

# 1 Globalization, offshoring and jobs

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## 1.1 Introduction

The labour market consequences of globalization in general, and offshoring in particular, have been hotly debated in recent public discussions and academia, in particular in industrialized countries. One of the reasons for this may be illustrated with reference to the *World Investment Report 2004* (UNCTAD, 2004), which provides examples of recent offshoring cases in services industries in the United Kingdom, and the employment changes involved. Barclays Bank, for instance, is reported to have offshored 500 back-office staff to India. When such numbers are picked up in the media, there is a presumption that 500 jobs have been destroyed in the United Kingdom as a net effect of this offshoring. In fact, the calculation is, of course, more complicated.

These media reports go hand in hand with public perceptions that trade has negative employment effects at least for certain groups of workers. This is a concern particularly for low-skilled workers (see O'Rourke and Sinnott, 2001 and Scheve and Slaughter, 2001). Policy-makers need to take these anxieties seriously, but in order to devise appropriate policy responses they also need to consider carefully the economic arguments, from theory as well as from empirical evidence. This is what this chapter sets out to do, by examining the available theoretical arguments and empirical evidence as to the possible employment effects of globalization.<sup>1</sup>

Globalization is defined here somewhat narrowly; first, as total trade (that is, the flow of goods across borders) and second, as offshoring (that is, the relocation of production processes abroad, leading to trade in intermediate goods across borders).<sup>2</sup> In the next section, the focus is on employment responses to globalization. The first subsection looks at trade in general, while the second subsection considers specifically the literature that has studied the relationship between offshoring and jobs. Section 1.3 then takes a more long-run perspective and looks at two aspects of structural change in economies, namely, towards more high skill-intensive production

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and towards more service activities, and considers whether and how these trends may be related to offshoring. Section 1.4, finally, discusses some policy approaches which may be used to compensate potential losers from globalization, and to maximize the benefits thereof.

## 1.2 Globalization and (un)employment

### *Trade, employment and unemployment*

Economists have for a long time neglected possible links between trade and employment levels. This is mainly due to the theoretical “straitjacket” that was generally used. Traditional models of trade, such as the workhorse Heckscher–Ohlin model, are based on the assumption that there are perfectly competitive labour markets. So the prediction of the model, namely, that sectors which use the relatively abundant factor relatively intensively expand, while other sectors contract, does not imply any net employment changes in the economy. Workers in the contracting sectors may lose their jobs, but given the assumption of full employment, they will instantaneously find new employment in the expanding sectors where new jobs are being created. What may adjust, of course, is the wage rate (or more generally factor prices).

Hence, trade leads to a reallocation of labour (and other factors of production) across sectors, but it does not have any implications for overall employment levels. A quote by Paul Krugman (1993, p. 25) summarizes this idea succinctly:

It should be possible to emphasize to students that the level of employment is a macroeconomic issue, depending in the short run on aggregate demand and depending in the long run on the natural rate of unemployment, with microeconomic policies like tariffs having little net effect. Trade policy should be debated in terms of its impact on efficiency, not in terms of phoney numbers about jobs created or lost.

Most people working on the basis of these models would probably acknowledge that there may be short-run employment effects due to adjustment costs, that is, workers may face some (short) spell of unemployment as they lose their job and search for new employment. However, in the long run, when the economy is in a new equilibrium, full employment resumes – or, more realistically and in line with Krugman’s quote, the level of unemployment will be back to its natural level, which is not affected by trade. Hence, there may be short-run, but no long-run, effects of trade on levels of employment or unemployment.<sup>3</sup> As a result, economists largely focused on wage effects of trade – an issue that will be touched upon in greater detail in Chapter 7 of this volume.

Since the 1990s, this view that there should be no substantial link between employment and trade has slowly changed, due to new empirical results and theoretical developments. On the theoretical side, recent models take the possibility that there are long-term effects of trade on levels of unemployment more seriously. This is done by assuming that labour markets are imperfectly competitive, leading to the possibility of unemployment in the model. There are various ways of inserting unemployment into such trade models, leading to different classes of models.

For example, Davidson and Matusz in a series of papers consider search-theoretic models, where the labour market is explicitly modelled in terms of workers searching for vacancies which are posted by firms.<sup>4</sup> Here, costs of searching for suitable jobs and employees introduce frictions in the labour market which may lead to workers experiencing non-trivial spells of unemployment after losing their jobs. Davidson and Matusz also show in their models that trade and job turnover are linked, implying that increasing trade may have implications for levels of unemployment in the economy.

A different class of models introduces unemployment due to minimum wage, efficiency wage or fair wage considerations.<sup>5</sup> The key idea is that firms pay wages above the market clearing wage in order to entice workers to exert effort and avoid shirking, or because workers have a notion of what is a fair wage which depends on own efforts and outside options. Given that the equilibrium wage is not the wage at which the labour market clears, unemployment occurs in these models. These types of models have also been used to investigate the relationship between trade and employment, also yielding the result that there is a relationship as trade affects levels of unemployment in equilibrium.

While traditional models without labour market imperfections are clear in their theoretical prediction that there should be no long-run link between trade and employment, the models with imperfect labour markets produce somewhat more ambiguous results. Embedding minimum or efficiency wages into a Heckscher–Ohlin setting and assuming that the home country is relatively capital abundant, that is, being a net importer of the labour-intensive good, yields the result that increasing trade increases unemployment. This is because the more capital-intensive sector expands while labour-intensive industry contracts, and the labour market does not clear.

However, in models of monopolistic competition in production, allowing for intra-industry trade, this prediction can change. Matusz (1996) has a model of intra-industry trade in intermediate products and efficiency wages and finds that trade unambiguously reduces unemployment compared to the autarky equilibrium. Egger and Kreckemeier (2010) embed fair wages into a model with heterogeneous firms and find that employment effects of trade are ambiguous. On the one hand, output

increases which raises employment. On the other hand, however, exporting leads to higher profits and workers partake in those, implying higher wages and, hence, a cost penalty for producers. This, *ceteris paribus*, reduces employment. The relative importance of these two effects determines whether overall employment increases or contracts.

Empirical evidence taking the link between trade and employment seriously is still relatively scarce, certainly if compared to the large body of evidence examining how trade affects relative or absolute wages. On the positive side, however, given that the theoretical developments are relatively recent, the empirical evidence is as well.

