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The Impact of Outward FDI in Central and Eastern Europe on Employment in the EU-15 Countries

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Abstract

This paper has examined the home market effects of outward FDI into the CEE region based on the AMADEUS firm-level database. In particular, we investigated the substitution possibilities between foreign affiliate employment and parent company employment by distinguishing between manufacturing and non-manufacturing between the period 2000 and 2004. Despite fears of job losses in the home market due to outward FDI into the countries of central and Eastern Europe we find only limited evidence for the substitution of jobs between the parent companies in the EU15 and their affiliates in the CEEC. In particular we find that substitution possibilities are higher between employment in affiliates in high-wage countries and in the parent company than that of affiliate employment in the CEE region and parent company employment.

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and Eastern Europe on Employment
in the EU15-Countries**

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Projektkoordination: Yvonne Wolfmayr, Irene Langer

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Das Wichtigste in Kürze

Die seit Anfang der 90er Jahre ansteigenden Auslandsaktivitäten österreichischer Unternehmen in Mittel- und Osteuropa haben die Befürchtung geweckt, dass mit der Produktionsverlagerung auch eine spürbare Reduktion der Beschäftigung im Herkunftsland der Direktinvestitionen einhergeht. Nach wie vor gibt es zu wenig empirische Studien auf Basis von repräsentativen Firmendaten, welche zu einer Versachlichung der Diskussion beitragen können. Im Rahmen dieses Teilprojekts wurde eine neue empirische Untersuchung zu den Auswirkungen der Auslandsaktivitäten von multinationalen Unternehmen auf die Beschäftigung im Mutterunternehmen durchgeführt. Hierfür wurden Substitutionselastizitäten zwischen den Beschäftigten in den ausländischen Tochtergesellschaften und den Beschäftigten bei den Mutterunternehmen geschätzt. Ein zentraler Aspekt der Analyse ist der Vergleich der Substitutionselastizitäten zwischen verschiedenen Zielregionen. Die Fragestellung war hierbei, ob Beschäftigte im Stammland durch die Ausweitung der Beschäftigung in den Tochterunternehmen in Mittel- und Osteuropa stärker betroffen sind als in anderen Zielregionen, z. B. in den alten EU15-Ländern. Die Untersuchung wurde für die Sachgütererzeugung und Dienstleistungen getrennt durchgeführt, da in beiden Teilbereichen der Wirtschaft häufig unterschiedliche Motive für ausländische Direktinvestitionen anzutreffen sind. Die verwendete Datenbasis beruht auf der AMADEUS-Datenbank für 14 EU-Länder und 34.000 Firmenbeobachtungen für den Zeitraum 2000-2004.

Ein wichtiger und neuer Aspekt der empirischen Analyse ist, dass für die Schätzung der Substitutionselastizitäten das relative Lohn- und Beschäftigungsverhältnis zwischen den Beschäftigten im In- und Ausland herangezogen wird. Bisherige Analysen auf Firmenebene haben wegen fehlender Daten häufig nur Informationen über die Beschäftigten verwendet, nicht aber über deren Löhne bzw. nur Löhne auf aggregierter Ebene. Eine positive oder negative Korrelation zwischen In- und Auslandsbeschäftigten ist jedoch nicht notwendigerweise auf die Substitutionsmöglichkeiten zurückzuführen sondern zum Teil auf die unterschiedliche relative Outputentwicklung.

Hauptergebnis der empirischen Analyse auf Basis von 36.000 Firmenbeobachtungen ist, dass in- und ausländische Beschäftigte Substitute sind. Dies gilt sowohl für Unternehmen in der Sachgütererzeugung als auch in den Dienstleistungen. Allerdings ist das Substitutionsverhältnis zwischen den Beschäftigten der Mutterunternehmen und den Töchtern in den EU15-Ländern stärker als zwischen den Beschäftigten der Mutterunternehmen und den Töchtern in den mittel- und osteuropäischen Ländern. Relative Lohnkostenvorteile sind damit ein untergeordneter Erklärungsfaktor für den teilweise hohen Personalbestand in den Tochtergesellschaften in Mittel- und Osteuropa. Ohnehin wird dieses Motiv in Zukunft an Bedeutung verlieren, da die Lohnkostenvorteile der Töchter in Mittel- und Osteuropa mit der Zeit schwinden.

