

Do Multinational Enterprises Relocate Employment to Low Wage Regions?

Evidence from European Multinationals

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Abstract

This paper analyzes the employment behavior of home multinational enterprises (MNEs) in Europe. To this end we use a unique firm level panel data set of more than 1,000 European multinational parent enterprises and their affiliates. The affiliates are located either in the European Union (North, South), Central and Eastern Europe or both.

We find for parent firms operating in the manufacturing sector that the labor cost elasticity of parent employment with respect to North EU affiliates' labor costs is positive and statistically significant, ranging from 0.03 to 0.08, depending on the specification considered. This implies employment substitution between parents and their North EU based affiliates takes place in response to wage cost differentials between the parent and its North EU based affiliates. This substitution effect becomes stronger when affiliates are operating in a different sector than their parent firm.

However, we find no evidence for such substitution effects between parent employment and its affiliates that are located in low wage regions in the EU and in Central and Eastern Europe. Furthermore substitution effects are absent for parent firms operating in the non-manufacturing sector.

Our results suggest that on average the competition from low wage countries in Central and Eastern Europe and the South of the EU did not contribute to a relocation of domestic jobs to these low wage regions.

JEL classification: F23, J23

Key words: Relocation, Multinational Enterprises, Labor Demand

1. Introduction

The opening up of Central and Eastern Europe posed a profound economic challenge for the European Union (EU). Virtually overnight EU countries were confronted with a group of neighboring countries with structurally very different economic conditions. Not only was the economic system of the Central and Eastern European Countries (CEEC) built on nearly 50 years of centrally based planning. Even more importantly from the EU's perspective was the huge gap in income, wages and productivity between the two regions. The demise of the Communist legacy represented an abrupt shock, especially when compared to the gradual process that characterizes post-war West European integration. Most of the policy concerns relate to employment, because Eastern Europe represents a large reservoir of low wage labor in the EU's backyard. In light of the above, one concern is that low wage import competition from the CEECs may result in job losses in EU member states. Alternatively, EU companies may just move some of their operations to the CEEC. One of the most obvious channels through which home (EU) jobs may be affected by this increased economic integration is through the employment (re)-allocation decisions of multinational enterprises (MNEs). It is often argued that MNEs are footloose (Caves, 1996; Görg and Strobl, 2002). They operate over a range of diverse national markets and can reallocate their factors of production across these markets to minimize total costs of production. The assumption being that they can respond to changing local economic conditions, without having to incur major set up costs.

In this paper we study the effect of foreign wages¹ on the demand for labor by EU MNEs. We use *firm* level data of 1,067 medium and large sized parent MNEs matched with their 2,078

affiliates located in the EU and/or Central and Eastern Europe. Therefore, we can analyze how labor demand in parent and affiliate enterprises is associated with changes in affiliate wages² relative to parent wages. We define a parent as a firm located in country i holding a direct ownership share of at least 50% in one or more firms located in another country $j \neq i$ and refer to these firms as affiliates. Thus we only consider this direct relationship and do not consider indirect holding structures. The fact that we have a panel of matched parent firms with their affiliates allows us to control for firm specific technology that may affect labor allocation across different regions. This enables us to focus on the employment substitution effects between parent firms (or home parent employment) and their affiliates. Substitution effects may exist in response to changing wage conditions in different countries, while at the same time keeping as a given global output that the MNE seeks to produce. This paper is not about the actual investment decision and its impact on employment in MNEs, rather we take locations as given. What we consider is how MNEs reshuffle jobs between the parent and their affiliates in response to wage differentials that may exist between these operations. Our data do not provide any information on the actual timing of the investment decision, so that we cannot evaluate the effects on employment in response to the actual investment/location decision. Of course relative wage costs in various countries may play a role in the location decision of a MNE, which may have implications for employment responses. However, strategic reasons related to market penetration and market expansion are often found as the main driving forces for foreign direct investment, rather than labor cost differentials (e.g. Lankes and Venables, 1996, Abraham and Konings,

¹ Wages refer to total labor costs including social security contribution and payroll tax.

² A related literature is concerned with outsourcing by multinational firms in reducing demand for unskilled labor in the home country (e.g. Slaughter, 2000; Feenstra and Hanson, 1996). However, we have no information on the skill

1999). Braconier and Ekholm (2001) investigate whether the actual location decision of Swedish MNE affiliates matters in estimating employment responses within the MNE. While they find that relative wage costs matter in explaining location patterns of Swedish affiliates, they find no evidence that sample selection matters in explaining parent employment responses to wage cost changes in their affiliates.

Given the complexity of location choices and limitations in our data set, we do not analyze this location decision rather we focus on how relative wages may affect employment decisions of the MNE once locations are fixed. Our results can therefore be interpreted as the short-run effects of wage differentials on the employment allocation decision of MNEs.

It is only recently that matched parent-affiliate data sets have become available and have been used to address similar questions. Brainard and Riker (1997) use firm level data of US MNEs in the 1980s, but find very low substitution effects between home parent employment and their foreign affiliates. In contrast, Blomström, Fors and Lipsey (1997) also using firm level data on US and Swedish MNEs find evidence that US parent firms have allocated some of their more labor-intensive operations to affiliates in developing countries. In addition, they find no evidence that Swedish MNEs relocate employment between the parent and its low-wage foreign affiliates. Likewise, Bruno and Falzoni (2000) find strong employment relocation effects between US parent firms and their affiliates in developing countries. Interestingly, Hatzius (1998) and Braconier and Ekholm (2000) use Swedish firm level panel data, collected through surveys, and find that employment relocation is taking place between the Swedish headquarters and their affiliates in other high-income locations.

composition of the workers in our firm level data, so we are not able to focus on these type of demand shifts.