Dutt et al. (2009) examine the link between trade protection and unemployment rates using cross-country data for 90 countries over the period 1985–2004. Their empirical estimation is based on a theoretical model with search-induced unemployment embedded in alternatively a Heckscher–Ohlin or Ricardian setting. The theoretical prediction for the H–O model is that in a relatively capital-abundant country, trade liberalization leads to increases in unemployment, while employment should increase in a relatively labour-abundant country. In the Ricardian model, trade openness and unemployment are negatively related. The empirical analysis is particularly interesting because the authors attempt to distinguish short- and long-run effects of increasing trade on unemployment.

They start off with a cross-section analysis, where they define all variables in the empirical model as averages over the 1990s and, hence, use only one observation per country. In this setting, the estimated coefficients can be interpreted as long-run effects. The estimation first considers a Ricardian setting, where countries are not distinguished by factor abundance. In this setting, the authors find the unambiguous result that trade liberalization is associated with reductions in country-level unemployment. This result is robust to different measures of trade liberalization,<sup>6</sup> a battery of control variables and instrumental variables techniques. In a second step the authors proceed to a Heckscher–Ohlin setting, where they allow the effect of trade liberalization to differ according to a country's relative labour abundance. To do so they include an interaction between the measure of trade liberalization and a country's capital–labour ratio in the econometric model. The empirical results do not, however, provide any robust evidence that the effect of trade liberalization varies depending on the factor abundance. The authors interpret this not as an absence of any H–O effects, but rather that Ricardian-type productivity-related effects dominate any H–O effects. In short, their evidence shows that trade liberalization is associated with decreases in unemployment, hence, there is a positive long-run relationship between trade and employment.

The authors go further in their analysis and exploit the panel dimension in their data. This, among other things, also allows them to distinguish short-run and long-run effects in their estimation. They estimate a model of the following form

$$u_{it} = \alpha u_{it-1} + \beta_0 trade_{it} + \beta_1 trade_{it-1} + \beta_2 trade_{it-2} + \beta_3 trade_{it-3} + \beta_4 trade_{it-4} + \varepsilon_{it} \quad (1.1)$$

where  $u$  is the unemployment rate in country  $i$  at time  $t$ , and  $trade$  is a dummy equal to one if a country liberalized trade.<sup>7</sup>

The coefficients  $\beta_0$  to  $\beta_4$  allow the identification of short- to medium-run effects of trade liberalization on unemployment with  $\beta_0$  giving the immediate contemporary effect and, say,  $\beta_2$  giving the impact of a trade liberalization on unemployment two years after the event. The authors find that the coefficient  $\beta_0$  is positive, implying that trade liberalization is associated with an immediate increase in the unemployment rate. The point estimates of the coefficients suggest that this increase is about 0.6 per cent on average. In the more medium term, the increase in unemployment is, however, reversed: the coefficients  $\beta_1$  and  $\beta_2$  are negative. Their magnitude suggests that the initial surge in unemployment is more than outweighed: the authors' preferred specification of the model suggests that there is a decline by 3.5 per cent in unemployment three years after the liberalization. The coefficients  $\beta_3$  and  $\beta_4$  are statistically insignificant, indicating that there is no further adjustment in the unemployment rate after three years.

The dynamic specification of the model also allows the calculation of long-run coefficients indicating the equilibrium relationship between trade and unemployment.<sup>8</sup> In the above model, summing all coefficients  $\beta_0$  to  $\beta_4$  indicates that there is a negative relationship between trade liberalization and unemployment in the long run. In other words, unemployment will be lower in the economy in the new equilibrium after trade liberalization was implemented.

In a related paper, Hasan et al. (2009) conduct a similar exercise using panel data for Indian states. They regress unemployment rates on measures of trade protection based on tariffs and non-tariff barriers at the state level. Their results show no evidence that protection is associated with lower unemployment. Indeed, they find that unemployment declines with trade liberalization in particular in urban areas with flexible labour markets. Hence, the case study of India is much in line with the cross-country evidence by Dutt et al. (2009).

While the above two papers establish a largely negative impact of trade on aggregate unemployment, it needs to be made clear that these are aggregate data looking at net changes in unemployment. They do, however, hide a possibly large flow of workers into and out of unemployment that may or may not be caused by trade.

Examining the link between gross worker or job flows and trade has also been on the agenda of international economists. While these types of studies are particularly useful for uncovering the dynamic aspects of trade adjustment, the results generally only relate to the short run, that is giving the short-run adjustment effect of trade on employment.

A widely cited in-depth analysis of worker flows for the United States is presented by Kletzer (2000). She uses data over the period 1975–95 from the Displaced Workers Survey (DWS) of the US Department of Labor, which provides information on job displacement. The DWS is a survey that is undertaken biennially. In each survey, respondents are asked whether they had lost their job in the preceding three or five years.<sup>9</sup> If the answer is affirmative, they are also asked about the old job and whether or not they have already found a new job. Kletzer uses these data with a view to establishing whether there is a statistical correlation between self-reported job losses and import activity in the sector in which the individual worked. She finds that rates of job losses are particularly high in sectors with high levels of imports, and sectors with high import growth. By contrast, export activity at the sectoral level is correlated with lower rates of job losses.

In a related study, Kletzer (2001) uses data from the DWS for the period 1979–99 to investigate whether unemployment after job loss is merely transitory, and in which sectors workers find new jobs after being displaced from import-competing sectors. She finds that roughly two-thirds of workers that had lost their jobs had also found re-employment at the survey date. In other words, for these workers unemployment spells have not been longer than three to five years (possibly even much shorter) given the design of the survey questions. There are some differences between workers displaced from manufacturing and non-manufacturing industries (where the former only have a re-employment rate of 65 per cent compared to 69 per cent for the latter), but these differences are not very substantial. While this suggests that most job displacements led to only transitory increases in unemployment, it is also clear that about one-third of the displaced workers did not find new employment immediately (that is, within the survey period). As the DWS does not follow individuals over time, it is not possible to know their exact length of unemployment. It is arguably reasonable to assume that some share of these workers also find jobs in the future, hence, the re-employment rate of roughly 66 per cent may be underestimating the true level of transitory unemployment. The data also allow Kletzer to look at the sectors in which workers found re-employment. This is an issue to which we return in section 1.3, where we look at sectoral adjustment due to globalization.

Following on from the work by Kletzer (2000, 2001) other researchers have used different data and approaches to look at similar issues. Davidson and Matusz (2005) use US firm-level data from the US Census Bureau's Longitudinal Research

Database (LRD) to calculate rates of job creation and destruction at the level of the firm and analyse whether these are influenced by trade. Their results suggest that job destruction rates are negatively affected by net exports, implying that, as in Kletzer (2000), import-competing sectors may experience job displacement. They also find that there is a positive association between net exports and job creation.

