprises Substitute Parent Jobs for Foreign Ones? Evidence from European Firm-Level Panel Data", Centre for Economic Policy Research, Discussion Papers, London, 2001, (2972).
- Marin, D., "A Nation of Poets and Thinkers – Less So With Eastern Enlargement? Austria and Germany", Centre for Economic Policy Research, Discussion Papers, 2004, (4358).
- Pfaffermayr, M., "Employment in domestic plants and foreign affiliates: a note on the elasticity of substitution", Weltwirtschaftliches Archiv, 2001, 137(2), pp. 347-364.