THE IMPACT OF OFFSHORING ON EMPLOYMENT: MEASUREMENT ISSUES AND IMPLICATIONS

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INTRODUCTION

1. The impact of relocation on the labour market has become one of the major issues of concern to policy makers and public opinion. The phenomenon of relocation as such is not really new but it still arouses just as much debate and concern, essentially for three reasons.

2. Firstly, in many countries, relocation for a long time only affected traditional low technology sectors of manufacturing industry (e.g. textiles, shoes...) which were transferred to low labour cost countries. For some time, however, relocation has also involved sectors which are technologically more intensive, such as motor vehicles or electronics. These new forms of relocation, as in the 1980s, have revived the debate on the dangers of deindustrialisation and loss of know-how, especially on the technological level. Yet one of the reasons which explains the new worries is the fact that relocation is no longer confined to manufacturing industry but also increasingly concerns services. The rapid development of information technology means that different categories of services can now be imported, especially services to business.

3. Secondly, the jobs that used to be affected by traditional relocation were in the main low-skilled jobs. On the other hand, the jobs affected by recent relocation also involve highly skilled jobs.

4. Lastly, the third reason which causes anxiety concerns the emergence of the two great Asian economies, China and India, which have in part caught up technologically and which have a vast low cost but increasingly skilled workforce.

5. In this context, to maintain their competitiveness, multinational firms are encouraged to displace many activities outside their country of origin. This displacement of activities may have a short-term consequence, either job losses in the country of origin and job creation abroad, or lack of job creation in the compiling country and job creation only abroad.

6. The almost permanent restructuring of multinational firms in the face of the challenges of globalisation arouses fears and worries concerning the labour market and even more generally maintaining people’s living standards and social security systems. Another reason which adds to the malaise is the wide media coverage of many cases of relocation, notably those involving major groups, while the benefits of relocation are almost absent from the information broadcast by the media, either because they are more difficult to evaluate, or because they take a while to appear and do not seem to be directly linked to relocation.

7. Another cause which contributes to the revival of concerns is the lack of quantitative information and the poor quality of the data used in public debate to grasp the consequences of relocation. Furthermore, the public debate is all the more confused because the term “relocation” is used without a strict and agreed definition. Thus, the term is often attributed to a variety of cases which may have a negative impact on employment but which are not directly linked to the phenomenon of relocation.

8. For example, competition from low income countries may have certain negative effects, especially on low skilled jobs, but not all the imports from these countries are necessarily linked to relocation. Similarly, much of the foreign direct investment may create jobs in other countries but not
necessarily in the investing country. However, these cases do not directly involve relocation but refer more generally to the effects of trade and international investment on the labour market.

9. Despite the absence of precise data, many studies have been undertaken recently to measure, even indirectly, the impact of relocation on employment (see the bibliography at the end of the document). All these studies, despite their imperfections, conclude that, for the time being, relocation has little impact on job losses in the compiling country. Moreover, some studies show that at present jobs lost in manufacturing industry because of relocation are considerably more numerous than jobs lost in services which, unlike manufacturing industry, are net job creators. Paradoxically, the majority of empirical studies produced recently on relocation refer exclusively to the impact on employment in services.

10. The discussions concerning the role of relocation in international trade have recently aroused new theoretical debates which seek to identify cases where the gains from bilateral trade would no longer be mutual for the trading partners, at least for transitional period of uncertain duration. The debate on relocation has aroused numerous questions some of which could be summarised as follows:

- How can relocation abroad be defined?
- What is the scale of the phenomenon?
- Has the pace of relocation accelerated in recent times?
- How many jobs are affected by relocation?
- What is the nature of the jobs affected by relocation in terms of skills?
- What are the chief reasons for relocation?
- What is the relative importance of relocation of services compared with relocation of goods?
- Which sectors (goods and services) relocate the most?
- Is there a predominant form of relocation (direct investment or subcontracting) which characterises each sector?
- Could relocation constitute a threat of deindustrialisation?
- What are the compiling countries and countries of destination of relocation by mode and sector concerned?
- Is there a difference as regards resort to relocation between firms controlled by residents of a country and affiliates under foreign control?
- How can the benefits of relocation be evaluated, especially in terms of jobs?
- How are the benefits of relocation shared between the different economic actors?
- How many jobs are created or maintained thanks to relocation?
- What is government policy on relocation?
• How can public concerns be allayed and confidence restored?

11. This report can only answer some of the above questions. It should nevertheless be explained at the outset that this version of the report, which is still preliminary, focuses its attention not on all cases of relocation of an activity abroad, but only displacements accompanied by a reduction in activity in the compiling country, usually with loss of jobs.

12. The first chapter is dedicated to a definition of the concept of relocation. It distinguishes between relocation through foreign affiliates and that resulting from international subcontracting. Particular attention is also paid to the terminology used.

13. The second chapter deals with the dynamic of relocation and effects on employment. The interaction between production, direct investment and international trade has an impact on employment which differs in the short and medium term. The chief motivations for relocation are briefly presented in this chapter together with the latest developments in the theoretical debate concerning trade, relocation and employment.

14. The third chapter concerns measurement issues. It describes all the difficulties involved in the quantitative evaluation of jobs affected by relocation, and the reasons why there are no indirect measurements. Various indicators are suggested in the chapter to measure the impact on employment and other approaches which have been adopted together with their limitations.

15. The fourth chapter presents some preliminary results based on sectoral data concerning a limited number of OECD countries. The limitations of available public data are also considered in this part, first to identify cases of relocation and then to measure their impact on employment. Two brief monographs are presented concerning the United States and France. The choice of the United States was justified by the wealth of public data available, while France was chosen because its statistical services apply a method very similar to that suggested by the Secretariat to individual data by establishment. Indicators concerning several other countries are presented in annex.

16. Finally, the last chapter sets out government reactions to relocation and current policies or regulatory measures. It consists chiefly of countries’ replies to a Secretariat questionnaire.
17. Defining relocation abroad is a difficult but essential task in the present context where public debate is often muddled and refers to excessively broad notions which distort understanding of the phenomenon and prevent a proper evaluation of its consequences.

18. First of all, the term *outsourcing* is used to designate the fact that an enterprise carries on one or more production activities or services on its own account outside the enterprise. Outsourcing can occur within the country where the enterprise is located (*domestic outsourcing*) or abroad (*outsourcing abroad*).