While this paper is not directly testing various theories of foreign direct investment (FDI) it is worth mentioning - as a background - the distinction that is made in the literature between *horizontal* and *vertical* FDI because this is also related to labor cost differentials in different locations. The approach of vertical FDI says that the MNE locates in a particular place to take advantage of international factor-price differences (e.g. Feenstra and Hanson, 1996). Parent headquarters engage in more capital-intensive activities, while production is labor intensive and is outsourced to the low-wage locations. The horizontal FDI view asserts that MNE investment arises because trade barriers increase the costs of exporting. FDI in this view takes place primarily for market expansion reasons (e.g. Markusen, 1995; Markusen and Venables, 1998, 2000). Empirical work has provided evidence supporting the horizontal view of FDI, assisted by the fact that a significant proportion of FDI flowed between rich countries (e.g. Markusen, 1995, Lipsey, 1999, Carr, Markusen and Maskus, 2001). More recent empirical work by Hanson, Mataloni and Slaughter (2001)³ emphasizes the significant role of outsourcing and conclude that *both* horizontal and vertical strategies in MNE decisions are important. Hanson, Mataloni and Slaughter (2001) use matched US parent-affiliate data taken from the US Bureau of Economic Analysis and document a striking difference in MNE strategies in the 1980s versus the 1990s. In the 1980s a rising concentration of affiliate activities in high-income countries took place, with relatively stable employment in US affiliates, however, this changed in the 1990s. By 1999 the OECD employment share had fallen below its 1982 level, with the non-OECD share up to 35.7%. US affiliates in low-income countries experienced rapid annual employment growth rates in the 1990s, especially in the emerging market economies of China and Central and Eastern Europe.

³ They exploit micro data on US headquartered MNEs and their affiliates during in the 1980s and 1990s.

The data that we use in this paper offer a number of advantages. First, in contrast to earlier studies, this paper uses a large firm level panel data set of medium and large sized MNEs with parents located in various EU countries. Second, our data includes both manufacturing and non-manufacturing parent firms and their affiliates. This allows us to make a distinction between MNEs with affiliates operating in the same sector or different sectors compared to their parents, which may shed some light on the strategies that MNEs are pursuing. A third advantage of the current work and data is that we are able to differentiate on the basis of wage costs across the European regions. In our analysis we can distinguish between ‘very low’ wage locations (CEEC), ‘low’ wage locations (South EU) and ‘high’ wage locations (North EU). This allows us to assert whether low wage competition may potentially be important for ‘footloose’ multinationals, enabling them to reshuffle expensive jobs to cheaper ones in the low wage locations within and outside the EU.

Our main findings can be summarized as follows:

- (i) We find supporting evidence for employment relocation effects between parent home employment and affiliate foreign employment. This relocation effect depends on the activity in which the parent MNE is operating.
- (ii) For MNE parent firms operating in the manufacturing sector we find that, contrary to the popular belief, employment relocation occurs mainly between home parent firms and their North-EU based affiliates. Employment relocation does not occur on average from parent firms to either South-EU or Central and East European based affiliates.

- (iii) Additionally, we also find that the substitution effects are stronger when the sector of activity of the parent firm is different than the sector of activity of the affiliates.
- (iv) In contrast, for parent firms operating in the non-manufacturing sector we find no evidence of relocation effects.

The structure of this paper is as follows. In the next section we have a first look at the data that we use. Section 3 sets up the econometric framework and reports the main results. Section 4 reports some robustness checks, while section 5 gives the conclusion.

2. Data and Preliminary Facts

We make use of a commercial database of company accounts, comparable to other company account data sets such as the Compustat database in the US or the Exstat database in the UK. The data is commercialized under the name “Amadeus” by Bureau Van Dijk (BvD) and has been used in recent years to analyze various economic issues⁴ in a growing number of academic papers. Amadeus data includes information from the Balance Sheets and Income and Loss Statements of medium and large sized companies in the EU and in Central and Eastern Europe (see also data appendix). In most European countries medium and large sized enterprises are required by law to submit company accounts to their Central Bank or National Statistical Offices. All these company accounts went through a formal external auditing process, so we have no reasons to believe that the reported information in the Balance Sheet and Income and Loss

⁴ For example, Budina et al (2000) investigate liquidity constraints in Bulgarian firms, Konings et al. (2001) study price-cost margins in Belgian and Dutch firms, Budd et al (2002) analyze international rent-sharing in European multinational firms, Checchi et al (2003) investigate how labor demand adjusts in foreign versus domestic European firms.

Statement is incorrect.

Apart from the standard data provided in company accounts, the data also includes information on the ownership structure of firms. The company records include information on whether the company has an ownership stake in a foreign affiliate, and identify affiliates by name and an identification number. For some countries (e.g. Belgium) companies are required by law to report their affiliates, while for some other countries (e.g. the Netherlands) companies can voluntarily choose whether or not to report their affiliates.

Financial and operational information is available for 1993 through 1998, and we retrieved all companies for which unconsolidated accounts were available separately for the parent and its affiliates. Due to variation in national reporting requirements, all companies in some countries—in particular Greece and Finland—lack basic information (e.g., wage bills) that are essential for our analysis. Otherwise, we include companies in the data set simply on the basis of data availability and the ability to link parents with foreign affiliates. Companies in all industries are included, with primary industry for each parent and affiliate reported at the two-digit level of the NACE system.

The available ownership information refers to the year 1998, and we assume that the parent-affiliate ownership structure for 1998 applies to the earlier years. While we cannot trace ownership changes during the sample period, we do not believe that this is a serious problem. To the extent that we are potentially including a few affiliates who were not affiliated in earlier years, we are introducing measurement error that may bias our results towards zero.

Our eventual data set covers the period 1993-98 and is an unbalanced panel of 1,067 parent companies located in the EU, with 2,078 affiliates located in the EU or Central and Eastern

Europe or both⁵. We only take into account direct ownership links⁶ and furthermore there is no affiliate that also appears as a parent in our data set. Tables 1 and 2 show the distribution of parent firms and their affiliates across the various European countries. Germany, France and Belgium host almost 60% of the parent firms in our sample. France, Italy, Spain and the UK contain many of the affiliates in our sample, with only 5.34% located in Central and Eastern Europe.

Table 3 shows the distribution of parent-affiliates across the two broad classes of sectors, manufacturing versus non-manufacturing. In our sample nearly half (48%) of manufacturing parent firms have affiliates solely in the manufacturing sector. Almost one third (32.19%) of manufacturing parents have affiliates in non-manufacturing only, while (19.72%) have affiliates both in manufacturing and non-manufacturing. Typically, manufacturing parent firms in these last two categories have over 80% of their affiliates in the wholesale and retail distribution sectors. It is therefore unlikely, for this category of firms, that reallocation of employment in response to wage cost differentials is important. This is because the main activity of the foreign affiliate is related to distribution rather than production within the multinational group.

Turning to the non-manufacturing parent firms we note that (58.47%) of them control affiliates only in the non-manufacturing sectors, with a substantial fraction (24.66%) having affiliates in manufacturing only. This latter fraction could reflect that the production is ‘outsourced’ to the affiliates, while the ‘administration’ is done in the home parent firm. Our analysis will exploit some of these dimensions.

