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A New International Division of Labor in Europe: Outsourcing and Offshoring to Eastern Europe

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Abstract

Europe is reorganizing its international value chain. I document these changes in Europe's international organization of production with new survey data of Austrian and German firms investing in Eastern Europe. I show estimates of the share of intrafirm trade between Austria or Germany on the one hand and Eastern Europe on the other. Furthermore, I present empirical evidence of the drivers of the new division of labor in Europe. I find among other things that falling trade costs and reduced levels of corruption as well as improvements in the contracting environment in Eastern Europe are affecting the level of intrafirm imports from that region. These factors also favor outsourcing over offshoring. In contrast, low organizational costs of hierarchies and large costs of holdup (when there are no alternative investors in Old Europe or no alternative suppliers in Eastern Europe) favor offshoring over outsourcing. Tax holidays granted by host countries in Eastern Europe also mildly affect the organizational choice.

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1. Introduction

Within the last decade, a new division of labor has emerged in the world economy. The international division of labor is characterized by firms geographically separating different production stages across the world economy in order to exploit differences in production costs. Thus, firms organize their activity in a global value chain. With Eastern Enlargement, Europe is reorganizing its international value chain. European firms outsource and offshore production to Eastern Europe. As a result, Eastern Europe is becoming an important location for European firms' international organization of production. This paper raises three issues. First, why do firms organize in an international value chain? Second, what is the extent of outsourcing and offshoring to the new member states (New Europe), to the countries of the next enlargement round (Bulgaria, Romania, Croatia), and to the Former Soviet Union – in particular, Russia and Ukraine? Third, what determines empirically the level of offshoring and the organizational choice between offshoring and outsourcing to Eastern Europe? In addressing these questions, the paper makes use of new firm survey data of 660 German and Austrian firms with 2,200 investment projects in Eastern Europe during the period 1990 to 2001. The new survey data represent 100% of Austrian and 80% of German direct investment in Eastern Europe.[1]

2. The Organizational Choice: Outsourcing versus Offshoring

Why do firms organize in an international value chain? Firm's management must decide regarding two aspects. First, how much control does it want over the firm's activity – that is, should the firm produce inside or outside of the firm boundaries? Second, where should it locate production, at home or abroad? These two decisions lead to the phenomenon of *international outsourcing* or *offshoring*. International outsourcing is a relocation of activity outside the firm to an independent input supplier in New Europe. Offshoring is a relocation to New Europe of activity that remains inside the firm.

The benefit of organizing an activity inside the firm is that headquarters then have more control over the activity and stronger incentives to provide headquarter services. The costs of hierarchies, however, include the loss of middle management initiative. The benefit of organizing an activity outside the firm by outsourcing to an independent input supplier is that it promotes the incentives and initiative of the input supplier. However, it does risk the cost of holdup due to incomplete contracting. The firm

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[1] For more details on the data, see Marin (2004).

chooses the offshoring option when the net gain from organizing the activity inside the firm outweighs the costs: that is, when headquarter services are more important than the incentives of the input supplier on the one hand and, on the other hand, when reduced initiative on the part of skilled workers is less critical than the potential holdup problem. The firm chooses to outsource when the reverse is the case. Furthermore, the firm chooses the location with lowest production costs (including wages, transport costs, and the cost of contracting). Hence, a European firm will relocate activity inside or outside of firm boundaries to New Europe when unit labor costs there are lower than in Old Europe.[2]

3. Eastern Europe – A New Member in the International Division of Labor?

How important are outsourcing and offshoring to Eastern Europe? One way to answer this question is to look at the pattern of intrafirm trade with Eastern Europe. Table 1 I characterizes the offshoring investment of a parent firm in Germany or Austria that is exporting input goods to its affiliate in Eastern Europe and is also importing these goods back from its affiliate in Eastern Europe after refinement. Thus, offshoring investments involve an intrafirm export from the parent firm in Germany or Austria to its affiliate in Eastern Europe as well as an intrafirm import from the affiliate in Eastern Europe to Germany or Austria. [3]

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[2] For the different global sourcing strategies see Antras (2003) and Antras and Helpman (2004); for the costs of hierarchies in the world economy see Marin and Verdier (2003, 2005); and for the extent of the division of labor see Acemoglu et al. (2005).

[3] For different measures of offshoring and outsourcing, see Hummels et al. (2001) and Hanson et al. (2001).