Abstract

This paper has examined the home market effects of outward FDI into the CEE-region based on the AMADEUS firm-level database. In particular, we investigated the substitution possibilities between foreign affiliate employment and parent company employment by distinguishing between manufacturing and non-manufacturing between the period 2000 and 2004. Despite fears of job losses in the home market due to outward FDI into the countries of central and Eastern Europe we find only limited evidence for the substitution of jobs between the parent companies in the EU15 and their affiliates in the CEEC. In particular we find that substitution possibilities are higher between employment in affiliates in high-wage countries and in the parent company than that of affiliate employment in the CEE-region and parent company employment.

1. Introduction

The aim of this section is to investigate empirically the substitution possibilities between parent company employment and foreign affiliate employment. In the literature there is an ongoing debate whether parent company employment and foreign affiliate employment in low-wage countries are substitutes or complements (see for the US: Brainard and Riker, 1997; Hanson et al., 2003; Desai et al., 2005; Harrison et al., 2007; for EU countries, Cuyvers et al. 2005; Marin, 2004, Konings and Murphy, 2006; Becker et al., 2005), In summarizing the results Molnar et al. (2007) conclude that "previous studies fail to provide a clear picture across countries and industries of the relationship between the expansion of activities abroad and total production/employment at home". Hence, the paper aims at reconciling these contrary views using firm-level data for EU15-countries.

The paper estimates the elasticity of substitution between parent company employment and foreign affiliate employment using both data on relative employment and relative wages for the period 2000-2004. Furthermore, we provide separate regression results for the CEE-region and between manufacturing and non-manufacturing. The study is organized as follows. In section 2, we provide a brief survey of the literature, section introduce the empirical model and the description of the data follows in section 4. The empirical results are shown in part 5. Section 6 concludes.

2. Previous literature

The empirical evidence in the related literature yields no conclusive results. For the US, in an early study for the period 1983-1992 and a panel of manufacturing multinationals, Brainard and Riker (1997) find a weak, but significant labour substitution effect between parent companies and their affiliates. Their results also show that the substitutability in employment is much stronger among different affiliates of the same MNE that are located in different low cost host countries. Two later papers for the US, both based on BEA's (Bureau of Economic Analysis) firm level data find a complementary relationship between increases in affiliates' activities and employment in the parent companies: Hanson et al. (2003) examine MNE data for the two sub-periods 1989-1994 and 1994-1999 and find a significant positive association between higher sales in foreign affiliates and US parent employment, with stronger results for the period 1989-1994. Desai et al. (2005) look at data spanning the period 1982-1999 and conclude with a significant positive relation between employment growth in the foreign affiliates and employment in the parent companies. Both of the latter papers make no distinction between low-wage and high-wage countries. Yet another study for the US (Harrison et al., 2007) using BEA-firm level data, examining simple correlations between US multinational employment at home and abroad for the period 1977-1999 finds positive correlations between job growth in foreign affiliates located in high-income countries and employment in the US parent company. The correlation is negative in the relation between affiliates in low-income countries and the parent company. The latter substitution effects are more pronounced in some of the key sectors such as computers, electronics and transportation.

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 percent - with constant wages in the home-economy - leads to a reduction in home-country employment in the amount of 0.5 percent. 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. Furthermore, using data for 158 Swiss multinationals Henneberger and Ziegler (1999) find that foreign employment does not affect employment at home. Using a firm-level data for the manufacturing sector for Germany Dörn (2003) find that investment abroad has a negative impact on employment at home. Based on firm level data for twelve EU countries for the years 1994-1998 extracted from the AMADEUS databank, Cuyvers et al. (2005) report further evidence of employment substitution of outward FDI in the CEEC. Using AMADEUS data for Belgium and France, a European Commission (2005) study finds substitution between parent company and affiliate employment in the CEEC, while there is a neutral (Belgium) respectively a complementary (France) employment relationship with affiliates located in EU15 host countries.