⁵ Amadeus does not report financial information on companies that are located in the US, Africa, Asia, so our analysis is restricted to Europe. Given that wage cost differentials are already substantial within Europe we believe we are already picking up some basic patterns, which would persist if we included more low wage regions in the

Figures 1, 2 and 3 show the evolution of total affiliate employment as a fraction of total MNE employment, i.e. the sum of total affiliate and parent employment. Figure 1 shows us that the employment share of parent MNEs has declined from 85% to 72% between 1993 and 1998, while the employment share of its affiliates has steadily increased from 15% to 28% in this period. This suggests that some reshuffling of jobs between parent firms and their affiliates took place in this relatively short time period. Figures 2 and 3 shed some more light on this reshuffling. Looking at figure 2 we note that it is especially the affiliates located in the EU that have gained in relative employment, while the employment shares of the affiliates in CEEC remained relatively stable. Finally, figure 3 makes an additional distinction between affiliates located in ‘South’ Europe and ‘North’ Europe. We defined the ‘South’ of Europe as the low wage countries in the EU, i.e. Spain, Italy, Portugal and Ireland. We can see that the increased fraction of affiliate EU employment is mainly driven by an increased fraction of employment in affiliates located in the ‘North’ of Europe. These patterns suggest that most of the job relocation took place between EU parent firms and their affiliates located in the ‘North’ of Europe. We will test this hypothesis in a more rigorous framework in section 3.

Table 4 shows summary statistics on the data that we are using. We proxy output by the total value added of the MNE using a weighted sum of the value added of the parent and of its affiliates. As we can see from table 4, parent companies in our sample employ on average 1,873 persons, while their affiliates employ less workers on average. The typical EU affiliate employs 243 workers on average, while the typical affiliate in CEEC employs almost twice as many workers, 460. This is not surprising since unit labor costs are much lower in the latter region. The

world.

average labor cost per worker per year is \$ 52,000 in parent firms, while this is only \$7,000 in the typical affiliate in Central and Eastern Europe. Although the labor cost in Central and Eastern Europe is much lower than in Europe, also the average labor productivity is much lower. In our sample value added per worker in the ‘North’ EU is \$83,000 and is \$81,000 in the ‘South’ EU, but only \$22,000 in the Central and Eastern Europe region on average.

3. Econometric Framework and Results

3.1 Econometric Specification

Consider a MNE that produces global output, Y , using the following production function, which depends only on labor input in the various locations.

$$Y = F(L^P, L^A_{NEU}, L^A_{SEU}, L^A_{CEEC}) \quad (1)$$

Where

Y = Total output of the multinational (i.e.: the sum of output in the parent and all its affiliates), F is the production function, L^P = Parent employment, L^A_l = Affiliate employment in location l (l = NEU, i.e. North EU, SEU, i.e. South EU, CEEC).

Total cost minimization under constraint (1) yields us the conditional demand for parent employment

⁶ Information on indirect ownership structures was often lacking from the data.

$$L^P = h^P(W^P, W_{NEU}^A, W_{SEU}^A, W_{CEEC}^A, Y) \quad (2)$$

- + + + +

Where W^P stands for the parent wage cost per worker, W_l^A stands for the wage cost per worker of the affiliate located in l ($l=NEU, SEU, CEEC$).

We expect the following partial derivatives:

- The own wage to be negatively related to home parent labor demand;

$$\delta h^P / \delta W^P < 0.$$

- If there are *substitution* effects between parent and affiliate employment;

$$\delta h^P / \delta W_l^A > 0, \text{ with } l= NEU, SEU, CEEC.$$

- If there are no *substitution* effects between parent and affiliate employment;

$$\delta h^P / \delta W_l^A \leq 0, \text{ with } l= NEU, SEU, CEEC.$$

The substitution effect or employment relocation effect gives an indication of the technological substitution possibilities between parent and affiliate employment, for a given production of a global output level. It represents the technological possibilities to move along the same isoquant. Equation (2) will form the basis of our empirical specifications. In particular we will estimate (2) by assuming a log-linear approximation or

$$\ln L_{it}^P = \alpha_i^P + \alpha_1 \ln W_{it}^P + \alpha_2 \ln W_{iNEU}^A + \alpha_3 \ln W_{iSEU}^A + \alpha_4 \ln W_{iCEEC}^A + \alpha_5 \ln Y_{it} + \varepsilon_{it} \quad (3)$$

With i = firm i , t = year, ε_{it} = white noise.

We include α_i^P , which is a firm specific fixed effect that is not observable. This may include distance between the parent and affiliate company, in general it refers to unobserved heterogeneity. To take into account that not all parent firms have affiliates in *all* locations (NEU, SEU, CEEC) we will estimate equation (3) including location dummies⁷. Furthermore we include in (3) year dummies to control for unobserved aggregate shocks, which are common to all parent firms. The above framework does not take into account potential employment adjustment costs in response to shocks, which would imply a dynamic specification. To theoretically model adjustment costs for multinational enterprises is not straightforward as these costs may be different for the parent company and its affiliates, depending on the local institutional constraints. Studies that assume symmetric quadratic costs of adjustment suggest that the speed of adjustment varies in different countries. For instance Anderson (1993) finds for American retail establishments that most of the adjustment is completed in one quarter. Likewise, Mairesse and Dormont (1985) find that for American manufacturing firms nearly five-sixths of the response is completed within a year, while for French and German manufacturing firms they find a very slow adjustment. Also Nickell and Wadhvani (1991) find for British manufacturing firms that only 20 percent of the adjustment to a shock is made up in one year. Hamermesh and Pfann (1996) suggest the assumption of symmetric quadratic adjustment costs is one of the reasons to find differences in the speed of adjustment and suggest some alternatives. It is not our purpose to model such an adjustment process for the allocation decision of employment for MNEs. Information on the opening and closing of affiliates is likely to be important for this, however this is not given in our data. Instead we will conduct a number of robustness checks by estimating a simple dynamic employment equation, without deriving this theoretically.