19. The term *offshoring* is used to designate outsourcing abroad. This term covers two situations:

- Production of goods or services effected or partially or totally transferred abroad *within the same group of enterprises* (*offshore in-house sourcing*). This means where an enterprise transfers some of its activities to its foreign affiliates. These affiliates may already exist or have been created from scratch (*greenfield affiliates*).

- The second form involves the partial or total transfer of the production of goods or services abroad to a *non-affiliated enterprise* (*offshore outsourcing*). This operation consists of *subcontracting abroad*. The non-affiliated foreign enterprise could be either (i) a firm controlled by residents of the country, or (ii) a foreign affiliate controlled by a third party, or (iii) an affiliate of the outsourcing country controlled by another group. The following table summarises the different situations in which a good or service is produced within an enterprise (or a group of enterprises) in the same country or abroad.

<table>
<thead>
<tr>
<th>Location</th>
<th>Internal production (in-house)</th>
<th>External production (outsourcing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within the country (domestic)</td>
<td>Production within the enterprise and the country (domestic in-house)</td>
<td>Production outside the enterprise but within the country (domestic outsourcing)</td>
</tr>
<tr>
<td>Abroad (offshoring or cross-border)</td>
<td>Production within the group to which the enterprise belongs but abroad (by its own affiliates) (offshore in-house sourcing in the sense of relocation abroad)</td>
<td>Production outside the enterprise (or the group) and outside the country by non-affiliated firms. This involves foreign subcontracting (offshore outsourcing or subcontracting abroad)</td>
</tr>
</tbody>
</table>


20. In other words, production abroad of an enterprise’s activities could be carried on internally (*offshore in-house sourcing*), or externally (*offshore outsourcing*), which corresponds to *subcontracting abroad*. The case of transfer of production abroad to its own affiliates will be called “relocation in the strict
sense” and transfer of production abroad to non-affiliated firms will be called “relocation in the broad sense”.

1.1 Relocation in the strict sense (offshore in-house sourcing)

21. This report concerns exclusively cases where there is a partial or total cessation of an activity within an enterprise in the compiling country involving the transfer of that activity to one of its existing foreign affiliates or one specially formed for the purpose (relocation abroad). This operation comprises three characteristics which are summarised in Box 1.

Box 1. Characteristics of relocation in the strict sense (offshore in-house sourcing)

Relocation through affiliates in the same group must satisfy the following characteristics:

- Total or partial closure of the enterprise’s production units in the compiling country with workforce reductions.
- Opening of affiliates abroad (or production units) which produce the same goods and services. These goods and services could also be produced by existing affiliates.
- In the compiling country, the enterprise which has relocated its production imports goods and services from its own affiliates abroad which had previously been consumed in that country, while exports decline due to the fact that they are partially or totally supplied from abroad and destined for the same markets as the exports from the compiling country.

22. In the case of relocation in the strict sense (offshore in-house sourcing), the three preceding conditions are necessary and exclusively concern multinational firms to the extent that they involve direct investment. The multinational firms involved in this category of relocation may be either (a) parent companies controlled in principle by residents of the compiling country, or (b) affiliates under foreign control. It will be seen later in the report whether foreign affiliates in a compiling country tend to relocate more than parent companies.

1.2 Relocation in the broad sense (offshore outsourcing or subcontracting abroad)

Box 2. Subcontracting defined

Subcontracting occurs when one firm, the prime manufacturer or contractor (“principal”), contracts with another firm, the subcontractor or “supplier”, for a given production cycle, one or more aspects of product design, processing or manufacture, or construction or maintenance work.

The output is generally incorporated into the principal’s final products. Subcontracting can also involve services, particularly studies, accounting, engineering, R&D, advertising, computer services or legal advice. Most of these services are of the kind that can be subcontracted abroad (international subcontracting).

The “supplying” firm must adhere strictly to the “principal’s” technical or commercial specifications for the products or services in question.

Source: OECD (2005), OECD Handbook on Economic Globalisation Indicators, Section 5.4.2, Chapter 5.
23. Relocation in the broad sense involves resort to international subcontracting without direct investment.

24. While subcontracting essentially concerns multinational firms, it may also concern SME which do not have activities abroad. Depending on the nature of the subcontracting, prime contractors may abolish jobs in the compiling country and only create jobs abroad, or else create jobs abroad without abolishing jobs in the compiling country. Subcontracting takes place between non-affiliated firms but often in a relationship of cooperation or partnership. When the production subcontracted abroad was previously undertaken within the enterprise in the compiling country, it implies a reduction in the number of employees responsible for that production. This project is exclusively concerned with subcontracting of a permanent and regular character. Ad hoc subcontracting can be justified either by a temporary lack of capacity to meet additional demand within the deadlines imposed by the order, or to accomplish an occasional task which requires skills not available within the enterprise and the compiling country.

25. An important distinction concerns the difference between subcontracting and cooperation or partnership. To grasp the difference, it is useful to distinguish two categories of subcontracting. The first concerns relatively commonplace goods and services with a low technological content (e.g. call centres, accounting, spare parts, etc.). Goods and services in the second category have a high technological content and are generally the subject of constant innovation.

26. Relations between prime contractors and suppliers are not the same in the two categories. Prime contractors in the first category, having a wide choice, very often exert very strong pressure on prices and delivery times and can replace their subcontractors relatively easily.

27. On the other hand, suppliers in the second category are more closely associated with the design of the products and thus assume a partnership role. This type of subcontracting could be called partnership subcontracting.

28. As a typical example of this type of subcontracting, relations between automobile or aircraft manufactures and their respective parts suppliers might be mentioned, (providing landing gear, instrument panels, etc.).

29. Both these cases generally involve high tech goods for which the suppliers cannot be mere executing agents. They must also participate in the design of products and monitoring technological developments, sometimes even imposing certain innovations on the prime contractors. The latter are much more dependent on their subcontractors than prime contractors in the first category. It would be difficult, however, to liken these arrangements generally to cooperation agreements.

30. In cooperation agreements, the partners often establish financial links between them (mutual capital investment) and seek through their cooperation to share costs and risks, notably in research and development, or they undertake to jointly develop a new technology.