Table 1. Offshoring to Eastern Europe[1]

	As % of all FDI[2]	
	Austrian	**German**
CEE	**17.12**	**46.68**
Baltic States	3.11	28.43
Czech Republic	11.73	75.95
Hungary	10.19	27.18
Poland	41.54	14.50
Slovak Republic	9.94	68.71
Slovenia	15.49	12.44
SEE	**12.06**	**55.68**
Bulgaria	2.99	71.94
Romania	24.20	63.68
Other SEE	8.46	14.29
CIS	**42.11**	**29.15**
Russia	67.90	26.59
Ukraine	16.14	17.11
Other CIS	3.72	49.36
Total Eastern Europe	**17.27**	**45.44**

Source: Chair of International Economics, University of Munich, firm survey of 2,200 investment projects in Eastern Europe by 660 firms.

[1] Parent firms export intermediate goods as well as import intermediate or final goods from their affiliates in Eastern Europe; A tighter criterion for outsourcing requiring that parent firms import at least 20% of their Eastern European affiliates' output (rather than import at all) reduces the German multinationals' outsourcing numbers for the Czech Republic to 10%, for Russia to7 %, and for Ukraine to 2 %. All other numbers remain the same.

[2] Firms' offshoring activities as percentage of all foreign direct investments in respective Eastern European country.

I focus first on Germany. From Table 1 we see that on average about 45% of German investment to Eastern Europe fulfill these criteria and thus constitute offshoring activities of German firms. The importance of offshoring investment is much greater, however, for certain individual Eastern European countries. Offshoring dominates among German investment in the Czech Republic, Bulgaria, Slovakia, and Romania (a share of about 70%), though it plays little role in Slovenia and Poland. Offshoring to Eastern Europe is much less important among Austrian firms: only 17% of Austrian investments to Eastern Europe are offshoring investments. Again there is considerable variation across individual countries, with 68% of offshoring investment in Russia and 42% in Poland. [4]

Finally, the data allow me to calculate for the first time the share of intrafirm trade - international trade that takes place inside the multinational corporation between the parent firm (in Germany or Austria) and its affiliates in Eastern Europe. These numbers are given in Table 2. It turns out that intrafirm

trade with Eastern Europe is a dominant phenomenon in Austria (68.5% of Austria's imports from Eastern Europe are goods from Austrian affiliates in Eastern Europe to their parent firms in Austria, and 22.4% of Austria's exports to Eastern Europe is trade within the multinational enterprise). For Germany, however, such intrafirm transactions are a less important part of Eastern European trade (only 21.6% of imports from EE and 11.7% of exports to EE are intrafirm trade). The table shows considerable variation across individual countries, with a share of 65% of Germany's imports from Slovakia and a share of 34% of its export to Slovakia as intrafirm trade.

Table 2. Intrafirm Trade as Percentage of Total Trade with Eastern Europe

	Austria [1]		Germany [2]	
	Share of intra-firm exports in total exports to EE [3]	Share of intra-firm imports in total imports from EE [4]	Share of intra-firm exports in total exports to EE [3]	Share of intra-firm imports in total imports from EE [4]
CEE				
Baltic states	13.95	n.a.	5.19	14.41
Czech Republic	19.67	42.17	6.83	15.64
Hungary	20.03	136,47 [5]	11.95	40.46
Poland	41.08	64.91	17.77	15.34
Slovak Republic	26.11	54.71	34.01	64.98
Slovenia	18.70	48.36	3.32	9.38
SEE				
Bulgaria	3.36	11.32	2.30	4.20
Croatia	16.08	40.40	1.78	1.95
Romania	22.72	57.46	3.86	7.17
CIS				
Russia	34.57	26.70	4.94	1.67
Ukraine	12.00	21.52	4.51	2.44
Total	**22.40**	**68.52**	**11.67**	**21.56**

Source: Chair of International Economics, University of Munich, firm survey of 2,200 investment projects in Eastern Europe by 660 firms; Statistik Austria; Statistisches Bundesamt.

[1] For Austria, total trade with Eastern Europe is the average of 1999-2000, since the numbers of intrafirm exports and imports from the firm survey are from these years. The survey information on intrafirm exports and imports varied greatly for individual countries in Eastern Europe as a result of missing cases. In order to make the intrafirm trade numbers comparable with total trade with Eastern Europe, we artificially reduced total exports and imports by the number of missing cases of intrafirm exports and imports for individual Eastern European countries. Exports (resp. imports) from Eastern Europe are reduced by a factor of 0.17 (resp. 0.10) for the Czech Republic, by 0.51 (0.39) for Hungary, by 0.26 (0.24) for Poland, by 0.58 (0.30) for the Slovak Republic, by 0.55 (0.20) for Slovenia, 0.48 (0.47) for Bulgaria, by 0.38 (0.11) for Croatia, by 0.62 (0.47) for Romania, and by 0.74 (0.62) for Russia. For the Baltic States and for Ukraine, total trade is not reduced because there were no missing cases.