3.2 Results

Table 5 shows firm level fixed effects estimates for equation (3). Column (1) gives the results for the overall sample, while columns (2) and (3) for parent firms operating in the

⁷ Technically the firm level fixed effects control for these location dummies as they are perfectly collinear with the

manufacturing and non-manufacturing respectively. The first point worth noting is that the own wage elasticity (i.e. the effect of W_P) is estimated at -0.89 , this is well within the range of estimated labor demand elasticities reported in the literature (e.g. Hamermesh, 1993). The substitution elasticities give an indication about the responsiveness of parent employment to wage changes in affiliates. These elasticities are given by the coefficients that are associated with W_{NEU} , W_{SEU} , W_{CEEC} , reflecting the effect of wage changes in affiliates located in Northern Europe, Southern Europe and Central and Eastern Europe respectively. All three are estimated positively, however, only the wage effect on parent employment of affiliates located in Northern Europe is estimated positive and statistically significant, with a coefficient of 0.018. This suggests that a reduction of say 10% in affiliate wages located in the North European countries is associated with a reduction in home (parent) employment of 0.18% on average. We find no statistically significant effect of a reduction in wages of affiliates located in the South of the EU and in Central and Eastern Europe. This suggests that employment substitution or relocation in response to relative wage changes only takes place between parent firms (which are mainly located in the North of the EU) and their affiliates that are also located in the North of the EU. This result comes as a bit of a surprise and suggests that competition from low wage locations (on average) does not constitute a threat to parent employment. Braconier and Ekholm (2000) report similar results for Swedish MNEs. A potential explanation for this finding is the proximity hypothesis put forward by Brainard (1997). Brainard shows that it is more likely that substitution between parent and affiliate employment takes place in response to wage cost differentials when the proximity to the final market is important. In this case transport or trade costs are assumed to be negligible. Such substitution effects are also more likely when the initial factor endowments are similar across locations. This is the case for North European affiliate and (mostly North EU based) parent firms in our sample.

In the second and third column of table 5 we report results for the sub-samples of parent companies operating in the manufacturing versus the non-manufacturing sector. We can see that the relocation effect, estimated by the coefficient on W_{NEU} , is driven mainly by the sub-sample of parent firms operating in the manufacturing sector. From column (2) we note that this estimated

firm level fixed effect.

effect is now twice as high, at 0.032, compared to the estimate based on the whole sample in column (1). Moreover, we find no statistically significant substitution elasticities for our subsample of parent firms operating in the non-manufacturing sector as shown in column (3). One potential reason why we find no substitution effects in the non-manufacturing sector could be due to the nature of these activities, in that it is believed that there are more non-tradables in non-manufacturing.

In table 6 we report some robustness checks. As discussed earlier it is well known that adjustment costs in employment are potentially important, which may imply a dynamic employment specification. In table 6 we report a simple dynamic model in which we include the lagged dependent variable. The introduction of a lagged dependent variable in a fixed effects model introduces an endogeneity bias. We therefore estimated this model in first differences to control for the unobserved firm level fixed effects and applied the Arellano and Bond (1991) IV GMM estimator. This means that we used all available moment restrictions on employment dated from $t-2$ and before. Furthermore, we also instrumented output using all available moment restrictions from $t-2$ and before. Additional instruments included parent country dummies, which may capture institutional differences such as minimum wage laws, employment protection legislation, etc. between countries. The Sargan test (Chi-2 distribution) and the second order serial correlation test (Normal distribution) suggest that the instruments and model specification are valid. Our basic results remain robust. We find that the parent own short and long run wage elasticity is estimated at -0.65 and -1.0 respectively, while the short and long run substitution elasticity between parent employment and North EU affiliate employment is estimated 0.03 and 0.05 respectively. Thus, as before employment relocation seems to take place, but only between North EU parent employment and North EU affiliate employment. Again, this result is driven by the substitution possibilities in the manufacturing sector, where estimated short and long run elasticity of substitution is 0.06 and 0.08 respectively.

One of the empirical regularities characterizing MNEs is that they mostly operate in sectors that are R&D intensive and are often characterized by high levels of intangible assets, which is often reflected in the skill composition of their workforce (Markusen, 1995). The data that we use have no information on the skill composition of the workforce, so we treated labor as

homogeneous. Slaughter (2000) has shown for the US, that this may not be too much of a problem. He finds that MNE transfer to low wage countries has occurred, however, he finds no evidence that this has contributed to shifts in the relative demand for fewer unskilled workers in the US. As an extra robustness check we include as extra controls in our equation proxies for R&D intensity at the parent firm. As a proxy for R&D we use intangible assets as a percentage of total assets in the parent firm. A second control variable that we include is capital, proxied by the book value of tangible fixed assets. Our results, reported in table A1 of the appendix, remained robust to the inclusion of these extra controls.

The previous results did not make any distinction between affiliates that are operating in the same sector as their parent versus affiliates that are operating in a different sector as their parents. However, many of the affiliates of manufacturing parents are operating in the ‘wholesale’ and ‘retail’ trade sector. Arguably, these affiliates have as their main function selling and distribution activities aimed at market expansion. In these cases it seems unlikely that employment substitution based on labor cost differentials takes place. In table 7 we report fixed effects estimates of manufacturing parents with affiliates operating in the same 2-digit sector, affiliates operating in a different 2-digit sector and finally, in column 3, affiliates operating in a different 2-digit sector, but excluding the wholesale and trade sectors. We find that employment substitution between parents and their affiliates takes place, but only if they are operating in a different sector. Moreover, the substitution elasticity increases when we exclude the wholesale and retail trade sectors and is equal to 0.08 (column 3). This suggests that a reduction in labor costs in the North EU affiliates of 10% is associated with a reduction in home (parent) employment of about 1%, which is quite substantial. These results hold up if we consider a dynamic specification and use instrumental variables, not reported here for brevity.

A final experiment, reported in the appendix table A2, considers employment equations of affiliates in the various regions. Again our main result is confirmed. There is only evidence of substitution effects between North EU affiliate employment and parent employment. Furthermore, table A2 shows also that there is no substitution taking place between the different affiliates. In contrast, we find that for affiliates located in the South EU, the wage cost of CEEC

affiliates of the same MNE have a negative effect on South EU employment, which suggests that CEEC employment and South EU employment are complements.

In summary, our results indicate that competition from low wage locations does not contribute significantly to employment relocation from home (parent) firms to their affiliates in these low wage locations. Since we have no information on the actual opening up of affiliates we could not investigate whether the actual investment is associated with job loss and therefore the results in this paper need to be interpreted as short run employment relocation between parents and their affiliates.

