Working Papers

Outsourcing Motives, Location Choice and Labour Market Implications: An Empirical Analysis for European Countries

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Outsourcing Motives, Location Choice and Labour Market Implications: An Empirical Analysis for European Countries *

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Abstract: We use data on motives of international outsourcing and location choices from a recent survey of European companies to assess the labour market repercussions at home. Employing Tobit models we differentiate between job losses as well as job creation for high and low skilled employees at the sector level in ten European home countries. Our findings are in conflict with public concerns about adverse employment effects resulting primarily from cost-oriented sourcing in low wage locations. The quantitative impact on job losses remains modest in the case of cost-saving motives. The simple divide between low and high wage locations hides substantial heterogeneity within both groups. We also find that job losses are typically compensated partly by new job creation, particularly for high skilled workers.

Keywords: outsourcing, outward FDI, motives, location choice, job loss, job creation, (un)skilled labour

JEL classification: F23; J21

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1. Introduction

The labour market repercussions of international outsourcing and offshoring take centre stage in the public debate on globalization. At the same time, the academic debate is far from resolved as the empirical evidence on the employment effects in the home countries of multinational enterprises (MNEs) is still limited and inconclusive. Previous literature focuses on the United States.[1] It is open to question, however, whether findings for the United States hold in Europe. The motives underlying international outsourcing and offshoring may differ, European MNEs may prefer other locations than US peers, and the employment effects may be shaped by labour market rigidities in various continental European home countries.

We draw on a recent survey of European companies conducted by Eurostat (the statistical office of the European Communities), described in more detail in Section 2 below, to assess important aspects of international sourcing that are controversially debated or have received insufficient attention in earlier studies.[2] We use data on job losses and job creation at the sector level in ten European home countries as dependent variables, and the survey results on firms' motives for international sourcing as well as the locations where it takes place as possible determinants of employment effects.

The literature on the coexistence of horizontal and vertical foreign direct investment (FDI) renders theoretical predictions about labour market repercussions in the home market of MNEs rather ambiguous (Becker et al. 2005). Horizontal FDI is generally driven by market-seeking motives, while cost-saving motives are underlying vertical FDI. Horizontal FDI could be expected to involve substitution between the firms' foreign and domestic activities in the tradable goods sector. FDI replaces trade in the Heckscher-Ohlin framework so that horizontal FDI would have a negative effect on production (Mundell 1957) and thus on employment at home.

By contrast, vertical FDI is often supposed to involve "an element of complementarity between the firm's domestic and foreign operations" (Braconier and Ekholm 2000: 448). However, vertical FDI may also involve labour substitution if upstream or downstream

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[1] Lipsey (2002) provides a comprehensive review of this literature.
[2] The term "international sourcing" is used in the following to cover both outsourcing to independent foreign suppliers and offshoring by means of outward FDI. As explained in more detail in Section 2, the survey also covers motives of horizontal FDI; for definitions and coverage of the survey see http://epp.eurostat.ec.europa.eu/portal/page/portal/european_business/special_topics/international_sourcing (accessed: August 2009).

activities traditionally conducted at home are relocated to foreign affiliates.[3] Net effects depend on whether cost savings through vertical fragmentation enable the parent company to improve its productivity and expand its market share, and on the degree of complementarity between foreign and domestic stages of production (Hanson et al. 2005).

Empirically, the survey by Lipsey (2002: 13) finds "not much evidence for this conjecture [of horizontal FDI substituting for parent activities at home, and vertical FDI adding to parent activities]." Typically it proves fairly "difficult to classify actual foreign operations into these theoretically neat categories" (ibid). We address the classification of international operations as horizontal or vertical in the following by drawing on the Eurostat survey results with respect to the major motives underlying international sourcing by European firms.

Similarly, most existing studies do not distinguish between different locations of foreign operations by MNEs. Yet the relevance of heterogeneous locations is evident from the literature assessing the effects of offshoring on the skill intensity of domestic production. For instance, Head and Ries (2002) find that foreign affiliate employment of Japanese MNEs in low income countries raises the skill intensity at home, while this effect diminishes when FDI is undertaken in higher income countries. The question of whether overall employment effects of outward FDI depend on where foreign affiliates locate has received less attention, and the available evidence is inconclusive.

According to Blomström et al. (1997), affiliate production in developing countries is negatively associated with parent employment for US-based MNEs, which is attributed to relocation of labour intensive production operations to low wage host countries of US FDI. Harrison et al. (2007) stress the crucial distinction between US affiliates in low income and high income countries, with jobs in low income (high income) countries substituting for (complementing) US jobs. In contrast to the United States, domestic employment (of white-collar workers) by Swedish MNEs actually increases with more affiliate production in low income countries.[4] Japanese firms resemble Swedish firms in this respect (Lipsey et al. 2000). Barba Navaretti et al. (2006) do not find evidence of a negative effect of FDI by French and Italian MNEs in low income countries on economic activity at home.

Inconclusive results are also reported with respect to the employment repercussions of FDI in Central and Eastern Europe as a low wage host region. While Becker et al. (2005)

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[3] Marin et al. (2003: 159) argue that no change in relative wages or employment should be expected when West European countries undertake horizontal FDI in Eastern Europe, "while this should be expected if FDI is vertical."

[4] Results on Swedish MNEs reported by Braconier and Ekholm (2000) are similar to the findings of Blomström et al. (1997).

conclude that lower wages in Central and Eastern Europe tend to reduce employment in Germany, Konings and Murphy (2006) reject the notion of employment substitution between European manufacturing parent companies and their affiliates located in low wage regions in the EU and Central and Eastern Europe. Marin (2004) argues that low cost workers of affiliates in Central and Eastern Europe help Austrian and German parent companies to stay competitive.

In addition to Central and Eastern Europe, it is mainly China and India that have raised public concerns about negative employment repercussions of outsourcing and offshoring to low wage locations. The Eurostat survey allows us to clearly separate these locations one-by-one from high wage locations such as the more advanced EU member states and North America.