Trefler (2004) uses the Canada–US free trade agreement as a “natural experiment” to consider the employment and productivity effects of trade liberalization in an industrialized country, using both industry- and plant-level analysis. He finds that the establishment of the free trade area was associated with overall employment losses. Employment in highly import-competing industries which were most affected by the liberalization experienced employment reductions of about 12 per cent, while manufacturing as a whole contracted employment by 5 per cent. These short-run adjustments were, however, compensated by productivity increases; overall manufacturing industry improved its labour productivity by about 6 per cent in the wake of the establishment of the free trade area. These productivity increases should be expected to lead to increased employment in the longer run – a question which could not be answered by Trefler, however.

While Canada and the United States have received much attention, there is also similar work for other countries available. Biscourp and Kramarz (2007) use French firm-level data to examine the impact of importing and exporting on job creation and destruction in firms. The authors look at changes in the number of jobs over a five-year period, which is somewhere between the short and long run. They find that importing is associated with lower employment growth, in particular if the firm imports finished goods rather than intermediate goods. By contrast, exporting is generally associated with job growth in the firm, a finding that is also echoed in other studies, such as Bernard and Jensen (1997).

Ibsen et al. (2010) present a similar analysis using firm-level data for Denmark. They find, in contrast to the French study, that imports of finished and intermediate goods are generally positively related to employment growth. This is true in the short run (based on annual employment changes) and the long run (which looks at changes in employment in firms over a ten-year period) with one exception: in the long run, imports are negatively associated with employment growth in large firms, which are defined in the Danish case as firms with 50 or more employees.

To summarize, although economists have for a long time neglected the link between trade and employment, this has changed recently due to new theoretical developments and new empirical results. These results generally suggest that imports may cause job displacement in the short run, due to adjustment costs.<sup>10</sup> By contrast, exporting is generally associated with lower rates of job losses and higher

rates of job creation.<sup>11</sup> While far fewer studies have been able to consider differences between the long and short run, those that have done so generally find that, in the long run, there appears to be a positive relationship between imports and employment. However, this may not be true for all firms that engage in importing, as suggested by Biscourp and Kramarz (2007) and Ibsen et al. (2010).

While research using firm-level data allows researchers to dig deeper into questions related to firm heterogeneity and how this relates to trade, it leaves out an important facet – namely, what happens to firms that are in, say, import-competing sectors but that do not trade. They may experience substantial employment adjustments which are not generally considered in the firm-level work, but which would be picked up by the approaches taken by Kletzer (2000) or Dutt et al. (2009). It is also not clear why studies for different countries such as Denmark and France produce different results – is it due to data differences, or different methodological approaches, or do they reflect differences in institutional settings in the countries? This suggests that there is scope for further research, in particular in cross-country comparisons to investigate more thoroughly the link between jobs and trade.

### *Outsourcing and jobs*

In recent years, the focus in the analysis of the link between trade and jobs has shifted somewhat towards international outsourcing or offshoring.<sup>12</sup> This means the breaking up of the production process, which allows the relocation of some parts abroad and increasing specialization at home. In industrialized countries, the assumption is that generally the labour-intensive parts of production are relocated abroad, allowing production at home to focus on more capital- or skill-intensive production (see, for example, Glass and Saggi, 2001). This is different from trade in final goods in an H–O model, where adjustments take place between sectors. With outsourcing, this adjustment takes place within a sector, or possibly even within a firm. Hence, employment effects may be much stronger than for trade in final goods. Also, one would expect a shift in the demand for skills within sectors or firms in industrialized countries, with outsourcing increasing the (relative) demand for skills.<sup>13</sup>

As pointed out in the introduction, the labour market consequences of offshoring have been hotly debated recently. One of the reasons may be that relocations of jobs abroad are attributed directly to offshoring and are presumed to be the net effects of the relocation. In fact, the calculation is, of course, more complicated than that. For example, to use the terminology of Hijzen and Swaim (2007), the 500 jobs relocated to India by Barclays Bank referred to in the introduction constitute a relocation effect. If, however, offshoring these jobs results in the business increasing productivity and operating more efficiently,<sup>14</sup> sales can expand, increasing employment. This is the scale effect of offshoring. Careful empirical work needs to account for both



possibilities. Note, however, that these are direct effects impacting only on the enterprise engaging in offshoring. In addition, there is a strong likelihood of indirect employment effects of two forms. First, if as a consequence of offshoring Barclays can provide its services to other businesses at a lower cost, they may be able to expand activity and employment (depending upon their employment–sales ratio). Second, if offshoring results in lower prices to final consumers their real income increases, and some proportion of that real income will be spent on domestically produced goods and services, again raising overall employment.

When offshoring occurs, there will therefore be second-order effects within the sector where the offshoring has taken place and ripple effects across the economy more widely. In principle, one should account for all of these changes in any empirical evaluation; in practice, the data requirements for full “general equilibrium” analyses are just too demanding and most analysts focus on what we refer to as the direct effects.

The final point which must be borne in mind when assessing employment effects is that offshoring is not the only phenomenon which results in separations between employer and employee: changes in technology; changes in consumers’ tastes and preferences; changes in the origin of imports and in competitiveness of the environment more generally; and cyclical changes in economic activity all impact on job destruction and job creation. And the scale of churn, or turnover in labour markets, in modern dynamic economies is quite staggering. For example, Hijzen et al. (2007) estimate that in the United Kingdom 51,000 jobs are destroyed and 53,000 jobs created in the private sector, every week. This is equivalent to 2.65 and 2.76 million jobs each year, or 15–16 per cent of the private sector workforce. Thus, it is vitally important that the job losses attributed to outsourcing are appropriately contextualized.

Table 1.1, reported in OECD (2007) and based on survey work conducted by the European Restructuring Monitor (ERM), does that. This reports total jobs lost from enterprise restructuring in 2005 and job losses attributed to offshoring. Note that only relatively small percentages for France, Germany or the United Kingdom were deemed attributable to offshoring. Note also that some of the highest proportions are in economies like Ireland and Slovenia which are generally thought of as being only recipients of offshored jobs.