7. Conclusions

This paper used a large representative panel data set of more than 1000 EU MNEs and their affiliates located in the EU and CEEC to test whether parent jobs are substituted for by foreign ones. We find evidence supporting the presence of substitution effects between parent employment and foreign employment, however, contrary to the popular belief we find that employment relocation mainly takes place between (mainly Northern EU based) parent companies and their affiliates located also in the North of the EU, rather than their affiliates located in the South of the EU and Central and Eastern Europe. Furthermore, this effect is mainly present in the manufacturing sector and amplified in affiliates that are operating in a different sector than their parent.

For parent firms operating in the manufacturing sector we find employment substitution elasticities ranging between 0.03 and 1.0. This potentially can cause large flows of employment if labor costs in different regions change, perhaps due to institutional changes affecting labor costs, such as changes in employer contributions. Our findings are consistent with the proximity hypothesis discussed in the literature. The results in this paper suggest that on average the opening of CEEC should not be viewed as a threat to European employment. It is rather competition between EU countries that lead multinational parent firms to relocate employment between EU locations. This paper has not, however, investigated the employment impact of the actual investment/location decision of MNEs due to data limitations. Further research on this latter issue seems to be important to assess the full impact of the increased global nature of firms.

Figure 1: Evolution of all Parent and all Affiliate Employment in Total Employment of all MNEs (Parents and Affiliates)

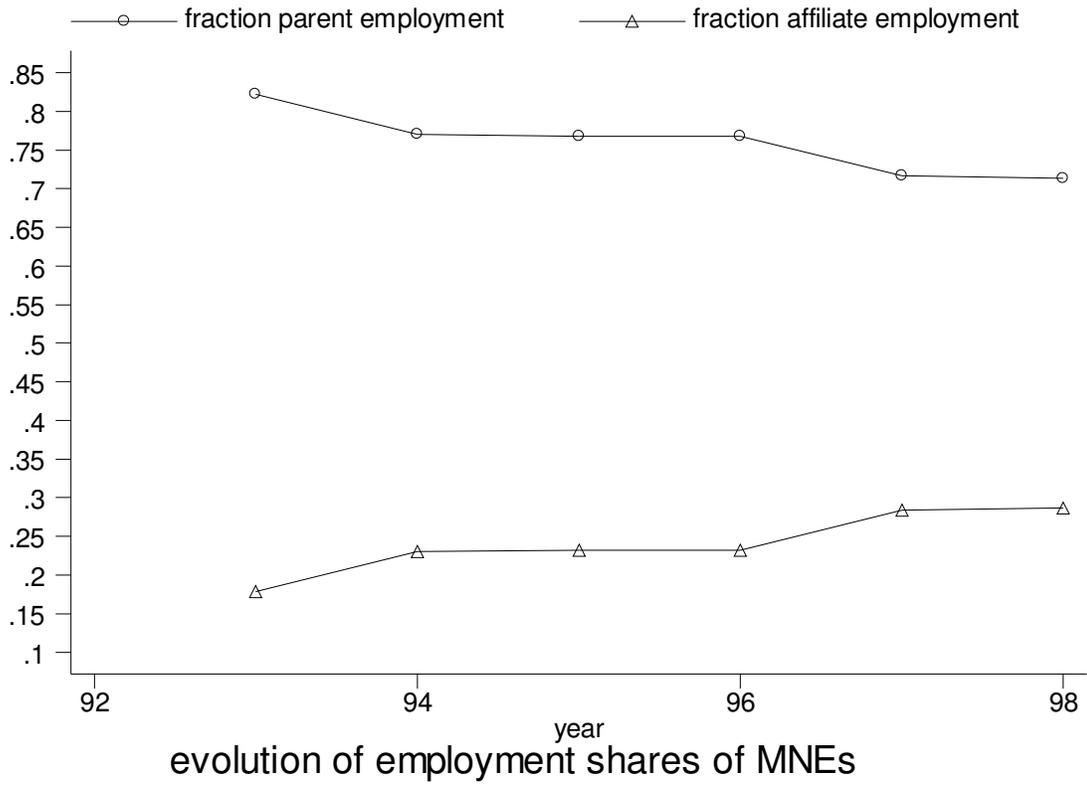


Figure 2: Evolution of all EU and CEEC Affiliate Employment in Total Employment of all MNE (Parents and Affiliates)

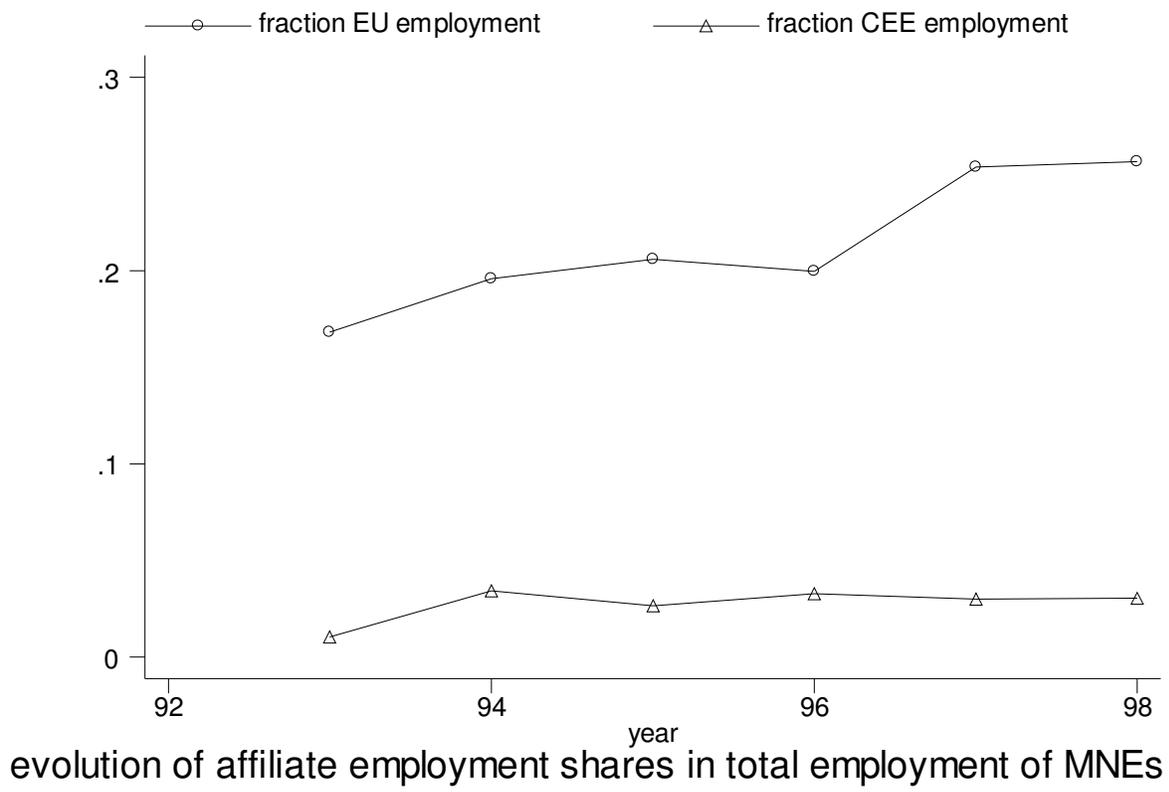


Figure 3: Evolution of all EU, South EU, North EU and CEEC Affiliate Employment in Total Employment of all MNE (Parents and Affiliates)