With international sourcing being driven at least partly by cost motives and taking place in low wage locations, the labour market repercussions are unlikely to be evenly spread in the home countries of MNEs. Rather, it was widely agreed until recently that mainly low skilled labour would be affected negatively. According to the North-South model of Feenstra and Hanson (1996), skill intensive headquarter services remain in the more advanced home countries of MNEs and subsidiaries in less advanced host countries draw primarily on less skilled labour. Consequently, offshoring raises the skill premium in the home countries of MNEs. Unemployment of low skilled labour would result if workers resisted widening wage disparity.[5]

Baldwin (2006) has challenged this traditional view, arguing that the international division of labour is occurring at a much finer level of disaggregation. MNEs are increasingly offshoring specific tasks that were previously considered non-traded so that "old-globalisation's correlation between skill groups and winners and losers breaks down" (Baldwin 2006: 5). More precisely, the fall in communication and coordination costs leads to an unbundling of tasks that no longer stops short of skills. High skilled jobs may be as easily offshored as low skilled jobs if the services they provide do not require physical closeness to where these services are demanded (Blinder 2007).

The Eurostat survey renders it possible to address the conflicting hypotheses on international sourcing and skills as the employment effects are given not only for the overall workforce of responding firms but also for the high skilled part of the workforce. Moreover, the survey separates between jobs lost due to international sourcing and new jobs created in

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[5] Feenstra and Hanson (2003) argue in their survey on trade and wages that trade in intermediate inputs is a potentially important explanation for the increase in the wage gap between skilled and unskilled workers in advanced countries.

this way. This allows for testing another implication of MNEs organizing the division of labour at an increasingly fine level of disaggregation. The focus of previous studies on *net* employment effects of outsourcing and offshoring may obscure that there are winners and losers not only across skill categories but also within skill categories. In other words, outsourcing and offshoring may involve structural employment shifts at different levels.

2. Data and stylized facts

Our estimations are based on a recent survey on international sourcing by European firms, conducted "to provide policy makers at national and EU level with relevant statistical evidence and information about factors driving international sourcing, together with indications of the consequences for employment."[6] Thirteen European countries participated in the survey.[7] Ireland, Italy and Spain are not included in our estimations due to missing data on job losses and job creation. The survey covers firms with more than 100 employees. A fairly high number of over 54,000 questionnaires were returned. About 16 percent of participating firms reported to be engaged in international sourcing. This share ranges from less than five percent for Czech firms to 35-38 percent for UK and Irish firms (Alajääskö 2009). Survey information refers to the period 2001-2006.

The survey uses the term "international sourcing" to capture the relocation to foreign countries of core and support functions traditionally performed in-house or sourced in the firm's home country. The relocated business functions may be performed by foreign affiliates of the surveyed firms or by non-affiliated firms in the foreign country. In other words, international sourcing as defined by Eurostat includes outward (horizontal and vertical) FDI by the surveyed firms as well as the supply of inputs by independent foreign firms.[8] While firms use both outward FDI and outsourcing to independent foreign suppliers, FDI was about twice as common as outsourcing in the sample (Alajääskö 2009).

As detailed below, the survey offers most useful information to assess the employment repercussions of international sourcing. Yet there are two major limitations. Most importantly, Eurostat has not disclosed the firm-specific survey responses for reasons of confidentiality.

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[6] Quote taken from: http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/iss_base_an1.pdf (accessed: August 2009). For a summary of findings and descriptive statistics, see Alajääskö (2009); data are from: http://epp.eurostat.ec.europa.eu/portal/page/portal/european_business/special_topics/international_sourcing#publications (accessed: August 2009).

[7] Apart from Norway, all participating countries are EU members: Czech Republic, Denmark, Finland, Germany, Ireland, Italy, Netherlands, Portugal, Slovenia, Spain, Sweden, United Kingdom.

[8] Eurostat's notion of international sourcing may be misleading in suggesting that only vertical FDI and sourcing of inputs is taken into account. However, horizontal FDI to penetrate foreign markets is also included. As a matter of fact, access to foreign markets is considered to be a major motive of "international sourcing."

The available survey data are aggregated at the sector level for each of the participating countries. The sector coverage is fairly broad, including essentially all market activities (according to the NACE Rev.1.1 classification). It is not possible, however, to differentiate between specific industries within the manufacturing sector.[9] Taken together, this results in a limited number of observations and constrains the specification of estimation equations (see Section 3 below).

The subsequent analysis focuses on firms' motives for, as well as the location of international sourcing activities as possible determinants of labour market repercussions at home. We are particularly interested in motives related to costs and market access as these are typically regarded to be the driving forces of vertical and horizontal FDI, respectively. As a matter of fact, Alajääskö (2009) lists the reduction of labour costs as the top motive of all sample firms, closely followed by access to new markets. Given that cost reduction other than labour costs is also mentioned to be an important motive by about one third of the sample, we construct a combined cost variable by taking the simple average of the percentage of firms stating reduction of both kinds of costs to be "very important" in their decision to outsource core and support functions.

As concerns locations, international sourcing by European firms is mainly taking place within the EU. As shown in Appendix 2, the average share of firms that source in the relatively advanced EU15-member states is clearly highest (almost 45 percent). By this measure, the less advanced new EU-member states rank second as a location of international sourcing. The average share of firms that source in North America, India and China is considerably smaller (about 6-9 percent). Yet these three locations are expected to offer interesting insights on whether the employment repercussions of international sourcing differ systematically between low and high income host locations.[10]

Finally, the survey offers sector-specific information on the employment effects of international sourcing. This information is based on the participating firms' own assessment. More precisely, the firms are requested to provide their best estimate of the number of jobs lost as well as the number of jobs created domestically within the firm as a consequence of international sourcing. Furthermore, the firms are requested to provide the same information

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[9] Available sectors are as follows: mining and quarrying; manufacturing; electricity, gas and water supply; construction; wholesale and retail trade (including repair); hotels and restaurants; transport and communication; financial intermediation; real estate and business activities.