[2] For Germany, total trade with Eastern Europe is the average of 1996-2000, since the numbers of intrafirm exports and imports from the firm survey are from these years. The survey information on intrafirm exports and imports varied greatly for individual countries in Eastern Europe as a result of missing cases. In order to make the intrafirm trade numbers comparable with total trade with Eastern Europe, we artificially reduced total exports and imports by the number of missing cases of intrafirm exports and imports for individual Eastern European countries. Exports (resp. imports) from Eastern Europe are reduced by a factor of 0.63 (resp. 0.50) for the Baltic States, by 0.13 (0.00) for the Czech Republic, by 0.60 (0.40) for Hungary, by 0.87 (0.52) for Poland, by 0.10 (0.00) for the Slovak Republic, by 0.57 (0.35) for Romania, by 0.64 (0.34) for Russia, and by 0.75 (0.00) for Ukraine. For Slovenia, Bulgaria, and Croatia, total trade is not reduced because there were no missing cases.

[3] Intermediate inputs delivered by parent firms to Eastern European affiliates.

[4] Intermediate or final goods delivered by Eastern European affiliates to parent firms for marketing or further reprocessing.

[5] Austria's share of of intrafirm imports in total imports from Hungary exceeds 100% owing to one particular large investment for which we could not disentangle goods delivered to the parent firm in Austria from those goods delivered to the parent firm in Singapore.

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[4] The reason for this difference between Germany and Austria is that 56.5% of German offshoring investments to Eastern Europe are in the manufacturing sector, whereas for Austria the offshoring is mainly (71.7%) in the services sector - in particular in banking and financial services.

In sum, the pattern of intrafirm trade that has emerged between Germany and Eastern Europe and be-tween Austria and Eastern Europe, suggests that some of the Eastern European countries (such as Hungary, Poland, the Czech and Slovak Republics, Romania, Bulgaria, and Russia) have clearly be-come new members in the international division of labor.[5]

4. Determinants of Offshoring and Outsourcing

What forces are driving the new international division of labor that is emerging in Europe? Section 2 briefly summarized the factors determining the choice of organization. The firm will allocate power to the headquarter (offshoring) when the headquarter's supply of services is more important than the input supplier's incentives to deliver a specialized input for a certain price, since the party with control captures a larger fraction of the surplus and thus will have greater incentives to supply its own ser-vices. Moreover, the firm will prefer offshoring to outsourcing when the organizational costs of hier-archies are less than the costs of holdups due to independent suppliers. The fall of communism and the prospect of Eastern Enlargement led to reduced trade costs and levels of corruption as well as to an improved contracting environment in the new member states, increasing the attraction of this region as a location for European firms' activities.[6]

In order to determine the choice of organization in Eastern Europe, I run two types of regressions. First, I estimate the determinants of the share of intrafirm imports from affiliates in Eastern Europe as a percentage of parent firms' sales (the level of offshoring) in Austria and Germany; see Table 3. Sec-ond, I show (in Table 4) probit estimates of the choice between outsourcing and offshoring by German firms. As a proxy for the importance of headquarter services, I use the variable *R&D as percentage of sales* of parent firms. The dummy variable *Aalternative* captures the holdup problem faced by German or Austrian investors; the holdup problem is severe when there are no alternative suppliers in Eastern Europe for the German investor. *Property rights* is an alternative measure for the holdup problem and captures the effectiveness of contract enforcement in Eastern Europe. *Workers' initiative* is a proxy for the organizational costs of hierarchies. As firm decision making becomes less centralized, the costs

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[5] For the impact of the new international division of labor on the skill premia in Germany and in Austria and Poland see (respectively) Marin and Raubold (2005) and Lorentowicz et al. (2005); for its impact on unemploy-ment in Austria and Germany, see Marin (2004). For the pattern of skill offshoring to Eastern Europe, see Marin (2004) and Marin et al. (2003).