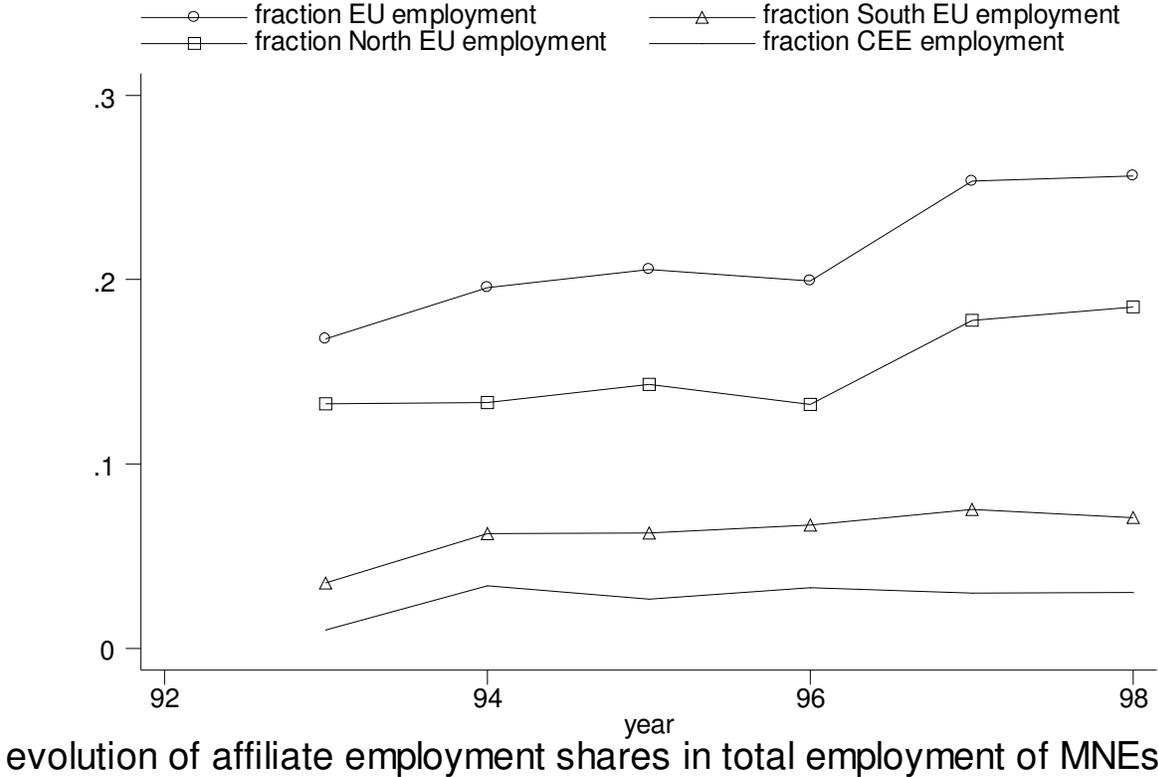


Table 1: Distribution of Parent Firms across the EU

Parent Country	Frequency of Firms
Austria	2.08%
Belgium	13.54%
Denmark	3.65%
Ireland	0.22%
France	27.16%
Germany	20.83%
Italy	14.14%
Luxemburg	0.30%
Netherlands	2.23%
Portugal	0.15%
Spain	5.36%
UK	10.34%

Table 2: Distribution of Affiliates across Countries

Affiliate Country	Frequency of Firms
Central and Eastern Europe	5.34%
Austria	1.89%
Belgium	8.45%
Denmark	0.68%
France	22.62%
Germany	2.27%
Netherlands	2.12%
Ireland	0.89%
Italy	11.37%
Luxemburg	0.83%
Portugal	3.18%
Spain	20.58%
Sweden	3.83%
UK	15.95%

Table 3: Sector Distribution of Parents and Affiliates:

		AFFILIATE		
		Manufacturing	Non-Manufacturing	Both
PARENT	Manufacturing	48.09%	32.19%	19.72%
	Non-Manufacturing	24.66%	58.47%	16.87%

Table 4: Summary Statistics

	Mean	Standard error
Parent employment	1873	4444
Affiliate employment	257	409
Of which:		
In the EU	243	390
In CEEC	460	577
In 'South' EU	225	354
In 'North' EU	252	407
Parent wage cost per worker	52	18.38
Affiliate wage cost per worker		
Of which:		
In the EU	45	17
In CEEC	7	7
In 'South' EU	41	15
In 'North' EU	47	17
Parent Value added per worker	104	79
Affiliate value added per worker		
Of which		
In the EU	82.3	71
In CEEC	22	36
In 'South' EU	81	62
In 'North' EU	83	76
Number of affiliates	1.65	2.44

Note: (i) Wage costs and value added in terms of 1000 US Dollars.

**Table 5: Parent Employment and Wages in Northern, Southern and Eastern Europe
Fixed Effects Estimates**

	(1) Whole sample	(2) Manufacturing	(3) Non-manufacturing
W^P	-0.89*** (0.032)	-1.03*** (0.041)	-0.69*** (0.050)
W^A_{NEU}	0.018** (0.01)	0.032** (0.011)	-0.02 (0.017)
W^A_{SEU}	0.002 (0.01)	0.009 (0.012)	-0.013 (0.02)
W^A_{CEEC}	0.024 (0.021)	0.015 (0.028)	0.04 (0.03)
Y	0.48** (0.015)	0.57*** (0.02)	0.33*** (0.024)
Number of observations	4375	2817	1558
R^2 within	0.35	0.42	0.26
R^2 between	0.62	0.64	0.59
R^2 overall	0.69	0.72	0.64

Notes: (i) All equations include year dummies.
(ii) ***1%, ** 5% significance and * 10% significance.
(iii) Robust standard errors in brackets.