[10] In our estimations, we do not account for other locations than those mentioned in the text. Other locations typically play a minor role (Alajääskö 2009: Figure 4). Moreover, groups such as "other Asian countries" include both low and high income countries.

separately for high skilled workers. All jobs held by workers with tertiary education are classified as high skilled in the Eurostat survey.[11]

By relying on the firms' own assessment, the actual impact of international sourcing on employment at home may suffer from measurement error. In particular, responding managers may underrate negative effects in order not to fuel public reservations against international sourcing. However, even if the survey results were generally biased "positively" this would not invalidate our approach of assessing differences in employment repercussions depending on the motives for, and locations of international sourcing. In fact, the subjective assessments of survey respondents may even be preferred over objective employment data. The latter are often deficient in that it is hardly possible to establish the counterfactual of what would have happened to employment if the firms had not undertaken international sourcing. By contrast, it appears reasonable to suspect that survey respondents are able to take into account how domestic employment within the firm would possibly have developed without international sourcing.

Table 1 presents some stylized facts on job losses as well as job creation due to international sourcing. The sum of job losses reported by all sample firms is about 300.000; German and UK firms account for almost 80 percent of overall job losses. Relating total job losses to the number of sample firms being engaged in international sourcing results in about 45 jobs lost per firm. Reported job losses per firm are highest in Sweden (about 90), Germany (75) and Denmark (57). The public perception that low skilled workers are more seriously affected finds support as far as absolute numbers can tell: 65-97 percent of total job losses in the sample countries fall into the low skilled category.

Yet the negative employment repercussions of international sourcing appear to be rather modest once it is taken into account that job creation compensates for almost half of job losses reported by survey respondents. The creation of high skilled jobs falls only 14 percent short of losses of high skilled jobs for all countries taken together.[12] For several smaller sample countries, high skilled job creation even exceeds job losses. By contrast, the creation of low skilled jobs accounts for just 35 percent of low skilled jobs lost. Net losses of low skilled jobs are concentrated in Germany, slightly exceeding 30 workers per participating (German) firm with international sourcing.

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[11] For the questionnaire see: http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/iss_base_an2.pdf (accessed: August 2009). See Appendices 1-3 below for exact definition of variables, summary statistics and bivariate correlations.

[12] The Netherlands and the UK have to be excluded (due to missing data) when calculating skill-specific balances of jobs lost and created.

3. Method and results

Estimation approach

There are various zero observations for our dependent variables. In the underlying survey it often occurs that responding firms do not consider international outsourcing to have negative employment repercussions for workers with different skills in the home countries. Likewise, job creation is given as zero for several combinations of skill categories, industries and home countries of firms engaged in international outsourcing. We perform standard Tobit estimations to account for this distinguishing feature of the dependent variables; OLS estimations might be biased. By applying Tobit models to the data we assume that the probability of any employment effects as well as the magnitude of employment effects can be explained by the same set of variables. Tobit models also require each explanatory variable to bear the same sign in both instances. We consider both assumptions to be plausible in our estimations.

We estimate Tobit models for each of the following labour market outcomes as dependent variables y_{ij}: the number of job losses for (i) all, (ii) high skilled and (iii) low skilled workers in industry i and country j in the period 2001-2006; the number of jobs created for the same three categories of workers; and the net employment effects, given by jobs lost minus jobs created. The dependent variable is modelled in terms of a latent variable y_{ij}^*:

$$y_{ij}^* = x_{ij}\beta + \varepsilon_{ij}$$
$$y_{ij} = y_{ij}^* \qquad\qquad if\ y_{ij}^* > 0$$
$$y_{ij} = 0 \qquad\qquad otherwise$$

The coefficients β (reported in Appendix 4) cannot be interpreted directly in the context of Tobit models. Instead, we are interested in the overall marginal effects of the explanatory variables on $E\left(y_{ij}\big|x_{ij}\right)$ taking into account the probability that there are any job effects at all. We calculate them at the mean of the respective covariates (Greene 2003: 764-773).[13]

In the following, the dependent variables are always in logs.[14] Motives and location of international sourcing are our explanatory variables of principal interest. In all estimations, we

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[13] The marginal effects can be interpreted as elasticities when the dependent and independent variables are in logs. We get semi-elasticities when the independent variable is in levels.

[14] In order to preserve zero observations we transformed dependent variables according to $\ln y = \ln(1 + y)$

consider two controlling variables: *log_nrworkers* captures the size of sector i in country j, proxied by the number of full-time equivalent jobs; *nrsourcing* controls for the level of international sourcing activities in the given sector and country. Furthermore, we include (but do not show) dummies for all home countries and all sectors to control for unobserved heterogeneity in the data. We computed heteroskedasticity robust standard errors for all estimations.

Outsourcing motives

Table 2 presents the overall marginal effects obtained from the estimation of the Tobit model focussing on the motives of international sourcing. Columns (1) to (3) provide the effects for total job losses and high skilled and low skilled job losses separately. Columns (4) to (6) provide the corresponding estimations for job creation. Sector size almost always enters significant and positive, while the second controlling variable, *nrsourcing*, turns out to be significantly positive only when job creation is the dependent variable. At first sight, it may be surprising that the marginal effect of sector size ranges up to three percent. This result is plausible, however, once the coverage and definition of sectors in the Eurostat survey is taken into account (Section 2). Typically, manufacturing is by far the largest sector in the countries under consideration. At the same time, international sourcing figures most prominently in this sector (Alajääskö 2009).

