Aussenwirtschaft, 64. Jahrgang (2009), Heft IV, Zürich: Rüegger, S. 419–429

Modes of International Sourcing and the Competitiveness of Firms: An Analysis of European Survey Data

Marcus Neureiter and Peter Nunnenkamp*
Kiel Institute for the World Economy

We draw on a recent survey of European companies to differentiate between alternative modes of international outsourcing as possible determinants of market, cost and knowledge-related aspects of the competitiveness of firms. We find that internalized modes are often superior to outside options, and using existing subsidiaries tends to be more (cost) effective than undertaking new greenfield FDI.

JEL Codes: F23, L24, L25
Keywords: International sourcing, FDI, competitiveness of firms, market access, cost reduction, core and support functions

Motivation

The labour market repercussions of foreign direct investment (FDI) and international outsourcing continue to be disputed. The net employment effects in the home countries depend on whether the competitiveness of multinational firms is improved through cost reductions and gains in market shares.[1] For instance, MARIN (2004) finds that offshoring to (some) lower-wage locations in Central Europe actually increased the labour demand of Austrian and German parent companies at home. She attributes this finding to labour cost reductions that have helped the parent companies to stay competitive.

However, the exact channels through which FDI and international outsourcing affect the competitiveness of firms have received only scant attention in the empirical literature. In particular, the relative importance of (labour) cost reductions is open to debate. The motivations of firms to engage in outsourcing and FDI are fairly complex. In addition to cost factors, gaining access to new markets, superior knowledge and state-of-the-art technology figures prominently in enterprise surveys and in the literature on the determinants of FDI.

* Corresponding author: Peter Nunnenkamp, Kiel Institute for the World Economy, P.O. Box 4309, D-24100 Kiel, Germany; email: peter.nunnenkamp@ifw-kiel.de; phone: +49-431-8814209; fax: +49-431-8814500.

1 See MOSER et al. (2009) and the literature given there.

We draw on a recent survey of European companies conducted by Eurostat, the statistical office of the European Communities, to assess the impact of international sourcing on major aspects of the competitiveness of firms.[2] We take into account whether international sourcing involves core business functions or support functions such as administration, logistics, marketing and ICT services. At the same time, we differentiate between alternative modes of international sourcing as possible determinants of competitiveness. In particular, we suspect that the impact on competitiveness depends on whether international sourcing is internalized within the multinational firms or involves independent partners in the host country.

Data and Method

The Eurostat survey covers about 8300 companies engaged in international sourcing. They are based in 12 European countries: Czech Republic, Denmark, Finland, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Slovenia, Sweden, and the United Kingdom. The firms rated (as positive, neutral, or negative) the impact of international sourcing on their overall competitiveness as well as specific aspects, notably (i) cost reduction, (ii) access to new markets and (iii) access to specialised knowledge and technologies. While Eurostat does not disclose firm-specific data for reasons of confidentiality, all survey results are available at the sector level for each of the participating countries. The sector coverage is fairly broad, including various services sectors. Survey information refers to the period 2001–2006.[3]

We perform OLS estimations of the following specification in order to assess the impact of international sourcing:

$$\ln(c)_{ij} = \beta_0 + \beta_1 \ln(m_{ij}) + \beta' x + \varepsilon_{ij}$$

where c_{ij} is the number of firms in country i and sector j reporting positive effects on either overall competitiveness or one of the specific aspects of competitiveness. The independent variable of interest is m_{ij}, the number of firms in country i and sector j that outsourced and off-shored core and/or

2 The Eurostat survey uses the term international sourcing to cover both outsourcing to independent foreign suppliers and offshoring by means of outward FDI. For details see Internet: http://epp.eurostat.ec.europa.eu/portal/page/portal/european_business/special_topics/international_sourcing (as of 1 September 2009).