[6] Marin and Schnitzer (1995, 2002) and Nunn (2005) show that incentive problems and the contracting environ-ment also affect the pattern of trade.

of organizing an activity inside the firm increase. This will be so, because firms choose a less hierarchical organization to avoid the costs of losing the initiative of their skilled workers.[7]

Starting with the right-hand side of Table 3, for Germany we see that intrafirm imports from Eastern Europe are larger [a] when the parent firm is larger, more labor intensive (smaller ratio *K/L* of capital to labor ratio), and more R&D intensive; [b] when organizational costs of hierarchies (more centralized decision making by parent firm), transport costs (as measured by distance), and affiliate/parent wage ration are all lower; [c] when contract enforcement is weak in the Eastern European country; and [d] when the German firm cannot choose between alternative input suppliers in the host country. These results suggest that German firms want to offshore to a low-wage country (and thus intrafirm imports are larger) when labor costs matter and transport costs are not too high. The risk of holdup is larger in countries with weak contract enforcement, and this increases the costs of organizing the activity outside the firm. The other measure of holdup, *Aalternative*, appears, however, not to be significant at conventional levels, whereas the cost-of-hierarchies variable *workers' initiative* is highly significant. The other variables suggested by theory – such as the productivity dispersion among German firms and ratio of affiliate to parent wages (see Antras and Helpman 2004) – appear not to be significant.

The left-hand side of Table 3 summarizes the results for Austrian firms and shows some striking differences. Austrian firms do more offshoring when they are less (rather than more) R&D intensive and when they are capital intensive rather than labor intensive. This is so even when controlling for the fact that Austria's investments to Eastern Europe are mainly in the banking and financial service industries. Also, Austrian parent firms import the more from their Eastern European affiliates that are more R&D intensive.[8] Holdup costs (*property rights* and *Aalternatives,* not shown) and organizational costs (*workers' initiative*) are not significant, but tax holidays granted by the host country and productivity dispersion among firms both significantly affect the level of Austrian intrafirm imports.

I turn now to the choice of organization between outsourcing and offshoring by German firms; see Table 4. To decide between outsourcing and offshoring is to decide on the amount of control the firm retains over activity in Eastern Europe. I use the German firm's control stake in its Eastern European affiliate to distinguish between outsourcing and offshoring: "outsourcing" applies when the parent firm's ownership share the Eastern European subsidiary is no more than 30%; "offshoring" applies

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[7] See Marin and Verdier (2003, 2005) for the reasoning.
[8] These results are consistent with the fact that Austria is "human capital poor" relative to Eastern Europe and thus offshores the skill-intensive stages of production to that region (Marin 2004); for the effect of this on the skill premium in Austria, see Lorentowicz, Marin, Raubold (2005).

when that share exceeds 30%. If the parent's controlling stake is less than 30%, then any deal between parent and affiliate more resembles an arms-length transaction than a transaction within the firm.[9] German outsourcing to Eastern Europe relative to offshoring is more likely when the parent firm is more capital intensive and less R&D intensive and when transport costs are larger. These results are consistent with the estimates on intrafirm imports in Table 3. Moreover, outsourcing relative to off-shoring is more likely when the host country has a low level of corruption and when the holdup prob-lem is mild because the input supplier in Eastern Europe can choose between several alternative inves-tors from Old Europe. Both factors tend to lower the costs of organizing an activity outside the firm. Finally, larger firms (as measured by the number of workers) with larger organizational costs tend to favor outsourcing, whereas the most productive firms (relative to the industry average) tend to favor offshoring.

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[9] I follow this procedure because I do not have separate data on outsourcing. My data include offshoring invest-ments with an ownership share of the parent company of between 10% and 100% (fully owned subsidiary). Typically, national banks define an offshoring investment as one where the parent firm owns at least 10% – 20% of the affiliate's assets.

Table 3. Determinants of German and Austrian Intra-Firm Imports from Eastern Europe