Unfortunately, the table is silent on jobs created due to offshoring, which would balance against jobs lost.<sup>15</sup> Another shortcoming is that these are self-reported employment changes, where respondents attribute jobs lost to offshoring. This may misrepresent the true effect, if the indirect employment effects are not fully captured. In order to provide more reliable estimates, and to consider job gains as well, researchers have turned to econometric analysis of industry, firm or worker data.

**Table 1.1** Total job losses due to offshoring announced in the ERM, by country, in 2005

Total job losses		Job losses due to offshoring		Offshoring job losses as a percentage of total	
United Kingdom	200,706	Germany	7,765	Portugal	54.7
Germany	108,233	United Kingdom	6,764	Austria	29.6
France	45,405	Portugal	2,448	Denmark	28.8
Poland	27,117	France	2,080	Slovak Republic	25.2
Netherlands	22,111	Slovenia	1,516	Slovenia	24.0
Sweden	16,691	Denmark	1,505	Ireland	23.6
Czech Republic	14,949	Ireland	1,345	Finland	15.9
Spain	13,963	Italy	1,171	Italy	15.7
Hungary	10,960	Finland	1,153	Belgium	10.9
Italy	7,467	Sweden	904	Germany	7.2
Finland	7,240	Hungary	620	Hungary	5.7
Slovenia	6,327	Poland	610	Sweden	5.4
Ireland	5,697	Slovak Republic	600	France	4.6
Belgium	5,266	Belgium	576	United Kingdom	3.4
Denmark	5,234	Austria	505	Spain	2.3
Portugal	4,478	Spain	320	Poland	2.2
Lithuania	3,398	Netherlands	160	Czech Republic	0.9
Slovak Republic	2,383	Czech Republic	130	Netherlands	0.7
Austria	1,708	Cyprus	0	Cyprus	0.0
Estonia	1,068	Estonia	0	Estonia	0.0
Malta	850	Latvia	0	Latvia	0.0
Latvia	600	Lithuania	0	Lithuania	0.0
Cyprus	60	Malta	0	Malta	0.0

Source: OECD (2007).

First we consider a number of industry-level studies. Amiti and Wei (2006) analyse the impact of offshoring on jobs in the United States.<sup>16</sup> They estimate a labour demand equation, allowing for both substitution effects and output effects (equivalent to the relocation and scale effects mentioned above). As the study is multi-industry and multi-year, they control for industry-specific characteristics (such as differences in technology). They report modest employment effects, the magnitude of which depends on how narrowly or broadly defined a sector is. When it is narrowly defined (450 sectors in their case) there is evidence of a link between job losses and outsourcing, though the numbers are small. When they consider employment change across 96 broader sectors, there is no observable link between outsourcing growth and job loss (or job gain) by sector. Intuitively this makes sense: the more narrowly defined an economic activity and the shorter the time period investigated, the more likely one is to identify a negative link because only the direct effects in general and the relocation effect in particular are being picked up. When the field of vision is broadened, both sectorally and temporally, one is more likely to pick up both direct and indirect effects.

Crino (2010a) uses data at the occupation–industry level for the United States over the period 1997–2002. He can, thus, calculate employment and wages for specific occupations in an industry. He uses this data to investigate whether offshoring of services activities at the industry level has had any implications for employment in the services industry of different occupational types in the United States. This is in contrast to most of the literature which focuses on manufacturing industries. Using the occupational dimension allows him to identify whether certain occupations are more likely to lose through offshoring than others. The expectation is that occupations that are more tradable are those that are hit hardest by offshoring, as these occupations carry out tasks that are easily transferred abroad – for example, carrying out back-office administrative tasks. His results are in line with that expectation.

First, Crino finds that services offshoring has mild negative effects on the employment of workers in low-skilled occupations, but positive effects on high-skilled occupations. Simulations based on his econometric results suggest that high-skilled services employment was 2 per cent higher than it would have been if service offshoring had remained at its initial level. Employment of medium- and low-skilled workers was lower by 0.1 per cent and 0.4 per cent, respectively. Overall his results imply net job losses of around 16,000, with 49,000 jobs created for high-skilled but 65,000 jobs being destroyed for low- and medium-skilled workers. These results are, of course, only suggestive and based on the specific assumptions of his model and the data available. Still, keeping in mind the points raised above, these total effects are quite small. Second, he finds that these effects depend on the tradability of the occupation. Independent of skill level, tradable occupations are negatively affected by service offshoring, as these can be easily relocated abroad. By contrast, complex and highly specialized non-tradable occupations tend to benefit from offshoring, possibly due to gains from specialization and improvements in productivity. Unfortunately, no comparable simulations are available to grasp the economic magnitude of these qualitative results.

Amiti and Wei (2005) investigate the link between offshoring and employment for the United Kingdom, applying a similar methodology as in their paper for the United States. They focus on 69 manufacturing industries and nine service industries from 1995 to 2001. For manufacturing, they conclude that “outsourcing does not have a negative effect on manufacturing employment at the sectoral level” (p. 337). Their services sample captures the key sectors which are most typically “headlined” in connection with offshoring, namely: telecommunications; banking and finance; insurance and pension funds; ancillary financial services; renting of machinery; computer services; research and development; legal activities; accountancy services; market research; management consultancy; architectural activities; technical

consultancy and advertising. They examine both material and service outsourcing from these service sectors and can find no negative employment effects. In fact, they conclude that jobs displaced “are likely to be offset by new jobs created in the same sector” (p. 338).

The most comprehensive multi-country analyses to date are OECD (2007) and Hijzen and Swaim (2007). The former takes as its indicator of outsourcing the share of value added in turnover by sector. In linking this to jobs, the study adopts a similar methodology to Amiti and Wei and applies it to sectoral data for 12 OECD countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, the Republic of Korea, Norway, Sweden and the United States), 26 industries and for two years (1995 and 2000). Using this method, they identify a job destruction effect of foreign outsourcing, albeit a small one. Thus, a 1 per cent increase in foreign outsourcing results in a 0.15 per cent decrease in sectoral employment in manufactures and 0.08 per cent in services. In both cases these are direct effects only.

Hijzen and Swaim (2007) use the same data sources and same years as OECD (2007) but refine the methodology to disentangle relocation and scale effects and extend the country coverage to 17 countries (the OECD 12 minus the Republic of Korea and plus Australia, Canada, the Netherlands, Portugal, Spain and the United Kingdom). They find that offshoring within the same industry has no overall effect on employment because the productivity effect is sufficiently strong that new jobs created by increased sales (the scale effect) offset jobs lost because production becomes less labour intensive (the relocation effect). When offshoring is inter-industry, labour intensity does not seem to be affected and the scale effect means that overall offshoring has a positive effect on employment.