31. Figure 1 presents a classification of the different forms of international subcontracting.
32. The presentation in Figure 1 makes a distinction not only between ad hoc and permanent subcontracting, but also between goods and services. However, in the context of this document, it must be emphasised that both for goods and services, it is the permanent as opposed to the ad hoc character of subcontracting which is of interest. Furthermore, it must be considered even more restrictively to the extent that it must be associated with a reduction on production capacity in the compiling country. In other words, subcontracting in this report means the outsourcing abroad of an activity which previously was partially or totally integrated in the enterprise in the compiling country.

33. As in the case of relocation in the strict sense (Box 1), Box 3 summarises the three conditions which characterise relocation in the broad sense.

Source: OECD (2005), OECD Handbook of Economic Globalisation Indicators.
Box 3. Characteristics of relocation in the broad sense (offshore outsourcing)

This category of relocation concerns non-affiliated firms (international subcontracting).

- Partial or total cessation of an activity of production of goods or services in the compiling country with a reduction in the workforce.

- The same activity which was partially or totally ceased is subcontracted on a regular basis with another non-affiliated firm or another institution abroad.

- The enterprise which gave the order and subcontracts goods and services abroad then imports these goods and services previously produced within the enterprise to satisfy domestic demand in the compiling country (country of the prime contractor).

34. The conditions shown in Boxes 1 and 3 are of great importance because they can be used to define the scope of this analysis. They do not flow automatically from the terminology used. Thus, the term “relocation abroad” is used to indicate that a domestic activity is carried on abroad and that it is replaced by imports of goods and services produced abroad. However, neither the term “relocation abroad” nor “offshore in-house sourcing” necessarily means a reduction in production in the compiling country whether or not accompanied by job losses. But if that were the case, it would be necessary to analyse much more broadly:

- The impact of direct investment on employment.

- The impact of international subcontracting on employment.

35. It is considered that in the present context where the closure of production units in many OECD countries is accompanied by job losses and these activities, for various reasons, are then shifted abroad, it would be a necessity, before expanding the analysis, to address this priority aspect of the problem first of all. It will be seen later that the majority of the studies devoted to relocation do not simultaneously take account of all the conditions set out in Boxes 1 and 3. This could be explained by the extreme difficulty, not to say impossibility, of quantifying all the proposed conditions, even with access to individual firms’ data.

1.3 Particular forms of relocation

36. Certain forms of relocation are of particular interest and are worth examining separately:

- Relocation abroad of research and development laboratories (R & D)

Bearing in mind the importance of R & D for technological innovation and competitiveness in enterprises, relocation abroad of research laboratories could have much greater effects on the economies of the compiling countries than mere loss of jobs. It would therefore be useful if the analysis of relocation of research laboratories were not confined to counting the number of researchers and technicians affected by relocation but took a broader approach to the question, measuring the consequences for the technological potential of the country concerned. The necessary investigations to analyse the problem are outside the scope of this report but they could be undertaken in the context of the Committee for Scientific and Technological Policy (CSTP) project on the internationalisation of research and development.
• Relocation abroad of parent companies or decision making centres

As a particular case of relocation in the strict sense, it would be interesting to examine the relocation abroad of parent companies or head offices of multinationals. As in the case of research laboratories, the jobs concerned are likely to represent only a very small percentage of the total employment involved in relocation. However, this phenomenon is more revealing of a country’s power to attract decision-making centres than to maintain employment.

• Migration abroad of scientific staff for an indefinite period

All the cases mentioned above concern relocation relating to the activities of the enterprise.

The migration abroad of scientific staff is a very special form of relocation which does not concern enterprises but personal choice. When the migration is temporary, it could be beneficial for the persons concerned and indirectly their compiling country, to the extent that such persons could acquire new knowledge and skills. If, on the other hand, it is permanent, it could have a relatively high social cost. This phenomenon, which is marginal to the problem of relocation, is studied separately by “brain drain” specialists. It again shows the problem of attractiveness of countries for highly qualified persons.

• Repatriation of activities to the compiling country

Repatriation of activities to the compiling country is the opposite phenomenon to relocation. It is not particularly unusual for some activities which had been relocated abroad to return to their compiling country. Most often, this occurs when the relocation has not delivered the expected returns to the enterprises concerned, or because the framework of conditions for the relocated activities has considerably improved in the compiling country or deteriorated in the country of relocation. In almost all countries, governments seek the repatriation of relocated activities, especially in the case of job creating activities or those with high added value. This question will be examined in the last part of this document.

1.4 Terminology issues

37. Before examining the dynamic of the impact on employment of activities carried on abroad, it is worth recalling the terms that will be used throughout the report. This is all the more necessary because often different terms are used to describe the same phenomenon.

38. If the title of the report reflects only certain aspects of activities carried on abroad (relocation abroad), that is because of the constraints set out in Boxes 1 and 3.

39. Externalisation abroad (outsourcing abroad) can be either through direct investment, i.e. in its own affiliates (offshore in-house sourcing or cross-border outsourcing to its own affiliates) or through foreign subcontracting (offshore outsourcing or outsourcing abroad or subcontracting abroad or cross-border outsourcing to non-affiliates). The first form of externalisation has been termed “relocation in the strict sense” and the second “relocation in the broad sense”. Table 2 summarises the terms used.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic outsourcing</td>
<td>Externalisation within a country</td>
</tr>
<tr>
<td>Outsourcing abroad</td>
<td>Externalisation abroad</td>
</tr>
<tr>
<td>Offshoring</td>
<td>Activity carried on abroad</td>
</tr>
<tr>
<td>Offshoring</td>
<td>Relocation abroad</td>
</tr>
<tr>
<td>Relocation abroad in the strict sense</td>
<td>Offshore in-house sourcing or cross-border outsourcing to its own affiliates</td>
</tr>
<tr>
<td></td>
<td>(Partial or complete closure of production unit in the compiling country and relocation of the same production to its own affiliates abroad)</td>
</tr>
<tr>
<td>Relocation abroad in the broad sense</td>
<td>Offshore outsourcing or outsourcing abroad or subcontracting abroad or cross-border outsourcing to non-affiliates.</td>
</tr>
<tr>
<td></td>
<td>(Partial or complete closure of production unit in the compiling country and transfer of the same production to a subcontractor abroad)</td>
</tr>
</tbody>
</table>
CHAPTER 2. THE DYNAMIC OF THE IMPACT OF RELOCATION ABROAD ON EMPLOYMENT

40. The phenomenon of relocation abroad is the result of interaction between direct investment, subcontracting with non-affiliated firms and international trade. In general, both direct investment and the use of subcontracting abroad involve trade flows, notably imports into the compiling country but also exports. The dynamic of these interactions can have positive or negative effects on employment, both directly and indirectly, and depending on whether it is short or long term.