The two major motives of international sourcing enter significant, but with opposite signs in column (1) for total job losses. Cost reduction as a motive of vertical FDI and outsourcing is associated with total job loss. More precisely, sectors with a higher percentage of firms stating cost reduction to be "very important" for their sourcing decision report significantly more job losses. By contrast, access to new markets as a "very important" motive for locating business functions abroad is associated with a significantly lower number of job losses. Horizontal FDI thus appears to destroy less jobs at home than vertical FDI. This result underscores public concerns about cost-related outsourcing and offshoring. It conflicts, however, with a widely held view in the earlier literature according to which horizontal FDI may have negative employment effects through replacing exports and, thereby, production at home by local production in the host countries. While this reasoning may still apply to horizontal FDI in the tradable goods sector, an increasing share of horizontal FDI takes place in services (UNCTAD 2004).[15]

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[15] Note that Vernon's (1979) product cycle hypothesis, according to which exports precede FDI, does not hold in service sectors producing non-tradables.

While the two major motives have significant effects working into opposite directions with respect to total job losses, they have in common that the effects are quantitatively fairly small. Assuming that the share of firms stating cost motives to be very important would increase by 10 percentage points from its mean of about 44 percent (Appendix 2), job losses would increase by less than 0.2 percent. The same assumption as for the importance of market access would reduce job losses by slightly more than 0.2 percent. Furthermore, job losses may be compensated at least partly by the creation of new jobs through international sourcing. For instance, column (4) in Table 2 indicates that the employment repercussions of cost-oriented international sourcing are not restricted to job destruction, even though the effect on job creation remains statistically insignificant at conventional levels. This provides weak support for the view that international sourcing increases the competiveness of firms which, in turn, may generate new employment opportunities (e.g. Marin 2004).

Columns (3) and (6) in Table 2 reveal that the results for the overall workforce reported so far are mainly driven by job losses of low skilled workers. As before, job losses rise with an increasing share of firms stating cost motives to be very important, and a predominance of market access motives tends to reduce job losses. The quantitative effects, though still modest, are somewhat larger than for total job losses.

The pattern of job losses and job creation for high skilled workers differs in several respects from the pattern for low skilled workers. Cost-related motives do not impact significantly either job losses or job creation for high skilled workers. In other words, skills still appear to matter for the employment repercussions of cost-driven international sourcing. This qualifies the view that high skilled jobs may be as easily offshored as low skilled jobs in the current phase of globalization. Possibly, the unbundling of tasks according to Baldwin (2006) is a fairly recent phenomenon not yet captured in the data used here.

More strikingly, the results in column (2) indicate that job losses for high skilled workers are higher in sectors and countries where more firms rate market access motives to be very important. This effect is significant at the one percent level. However, the quantitative impact is once again fairly modest. Furthermore, the results in column (5) suggest that horizontal FDI also has significant potential to create new high skilled jobs in a particular sector of a country. The finding that market-related motives are significantly associated with both job losses and job creation for high skilled workers gains plausibility when more closely inspecting the underlying data for the biggest economy in the sample, Germany. The number of high skilled jobs lost in Germany is only seven percent higher than the number of high skilled jobs created (Table 1). The pattern of high skilled job creation deviating just slightly

from job losses holds for almost all German sectors. At the same time, the average share of German firms rating market access to be "very important" for their sourcing decisions is far above average (65 percent compared to 46 percent).

Taken together, the findings reported in Table 2 invite some tentative conclusions. The employment repercussions of international sourcing clearly differ between high skilled and low skilled workers, even though quantitative effects are generally modest. High skilled workers do not necessarily suffer less job losses under all circumstances. However, compensating shifts in employment within skill categories are particularly pronounced for high skilled workers, indicating that these workers have better chances to find new jobs.

Location choice

As noted in the Introduction, the public is primarily concerned about outsourcing and offshoring to low wage locations such as China, India and the new EU-member states. Therefore, we separate high from low wage countries in order to test whether the labour market repercussions differ significantly between these groups. *High wage* is defined as the average share of firms that reported to invest in either North America (i.e., Canada and the United States) or the European Union in pre-2004 borders (EU15); *low wage* is the average share of firms investing in China, India or the twelve new member states of the European Union since 2004. The results are shown in Table 3. Note that the marginal effects for the controlling variables are essentially as before (see Appendix 4).[16]

Strikingly, the distinction between low and high wage locations does not matter for job losses. This is in contrast to previous findings for the United States (Blomström et al. 1997; Harrison et al. 2007). Moreover, this result applies irrespectively of the skill category of workers (columns (1) to (3)). As for job creation (column (4)) we even find that international sourcing in high wage locations is associated with *less* job creation. The negative and significant effect on total job creation can be attributed exclusively to low skilled workers. While blue-collar workers appear to suffer from the replacement of previous exports by local production in advanced host countries, white-collar workers may be less affected as long as headquarter services remain in the home country.

Having found no significant employment effects of international sourcing in all low wage countries taken together, we refine the dichotomy between low and high wage countries. Arguably, this dichotomy hides substantial heterogeneity within both groups. Hence, we differentiate between specific regions and major host countries in the following. The Eurostat

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[16] The regression coefficients for the estimations with *low wage* and *high wage* are not reported to save space, but are available on request.

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survey enables us to distinguish three important low wage locations, i.e., China, India, and the twelve new EU members, and two high wage locations, i.e., North America and the EU15. As before, we control for sector size and the overall level of sourcing in the sector. The results presented in Table 4 reveal that there are indeed different effects within the low income and the high income group, respectively.

As for high wage locations it is mainly the EU15 that accounts for two previous findings. Similar to Table 3, international sourcing within the EU15 has a significantly negative effect on job creation for low skilled workers – and this effect again carries over to total job creation (columns (6) and (4) in Table 4). Furthermore, column (2) shows higher job losses for high skilled workers due to sourcing within the EU15, resembling the previous finding for market-related motives in Table 2. Job losses for high skilled workers may result from the consolidation of headquarter services through mergers and acquisitions within the common EU market. According to UNCTAD (2004: 162), 185 regional headquarters were established in the EU15 in 2002-03 alone, accounting for one third of new regional headquarters worldwide.