An alternative approach is to use firm- or plant-level data to investigate links between labour demand and offshoring. Görg and Hanley (2005) is an example using plant-level data for the electronics industry in Ireland over the period 1990–95. They find that offshoring (measured in terms of a plant's imports of intermediate materials and components) leads to significant reductions in employment levels in offshoring plants. These, however, are the short-run effects and, as one might expect, in the short run the result of a relocation of activity abroad is a reduction in employment at home, as part of the production process is no longer carried out. However, in the medium or long run, employment may increase again, reflecting the productivity effects mentioned above. Unfortunately, the study by Görg and Hanley does not investigate long-run effects. Also, the study only considers the direct effects on the offshoring plants and neglects possible indirect effects.<sup>17</sup>

Hijzen et al. (2007) use information from a British data set, the Inquiry into International Trade in Services (ITIS), published by the Office for National Statistics,

which collects data at the firm level and covers 39 different kinds of services transacted. They link this to firm-level data from the Annual Business Inquiry (ABI) and attempt to identify the implications of increased offshoring of services activities for changes in employment, where these changes are defined over the seven-year period 1997–2004, that is, to capture the medium to short run. They can find no evidence that increased imports of intermediate services results in job destruction. In fact, those firms that outsource service provision actually have faster employment growth. A second interesting finding is that intra-industry trade in intermediate services takes place on a significant scale. In other words, many of the same firms that are offshoring are also “inshoring”. However, due to the nature of the data, Hijzen et al. cannot consider imports of intermediate materials, which is likely to be even more important than offshoring of services.

Wagner (2011) takes a different approach in his analysis of firm-level data for Germany. He has available official German enterprise-level statistics which are linked to a special unique survey on offshoring activities of firms, undertaken by the German Statistical Office. The data relate to the period 2000–06. His research question is whether or not firms that start offshoring reduce employment in Germany. To address this question, he uses propensity score matching techniques. The idea of this approach is to compare the set of offshoring firms with a set of “control group” firms that display similar characteristics but that did not choose to offshore. Under the matching assumption any difference in performance after offshoring is due to the offshoring decision.<sup>18</sup> In a first preliminary comparison of offshoring firms and non-offshoring firms, he finds that the former are generally larger, more productive and more export-intensive. This suggests that a simple comparison of the two groups of firms which does not account for these *a priori* differences provides misleading estimates of a possible causal effect of offshoring, as this effect would be confounded with the effects of size and productivity, and possibly other firm characteristics. The matching approach accounts for such differences. Using this approach he finds that there are no statistically discernible effects of offshoring on employment for German firms. He finds that offshoring does have a strong and positive effect on firm-level productivity, however. Hence, any possible job losses due to offshoring (the relocation effect) are more than outweighed by the increased productivity and competitiveness in the firm, which allows it to expand employment (the scale effect).<sup>19</sup> These results relate to the short to medium run, being estimated for one to three years after the event.

Most of the current research takes a different approach and investigates worker-level data in order to examine whether offshoring has any impact on an individual's job security or wages. This approach has a number of advantages. First, it allows one to focus on the level of the individual where one can control for observable and unobservable characteristics that may play a role in job turnover, but that cannot be

controlled for in firm or industry data (for example, the age, tenure or marital status of a worker). Second, it provides information on the various aspects of skills of an individual, which can be exploited in the estimations. Third, relating the employment status of a worker to outsourcing activity in the industry allows one to capture also indirect effects, as the question is not what happens to workers in the offshoring firm but what happens to all workers in an industry that offshores intensively.

A number of recent studies have taken this approach. Ebenstein et al. (2009) use the Current Population Surveys in the United States over the period 1983–2002 to investigate the labour market effects of offshoring. These surveys are produced by the US Census Bureau for the US Bureau of Labor Statistics. Offshoring, importantly, is not defined in terms of imported intermediates, as in most studies using industry or micro data, but as employment in foreign affiliates of US multinationals at the industry level. This measure, thus, does not consider any outsourcing that takes place between firms that are not part of the same multinational, a fact that should be borne in mind. In terms of labour market effects, the focus of the paper is on wages, as in most of the trade literature discussed in the previous section, and also a number of studies on offshoring.<sup>20</sup> When investigating the impact of offshoring on employment levels, Ebenstein et al. actually discard the advantage of their worker-level data and instead aggregate employment to the education–industry level, similar to Crino (2010a). They then study labour demand in a set-up similar to Amiti and Wei (2005, 2006), as discussed above.

Their results suggest that an increase in affiliate employment in low-income countries reduces domestic employment, but this effect is economically very small: an increase in offshoring by 1 per cent leads to a reduction in employment by 0.02 per cent.<sup>21</sup> Offshoring in high-income countries, by contrast, increases employment, but by a similarly small number. The negative employment effects are largest for workers in highly routine industries, while the positive effects apply to the most routine and intermediate routine industries, but remarkably not to the least routine industries. The least routine industries should be similar to the non-tradable occupations in Crino (2010a), although these concepts are of course not identical.

Liu and Trefler (2008) also use the US Current Population Surveys, for the period 1996–2006. They focus on the labour market effects of outsourcing of services to China and India. In addition, they also include a measure of “inshoring”, which is exports of services from the United States to China and India. They consider the effects on the workers' time spent unemployed, workers switching occupation and industry, and wages. Their estimations suggest small positive effects of services exports and smaller negative effects of services offshoring. The estimated net effect is positive. They illustrate the magnitude of their effects by engaging in a thought

experiment, assuming that services exports and imports were to grow at the rates experienced between 1996 and 2005. Their empirical model then suggests that if this were the case, workers would spend 0.1 per cent less time unemployed, or would switch occupations 2 per cent less often, or would earn 1.5 per cent more.<sup>22</sup> These are, thus, very small effects, although it should be kept in mind that the authors only consider outsourcing to China and India.

There are also a number of recent studies for European countries, which use econometrically sophisticated estimations based on hazard models. Geishecker (2008) analyses individual level data from the German Socio-Economic Panel for the period 1991–2000. This is a worker panel which provides monthly employment spell data. Geishecker uses this data to examine whether outsourcing affects an individual's risk of leaving employment with a micro level hazard rate model. He is also careful to evaluate the economic significance of his estimation. His empirical model predicts that between 1991 and 2000 international outsourcing increased the hazard of exiting employment by approximately 16 per cent. This is a much stronger effect than that of the other potential culprit for job losses, namely technological progress, which only raises the hazard of leaving employment by about 1 per cent. Geishecker also finds that there are no differences in the effect of outsourcing depending on skills (as found in much of the literature). Instead, tenure seems to matter. Within the first six months of employment, international outsourcing raises the hazard of leaving employment by more than one percentage point. With higher employment duration, the absolute changes in the hazard rate due to outsourcing are much smaller, as the hazard rate model is proportional and the hazard of leaving employment monotonically declines.