Variable	Austria				Germany			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
log (K / L)$_P$	-0.487 [1.493]	5.407*** [3.008]	-0.276 [0.822]	-0.128 [0.396]	-0.705*** [4.269]	-0.760*** [4.285]	-2.334*** [3.113]	-0.700*** [3.932]
log (R&D / sales)$_P$	-1.174*** [4.523]	-1.069 [0.986]	-1.192*** [4.177]	-1.413*** [4.892]	0.311*** [3.005]	0.341*** [3.305]	0.418 [0.643]	0.441* [1.760]
log (distance)	-0.314 [1.120]		-0.393 [1.271]	-0.455* [1.663]	-0.926*** [3.372]	-1.156*** [4.110]	-1.553*** [2.683]	-0.962*** [2.886]
log (K / L)$_A$		0.205 [0.493]						
log (R&D / sales)$_A$		1.814* [2.066]						
productivity dispersion$_p$				0.000*** [2.864]				0.000 [0.873]
workers' initiative			0.067 [0.217]				-2.220** [2.186]	
log (affiliate wage / parent wage)								-0.345 [1.026]
Aalternative							0.653 [0.583]	
property rights						-0.642*** [3.058]		
tax holidays				4.421*** [2.626]				
constant	-3.294 [0.927]	-64.390*** [3.297]	0.964 [0.187]	-0.610 [0.125]	13.160*** [3.592]	18.749*** [4.656]	22.495*** [4.386]	-343.168 [0.847]
industry fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
observations	192	37	165	191	277	275	77	192
Adjusted R^2	0.34	0.63	0.35	0.39	0.43	0.45	0.62	0.45

Dependent variable: log (intermediate imports / parent sales).
Absolute value of t-statistics in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%.
(K / L)$_P$: parent firm's capital-to-labor ratio.
(R&D / sales)$_P$: R&D expenditures as percentage of parent firm's sales.
Distance: distance in km between parent firm and its affiliates.
(K / L)$_A$: affiliate firm's capital to labor ratio.
(R&D / sales)$_A$: R&D expenditures as percentage of affiliate firm's sales.
Productivity dispersion: $(\lambda_{firm} - \overline{\lambda}) / \overline{\lambda}$ where λ_{firm} is firm's productivity and $\overline{\lambda}$ as the mean productivity over all firms.
Workers' initiative: mean of 16 parent firm decisions (without R&D) including decision on acquisition or hiring a secretary; value ranges between 1 and 5, where 1 is decision at the CEO level and 5 is decentralized decision at the divisional level.
Aalternative: dummy variable equal to 1 when there is no alternative supplier in Eastern Europe for the investor and equal to 0 when there is at least one alternative supplier.
Property rights: enforcement of contracts in the country in Eastern Europe as perceived by the investor, ranging between 1 (weak) and 5 (effective) contract enforcement.
Tax holidays: tax holidays granted by a country in Eastern Europe as ranked by the investor; values range between 1 and 5, where 1 is a tax holiday as a decisive reason to invest in Eastern Europe and 5 as an unimportant reason for investment.

Table 4. Probit Estimate of Choice between Outsourcing and Offshoring among German Firms

Variable	(1)	(2)	(3)	(4)	(5)
log (K / L)$_P$	0.124 [1.615]		1.035*** [3.704]	-0.043 [0.523]	1.022*** [3.413]
log (R&D / sales)$_P$	-0.095*** [2.599]	-0.040 [1.009]	-0.379*** [3.290]	-0.232** [2.081]	-0.452*** [3.545]
log (distance)		0.412** [2.247]	0.750** [2.238]	0.608* [1.897]	0.781** [2.181]
productivity dispersion$_p$		-0.000*** [3.456]		-0.000** [2.070]	
corruption			0.443** [2.363]		0.390** [1.969]
Palternative				-0.913** [2.214]	
log (L)$_P$					0.194* [1.838]
constant	-2.962*** [3.576]	-3.859*** [2.970]	-20.019*** [4.032]	-3.949* [1.724]	-21.608*** [3.934]
observations	330	461	205	156	205
Pseudo R^2	0.0591	0.1389	0.4104	0.3062	0.4583

Dummy dependent variable: 1=outsourcing (when ownership share is no more than 30%); 0=offshoring (when owneship share exceeds 30%).

Absolute value of z-statistics in brackets.

* significant at 10%; ** significant at 5%; *** significant at 1%.

(K / L)$_P$: parent firm's capital-to-labor ratio.

(R&D / sales)$_P$: R&D expenditures as percentage of parent firm's sales.

Distance: distance in km between parent firm and its affiliates.

Productivity dispersion: $(\lambda_{firm} - \overline{\lambda}) / \overline{\lambda}$ where λ_{firm} is firm's productivity and $\overline{\lambda}$ as the mean productivity over all firms.

Corruption: corruption in the Eastern European country as perceived by the investor, ranging between 1 (pervasive corruption) and 5 (no corruption).

Palternative: dummy variable equal to 1 when there is no alternative partner for the supplier in Eastern Europe and equal to 0 when there is at least one alternative partner.

L: number of parent firm's employees.

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