By contrast, the employment repercussions of international sourcing in similarly advanced, but more distant locations are more benign. Specifically, there is no evidence that sourcing in North America is associated significantly with higher job losses or less job creation for any skill category. This may be partly because sourcing in North America plays a minor role compared to sourcing within the EU15 (see Section 2). In addition, the motives underlying sourcing in North America may extend beyond the conventional horizontal versus vertical divide. For instance, some European FDI in the United States is driven by considerations of access to advanced technologies.[17] This could explain why the marginal effect on job losses for high skilled workers is negative, in contrast to the corresponding effect of sourcing in the EU15, and almost significant at the ten percent level.

While the marginal effects differ between the economically advanced EU15 and North America, the marginal effects reported in Table 4 are strikingly similar when comparing the more advanced EU15 with the less advanced new EU members. As observed earlier for the EU15, sourcing in the new member states is associated with higher job losses for high skilled workers and less job creation for low skilled workers.[18] The observation that high skilled workers, too, are affected negatively may be attributed to the favourable endowment of skilled labour in various Central European host countries. More generally, the similarities between

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[17] Indeed survey respondents stated relatively frequently that access to technology was a major motivation in sectors where sourcing in North America figured relatively prominently.
[18] Hence, our results tend to support Becker et al. (2005), rather than Konings and Murphy (2006).

the EU15 and new EU members are plausible, even though public reservations against sourcing in new member states suggest otherwise: On the one hand, previous research finds that horizontal FDI is not limited to the EU15, but figures prominently in the new member states, too (e.g. Resmini 2000; Carstensen and Toubal 2004). On the other hand, countries such as Ireland and Spain have traditionally hosted cost-oriented vertical FDI within the EU15.

The results for China and India underscore that it is misleading to assess the labour market repercussions of international sourcing along the simple divide of low versus high wage locations. The results on job losses shown in columns (1) to (3) of Table 4 suggest that the case of India fits best into the widely held view of international sourcing causing job losses for low skilled workers, whereas high skilled workers may benefit from improved competitiveness of companies realizing cost savings through outsourcing and offshoring. Indeed, the marginal effect in column (3), though still modest, is considerably higher than marginal effects found before. Accordingly, an increase by ten percentage points in the share of firms with sourcing in India would add 1.5 percent to low skilled job losses. Nevertheless, even sourcing in India does not have the one-sided negative effects as often perceived in the public debate. Job losses for low skilled workers are at least partly compensated by job creation. Hence, sourcing in India seems to involve employment shifts within the low skilled workforce. For instance, sourcing of routine ICT services in India may enhance the competitiveness of operations at home and, thereby, generate additional low skilled jobs performing tasks that require close personal contacts.

Compared to India, the employment effects of sourcing in China are much weaker for low skilled workers, while similarly favourable for high skilled workers.[19] Obviously, both China and India have a vast endowment of cheap labour that may affect low skilled labour in more advanced countries. All the same, there are important differences between the two low wage locations. For instance, India remained largely closed to low-tech and local market-oriented FDI until recently (Görg et al. 2009). By contrast, the public perception of China often neglects that FDI has helped penetrate local Chinese markets. According to Whalley and Xin (2006), FDI flows to China from Western Europe (and North America) were mainly of the horizontal type. Taking further into account that many Chinese markets were protected against imports, horizontal FDI was unlikely to replace previous exports and, thereby, have adverse labour market effects at home.

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[19] Note that the favourable effects for high skilled workers of sourcing in China and India are in line with Blomström et al. (1997) who report increasing white-collar employment in Sweden due to the engagement of Swedish MNEs in low income countries.

Net effects

We estimated separate Tobit models for job losses and job creation so far. This was meant to fully exploit the available information from the Eurostat survey. In the final step of our analysis, we attempt to capture net employment effects of outsourcing motives and location choices, by re-estimating the Tobit models with the difference between job losses and job creation as dependent variables. This meets with two problems that render the subsequent results rather tentative. First, we are left with less uncensored observations than before. The difference between jobs lost and jobs created is sometimes negative so that, in order not to completely ignore these observations, we treat them as zero observations.[20] Second, as mentioned in Section 2, it is mainly for skilled workers that jobs lost are often less than jobs created. As a consequence, it proved impossible to re-estimate the Tobit models with net job losses for high skilled workers.

Keeping these limitations in mind, several of our previous findings turn out to be fairly robust when redefining the dependent variables as such described. As for the overall marginal effects reported in columns (1) and (3) of Table 5, it still holds that the employment repercussions are more benign when international sourcing is motivated by market access considerations. Also in line with previous results, it is for low skilled labour that horizontal FDI tends to destroy less jobs at home than vertical FDI. This remains true even though cost reduction as a motive for vertical FDI and outsourcing is no longer associated in a significant way with more job losses for either all workers or low skilled workers. The latter result is not surprising recalling that gross job losses are compensated at least partly by the creation of new jobs due to cost savings and improved competitiveness achieved through international sourcing.

It also holds that the employment effects differ strikingly between locations that are similarly advanced economically. The differences between India and China are hardly affected when assessing net employment effects. Moreover, we still find no adverse labour market repercussions of sourcing in North America. On the other hand, the employment effects once again turn out to be fairly similar within Europe, even though the EU15 members are, on average, considerably more advanced than the new EU members. In the case of the new members, however, the marginal effects are now insignificant for all workers as well as for low skilled workers. Sourcing within the EU15 is significantly associated with net job

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[20] More precisely, we set all negative and zero observations to one and subsequently take natural logs.

losses in both estimations at the five percent level. Taken together, this provides even less reason to blame sourcing in low wage Europe for labour market problems at home.