Bachmann and Braun (2011) use a different data source for Germany, the IAB Employment Sample for the period 1975–2004. This data is provided by the Institute for Employment Research (IAB) which is part of the German Federal Employment Agency. The underlying data source is the employment statistics of the Employment Agency which, in 1995, covers around 80 per cent of all individuals employed in Germany. This data set allows the authors to calculate employment and unemployment spells which are exact to the day. In their analysis, they consider three possible movements of workers: direct job-to-job transitions, the move from employment to unemployment, and the move from employment to out of the labour market. They find that, for workers in manufacturing sectors, outsourcing leads to lower job-to-job and employment-to-unemployment transitions, but increases the risk of moving out of the labour market. Overall, the implication is that outsourcing increases job stability, but that the effects are economically very small. By contrast, the authors find much stronger effects for the services sector, where outsourcing also increases job stability, in particular (but not only) for high-skilled workers. The authors explain this by possible productivity-increasing effects of outsourcing.

Egger et al. (2007) use worker-level panel data for the period 1988–2001 in Austria. They find that international outsourcing reduces the chance of a worker finding or staying in a job in the manufacturing sector, in particular in sectors with a comparative disadvantage. Munch (2010), using similar worker data for Denmark, reports that offshoring also increases the likelihood of an employer–employee separation in Denmark. But in both instances the effects appear to be economically small, albeit statistically significant.

By way of summarizing it seems from the literature that, in general, outsourcing may have some effects on employment in line with expectations, where low-skilled workers may be more likely to lose and high-skilled workers more likely to benefit. However, any effects of outsourcing on employment are likely to be very small – a point that needs to be brought home to policy-makers and the public. There are a couple of exceptions (for example Geishecker, 2008) that find more sizeable effects. What needs to be kept in mind, though, is that the studies alluded to above almost exclusively only consider the short run, mainly due to data availability and the nature of the econometric approaches.

Overall, an important point is that it is difficult if not impossible to evaluate single individual studies within the larger literature, as these studies differ tremendously in terms of countries, databases, empirical estimations and their ability or willingness to calculate the magnitude of the effects, rather than just reporting the sign and statistical significance of the coefficients. Hence, there is need for further research to investigate differences across countries and to examine why there are differences in results (if not qualitatively, then certainly in terms of magnitudes) even within countries using different datasets.<sup>23</sup> Such analyses should be based on a common methodology. Furthermore, in future more efforts should be spent on attempting to calculate the short- and long-run employment effects of outsourcing. This would, of course, necessitate the availability of a fairly long time period of data, which may not be easily available.

Uncovering true differences across countries, that are not just due to differences in data or methodology, can provide valuable information for policy-makers as to the role of institutions. Is it the case that more flexible labour markets react differently to outsourcing than those with more restrictive institutions? At a first glance at the literature cited above, this does not appear to be the case. For example, studies for Austria, Denmark, Germany and the United States based on worker-level data find little evidence for substantial adverse employment effects. Does this imply institutions do not matter? This is an unwarranted conclusion based on the available evidence, as these studies just differ too much in order to compare them and to isolate the role of one factor (institutions) for the results.



One example of comparative work that goes in this direction is Geishecker et al. (2010). The authors use worker-level data for Denmark, Germany and the United Kingdom, and evaluate the impact of offshoring at the industry level on workers' wages. They do not consider employment, however. The three countries are chosen as they represent a country with very rigid labour markets (Germany) and one very flexible (the United Kingdom). Denmark is an interim case with flexible employment adjustment but relatively rigid wage setting. The data for Germany and the United Kingdom are from the German Socio Economic Panel (GSOEP) and British Household Panel Survey (BHPS) respectively, and are similar in coverage. The Danish dataset is also at the worker level, but is based on administrative data from Statistics Denmark. The reference period is 1991–2000 in all three cases. Overall, the results suggest that there are small negative wage effects on unskilled workers in all three countries, although these effects are lower in Denmark than in the other two countries. Only high-skilled workers in the United Kingdom seem to benefit from offshoring in terms of higher wages, however, which may point at the beneficial effect of flexible labour markets. This is, however, just a first stab at the question, and as the authors conclude, more theoretical and empirical work is needed in order to pin down the role of institutions. The role of institutions is also considered in more detail in Chapter 5 of this volume.

### 1.3 Globalization and the changing industrial structure

The discussion thus far has focused strongly on total employment growth or levels, without considering in any detail whether trade or offshoring has any implications for structural adjustment. Job turnover and displacements are possible immediate responses to globalization, when workers may be forced out of jobs. In the longer term, one important implication of globalization should also be sectoral adjustment in the economy. This is, at least, what traditional trade theory would predict: following an opening up of the economy, some sectors should expand and others contract. There may also be a skill bias, as demand for one type of skill may expand at the expense of another. Perhaps another way of putting this is to ask: does globalization in general, and offshoring in particular, have any sector or factor implications?

We have already touched upon the latter point. Outsourcing leads to within-sector adjustments of factors of production and therefore has a factor bias. In Feenstra and Hanson (1996), for example, the relocation of unskilled labour-intensive parts of the production process abroad leads to increases in the relative demand for skilled workers at home. While this need not be the case in somewhat different theoretical settings,<sup>24</sup> there is plenty of evidence suggesting that in developed countries there has been a shift towards more skilled workers (Feenstra and Hanson, 2003).

The perhaps more neglected issue of structural adjustment is the sectoral implication. Has the increased globalization of the world economy had any effect on specialization patterns in countries or regions? Can we see a shift towards more skill-intensive services or high-tech manufacturing production in developed countries?