**Table 6: Parent Employment and Wages in Northern EU, Southern EU and, Central and Eastern Europe
Arellano and Bond GMM IV Estimates**

	(1) Whole sample	(2) Manufacturing	(3) Non-manufacturing
L^P_{t-1}	0.40*** (0.05)	0.20*** (0.067)	0.46*** (0.10)
W^P	-0.65*** (0.11)	-0.82*** (0.15)	-0.57*** (0.11)
W^A_{NEU}	0.03* (0.017)	0.06*** (0.022)	0.022 (0.016)
W^A_{SEU}	0.015 (0.015)	0.03 (0.02)	-0.017 (0.014)
W^A_{CEEC}	0.012 (0.016)	-0.01 (0.02)	0.038* (0.022)
Y	0.57*** (0.086)	0.72*** (0.11)	0.33*** (0.10)
Number of observations	1576	1090	485
Sargan test (Prob>Chi2)	0.74	0.54	0.99
Test of Second Order Serial Correlation (z-value)	-0.22	0.17	0.93

Notes: (i) All equations include year dummies.
(ii) ***1%, ** 5% significance and * 10% significance.
(iii) Robust one step standard errors in brackets.
(iv) The lagged dependent variable and total output are instrumented using all available moment restrictions. Parent country dummies are included as additional instruments.

Table 7: Parent Employment and Wages in Affiliates Operating in the same 2-digit Sector Versus Affiliates Operating in Different 2-digit Sectors as their Parents

Manufacturing Parents

	Same Sector	Different Sector	Different Sector, excluding wholesale and retail trade
W^P	-1.02*** (0.07)	-0.99*** (0.05)	-1.5** (0.09)
W^A_{NEU}	-0.03 (0.05)	0.07*** (0.02)	0.08** (0.02)
W^A_{SEU}	0.06 (0.06)	0.004 (0.01)	-0.007 (0.02)
W^A_{CEEC}	-0.02 (0.09)	0.014 (0.03)	0.022 (0.03)
Y	0.68*** (0.05)	0.57*** (0.02)	0.60** (0.03)
Number of observations	682	1934	1166
R^2 within	0.50	0.43	0.47
R^2 between	0.59	0.66	0.43
R^2 overall	0.67	0.74	0.60

- Notes: (i) All equations include year dummies.
(ii) ***1%, ** 5% significance and * 10% significance.
(iii) Robust standard errors in brackets.

Appendix

The Database

Our basic data source is a commercial one, marketed by Bureau Van Dijck (BvD) and consists of published annual accounts of medium and large sized European firms, covering the years 1993-98. Firms in the data set have to satisfy at least one of the following criteria: number of employees greater than 100, total assets and operating revenue exceeding 16 million and 8 million USD respectively. The coverage of the data varies between countries, depending on the local accounting legislation. All in all the data for these medium and large sized enterprises are fairly representative for the manufacturing sector. For the non-manufacturing sector the coverage is somewhat weaker as the average firm size is typically smaller in the non-manufacturing sector.

Detailed information on the ownership linkages of firms is provided and BvD aims at providing as accurately as possible the information on foreign ownership holdings. For some countries in the data this is straightforward as by law companies have to report their foreign held affiliates (e.g. in Belgium and France). For some other countries this is not required by the law, but BvD directly contacts the companies and consults the annual company reports to retrieve the ownership information. For the companies that report foreign owned affiliates the identification number of these affiliates in Amadeus is provided, which allowed us to retrieve the annual accounts of the affiliates and match them up with the annual accounts of the parents. However, only affiliates that are located in Europe or Central and Eastern Europe are provided in Amadeus, which does not allow us to investigate the behavior of affiliates in other regions in the world like Africa, Asia, etc..

Definition of the Variables

Since some MNEs have more than one affiliate we constructed the average values of the variables of interest taken over all subsidiaries in Europe and the average values of the variables of interest taken over all affiliates in Central and Eastern Europe.

Total output of the MNE (Y): the weighted sum of value added in the parent company and the value added of its affiliates, where the weight represent the importance of value added in total value added for the parent versus the affiliates.

Unit wage cost of the parent (W^P): total wage bill of the parent company divided by total employment of the parent company.

Unit wage cost of the affiliates in the South of the EU (W^A_{SEU}): the average total wage bill of all South EU based affiliates of that particular MNE divided by the average total employment of all South EU affiliates of that particular MNE.

Unit wage cost of the affiliates in the North of the EU (W^A_{NEU}): the average total wage bill of all North EU based affiliates of that particular MNE divided by the average total employment of all North EU affiliates of that particular MNE.

Unit wage cost of the affiliates in CEEC (W^A_{CEEC}): the average total wage bill of all CEEC affiliates of that particular MNE divided by the average total employment of all CEEC affiliates of that particular MNE.

R&D intensity: intangible assets as a percentage of total assets in the parent firm.

Capital: the book value of tangible fixed assets.

Central and East European Countries (CEECs): Bulgaria, Czech Republic, Estonia, Poland, Romania, Slovak Republic (Note that data for Hungary are not available from Amadeus).

North European Union Countries ('North' EU): Austria, Belgium, Denmark, France, Germany, Luxemburg, Netherlands and United Kingdom.

South European Union Countries ('South' EU): Ireland, Italy, Portugal and Spain.

Table A1: Parent Employment and Wages in Northern, Southern and Eastern Europe
Fixed Effects Estimates

	(1) Whole sample	(2) Manufacturing	(3) Non-manufacturing
W^P	-0.87*** (0.032)	-1.01*** (0.04)	-0.65*** (0.05)
W^A_{NEU}	0.04*** (0.01)	0.06*** (0.012)	-0.02 (0.02)
W^A_{SEU}	-0.005 (0.01)	-0.006 (0.01)	0.003 (0.02)
W^A_{CEEC}	-0.009 (0.03)	-0.009 (0.04)	0.009 (0.05)
Y	0.31*** (0.016)	0.39*** (0.02)	0.19*** (0.03)
R&D	0.54** (0.26)	0.30 (0.30)	0.37 (0.53)
Capital	0.40*** (0.011)	0.42*** (0.01)	0.36** (0.02)
Number of observations	3204	2025	1179
R^2 within	0.59	0.65	0.50
R^2 between	0.73	0.72	0.69
R^2 overall	0.77	0.78	0.72

Notes: (i) All equations include year dummies.
(ii) ***1%, ** 5% significance and * 10% significance.
(iii) Robust standard errors in brackets.