3 For a summary of procedures, coverage and descriptive statistics, see ALAJÄÄSKÖ (2009).

support business functions in a particular mode.[4] We distinguish between "within" and "outside" modes of international sourcing, i.e., whether the function was off-shored within the multinational company or out-contracted to a local firm.[5] The "within" mode is differentiated further by distinguishing between (a) off-shoring to existing subsidiaries, (b) establishing new greenfield operations, or (c) acquiring local firms. The matrix x contains various controls. We enter the number of full-time equivalent workers (in logs) in each regression to control for the size of sectors in particular home countries. In addition we include dummy variables for each country and sector to account at least tentatively for heterogeneity at the sector and country level.

We estimate these models and then adjust standard errors to obtain robust estimates for the covariance matrices. This allows us to use Wald tests to test cross-equation constraints for core and support functions respectively. It is in two ways that we test for significant differences between coefficient values: (i) comparing the effectiveness of various modes of international sourcing with regard to a particular aspect of competitiveness, and (ii) comparing the impact of one particular mode on different aspects of competitiveness.

Results

Table 1 summarizes all estimations with alternative specifications of the dependent competitiveness variable and the independent mode of sourcing variable. To save space we show only the coefficients of the sourcing variables.[6] European sample firms clearly perceive the effects of international sourcing on their competitiveness to be positive. A higher frequency of international sourcing in a particular sector and home country is strongly associated with more firms reporting improved competitiveness. All coefficients are statistically significant at the one percent level.

Arguably, this benign picture may be because firms are reluctant to report having failed in achieving competitive gains through international sourcing. On average about two thirds of all sample firms rate the effects of interna-

4 Note that we transform all competitiveness and mode of sourcing variables by adding one before taking logs, in order not to lose zero observations. Summary statistics are provided in the appendix.

5 More precisely, Eurostat defines an "outside" business partner as a local firm without any equity shares held by the sourcing company or in which the sourcing company holds shares of 50 percent or less.

6 The variable controlling for the size of sectors, the log number of workers, almost always enters positive, though often insignificant at conventional levels. Detailed results are available on request.

tional sourcing on cost and market-related aspects of competitiveness to be positive. For knowledge-related aspects, however, positive assessments are clearly outnumbered by neutral assessments (on average, 27 versus 67 percent of sample firms).[7] Indeed, the estimation results point to striking differences across major aspects of competitiveness and modes of international sourcing. The coefficients in Table 1 range from elasticities of about 0.35 to elasticities of almost one. We are mainly interested in these differences that are unlikely to be biased by overly positive subjective assessments of participating firms.[8]

Table 2 summarizes our first set of tests for significant differences in coefficient values. A fairly clear pattern emerges when comparing the effects of international sourcing between different aspects of competitiveness. Outsourcing of both core and support functions is most effective in gaining access to new markets (upper panel of Table 2). By contrast, outsourcing is least effective in promoting the competitiveness of firms through gaining access to superior knowledge and technology.[9] This is plausible once it is taken into account that most sample firms are based in technologically leading European countries. Moreover, international sourcing in still more advanced countries, notably the United States where superior knowledge might be available, plays a minor role. While just about 16 percent of sample firms engage in sourcing in North America, the share with sourcing in (other) EU27 countries is almost fourfold.

The effectiveness of international sourcing in gaining access to new markets also tends to be relatively high compared to enhancing competitiveness through cost reductions. Recalling the reasoning of MARIN (2004), according to which labour cost reductions due to offshoring improve the parent firms' competitiveness and stimulate the demand for labour at home, our finding implies the possibility of adverse domestic labour market repercussions of international sourcing: Limited gains in cost competitiveness tend to constrain increases in domestic labour demand of parent companies. All the same, gaining market shares through outward FDI may replace exports from the firms' home base. The negative employment effect of export

7 Moreover, using actual data rather than subjective assessments, MOSER, URBAN and WEDER DI MAURO (2009) find similarly benign effects of offshoring and international sourcing on the productivity and market shares of German companies.

8 Note also that reverse causality, i.e., more competitive firms being more inclined to engage in international sourcing, is unlikely to distort our results based on the subjective assessment of competitiveness by participating firms.

9 We do not find any case where the impact of international sourcing on knowledge-related aspects of competitiveness is significantly stronger than the impact on either market or cost-related aspects.

substitution and related domestic downsizing may thus dominate over the positive effect of improved cost competitiveness (MOSER, URBAN and WEDER DI MAURO, 2009).