2.1 Short-term effects on employment

- Company X may reduce certain of its activities in a country for various reasons (e.g. insufficient demand, loss of competitiveness, technological change, etc.) without necessarily relocating its activities abroad. That may translate into job losses which are not linked to relocation.

- What more often happens is the relocation abroad of the activities of Company X, a large part of which were intended to satisfy domestic demand. In that case, the part destined for the domestic market of the compiling country will be imported (intra-firm imports) while the part destined for export will be exported directly to those markets from the affiliates of Company X. There would thus be a direct effect and an indirect effect on employment.

In certain extreme cases where all the activity of Company X is relocated abroad, the impact on employment could be greater, especially as some subcontractors might find themselves obliged to follow Company X abroad. More specific situations can arise when the imports of Company X from its affiliates partially or wholly concern intermediate goods. Then, after processing, one part of the finished goods will be sold in the domestic market and another exported.

- Company X may, however, relocate certain activities abroad which were intended solely for exports. If this relocation takes place through its foreign affiliates, employment in the compiling country may be directly or indirectly influenced. The direct effect would be the reduction in employment involved in the export-related activities which are transferred to affiliates abroad. The indirect effect might concern jobs in other subcontractors in the compiling country which contract production for exports by the firm in question. To the extent that foreign affiliates are going to export directly to the countries for which these exports are intended, jobs in other domestic firms could be affected if those firms exported similar goods to the same markets and which will now be in competition with the countries in which the affiliates of Company X which relocated its production are established.

- Now suppose that Company X ceases some of its activities and subcontracts them to non-affiliated firms abroad. In principle, these activities do not, at least directly, concern export markets in the sense that the subcontractors do not send the goods and services concerned to the export markets of Company X. On the other hand, Company X will import the subcontracted goods and services. For the compiling country, the negative impact on employment will be proportional to the number and nature of goods and services ceased and subcontracted abroad.
Company X may also decide from the outset to create new activities or expand existing activities directly in its foreign affiliates and then import part of the goods and services and products. In that case, it does not stop its activities and destroy jobs in the compiling country, but simply creates new jobs exclusively abroad but not in the compiling country.

Similarly, Company X may decide from the outset to subcontract certain activities to subcontractors abroad without reducing the same activities and without job losses in the compiling country.

A final case could be envisaged where Company X totally ceases its activities in the compiling country for various reasons which are unrelated to relocation – when, for example, there is a recession or its products are no longer in demand on the domestic market – and relocates its activities abroad.

Figure 2. Activities carried on abroad by country Y and short-term impact on employment

41. Figure 2 summarises the different situations described above concerning the interactions between domestic production, foreign direct investment and imports. The impact on employment here concerns only the short term, and may be negative or neutral. The negative effects on employment come from situations A, B, C and G while the effects of situations D, E and F are neutral.
42. The situations directly linked to relocation are those in A, B and C. Situations B and C are described in Box 1, while situation A is described in Box 3. Some authors consider that the fact of creating jobs abroad in affiliates, even if it does not reduce employment and activities in the same activities in the compiling country, is itself negative for employment. That could be wrong for two reasons. Firstly, there is no guarantee that an activity which was not developed abroad would necessarily be developed in the compiling country. Secondly, in macro-economic terms, the relationships between direct investment and exports are too complex, but often when the direct investment is within a framework of vertical integration, these relationships are mostly complementary.

Box 4. Firms concerned by relocation abroad

**Compiling countries which relocate abroad**

- The relocation characterised by situations B and C in Figure 2 may concern two categories of firms in country Y.
  - Parent companies controlled by residents of country Y.
  - Affiliates under foreign control established in country Y (some may also be parent companies).

Conversely, all the companies in country Y are affected by the relocation characterised by situation A in Figure 2, including companies which are not multinationals (which do not have affiliates abroad).

**Countries of destination of relocation abroad**

- Companies affected by countries of destination of relocation abroad, in situations B and C of Figure 2 will be:
  - Affiliates directly or indirectly controlled by parent companies in country Y.

It will be recalled that in accordance with the recommendations of the *OECD Handbook of Economic Globalisation Indicators*, indirect affiliates are firms controlled by parent companies in country Y but through other affiliates whose parent companies exercise direct control (majority shareholding) [OECD (2005), *OECD Handbook of Economic Globalisation Indicators*, Section 3.3.1.2, chapter 3.]

- In the case of subcontracting characterised by situation A in Figure 2, all the companies in the countries of destination of relocation may be affected with the exception of firms involved in trade between parent companies in country Y and their foreign affiliates (intra-firm trade). Conversely, affiliates of parent companies in country Y must be taken into account when the prime contractors in subcontracting concerning these affiliates are companies other than their own parent companies in country Y.

43. Another point which needs to be emphasised is the fact that relocation abroad is when the same goods and services are concerned as those for which production has been stopped or reduced in the compiling country and which are then imported. In other words, if the activity transferred either to the enterprise’s own affiliates abroad or subcontracted to foreign producers is not the same as that which was stopped or reduced in the compiling country, then that is not a case of relocation.

2.1.1 *Relocation abroad and restructuring*

44. Multinational groups distribute their activities in many countries. Given that each group has other secondary activities in addition to its principal activity, it operates a constant redeployment of its activities in the countries where it is established. Thus, it can concentrate certain activities in a few
countries where it can achieve economies of scale and reduce them in others. At the same time, in countries where certain activities have been reduced or relocated to other countries, the group can create new activities, assigning to them a large proportion of its workers previously employed in the relocated activities. If these movements are very frequent, the enterprise could find itself unable to identify the number of employees affected by relocation.

2.2 Prime motivation for relocation abroad

45. The reasons which lead firms to relocate abroad may vary depending on the sector and the form of relocation (to affiliates or through subcontracting to non-affiliated firms). Up to now, only consulting firms have questioned enterprises on this question. While for the choice of location of direct investment, the chief criterion seems to be the need for local presence in growing markets, as regards relocation of production, all the surveys show that the prime motivation is reduction of costs.