4.   Summary and conclusion

Drawing on a recent survey of European companies, we use data on job losses and job creation at the sector level in ten European home countries to evaluate the labour market repercussions of international sourcing. In particular, we analyze whether employment effects depend on the motives underlying international sourcing as well as the location where it takes place. This allows us to assess the widespread public concern about adverse employment effects resulting primarily from cost-saving sourcing in low wage countries.

By performing Tobit estimations, we find some support for this view insofar as the employment repercussions at home tend to be more benign when access to new markets is the motive for locating business functions abroad. However, the quantitative impact on job losses remains modest even in the case of cost-saving motives. Furthermore, in sharp contrast to public fears, the dichotomy between low and high wage locations does not offer meaningful insights into the employment effects of international sourcing.

This simple divide hides substantial heterogeneity within both groups of countries. The employment implications of relocating business functions differ between low wage countries such as China and India hosting a specific mix of sourcing activities. Sourcing in North America stands out among high wage locations for the absence of adverse employment effects, which can be attributed to technology-related sourcing activities. In the European context, it appears to be strongly misleading to contrast low wage EU accession states with high wage EU15 members, and blaming the former for job losses in the latter. Sourcing in both groups has strikingly similar effects as new and old EU members often attract horizontal as well as vertical FDI. Moreover, high as well as low skilled workers are affected by sourcing within the EU, though employment repercussions are again modest in quantitative terms.

It also turns out that job losses are typically compensated at least partly by the creation of new jobs. International sourcing involves considerable shifts in employment within specific skill categories. This applies especially to high skilled workers. In other respects, too, we find that skills still matter for employment repercussions in the current phase of globalization. In particular, our results qualify the view that high skilled jobs may be as easily offshored as low skilled jobs.

To derive more specific policy conclusions it would be highly desirable if Eurostat released the firm-specific survey results. This could be done in an anonymous form to maintain confidentiality of participating firms. The availability of firm-specific data would allow for refined specifications of the estimation equations presently prevented by the limited number of observations at the sector level.

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Table 1 – Job loss and creation (number of employees) in European home countries: Survey data

	# sample firms[a]	Job losses			Job creation			Net loss[b]		
		total	high skilled	low skilled	total	high skilled	low skilled	total	high skilled	low skilled
Czech Rep.	(194)	4360	231	4129	1146	189	957	3214	42	3172
Denmark[c]	(349)	19861	6994	12867	5929	2053	3876	13932	4941	8991
Finland	(278)	5886	683	5203	1881	839	1042	4005	- 156	4161
Germany	(2528)	188633	63284	125349	105492	59310	46182	83141	3974	79167
Netherlands[d]	(364)	10205	2332	7873	1437	…	…	8768	…	…
Norway	(…)	3895	776	3119	3650	918	2732	245	- 142	387
Portugal[e]	(286)	3269	99	3170	688	137	551	2581	- 38	2619
Slovenia	(149)	1568	50	1518	1741	193	1548	- 173	- 143	- 30
Sweden	(129)	11679	1088	10591	1225	624	601	10454	464	9990
United Kingdom	(2373)	49405	…	…	23868	14141	9727	25537	…	…
All countries	(6650)	298761	…	…	147057	…	…	151704	…	…

[a] Firms with international sourcing. - [b]Job losses minus job creation. – [c] Excluding mining & quarrying and construction. – [d] Only manufacturing. – [e] Only manufacturing, mining & quarrying, and electricity, gas and water.

Source: Eurostat survey

Table 2 – Motives of outsourcing and job effects: Overall marginal effects

	Job loss			Job creation		
	Total	High skilled	Low skilled	Total	High skilled	Low skilled
	(1)	(2)	(3)	(4)	(5)	(6)
costs	0.015*	-0.003	0.028**	0.010	0.008	0.004
	(1.71)	(-0.49)	(2.06)	(0.85)	(0.74)	(0.26)
access	-0.023**	0.021***	-0.027*	0.009	0.036**	-0.029
	(-2.09)	(3.31)	(-1.94)	(0.68)	(2.56)	(-1.54)
log_nrworkers	1.874**	2.755***	1.012	2.496***	1.874***	2.962**
	(2.34)	(8.16)	(0.94)	(3.10)	(2.86)	(2.53)
nrsourcing	0.032	0.065	-0.079	0.162**	0.124**	0.208*
	(0.37)	(1.57)	(-0.81)	(2.23)	(2.23)	(1.77)
Obs. total	39	41	39	41	39	41
Obs. un-censored	35	36	32	33	31	32

z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 3 – High wage versus low wage locations of outsourcing and job effects: Overall marginal effects

	Job loss			Job creation		
	Total	High skilled	Low skilled	Total	High skilled	Low skilled
	(1)	(2)	(3)	(4)	(5)	(6)
high wage	0.022	0.032	0.022	-0.039**	-0.019	-0.080**
	(0.81)	(1.61)	(0.62)	(-1.98)	(-0.81)	(-2.07)
low wage	0.024	0.026	0.083	0.019	0.038	-0.016
	(0.56)	(1.10)	(1.29)	(0.64)	(1.27)	(-0.32)
log_nrworkers	1.912***	2.650***	1.845***	2.989***	2.310***	3.048***
	(2.69)	(6.88)	(2.08)	(5.43)	(4.01)	(3.27)
nrsourcing	-0.023	0.062	-0.074	0.241***	0.240***	0.217**
	(-0.30)	(1.31)	(-0.82)	(4.66)	(4.61)	(2.01)
Obs. total	41	41	41	41	40	40
Obs. uncensored	36	33	32	34	30	28

z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 4 – Specific locations of outsourcing and job effects: Overall marginal effects