These differences are driven mainly by "within" modes of international sourcing. This applies to both core and support functions (lower panels of Table 2). Acquiring local firms provides an exception among "within" modes. Acquisitions as well as "outside" modes of international sourcing do not reveal any significant differences in their effectiveness across major aspects of competitiveness. In the case of acquisitions, this may be due to the minor importance of this mode (5.5 percent of sample firms) compared to greenfield FDI (19.5 percent) and existing subsidiaries (32.5 percent). As for the "outside" mode, it is hardly surprising that the gap in effectiveness narrows considerably. On the one hand, this mode could be expected to be less effective in providing access to new markets, recalling that it includes arms-length arrangements with local firms that are unlikely to affect the local market position of the European sample firms. On the other hand, the involvement of outside partners may help effectiveness when it comes to access to superior knowledge and technology that is not available within the multinational firm.

The results on the effectiveness of the two major "within" modes differ in one interesting respect. In contrast to existing subsidiaries, greenfield FDI is significantly more effective in gaining access to new markets than in reducing costs. This is plausible as greenfield FDI typically involves high sunk costs, while sufficient capacity can be established in this way to penetrate new markets. Capacity expansion within existing subsidiaries may be rather limited so that this strategy may have more balanced effects on cost and market-related aspects of competitiveness.

Turning to the second set of tests for significant differences in coefficient values, the effectiveness of "within" and "outside" modes of international sourcing does not differ significantly as long as the dependent variable is broadly defined in terms of overall competiveness of firms (first column of Table 3). However, the "within" mode proves to be clearly superior to the "outside" alternative when focussing on the market-related aspect of competitiveness as the dependent variable (second column). It seems that local partners have a minor role to play for European firms seeking access to new markets. The same applies to achieving cost reductions through outsourcing of core business functions. In other words, insufficient familiarity of European companies with host-country conditions does not appear to

constitute a binding constraint to gain a competitive edge in these dimensions. This is probably because of the strong focus of sample firms on neighbouring EU countries and their minor engagement in remote host countries. Relying on local partners, either as independent suppliers or majority shareholders in joint ventures, is an equally effective form of international sourcing, however, when European firms seek access to superior knowledge and technology or aim at reducing the costs of support functions.

As before, international sourcing of the "within" mode can be further refined. Assigning the task of improving competitiveness to existing subsidiaries frequently appears to be more effective than establishing new subsidiaries through greenfield FDI or acquiring local companies. This holds particularly for improving competitiveness through cost reduction. The time-consuming construction of new plants tends to delay cost reductions. However, greenfield FDI is not significantly inferior to using existing subsidiaries for gaining market shares or know-how in core business activities. This can again be explained by offsetting factors affecting the effectiveness of greenfield FDI relative to that of existing subsidiaries. The cost-related downside of the greenfield strategy is less relevant when market and knowledge-related aspects of competitiveness are at stake. Greenfield FDI offers better possibilities than existing subsidiaries to relax capacity constraints for penetrating new markets, and to implement process innovations required to operate at the technological frontier.

Cost reductions may also be delayed when acquired firms have to be restructured, local staff to be (re-) trained and different corporate cultures to be merged. In several of our estimations, acquisitions actually turn out to be the least effective mode of international sourcing. This underscores earlier studies finding that many mergers and acquisitions fail to realize synergies, raise productivity and gain market shares (e.g., ANDRADE, MITCHELL and STAFFORD, 2001; GÄRTNER and SCHMUTZLER, 2009). Acquirers often overpay for target firms due to asymmetric information and principal-agent conflicts. As a result, the shareholders of target firms rather than those of acquiring firms have benefited from merger transactions.