Figure 3. Motivations for relocation abroad

![Bar chart showing motivations for relocation abroad]

Reduce costs: 36%
Proximity to clients: 17%
Increase sales: 14%
Improve productivity: 13%
Get access to a foreign market: 9%
Improve service quality: 6%
Increase competencies: 3%
Other: 2%

As a % of respondents

The criterion concerning reduction of costs does not concern labour costs exclusively but all costs involved in the production process (wages, financial costs, management, advertising, communication, transport, etc.). The vertical investment corresponds to the search for cost differentials and reflects the traditional comparative advantage approach. However, horizontal investment is motivated more by reasons of market access.

Figure 3 illustrates the chief reasons why enterprises relocate abroad, according to a survey by the consulting firm A.T. Kearney. It could be inferred that the need for market access and the need to reduce costs make the distinction between horizontal and vertical investment less relevant.

While Figure 3 shows the motivation of large firms, other surveys have been carried out in SME. KPMG carried out such a survey in France among 212 firms with a turnover of between 7 and 25 million euros. While some enterprises sometimes confuse relocation and foreign investment, the results of the survey more or less confirm the reasons given by the enterprises as a whole (see Figure 4). It is important to emphasise that, according to that survey, the number of enterprises who said that they did not expect any gains from a possible relocation was 51% in 2003 but only 33% in 2004.

While tax does not seem to be a major cause of relocation of production, it becomes the chief motivation when it comes to relocation of decision-making centres (headquarters). Figure 5 presents a list of criteria given by a large number of European multinationals surveyed by the consulting firm, Arthur D. Little. The figures correspond to the number of times a criterion was mentioned. The same consulting firm calculated the number of relocations of headquarters of multinationals in Europe, and listed countries in terms of their attractiveness (percentage of headquarters relocated). (Figure 6).
Figure 5. **Specific criteria involved in the evaluation of relocation of a headquarter**

- Corporate tax advantages: 88%
- Availability of qualified managers: 72%
- Quality of life: 69%
- Central location: 62%
- Support of authorities: 55%
- Personal preference of CEO: 50%
- International managers: 48%
- International schools: 37%
- Language skills: 35%
- Labour flexibility (no trade unions): 35%
- Ease of attracting top managers: 31%
- High purchasing power: 25%
- High education: 22%
- Attractive personal taxes: 19%
- Image of the country: 17%
- Labour availability: 17%
- Proximity to existing production site: 10%

*As a % of respondents*

*Source: Arthur D. Little (desk research).*

Figure 6. **Relocation of headquarters in Europe by country (as percentage of total)**

- Switzerland: 55%
- Belgium: 16%
- United Kingdom: 16%
- Netherlands: 7%
- France: 3%
- Denmark: 3%

*Source: KPMG*
50. The number of jobs affected by the relocation of headquarters is very low compared with the relocation of production units. However, bearing in mind the fact that many decisions concerning the distribution of activities in different countries where the firms are established are taken by headquarters, it is difficult to evaluate the potential impact on employment.

2.3 The theoretical debate

51. It was emphasised in the introduction that many economists, as well as public opinion, were concerned at the economic awakening of China and India. These countries, thanks to their very low wages, relocation of activities to their territory and exceptional growth based largely on exports, would cause job losses in the OECD member countries, including the American economy.

52. Paul A. Samuelson, winner of the Nobel Prize for Economics in 1970, recently reopened the debate in an analysis of several scenarios of Sino-American relations published in 2004 in the *Journal of Economic Perspectives*. He envisages two acts, the first of which has two scenes. In Act I, Scene 1, the two countries are winners and in Act II, only China is a winner.

53. The *first scene of Act I* analyses the consequences of the following scenario. In the absence of international trade (autarky), China’s real income per capita is one tenth that of the United States. It is also assumed that China’s population is ten times higher than the population of America. In this example, two goods are considered, good 1 and good 2. Consumers’ tastes are assumed to be the same in both countries, while consumers spend half their disposable income to buy the two goods.

54. Despite the initial 10-to-1 superiority of the United States in average absolute productivity, it is assumed that China’s productivity compared with the United States is lower than that figure for good 1. Thus China’s handicap is worse than the 1-to-10 ratio. On the other hand, China’s productivity is higher than that figure for good 2 (China’s handicap is better than the 1-to-10 ratio). The differences in productivity for goods 1 and 2 explain the gains derived from specialisation and generated by trade.

55. Paul Samuelson, in the first scene of Act I, shows that international specialisation and trade exactly double each country’s total income compared with the autarky situation.

56. The second scene of Act I describes the situation of the two countries when labour productivity has quadrupled in China for the production of good 2 thanks to Schumpeterian technical improvement (exogenous shock from technical improvement). The Ricardian comparative advantages continue to force the United States to specialise exclusively in the production of good 1 and China in the production of good 2. When 100 American workers are engaged in the production of good 1, they produce no more than before, i.e. 200 units. On the other hand, if 1000 Chinese workers produce good 2, thanks to their productivity gains, they can achieve production of 800 units. Global production increases thanks to the improvement in China’s productivity.

57. The United States keep part of the gain related to the increase in global output following the liberalisation of trade. This is because the new abundance of goods produced in China (Q2) compared with the unchanging quantity of goods produced in the United States (Q1) reduces the price ratio \( P_2/P_1 \) of goods 1 and 2 for American consumers. The quadrupling of supply of good 2 in China may considerably worsen the terms of trade for China (\( P_2/P_1 \)) and this deterioration can cause per capita income to fall as a result of the exogenous shock from technological improvement well below the per capita income before the shock. After the shock, China’s share of global net output cannot be maintained at 50% but slumps to 20%. Thus, in this second scene, the United States wins because international trade allows it to benefit from China’s productivity gains.
Act II begins with the same productivities as Act I (labour productivity in the United States \( \pi_1 = 2 \), and \( \pi_i = \frac{1}{2} \) and in China \( \pi_1 = \frac{1}{20} \) and \( \pi_2 = \frac{1}{5} \)) but now expanding China’s labour productivity for good 1 of \( \pi = \frac{1}{20} \) to \( \pi' = \frac{8}{10} \). Despite the great increase in China’s labour productivity for good 1, with China becoming more productive than the United States in good 1, China still has a lower average real wage and still remains poorer in autarky than the United States.

Before the invention, just as in Act I, the United States produces only 200 units of good 1 and China 200 units of good 2. After the introduction of the invention, world output potential has markedly grown. However, all the comparative advantages have disappeared. In this situation, each country can do as well under autarky as it can if it engages in trade.