The question of sectoral specialization is one that economic geographers have worked on. In recent papers, for example, Brakman et al. (2005) and Aiginger and Rossi-Hansberg (2006) conclude that sectoral specialization in the European Union has increased.<sup>25</sup> Aiginger and Rossi-Hansberg motivate their empirical analysis with a theoretical model which shows that, in general, reductions in the costs of trade (what one may term “globalization”) lead to increases in specialization of production in the home country. They, hence, intuitively explain increases in specialization in the European Union with falling trade costs, although no formal econometric analysis of this is offered. As to the underlying characteristics of the increasing specialization of production, Brakman et al. (2005) conclude that their results “lend support to the increasing importance of services as a driving force behind ... specialisation trends” (p. 34), an issue that is also shown to be the case by Bickenbach et al. (2010). While these trends occur at the same time as increasing economic integration in Europe and the world, falling trade costs and increased offshoring, there is, to the best of my knowledge, no robust formal analysis of whether these phenomena are causally linked.

Hijzen et al. (2007) provide a different perspective on structural adjustment by looking at rates of job creation and destruction and comparing these in manufacturing and services sectors. Based on firm-level data for the United Kingdom for the period 1997–2004, they find that the job creation rate in the average service industry is about twice as high as that of the average manufacturing firm (81 per cent compared to 37 per cent). Also, the job destruction rate in manufacturing firms is at 45 per cent, while that of firms in services is about 30 per cent. Hence, these figures suggest a shift in employment away from manufacturing into services industries, in line with the studies cited above. In an econometric analysis of employment at the firm level they then go on to show that employment growth is higher in firms that import intermediate services (that is, offshore services activities). There is no robust evidence that exporting of services leads to employment growth, however. If importing of services were more important in service industries than in manufacturing, this may then explain a trend towards more employment in services industries. However, whether or not this is the case is not clear from their paper. In fact, a large share of services imports and exports in 2003 are transacted by manufacturing firms.

The US data used by Kletzer (2000) from the Displaced Worker Survey also allow examination of the question of sectoral adjustment. In particular, what is relevant for

this is the information displaced workers provide on their new job. Is this in the same sector as the old job, or do workers move industries? For workers displaced from manufacturing industries, Kletzer finds that only about one-third find a new job in the same broadly defined sector. Roughly another 10 per cent find a new job in related manufacturing industries. However, about 45 per cent of displaced manufacturing workers find a new job in services industries (defined as trade, transport, professional, and other services). Rates of same-sector re-employment are much higher in services sectors. For example, about 62 per cent of workers who lose a job in professional services also find a new job in the same sector. Taken together, this evidence suggests that there are indeed signs of sectoral adjustment, out of manufacturing and into services activities.

## 1.4 Policy implications

The findings of the above studies may be summarized as follows. First, globalization and, in particular, offshoring of activity may lead to higher job turnover in the short run. Second, in the long run, there is no indication that trade or offshoring leads to higher unemployment (or lower employment) overall, although employment of low-skilled workers may suffer while high-skilled employment may expand. Third, while the literature finds that these effects are statistically significant, the economic magnitude thereof is still debated, with many studies concluding that they are economically negligible. Fourth, there is evidence that the structural changes away from manufacturing towards service sectors in advanced economies goes hand in hand with the process of globalization. However, whether or not there is a causal relationship is still to be investigated.

The first policy implication that emerges is that economists and policy-makers need to try and identify the groups of society that win and lose from globalization. Generally, the high skill vs. low tech dichotomy has been employed for this, with the latter being the group that may have to expect losses. In recent work, however, this simple distinction is questioned, with new emphasis being put not only on the question of educational background, but also on the type of tasks an individual performs. To take a simple example, taxi drivers with relatively low educational attainment may not need to fear that their jobs be offshored to India, while computer programmers with university degrees may see their jobs being relocated, as they can be performed online by similarly skilled people in China. These issues have been touched upon by, for example, Blinder (2006) and, in the context of looking at wage effects of offshoring, by Baumgarten et al. (2010). However, as yet we know very little about the interplay of tasks and education for job gains or losses, or unemployment following offshoring. This is clearly an important issue for further research.

Standard theory tells us that even in the presence of losers from globalization, the overall welfare effects will be positive, as the gains to the winners should more than outbalance the losses incurred. This then opens up the possibility that losers could be compensated by the winners. While this is a strong theoretical possibility, putting this into practice is difficult, and this may reflect why it is seldom done. One of the problems is, of course, to identify who loses from globalization. How can one identify a job loss as being due to offshoring, say, rather than to other macroeconomic or industry effects? And even if one could, would it be reasonable to compensate someone who lost his job because of offshoring, while another worker who lost her job due to increased domestic competition is not compensated? These are political questions that need to be debated.

Assume that a country does decide it wants to go ahead with compensation, and can identify the losers. How should these be compensated? Here it is particularly important that mechanisms are set right so that there is an incentive to look for re-employment after job loss, rather than to rely on assistance. These incentive issues have been theoretically investigated by Davidson and Matusz (2006). In a model of trade where workers seek employment through a search process, they evaluate the effects of four different policies, namely: unemployment benefits, training subsidies, employment or wage subsidies. The first two policies are directed towards the unemployed, while the latter two policies would subsidize the employment of newly employed workers (after a spell of unemployment caused by globalization) either through a flat rate or a percentage of the wage payment. Their result is clearly that wage subsidies are the preferred policy, as they give the highest incentive to seek re-employment. This policy is in its general ideas similar to the wage insurance policy advocated by Kletzer (2004), where workers would also receive a fraction of their earnings that are lost due to globalization-induced job loss, but the payment would only start after re-employment. Again, the main idea is to give a strong incentive to gain re-employment after the job loss.

Another policy angle is to ask how one can maximize the benefits from globalization. Here, theory would broadly speaking suggest that countries with flexible labour markets should stand to gain most – or most quickly – as adjustment costs would be reduced if workers can move freely and flexibly from one employment to the other. In order to be able to do so, hiring and firing should be easy, and workers should easily be able to obtain the skills they need for their respective employment. Not an easy task for policy-makers. Countries with less flexible labour markets would inhibit the movement of workers to their most productive use, leading to inefficient allocation of workers into sectors that are no longer internationally competitive.<sup>26</sup>

While this theoretical argument seems sound, we know very little empirically about the role of institutions, in particular labour market institutions.<sup>27</sup> One reason is that

many of the recent studies are carried out with micro data for one particular country. Given the idiosyncracies of the available data in different countries, and the general tendencies of academics to make a methodological contribution in their paper, results from different countries with different data and methodologies are hard to compare. In order to judge meaningfully the importance of labour market flexibility – an issue that is generally set at the country level – researchers need to look at cross-country comparisons based on similar data for different countries and the same methodology. Incentives to do just this are, unfortunately, low in the economics profession, but this is an important angle that future research should take in order to provide relevant policy implications.