Table A2: Employment Regressions of Affiliates

	North EU	South EU	CEEC
W_{SEU}	0.006 (0.01)	-0.35*** (0.05)	-0.021 (0.044)
W_{NEU}	-0.29*** (0.04)	-0.004 (0.02)	-0.013 (0.05)
W_{CEEC}	0.008 (0.04)	-0.07** (0.03)	-0.03 (0.09)
W_P	0.09* (0.05)	0.002 (0.06)	0.05 (0.35)
Y	0.13*** (0.03)	0.018 (0.04)	0.05 (0.09)
Number of observations	1821	1186	258
R^2 within	0.07	0.13	0.04
R^2 between	0.08	0.03	0.006
R^2 overall	0.09	0.03	0.001

- Notes: (i) All equations include year dummies.
(ii) ***1%, ** 5% significance and * 10% significance.
(iii) Robust standard errors in brackets.

References

- Abraham, F. and J. Konings, 1999. Does the Opening of Central and Eastern Europe Kill Jobs in the West? *World Economy*, Vol.22, pp. 585-603.
- Anderson, P. 1993. "Linear Adjustment Costs and Seasonal Labor Demand." *Quarterly Journal of Economics*, 108 (4), pp. 1015 – 1042.
- Arellano, M. and S. Bond, 1991. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *The Review of Economic Studies*, 58, pp. 277-297.
- Blomstrom, M., G. Fors, and R.E. Lipsey, 1997. "Foreign Direct Investment and Employment: Home Country Experience in the United States and Sweden." *The Economic Journal*, 107 (November), pp. 1787-1797.
- Braconier, H and K. Ekholm 2000. "Swedish Multinationals and Competition from High- and Low-Wage Locations." *Review of International Economics*, 8, pp. 448-461.
- Brainard, S.L. and D.A. Riker, 1997. "Are U.S. Multinationals Exporting U.S. Jobs?" *The National Bureau of Economic Research*, Working Paper no. 5958.
- Brainard, S.L. 1997. "An Empirical Assessment of the Proximity – Concentration Trade – Off Between Multinational Sales and Trade." *The American Economic Review*, 87 (4), pp. 520 – 544.
- Bruno, G. and A.M. Falzoni, 2000. "Multinational Corporations, Wages and Employment: Do Adjustment Costs Matter?" *Centre for Economic Policy Research*, Working Paper no. 2471.
- Budd, J.W., J. Konings and M.J. Slaughter, 2002. "International Rent Sharing in Multinational Firms." *The National Bureau of Economic Research*, Working Paper No. 8809.

Budina, N., H. Garretsen, and E. de Jong, 2000. "Liquidity Constraints and Investment in Transition Economies: the case of Bulgaria." *Economics of Transition*, 8: pp.453-75.

Carr, D., J. Markusen, and K. Maskus, 2001. "Estimating the Knowledge-Capital Model of the Multinational Enterprise." *American Economic Review*, 91, pp. 693-708.

Caves, R., 1996. *Multinational Enterprise and Economic Analysis*. Cambridge University Press, (2nd edition) Chapters 1 and 3.

Checchi, D., G. Navaretti, and A. Turrini, 2003. "Adjusting Labour Demand: Multinational versus National Firms - A Cross-European Analysis." *Centre for Economic Policy Research*, Discussion Paper no. 3402.

Feenstra, R.C., and G. Hanson, 1996. "Globalisation, Outsourcing and Wage Inequality." *American Economic Review Papers and Proceedings*, 86, pp. 220-245.

Gorg, H., and E. Strobl, 2002. "Footloose Multinationals?" *Centre for Economic Policy Research*, Discussion Paper no. 3402.

Hamermesh, D., 1993. *Labor Demand*. Princeton University Press.

Hamermesh, D.S., and G.A. Pfann, 1996. "Adjustment Costs in Factor Demand." *Centre for Economic Policy Research*, Discussion Paper no. 1371.

Hanson, G., R. Mataloni, and M. Slaughter, 2001. "Expansion Strategies of U.S. Multinational Firms." *The National Bureau of Economic Research, Working Paper*, no. 8433.

Hatzius, J., 1998. "Domestic Jobs and Foreign Wages." *The Scandinavian Journal of Economics*, 100 (4), pp. 733-746.

Konings, J., and A, Murphy, 2001. "Do Multinational Enterprises Substitute parent Jobs for Foreign Ones? Evidence from Firm level Panel Data", *Centre for Economic Policy Research*, Discussion Paper no. 3402.

Konings, J., P.F., Van Cayseele, and F, Warzynski, 2001. "The Dynamics of Industrial Markups: Using Firm Level Panel Data in Two Small Open Economics to Assess whether Competition Policies Matter." *International Journal of Industrial Organisation*, 19(5), pp. 841-859.

Lankes, H.P. and A.J, Venables, 1996. "Foreign Direct Investment in Economic Transition: The Changing Pattern of Investments." *Economics of Transition*, Vol. 4, pp. 331-347.

Lipsey, R, 1999. "Foreign Production by U.S Firms and Parent firms Production." *The National Bureau of Economic Research*, Working Paper, no. w7357.

Mairesse, J. and B. Dormmont, 1985. "Labor and Investment Demand at the Firm Level: A Comparison of French, German and U.S. manufacturing 1970 – 79." *European Economic Review*, 28 (1-2), pp. 201 – 231.

Markusen, J.R, 1995. "The Boundaries of Multinational Enterprises and the Theory of International Trade." *Journal of Economic Perspectives*, Vol. 9, nr. 2, pp. 169-189.

Markusen, J.R and A.J, Venables, 1998. "Multinational Firms and the New Trade Theory." *Journal of International Economics*, 46, pp. 183-204.

Markusen, J.R and A.J, Venables, 2000. "The Theory of Endowment, Intra-Industry, and Multinational Trade." *Journal of International Economics*, 52, pp. 209-234.

Nickell, S. and S, Wadhvani, 1991. "Employment Determination in British Industry: Investigations Using Micro-Data." *Review of Economic Studies*, 58 (5), pp. 955 – 969.

Slaughter, M.J., 2000. "Production Transfer within Multinational Enterprises and American Wages." *Journal of International Economics*, 50, pp. 449-472.