American welfare can be judged after the Chinese invention by comparing the real income under autarky (measured by the geometric mean of the number of units of each good) after the invention in an autarky situation with that before the invention with international trade.

International trade results in the production of 200 units of good 1 by the United States and 2000 units of good 2 by China. These figures show that the two countries share world income equally measured by the geometric mean \( \sqrt{200 \times 200} = 200 \). This means that when trade is possible, per capita welfare in the United States before the invention is \( \frac{1}{2} \times \frac{200}{100} = 1 \). Forced to return to autarky by China’s invention, the United States with its unchanging technology again divides its 100 workers evenly between producing goods 1 and 2.

Producing \( 50 \times 1/2 = 25 \) units of good 2, real per capita income can be measured by the geometric mean \( \sqrt{100 \times 25/100} = 50/100 = 0.5 \). There is thus a fall in the national per capita income of Americans, since before the invention and thanks to international trade it was equal to 1.

According to P. Samuelson, it can be envisaged that such inventions in a foreign country can reduce in absolute and structural terms the per capita profits that the United States gains from international trade and globalisation. On the other hand, he concludes that it is unlikely that this would be as dramatic for the American economy as in the foregoing example.

Pursuing the debate opened by P. Samuelson, Jagdish Bhagwati, A. Panagariya and T. Srinivasan in the *Journal of Economic Perspectives* focus their analysis on problems of relocation. The authors reject the fears formulated in respect of relocation and show not only that the total number of American jobs “relocated” is very low but the United States has no need to fear significant loss of skilled jobs. Bhagwati and his collaborators develop three alternative models referring to the trade in services to illustrate their case.

The first model has only one good and two factors of production, labour and capital. It is assumed that these factors have diminishing returns and that the capital endowment in the economy is fixed. The fact that there is only one good excludes the need for trade from the outset. In Figure 7, the curve \( MP_L \) represents the marginal product of labour. If \( L^0 \) is the endowment of labour and \( W^0 \) represents wages, the

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1. Per capita income in the United States under autarky is 0.5, i.e. \( 0.5 = \sqrt{(W/P_1) \times (W/P_2)} = 0.5 \sqrt{\pi_1 \pi_2} = 0.5 \sqrt{2 \times 1/2} = 0.5 \).
wage bill will be the area formed by the rectangle $OW^0E^0L^0$. Suppose that an innovation allows the economy to buy the services of labour abroad electronically at the fixed wage $W'$. The economy continues to hire the same endowment of domestic labour but now paying the lower wage. In this case, the economy buys $L^0L'$ abroad paying the sum corresponding to the rectangle $L^0L'E'R$ for it. Domestic labour receives the sum corresponding to $OL^0RW'$ and capital the area under the $MP_L$ curve above the horizontal line $WE'$. The following economic effects result. The country’s total income rises by the triangular area $E^0RE'$, which is the net gain from relocation of activities. The income of labour, the “import competing” factor, declines by area $W^0E^0RW'$ and is redistributed to capital. Thus, the owners of capital make a gain corresponding to $W^0E^0RW'$. This model captures the essence of the popular rhetoric that expresses doubts about relocation of activities. It shows, however, that it may be of benefit for the economy as a whole. But in the absence of a method allowing some of the social benefits received by capital to be transferred to workers, it is firms and the owners of capital who receive more than 100 per cent of the social benefits of relocation, while workers experience only losses.

Figure 7. **Benefits of relocation abroad in a single good model**
66. The second model has two goods and three factors. The country takes part in world trade where technological innovation allows relocation of activities. The two goods each use a sector-specific factor and another factor that is common to both goods. It is assumed that the import-competing good uses unskilled labour as its specific factor and the exportable good uses capital as its specific factor, the common factor of production of both goods being skilled labour. Now imagine that a technological change makes it possible for skilled labour to be outsourced.

67. Suppose, indeed, that an innovation allows the country to purchase the services of skilled labour abroad at a lower wage. The figure for the second model is not reproduced in this report. By successive relocation of sector 1 then sector 2, the authors show that relocation increases national income. However, the distributional issues become more complex. Assuming diminishing returns to all factors of production, the increase in quantity used of skilled labour and a decline in the skilled wage will cause the unskilled wage and the rental on capital to rise. The relocation here remains of benefit provided that it concerns a small country with fixed terms of trade and there are no other prior distortions in the form of tariffs or distorting taxes.

68. In the case of a large country, however, the introduction of a process of relocation will not necessarily lead to a welfare gain because it may modify the terms of trade. Initially, relocation leads to greater expansion of production of the exportable good than demand for it, which raises the possibility that the terms of trade in the goods market will deteriorate. In other words, it will cost a country more in terms of exports to purchase a fixed quality of imports. This deterioration may more than offset the direct benefits of relocation. Alternatively, if relocation of activities causes a considerable expansion in the output of the import-competing good, the demand for imports will decline, which will lower the price of imported goods and improve the terms of trade. In this case, the direct gains from relocation of activities will be reinforced by the improvement in the terms of trade.

69. In the third model, there are three goods and two factors where goods 1 and 2 are traded internationally, while good 3 is initially a non-traded service. Assume that due to an innovation, the formerly non-traded service becomes tradable and is available from abroad at a lower price than the price in the domestic market. This means that the domestic supply of the service disappears, and the resources thus released will be absorbed by production of goods 1 and 2. As long as both of these goods continue to be produced, the factor prices measured in terms of those goods will remain the same. But since the price of the service, good 3, has declined, the buying power of the two factors in terms of that good rises. Thus, the relocation of activities will end up making the owners of both factors better off.

70. These three models can be thought of as describing several possible outcomes of a technological improvement that allowing intensified relocation. The first model involves benefits for society, but in the form of higher returns to capital and lower wages. In the second, with multiple factors of production and fixed prices of goods, relocation of activities again provides benefits, but some categories of workers gain and others lose. In the third, relocation of activities is beneficial by increasing real incomes of all workers, at least after they have made the transition to other sectors of activity.
Paul Samuelson¹

Samuelson examines three scenarios of trade between the United States and China.

- In the first scenario, the United States has an initial 10-to-1 superiority over China in average absolute labour productivity. Two goods are considered. For good 1, China’s productivity is worse than this 10-to-1 ratio. On the other hand, it is better for good 2. Paul Samuelson shows that trade leads to a doubling of income in each country compared with an autarky situation.