These results for EU countries differ from a study by Konings-Murphy (2006) or Murphy (2006), which use firm level data from the AMADEUS databank for European multinationals for the

period 1993-1998 and find no evidence for substitutive effects between parent employment and the affiliates located in the CEEC. For the manufacturing sector they find a significant negative correlation between parent employment and affiliate employment in the North-EU and EU15 based foreign affiliates, respectively. These substitution effects are nonexistent for MNEs in the non-manufacturing sector. These results resemble the findings for Austria in Pfaffermayr (2001), based on sector FDI data. For the manufacturing sector and the period 1990-1996, in Pfaffermayr (2001), employment in Austrian affiliates located in West-European countries substitutes for employment at home while there is no significant relationship with foreign employment in the CEEC. The study by Falzoni - Grasseni (2005) for Italian MNEs highlight the importance to account for different firm sizes. They find a general relocation of jobs in small firms, while for larger Italian firms it is only FDI in Asian countries that exerts a negative impact on home employment. Also for Italy, Barba-Navaretti - Castellani (2004) compare the employment performance of purely domestic firms and multinationals (with similar characteristics prior to FDI) and find no significant differences. Molnar et al. (2007) provide an excellent survey on these studies, and highlight this diversity of results which limits the possibility yet to draw firm conclusions on the issue of employment effects of FDI.

3. Empirical model

As stated before, we are going to analyse the relationship between relative employment and relative wages controlling for relative output. Starting point is the cost function specified as a CES cost function of the following form:

$$C_{it} = Y_{jit} \left(\alpha_{it}^{\sigma} W_{1it}^{\sigma} + (1 - \alpha_{it}^{\sigma}) W_{2it}^{1-\sigma} \right)^{1/(1-\sigma)},$$

where i denotes the firm and t denotes time. Y_j stands for output for the parent company and foreign affiliates respectively, w_1 is the wage rate for the parent company, and w_2 is the wage rate of the foreign affiliate. σ is the elasticity of substitution between the two types of labour. The demand function can be obtained by applying Shepard's lemma, i.e.

$$\frac{\partial C_{it}}{\partial W_{1it}} = L_{1it} = Y_{jit}^{1-\sigma} \alpha_{it}^{\sigma} W_{1it}^{-\sigma} \lambda_{1it},$$

$$\frac{\partial C_{it}}{\partial W_{2it}} = L_{2it} = Y_{jit}^{1-\sigma} \alpha_{it}^{\sigma} W_{2it}^{-\sigma} \lambda_{2it},$$

where the left-hand side variables, L_{1it} , and L_{2it} are parent company employment and foreign affiliate employment, respectively. The log linear labour demand function can be obtained by dividing the labour demand equation for the parent company by the labour demand equation of the foreign affiliates and taking the natural logarithm on both sides. This leads to following relative labour demand equation:

$$\ln \frac{L_{1it}}{L_{2it}} = \sigma \ln \frac{W_{1it}}{W_{2it}} + \beta \theta_i + \beta \ln \frac{Y_{1it}}{Y_{2it}} + \varepsilon_{it},$$

where $\lambda_{1it} / \lambda_{2it}$ is assumed to increase at a constant rate of time depending on size and industry of the parent company. Taking long differences leads to following estimation equation:

$$\Delta \ln \frac{L_{1it}}{L_{2it}} = \sigma \Delta \ln \frac{W_{1it}}{W_{2it}} + \beta \Delta \ln \frac{Y_{1it}}{Y_{2it}} + \sum_j \beta_j \text{dsec}_{ij} + \sum_k \beta_k \text{dco}_{ik} + u_{it},$$

dsec_{ij} and dsize_{ij} are set of sector and firm size dummy variables referring to the parent company. Δ is the difference operator and refers to the average annual change of the variables between 2000 and 2004. v_i is the error term that is assumed to be mutually independent and normally distributed. In order to test whether the slope parameter differs between destinations and regions we provide separate regressions for the CEE-region and non CEE-region and for manufacturing and service firms as well. The sign of the substitution elasticity indicates whether parent company employment and foreign affiliate employment are substitutes or complements. If there is a positive sign of the substitution elasticity, then the two factors are complementary to each other. In general, the specification in long differences can be estimated by OLS. However, in order to control for extreme observations influencing the mean, we apply the robust regression technique, which is an iterative, weighted least-squares procedure that puts less weight on outliers.