Summing up, we find significant differences in the positive effects of various modes of international sourcing on major aspects of the competitiveness of European firms. In particular, internalization within the multinational company is more effective in gaining access to new markets than the outside option of relying more strongly on local partners. This major result is robust to changes in the definition of the dependent competitiveness vari-

able, when replacing the number of positive assessments of sample firms by the difference between positive and negative assessments.[10] Using existing subsidiaries tends to be superior to other "within" modes, even though the differences across sourcing modes of core business functions weaken somewhat in our (unreported) robustness tests. Several modes of international sourcing have in common, however, that their effects on market access are relatively pronounced, particularly compared to their effects on knowledge creation and technological upgrading. In this regard, the evidence is even stronger in our robustness tests with redefined dependent variables. It then applies to all "within" modes that the effects on market access significantly exceed the effects on knowledge and technology.

10 Detailed results from our robustness tests are available on request.

References

ALAJÄÄSKÖ, PEKKA (2009), International Sourcing in Europe, Eurostat Statistics in Focus 2/2009, Internet: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-09-004/EN/KS-SF-09-004-EN.PDF (as of 31 August 2009).

ANDRADE, GREGOR, MARK MITCHELL and ERIK STAFFORD (2001), New Evidence and Perspectives on Mergers, *Journal of Economic Perspectives* 15 (2), pp. 103–120.

GÄRTNER, DENNIS L. and ARMIN SCHMUTZLER (2009), Merger Negotiations and Ex-post Regret, *Journal of Economic Theory* 144 (4), pp. 1636–1664.

MARIN, DALIA (2004), A Nation of Poets and Thinkers: Less So With Eastern Enlargement? Austria and Germany, *CEPR Discussion Paper* No. 4358, London: Centre for Economic Policy Research.

MOSER, CHRISTOPH, DIETER M. URBAN and BEATRICE WEDER DI MAURO (2009), Offshoring, Firm Performance and Establishment-Level Employment: Identifying Productivity and Downsizing Effects, *CEPR Discussion Paper* No. 7455, London: Centre for Economic Policy Research.

Appendix 1: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent variables:					
Overall competitiveness, log number of positive assessments	85	2.233723	1.962503	0	7.415175
Market-related competitiveness, log number of positive assessments	83	1.928137	1.796651	0	7.044033
Cost-related competitiveness, log number of positive assessments	78	2.047333	1.946866	0	7.183491
Knowledge-related competitiveness, log number of positive assessments	83	1.644473	1.538454	0	5.913503
Independent outsourcing variables:					
All functions, all modes (log number of firms)	73	2.835100	2.292129	0	7.972811
Core functions, all modes (log number of firms)	96	1.733570	2.084463	0	7.347300
Support functions, all modes (log number of firms)	79	2.517495	2.072135	0	7.207860
Core functions, within modes (log number of firms)	78	1.837129	1.945466	0	7.089243
Core functions, outside modes (log number of firms)	79	1.378525	1.831667	0	6.656726
Core functions, acquisitions (log number of firms)	80	0.676905	1.190183	0	5.365976
Core functions, greenfield FDI (log number of firms)	78	1.146218	1.503314	0	6.570883
Core functions, existing subsidiaries (log number of firms)	78	1.410080	1.768903	0	6.442540
Support functions, within modes (log number of firms)	85	2.251148	1.916299	0	6.938284
Support functions, outside modes (log number of firms)	80	1.726685	1.731061	0	6.559615
Support functions, acquisitions (log number of firms)	81	0.756526	1.155549	0	5.181784
Support functions, greenfield FDI (log number of firms)	80	1.448917	1.606280	0	6.525030
Support functions, existing subsidiaries (log number of firms)	86	1.957417	1.815126	0	6.192362
Size of sector i in country j (log number of workers)	95	12.29012	1.792397	7.96276	15.80053

Notes: Data on all variables from Eurostat.

Table 1: Impact of international sourcing on the competitiveness of firms: Coefficients from OLS regressions.