- In a second scenario, China’s labour productivity for good 2 has quadrupled thanks to an exogenous shock from technological improvement. The United States continues to specialise in producing good 1 exclusively and China in producing good 2. The quadrupling of the supply of good 2 in China worsens the terms of trade for China whose per capita income falls. Conversely, the United States wins because international trade allows it to benefit from China’s productivity gains.

- In the third scenario, thanks to special technical progress, China’s productivity for good 1 becomes higher than that of the United States. In this situation, Samuelson shows that the United States, with unchanging technology for good 1, experiences a decline in per capita income as a result of trade. According to him, it can be envisaged that such inventions in a foreign country can structurally reduce the per capita profits that the United States derive from international trade. He concludes, however, that it would not have serious consequences for the American economy.

J. Bhagwati – A. Panagariya and T. Srinivasan²

These three authors reject the fears expressed by Samuelson and focus their work on the impact of relocation. They develop three models.

- The first model has only one good and two factors of production: labour and capital. Relocation can be beneficial for the economy as a whole, but in the form of returns on capital and lower wages.

- The second model has two goods and three factors (capital, skilled labour and unskilled labour). In this model, relocation also brings benefits, but to the detriment of certain categories of worker (notably skilled workers related to exportable goods).

- In the third model, there are three goods and three factors. Here the third good concerns services which were not previously traded. If the third good (service) can be obtained abroad at a lower price than in the domestic market, relocation through subcontracting will increase the real incomes of all workers, at least after those who have lost their jobs have made the transition to other sectors of activity.


2. Journal of Economic Perspectives - Volume 18, Number 4 - Fall 2004, “The muddles over outsourcing”.

2.4 Medium-term impacts on employment

The recent theoretical debate on relocation shows that whether it is a question of goods or services, it is the structure of the economy which determines the benefits of relocating activities.

If relocation of an activity essentially involves an intermediate good used to produce other goods, it acts like a technical improvement allowing savings on this input, which will increase productivity.
73. If the relocation involves finished goods offered to the final consumer at a lower price, it will increase real incomes.

74. In all cases, in the short term, there are risks of job losses, but the gains from relocation could lead to the creation of new jobs.

75. The chief difference between the effects of relocation on employment in the short and medium term is that that short-term effects are mostly direct and negative while the medium-term effects are indirect and mostly positive.

76. The gains from relocation do not appear immediately and do not directly concern the people whose jobs have been affected. In consequence, the majority of positive effects are not seen as being in any way related to relocation and only the negative affects are directly associated with it.

77. The complexity of the phenomenon and the difficulty of identifying the scale of relocation other than approximately are certainly considerable obstacles to quantifying the gains and establishing cause and effect.

78. This section briefly presents the principal macro-economic effects of relocation abroad.

a) Positive effects

i) Growth in consumers’ incomes.

79. The importing of relocated goods and services at a price lower than the one which would have been applied if the same goods and services had been produced in the compiling country increases consumers’ incomes in that country.

80. The growth in incomes will increase consumption and possibly saving. The growth in consumption will have a favourable impact on employment if it is mainly oriented towards demand for goods and services produced in the domestic market rather than imported. On the other hand, jobs which might be created due to additional consumption may concern sectors and jobs very different from those lost due to relocation.

ii) Improved competitiveness and productivity in enterprises

81. The improvement in the competitiveness of enterprises is reflected first in the improvement of price competitiveness. If changes in the exchange rate do not limit the decline in the cost of imported goods and services, the enterprise can either increase its margins without a significant reduction in price or pass on the full reduction in import prices to the sales price and increase its market share and indirectly its profits.

82. The impact on employment will depend largely on the strategy adopted by the enterprise and also the macro-economic environment. If domestic demand is growing, the enterprise will be encouraged to invest and produce more, and will indirectly create new jobs. If domestic demand is weak but export markets are expanding, it will depend on the choice made by the enterprise: either to export or to establish new production units in foreign markets.

83. Another important effect that relocation may have on the activity of firms is improved productivity. Although this improvement may not necessarily have an immediate favourable impact on employment, it encourages investment in new technology and indirectly the creation of higher skilled jobs.
iii) Export growth

84. The relocation abroad of certain activities could influence exports in two ways. Empirical studies show that at macro-economic level, foreign investment often complements trade and generates additional exports, and indirectly job creation. Moreover, the growth in incomes in the countries of relocation which are increasingly integrated in the world economy creates additional demand which could be satisfied by new exports from the countries behind the relocations.

iv) Control of inflation

85. Reducing costs is one of the chief justifications for relocation. This reduction will contribute to better control of inflation and a slowdown in consumer price rises. This will encourage a flexible monetary policy and keeping real interest rates fairly low. Indirectly, low interest rates will stimulate investment and thus job creation.

v) Better returns on capital

86. One of the causes of relocation rarely mentioned explicitly is that in the destination countries of relocation, the wage bill is relatively low compared with the gross operating surplus. In other words, there is a higher return on investment. Thus repatriated dividends and profits, the level of which also depends on enterprises’ strategies, mean better remuneration of owners of capital (see also Chapter 2, theoretical debate). Based on these results, it is nevertheless very difficult to predict the probable impact on employment.

b) Negative effects

i) Fall in real wages of certain categories of worker

87. Depending on the nature of the relocation, the importing of goods and services at lower prices will result in lower wages for workers who produce these goods and services. In the initial phase when relocation involved mostly goods and services with low added value, it was low-skilled workers who were concerned. The real relative wages of those workers fell markedly and unemployment among them rose. It is likely that this phenomenon led certain countries to introduce minimum wages. However, the increase in cheaper skilled labour abroad, combined with relocation of goods and services that needed that labour, also resulted in a fall in the real wages of skilled workers in the relocating countries.

ii) Deterioration in the terms of trade

88. Relocation of activities is generally advantageous for a country to the extent that it leads to a further fall in the price of imported goods and services. However, that could cause a deterioration of that country’s terms of trade, especially if the exported goods and services are in a similar range. The chief cause will be inflation of the world supply at low prices of the goods and services normally exported by the country in question.

iii) Possible decline in capacity for innovation

89. This applies essentially in the case of relocation abroad of research and development laboratories. Such relocation occurs most often in the context of group restructuring, or following a merger, and most often concerns enterprises under foreign control. The scale of this effect depends on the nature of the research carried on by the laboratories. If the research is done for foreign affiliates or enterprises, the impact will be more modest and would be limited mainly to “spill over” effects.
iv) Loss of tax revenues

90. Loss of tax revenues can occur in the context of relocation of parent companies or head offices of multinationals, to the extent that a large part of the profits of the groups concerned will be transferred and taxed in other countries.

v) Regional effects

91. The closure of a factory and its relocation abroad might only have relatively minor consequences at national level, but the consequences for a particular region can be serious, especially when unemployment in the region is high and the factory was the chief centre of economic activity in the region.