4. Data and descriptive statistics

The firm level data on EU multinationals and its affiliates used in the paper is derived from the "AMADEUS" database of company accounts which is provided by the Bureau Van Dijk. AMADEUS covers only European firms and thus limits the information on European affiliates of the multinationals. The database has also been used by Cuyvers et al. (2002) and Konings - Murphy (2006) for a panel of European firms to analyse a similar question. In contrast to these papers we add to the AMADEUS based data, company data from the Bureau Van Dijk's "BANKSCOPE" database. This second data source includes balance sheet and income and loss statements of EU banks, that are not included in the AMADEUS database.

From these two databases we extracted data for all EU companies holding a minimum share of 10 percent in a foreign (European) subsidiary. On the basis of information on the parent-affiliate ownership structure all foreign affiliates were identified and linked to the data of the parent company. For the sample of selected parent and affiliate companies we extracted data on the number of employees, the turnover, the cost of employees, the 4-digit industry Nace-code, and the nationality of the subsidiary for the period 1993 to 2005. Unfortunately we found only limited coverage of the relevant variables for the years 1996 to 1999 and also 2005, so that in the empirical analysis we had to stick to the period 2000–2004. Table 1 shows summary statistics for the annual change in parent company's employment, turnover and wage costs and the corresponding changes for their foreign affiliates.

Table 1: Descriptive statistics (medians, 2000-2004)

	All destinations		CEEC		Non-CEEC	
	Parent company	Foreign affiliates	Parent company	Foreign affiliates	Parent company	Foreign affiliates
All industries						
Number of observations	34,415	34,415	813	813	33,602	33,602
Employment growth in %	1.7	1.5	0.5	3.4	1.7	1.5
Turnover growth in %	4.5	4.5	3.0	13.6	3.6	3.5
Wage costs growth in %	3.6	3.5	3.5	7.0	4.5	4.4
Manufacturing						
Number of observations	9,284	9,284	347	347	8,936	8,936
Employment growth in %	-0.2	0.3	-1.2	4.7	-0.2	0.2
Turnover growth in %	2.5	3.7	2.0	15.2	2.5	3.4
Wage costs growth in %	3.2	3.7	3.6	7.9	3.2	3.7
Non-manufacturing						
Number of observations	25,130	25,130	465	465	24,665	24,665
Employment growth in %	2.7	1.9	2.0	2.7	2.7	1.9
Turnover growth in %	5.7	4.8	4.2	11.4	5.7	4.7
Wage costs growth in %	3.8	3.4	3.2	6.2	3.8	3.4

Source: Own calculations based on AMADEUS.

5. Empirical results

Table 2 shows the estimation results of the elasticity of substitution for the total sample and for subsamples. In particular, we estimate elasticity of substitution for manufacturing and non-manufacturing and/or also for destination countries (i.e. CEEC and non-CEEC). All regressions are performed using the robust regression technique that gives less weight on observations with large residuals. Wald-test indicate that size and sector effects are jointly significant. These results are not reported because of space limitations, but they are available from the author upon request.