Functions and modes of outsourcing	Dependent variable: Overall comp.	Markets	Costs	Knowledge
All functions, all modes	0.69	0.86	0.71	0.64
	(9.12)	(16.38)	(12.78)	(9.43)
Core functions, all modes	0.59	0.74	0.63	0.43
	(7.30)	(11.39)	(8.69)	(4.24)
Support functions, all modes	0.71	0.89	0.72	0.58
	(7.00)	(17.06)	(8.02)	(5.01)
Core functions, specific modes:				
∞ Within	0.72	0.98	0.85	0.69
	(6.97)	(14.25)	(11.43)	(6.55)
o Existing	0.70	0.83	0.80	0.64
	(7.22)	(8.13)	(7.12)	(7.11)
o Greenfield	0.35	0.76	0.58	0.50
	(2.83)	(7.45)	(5.10)	(4.74)
o Acquisition	0.35	0.53	0.49	0.36
	(2.60)	(3.45)	(3.27)	(3.58)
∞ Outside	0.68	0.69	0.60	0.58
	(10.85)	(5.92)	(6.21)	(7.03)
Support functions, specific modes:				
∞ Within	0.72	0.99	0.70	0.57
	(5.31)	(22.92)	(5.51)	(4.35)
o Existing	0.91	0.98	0.91	0.83
	(13.02)	(17.19)	(15.36)	(14.25)
o Greenfield	0.62	0.96	0.57	0.44
	(3.71)	(15.15)	(3.73)	(3.42)
o Acquisition	0.41	0.69	0.58	0.49
	(2.59)	(4.30)	(3.93)	(4.78)
∞ Outside	0.70	0.72	0.71	0.65
	(8.15)	(8.07)	(8.76)	(8.54)

Notes: Dependent and independent variables are in logs.
All regressions include a dummy variable for each country and each sector as well as the log of the number of workers in sector i in country j.
All coefficients differ significantly from zero at the one percent level; t-statistics in parentheses.

Table 2: Comparing the effectiveness of specific modes of outsourcing with respect to different aspects of competitiveness.

Functions and modes of outsourcing	Dependent variables: Markets (ma) vs. costs (co) vs. knowledge (kn)
All functions, all modes	**ma>(co~kn)**
Core functions, all modes	ma>co>kn
Support functions, all modes	ma>co>kn
Core functions, specific modes:	
∞ Within	**ma>(co~kn)**
o Existing	**(ma~co)>kn**
o Greenfield	**ma>(co~kn)**
o Acquisition	ma~co~kn
∞ Outside	ma~co~kn
Support functions, specific modes:	
∞ Within	**ma>(co~kn)**
o Existing	**ma~co; co~kn; ma>kn**
o Greenfield	ma>co>kn
o Acquisition	ma~co~kn
∞ Outside	**ma~co~kn**

Notes: Significance level for the Wald tests is 10 percent.
Bold if comparison remains the same when redefining the dependent variable by subtracting the number of negative assessments from the number of positive assessments.

Table 3: Comparing the effectiveness of different modes of outsourcing with respect to major aspects of competitiveness.

Functions and modes of outsourcing	Dependent variable: Overall comp.	Markets	Costs	Knowledge
Core functions				
∞ Within (wi) vs. outside (out)	**wi~out**	**wi>out**	wi>out	**wi~out**
∞ Existing (ex) vs. greenfield (gr) vs. acquisition (ac)	**ex>(gr~ac)**	**(ex~gr)>ac**	ex>(gr~ac)	ex~gr ex>ac gr~ac
Support functions				
∞ Within (wi) vs. outside (out)	**wi~out**	**wi>out**	**wi~out**	**wi~out**
∞ Existing (ex) vs. greenfield (gr) vs. acquisition (ac)	**ex>(gr~ac)**	**(ex~gr)>ac**	**ex>(gr~ac)**	**ex>(gr~ac)**

Notes: Significance level for the Wald tests is 10 percent.
Bold if comparison remains the same when redefining the dependent variable by subtracting the number of negative assessments from the number of positive assessments.

Marcus Neureiter
Otto-Friedrich-Universität Bamberg
Erlichstraße 14
D-96050 Bamberg
Germany
marcus.b.neureiter@gmail.com

Peter Nunnenkamp
Kiel Institute for the World Economy
P.O. Box 4309
D-24100 Kiel
Germany
peter.nunnenkamp@ifw-kiel.de