## Endnotes

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1. The literature review does not cover every single study on these topics. Rather, the focus is on a number of studies which provide robust and reliable theoretical or empirical analyses. As to empirical studies, the focus is on studies for industrialized countries, although we also discuss some evidence relating to India. The chapter considers empirical studies published since the early 2000s, as these provide up-to-date evidence and also relate to recent theoretical advances in the literature. There are, of course, also earlier studies that look at the link between globalization and employment, such as Sachs and Shatz (1994), Wood (1994) or Rowthorn and Ramaswamy (1999).
2. The focus in this chapter is on trade (in final goods) and offshoring. There are also a number of papers that look at the effects of foreign direct investment on employment in the home country. We do not focus on this here, as the theoretical argumentation is largely similar to that for offshoring. In fact, the paper by Ebenstein et al. (2009), which is discussed in the second subsection to section 1.2, is about offshoring associated with multinationals investing abroad. In general, the results of studies looking specifically at the employment effects of multinationals are similar to the offshoring results, in that there may be statistically significant but small effects. See, for example, Harrison and McMillan (forthcoming) for US multinationals.
3. Taylor and von Arnim (2006) provide an interesting critique of some of the assumptions generally used in economic modelling of trade effects.
4. See Davidson et al. (2008) for a recent example and Davidson and Matusz (2004) for a survey.
5. See Helpman et al. (2009) and Egger and Kreckemeier (2010) for recent examples, and Kreckemeier (2008) for a survey.
6. The authors use in alternative specifications unweighted tariffs, an overall trade restrictiveness index from Kee et al. (2006), an index of trade barriers from the World Economic Forum's *Global Competitiveness Reports*, a measure of total import duties, and finally a measure of trade openness (exports + imports/GDP).
7. The model also includes a number of other control variables and country fixed effects.
8. This is calculated as  $\beta/(1 - \alpha)$ .

9. To be precise, in early versions of the survey (up to 1992) individuals were asked whether they had lost their job in the last five years; since 1994, this period has been shortened to three years.
10. Chapter 4, section 4.4, also discusses some studies that look at the short-run employment effects of trade and comes to a similar conclusion.
11. Also, exporting may help to raise wages, as exporting firms generally tend to pay higher wages than non-exporters (see, for example, Schank et al., 2007).
12. There appears to be some debate in the literature on whether the concept of international outsourcing and offshoring may or may not be different, depending on whether it occurs within the same firm or not. This distinction is of no concern here, as the interest is on employment in the home country. We therefore use the term "international outsourcing" and "offshoring" interchangeably. The early literature refers to the phenomenon as "fragmentation" or "vertical disintegration" (for example Jones and Kierzkowski, 1990; Feenstra, 1998) then as "international outsourcing" (Feenstra and Hanson, 1999).
13. At least this is the expectation from a simple trade model such as Feenstra and Hanson (1996). To be more precise, outsourcing may, however, also increase productivity in particular in the low-skill-intensive industry, which may actually increase demand for low-skilled workers. See Arndt (1997, 1999) and, more recently, Grossman and Rossi-Hansberg (2008).
14. This is predicted by theory; see, for example, Glass and Saggi (2001). Empirical studies such as Amiti and Wei (2006), Görg et al. (2008) and Görg and Hanley (2011) provide empirical evidence that outsourcing leads to productivity improvements and fosters innovative activities in firms.
15. Of course, it is usually easier to identify job losses associated with offshoring or globalization in general than jobs attributable to it.
16. We focus here on studies that try to examine the absolute employment effects of offshoring. A related literature has evaluated the impact of outsourcing on relative employment of skilled and unskilled workers. Feenstra and Hanson (1999) provide one of the first empirical assessments of this kind. In their study for the United States they approximate international outsourcing by the share of imported intermediates in an industry. According to their analysis, based on industry-level data covering the period 1979–90, international outsourcing can explain between 11 and 15 per cent of the observed decline in the relative demand for unskilled labour (measured as the cost share of production labour) in US manufacturing industries. Similar analyses yielding qualitatively similar results were undertaken by Hijzen et al. (2005) for the United Kingdom and Geishecker (2006) for Germany. See also Feenstra and Hanson (2003) for a survey of the international evidence.
17. In somewhat related work, Senses (2010) investigates whether offshoring impacts on labour demand elasticities, using plant-level data for the United States. She finds that offshoring leads to increases in labour demand elasticities.
18. While propensity score matching was first used in the field of economics by labour economists it has also become quite popular recently with international economists; see, for example, Girma and Görg (2007) and Arnold and Javorcik (2009). Blundell and Costa Dias (2008) provide an excellent overview of this and other evaluation methods in economics.
19. Crino (2010b) uses a similar approach with firm-level data for Italy, but considers only services offshoring. He also concludes that offshoring has no effect on employment. Interestingly, he does find that offshoring changes the employment composition in favour of high-skilled workers. This is an issue that Wagner (2011) does not consider due to data availability.

- 20.** See, for example, Geishecker and Görg (2008) and Baumgarten et al. (2010) also using worker-level data.
- 21.** They do not find robust evidence that imports or exports at the industry level impact on employment levels.
- 22.** The estimated effect for wages is very similar to that of Geishecker and Görg (2008) found using German worker-level data.
- 23.** This is illustrated by the papers by Geishecker (2008) and Bachmann and Braun (2011) with the former finding quite sizeable effects, while the latter identifies only small effects. It is not immediately clear what accounts for such within-country differences, although it seems likely that the different coverage of the datasets is one possible explanation. The papers also use different econometric methodologies, however, and the period of analysis is different.
- 24.** Here, most importantly, consider Grossman and Rossi-Hansberg (2008) who show that relocation of the unskilled-intensive part of the production increases productivity, which may ultimately increase the demand for unskilled workers in the home country.
- 25.** As Brakman et al. (2005) and Bickenbach et al. (2010) show, however, there is a wide variety of results in different papers. These differences in results can be mainly explained by differences in data, definitions of “regions”, “industries” or “specialization”, and methodological issues. See Bickenbach et al. (2010) for a consistent set of stylized facts on specialization and concentration in the European Union.
- 26.** Of course, more generally there is a multitude of other labour market institutions that may affect economic performance (see Freeman, 2009).
- 27.** An exception is the paper by Hasan et al. (2009) using data on Indian states, which show that unemployment is reduced most after trade liberalization in states with flexible labour markets.

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