	Job loss			Job creation		
	Total	High skilled	Low skilled	Total	High skilled	Low skilled
	(1)	(2)	(3)	(4)	(5)	(6)
china	-0.028	-0.027*	0.012	0.006	0.045	-0.023
	(-0.92)	(-1.69)	(0.31)	(0.18)	(1.40)	(-0.46)
india	0.090***	-0.027*	0.152***	0.042	-0.005	0.113***
	(3.89)	(-1.83)	(3.54)	(1.16)	(-0.10)	(3.32)
nms12	-0.006	0.026**	-0.009	-0.001	0.006	-0.061**
	(-0.36)	(2.40)	(-0.40)	(-0.10)	(0.37)	(-2.13)
namerica	-0.023	-0.054	-0.115	-0.000	-0.029	-0.003
	(-0.34)	(-1.61)	(-1.40)	(0.00)	(-0.46)	(-0.04)
eu15	0.009	0.041***	0.006	-0.021**	-0.013	-0.049***
	(0.68)	(4.10)	(0.35)	(-2.09)	(-1.08)	(-3.08)
log_nrworkers	1.746***	2.900***	1.393*	2.891***	2.376***	2.116***
	(2.98)	(6.53)	(1.72)	(5.26)	(3.74)	(3.12)
nrsourcing	-0.072	0.049	-0.191**	0.225***	0.252***	0.105
	(-1.14)	(1.17)	(-2.01)	(4.32)	(4.10)	(1.06)
Obs. total	39	41	38	40	38	40
Obs. un-censored	32	34	28	30	27	28

z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 5 – Motives, location and net job effects: Overall marginal effects

| | Jobs lost minus jobs created | | | |
| | Total | | Low skilled | |
	(1)	(2)	(3)	(4)
costs	0.007 (0.44)		0.015 (0.68)	
access	-0.060*** (-3.34)		-0.076*** (-3.35)	
china		0.023 (0.27)		0.132 (1.57)
india		0.195** (2.50)		0.152** (2.17)
nms12		0.026 (0.68)		0.045 (1.13)
namerica		-0.090 (-0.70)		-0.168 (-1.25)
eu15		0.087** (2.07)		0.087** (2.20)
log_nrworkers	5.864** (2.43)	5.149*** (2.90)	5.155** (2.25)	4.580*** (2.83)
nrsourcing	0.019 (0.11)	-0.349** (-2.06)	0.125 (0.82)	-0.197 (-1.40)
Obs. total	39	41	38	40
Obs. un-censored	25	26	23	24

z-statistics in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Appendix 1 – Description of variables

Name:	Definition:
log_losstot	number of total jobs lost in sector *i* and home country *j*; logged
log_losshi	number of high skilled jobs lost in sector *i* and home country *j*; logged
log_losslo	number of low skilled jobs lost in sector *i* and home country *j*; logged
log_creatot	number of total jobs created in sector *i* and home country *j*; logged
log_creahi	number of high skilled jobs created in sector *i* and home country *j*; logged
log_crealo	number of low skilled jobs created in sector *i* and home country *j*; logged
log_nettot	total jobs lost minus total jobs created in sector *i* and home country *j*; logged
log_nethi	high skilled jobs lost minus high skilled jobs created in sector *i* and home country *j*; logged
log_netlo	low skilled jobs lost minus low skilled jobs created in sector *i* and home country *j*; logged
log_nrworkers	number of employees in full-time equivalent units in sector *i* and home country *j*; logged
nrsourcing	percentage of sample companies in sector *i* and from home country *j* with international sourcing activities
costs	percentage of firms in sector *i* and home country *j* stating cost reduction to be "very important" as a motive for international sourcing
access	percentage of firms in sector *i* and home country *j* stating access to new markets to be "very important" as a motive for international sourcing
high wage	percentage of firms (average) in sector *i* and home country *j* with sourcing in high wage countries
low wage	percentage of firms (average) in sector *i* and home country *j* with sourcing in low wage countries
china	percentage of firms in sector *i* and home country *j* with sourcing in China
india	percentage of firms in sector *i* and home country *j* with sourcing in India
nms12	percentage of firms in sector *i* and home country *j* with sourcing in the twelve new member states of the European Union (accession since 2004)
namerica	percentage of firms in sector *i* and home country *j* with sourcing in Canada or the United States
eu15	percentage of firms in sector *i* and home country *j* with sourcing in the EU15

Note: All data are from the Eurostat survey. The exception is log_nrworkers; data for this variable are from Eurostat's Structural Business Statistics Database
(http://epp.eurostat.ec.europa.eu/portal/page/portal/european_business/data/database)

Appendix 2 - Summary statistics

Variable	Observations	Mean	Std. dev.	Min	Max
log_losstot	69	3.929361	3.723222	0	11.8259
log_losshi	67	2.519453	3.102881	0	10.64723
log_losslo	65	3.357063	3.60697	0	11.45819
log_creatot	67	3.366496	3.370346	0	11.14247
log_creahi	68	2.682989	3.057302	0	10.51867
log_crealo	65	2.691888	3.131322	0	10.37483
log_nettot	67	2.848552	3.618697	0	11.12294
log_nethi	66	1.26342	2.441112	0	8.532279
log_netlo	64	2.61098	3.493222	0	11.04502
log_nrworkers	95	12.29012	1.792397	7.962764	15.80053
nrsourcing	81	11.00988	13.24605	0	57.3
costs	51	44.38135	25.9777	0	100
access	53	45.53843	31.74694	0	100
high wage	60	25.64500	13.10612	0	50
low wage	60	15.15611	10.88771	0	41.66667
china	62	8.587097	10.41226	0	50
india	63	7.050794	8.140399	0	31.8
nms12	67	30.24478	27.41077	0	100
namerica	63	5.977778	8.073102	0	35.5
eu15	65	44.45692	24.24432	0	100