The results can be summarised as follows. For the pooled sample of all industries and destinations the estimated elasticity between parent company employment and foreign affiliate employment is highly significant of about -0.30. This indicates that parent company employment and foreign affiliate employment are substitutes but the size of the elasticity indicates that the substitution possibilities are quite limited. For the manufacturing sector we obtain a quite larger elasticity of about -0.45. The corresponding elasticity for non-manufacturing is -0.27. A possible explanation is that production workers in the parent company are more easily substitutable for foreign affiliate employment than workers in services. More important we find that in the CEEC-region the elasticity of substitution between parent company employment and foreign affiliate employment is lower in absolute terms than that of the non-CEEC-region. This is consistent with the results of Becker et al. (2005) who find that the relative labour demand of home and foreign employment more strongly reacts to differences in relative wages within high-wage countries than that between wage of high-wage countries and the CEEC. According to results, a drop in wages in foreign affiliates located in the CEEC of 10 percent - with constant wages in the home-economy - leads to a reduction in home-country employment in the amount of 0.28 percent. This is somewhat lower of the findings of Becker et al. (2005) who find for German multinationals a elasticity of substitution between parent company employment and foreign affiliate employment in the CEEC of about -0.50.

Table 2: Robust regression results for the relative labour demand equation

	Coeff.	t-value	# of obs
All industries			
All destinations	-0.296 ***	-85.8	36,499
CEEC	-0.066 ***	-6.0	845
Non-CEEC	-0.301 ***	-78.6	35,654
Manufacturing			
All destinations	-0.451 ***	-62.6	9,635
CEEC	-0.280 ***	-6.6	358
Non-CEEC	-0.466 ***	-60.9	9,277
Non-manufacturing			
All destinations	-0.265 ***	-65.3	26,863
CEEC	0.030	0.9	484
Non-CEEC	-0.270 ***	-59.7	26,377

Notes: Sector and size dummy variables are included but not reported.

Furthermore, we also provide estimation results of the relative employment equation augmented by the change in the relative output level between the parent company and foreign affiliate employment (see Table 3). For the pooled sample including all industries and destinations we again find a significant elasticity of substitution between parent company employment and foreign affiliate employment. The substitution elasticity is -0.50 indicating quite moderate substitution possibilities between parent company employment and foreign affiliate employment. When the sample is split between manufacturing and non-manufacturing it becomes apparent that the substitution effect is stronger in the manufacturing sector than in the non-manufacturing sector. The estimated values are -0.65 for manufacturing and -0.46 for non-manufacturing. Turning to the subsample of multinationals and their affiliates in CEEC we find that relative employment is much less sensitive to change in relative wages with elasticities of about -0.52 and -0.33. Since the elasticity of substitution in absolute terms of parent companies operating in the CEECs is smaller than that of the Non-CEEC we conclude that the home market effects of outward FDI to CEE-region is quite limited.

Table 3: Robust regression results for the relative labour demand equation including relative output change

	Relative wages			Relative output			# of obs
	Coeff.	***	t-value	Coeff.	***	t-value	
All industries							
All destinations	-0.510	***	-173.5	0.511	***	400.8	34,415
CEEC	-0.346	***	-21.4	0.407	***	37.8	813
Non-CEEC	-0.513	***	-170.9	0.512	***	398.8	33,602
Manufacturing							
All destinations	-0.650	***	-120.8	0.594	***	303.8	9,284
CEEC	-0.520	***	-25.5	0.697	***	36.1	347
Non-CEEC	-0.654	***	-113.4	0.585	***	299.3	8,936
Non-manufacturing							
All destinations	-0.463	***	-128.6	0.461	***	280.8	25,130
CEEC	-0.327	***	-12.9	0.366	***	27.2	465
Non-CEEC	-0.467	***	-128.3	0.465	***	281.2	24,665

6. Conclusions

This paper has examined the home market effects of outward FDI into the CEE-region based on the AMADEUS firm-level database. In particular we investigated the substitution possibilities between foreign affiliate employment and parent company employment by distinguishing between manufacturing and non-manufacturing between the period 2000 and 2004. Despite fears of job losses in the home market due to outward FDI into the countries of central and Eastern Europe we find only limited evidence for the substitution of jobs between the parent companies in the EU15 and their affiliates in the CEEC. In particular we find that substitution possibilities are higher between affiliate employment in high-wage countries and the parent company employment than that of affiliate employment in the CEE-region and the parent company employment. Thus it appears that FDI in that region is mainly driven by market access considerations.

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