Appendix 3 – Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) log_losstot	1																	
(2) log_losshi	0.918	1																
(3) log_losslo	0.973	0.836	1															
(4) log_creatot	0.845	0.883	0.801	1														
(5) log_creahi	0.823	0.923	0.752	0.955	1													
(6) log_crealo	0.836	0.822	0.831	0.956	0.858	1												
(7) log_nettot	0.841	0.720	0.872	0.579	0.578	0.620	1											
(8) log_nethi	0.567	0.627	0.531	0.423	0.423	0.447	0.564	1										
(9) log_netlo	0.812	0.657	0.869	0.576	0.575	0.593	0.931	0.401	1									
(10) log_nrworkers	0.756	0.822	0.680	0.799	0.820	0.711	0.618	0.396	0.630	1								
(11) nrsourcing	0.592	0.547	0.600	0.578	0.515	0.626	0.442	0.490	0.382	0.226	1							
(12) costs	0.017	-0.067	0.089	0.080	-0.021	0.130	0.074	-0.004	0.071	-0.079	0.174	1						
(13) access	-0.434	-0.306	-0.418	-0.111	-0.081	-0.174	-0.432	-0.380	-0.328	-0.112	-0.276	0.108	1					
(14) china	0.573	0.607	0.591	0.621	0.648	0.605	0.513	0.328	0.550	0.490	0.456	0.076	-0.053	1				
(15) india	0.536	0.552	0.483	0.513	0.505	0.496	0.393	0.306	0.276	0.418	0.324	0.177	-0.431	0.385	1			
(16) nms12	0.126	0.084	0.110	0.086	0.085	0.030	0.115	0.039	0.176	0.381	-0.155	-0.036	-0.168	-0.020	0.103	1		
(17) namerica	0.309	0.450	0.194	0.313	0.372	0.297	0.215	0.331	0.074	0.351	0.215	-0.146	-0.338	0.400	-0.303	0.124	1	
(18) eu15	0.124	0.057	0.063	-0.097	-0.066	-0.152	0.084	0.073	0.072	-0.001	-0.037	-0.357	-0.280	-0.101	-0.035	0.295	0.010	

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Appendix 4 – Tobit models on motives, location and job effects: Coefficients and t-statistics for all estimations

	Job loss						Job creation						Net (loss-creation)			
	Total		High skilled		Low skilled		Total		High skilled		Low skilled		Total		Low skilled	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
costs	0.015*		-0.003		0.028**		0.010		0.008		0.004		0.009		0.018	
	(1.712)		(-0.488)		(2.061)		(0.848)		(0.738)		(0.264)		(0.445)		(0.683)	
access	-0.023**		0.021***		-0.027*		0.009		0.036**		-0.030		-0.081***		-0.092***	
	(-2.091)		(3.307)		(-1.942)		(0.675)		(2.561)		(-1.522)		(-3.001)		(-2.932)	
china		-0.028		-0.027*		0.012		0.006		0.045		-0.023		0.025		0.159
		(-0.922)		(-1.686)		(0.314)		(0.182)		(1.404)		(-0.464)		(0.268)		(1.591)
india		0.090***		-0.027*		0.152***		0.042		-0.005		0.114***		0.218**		0.183**
		(3.894)		(-1.834)		(3.535)		(1.158)		(-0.095)		(3.319)		(2.349)		(2.024)
nms12		-0.006		0.026**		-0.009		-0.001		0.006		-0.062**		0.029		0.054
		(-0.364)		(2.403)		(-0.396)		(-0.097)		(0.372)		(-2.133)		(0.667)		(1.104)
namerica		-0.023		-0.054		-0.115		-0.000		-0.029		-0.003		-0.101		-0.202
		(-0.344)		(-1.606)		(-1.399)		(-0.003)		(-0.465)		(-0.037)		(-0.707)		(-1.285)
eu15		0.009		0.041***		0.006		-0.021**		-0.013		-0.049***		0.098*		0.105**
		(0.679)		(4.104)		(0.352)		(-2.093)		(-1.081)		(-3.087)		(1.912)		(2.002)
log_nrworkers	1.874**	1.746***	2.755***	2.900***	1.012	1.393*	2.496***	2.891***	1.875***	2.378***	3.050**	2.136***	6.420**	5.754***	6.268**	5.517***
	(2.343)	(2.983)	(8.158)	(6.531)	(0.936)	(1.720)	(3.100)	(5.265)	(2.862)	(3.734)	(2.479)	(3.133)	(2.309)	(2.820)	(2.002)	(2.719)
nrsourcing	0.032	-0.072	0.065	0.049	-0.079	-0.191**	0.162**	0.225***	0.124**	0.252***	0.214*	0.106	0.021	-0.390*	0.152	-0.237
	(0.367)	(-1.138)	(1.574)	(1.172)	(-0.809)	(-2.010)	(2.227)	(4.318)	(2.228)	(4.093)	(1.729)	(1.056)	(0.112)	(-1.935)	(0.785)	(-1.320)
constant	-19.3***	-19.1***	-33.4***	-37.5***	-11.7***	-17.4***	-27.2***	-29.4***	-24.8***	-27.2***	-31.2***	-17.5***	-64.8***	-72.0***	-62.2***	-71.8***
	(-2.360)	(-2.852)	(-9.534)	(-7.287)	(-1.070)	(-1.849)	(-3.339)	(-4.843)	(-3.534)	(-3.913)	(-2.552)	(-2.484)	(-2.316)	(-3.088)	(-1.978)	(-2.945)
Sigma	1.001***	1.018***	0.526***	0.449***	1.255***	1.239***	1.018***	0.936***	0.933***	1.011***	1.296***	0.988***	2.047***	1.901***	2.215***	2.061***
	(7.834)	(5.558)	(8.242)	(11.026)	(7.535)	(5.761)	(7.223)	(6.934)	(6.462)	(6.549)	(7.296)	(5.781)	(5.999)	(8.037)	(6.709)	(7.101)
Pseudo R²	0.467	0.479	0.716	0.781	0.406	0.431	0.488	0.509	0.511	0.477	0.428	0.528	0.325	0.361	0.315	0.345
Obs. total	39	41	39	41	39	41	39	41	38	40	38	40	39	41	38	40
Obs. un-censored	35	36	32	33	31	32	32	34	28	30	27	28	25	26	23	24