2.5 Principal factors unfavourable to relocation abroad

92. Although according to recent surveys, a great many enterprises do not exclude resorting to relocation in the near future, it should be emphasised that relocation abroad of certain activities also involves risks which enterprises should not underestimate. The most important are briefly described below.

a) Inadequate quality of goods and services supplied

93. Sometimes the quality of relocated goods and services, especially when subcontracted and then imported, does not meet all the criteria to satisfy consumers in the compiling country. A strict quality control system must be established, which can sometimes mean a complex and costly organisation.

94. However, apart from consumer satisfaction, two other problems can have serious consequences, especially in the case of subcontracting:

- defective spare parts which can cause safety problems, especially in transport (aeroplanes, automobiles, etc.);
- medicines which do not comply with all the standards and may raise health problems.

b) Failure to meet delivery times

95. Any delays in delivery of goods and services, especially in a “just-in-time” production system, can halt production and cause enterprises to lose sales.

c) Higher costs than anticipated

96. Apart from the extra costs that could arise from better quality control, there could also be higher transport costs (e.g. fuel, insurance, etc.), adverse movements in the exchange rate, or, more rarely, new regulations in the compiling country with respect to relocation. In addition, wages in the country of relocation may also rise faster than expected, which forces some enterprises to seek another country to which it can relocate its activities once again.

d) Failure to respect intellectual property

97. In a country where intellectual property is not respected, enterprises run the risk of being copied and of experiencing unfair competition as a result of counterfeiting. In such countries, high tech enterprises avoid forming affiliates and certain activities relocated to those countries are repatriated to the compiling country.
e) Technological change

98. Technological change can influence relocated activities in different ways. Firstly, technological change can make certain production obsolete, whether relocated or not. But some changes require fairly skilled personnel to put them in place. This assumes that the local workforce in the country of relocation will have the skill needed to meet the changes. Finally, innovation in the manufacturing process can automate production to the maximum, increase labour productivity and reduce the labour needed to the minimum. That could raise questions of profitability for the relocated activity.

f) Management difficulties

99. Sometimes difficulties arise in the field of management, related to language, cultural and communication problems. The problems could be more acute in the case of subcontracting, especially in services where the need for permanent communication between the local workforce and the home enterprise (prime contractor) assumes greater importance.
CHAPTER 3. PROBLEMS OF MEASUREMENT

100. Up to now, no public surveys have been undertaken in any OECD countries concerning the phenomenon of relocation abroad. Given the importance of the fears aroused by relocation in public debate, that might seem paradoxical.

101. One explanation might be the absence of a precise definition of the phenomenon and its complexity. A second reason will be the difficulty and sometimes the impossibility of enterprises providing certain information from their accounting systems.

102. In this context, it is not surprising to find that the bulk of the work done in this field comes from private sources, notably consulting firms.

103. Having defined the concept of relocation, the OECD Secretariat, in the Autumn of 2004, suggested certain indicators to measure the scale of the phenomenon. These were indirect indicators involving assumptions of relocation in the absence of direct measurement.

104. The majority of these indicators are presented in this report, together with others suggested by delegations.

3.1 Suggested indicators

105. The indicators suggested here exclusively concern identification of jobs lost because of relocation in accordance with the definitions set out in chapter one.

106. The example shown in Figure 8 will make it possible, in the context of relocation abroad, firstly (a) to ascertain better those transactions which have a direct or indirect effect on employment, and (b), secondly, to identify the data which can be used to quantify that impact. The example in Figure 8 is confined to the case where an enterprise in a country relocates certain of its activities to another country. It is assumed that in Country 1, company A is a parent company, which means that it is a case of a group of enterprises, and that the parent company is controlled by residents of Country 1 (the most frequent case). Parent company A decides to scale down certain of its activities (goods and services) in Country 1 and transfer them to its affiliate B in Country 2. The transfer of these activities will involve a direct investment flow from company A to its affiliate B. Part of the new production in affiliate B will then be imported by parent company A (intra-firm imports) to satisfy domestic demand in Country 1, the same as before the relocation. A second part of the new production of affiliate B could be exported directly to countries 3, 4, …, n, which are trading partners of Country 1. These exports will replace the exports which had previously been made directly by parent company A to those countries. Consequently, for a constant demand for imports by countries 3, 4, …, n, exports from parent company A to those countries are initially likely to diminish. In addition, affiliate B in Country 2 will be in competition on the markets of countries 3, 4, …, n, with all the other firms in Country 1 which export the same goods and services as affiliate B to those countries.
107. Parent company A can at the same time conclude subcontracting contracts with firm C in Country 2 which is not an affiliate of A. Thus, the goods and services subcontracted by firm C will then be imported by parent company A in Country 1.

108. The example shown in Figure 8 is simplified to the extent that not all the firms concerned are taken into account. In reality, if the compiling country is Country 1 whose firms relocate their activities to Country 2, it would be necessary to take account of other categories of firms concerned by the relocation. They are shown in Figure 9.

109. The different categories of firms taken into account in Figure 9 show the multiple aspects that need to be considered:

- The foreign affiliates D in Country 1 can relocate certain of their activities to their parent companies G in Country 2.

- The same foreign affiliates D can subcontract activities to firms B (affiliates of A) but also to the other categories F, H, and K with the exception of their parent companies G.

- The firms E in Country 1 have the possibility of subcontracting certain of their activities to firms in all the categories in Country 2.
Certain foreign affiliates D in Country 1 can disappear and be relocated in Country 2. If the group to which they belong does not have any other affiliates in Country 1, the goods and services which formerly were consumed in Country 1 will be imported by other firms located in Country 1. In that case, these imports will not be intra-firm imports.

Figure 9. Categories of firms to be considered in a case of relocation abroad

![Figure 9: Categories of firms to be considered in a case of relocation abroad](image)

<table>
<thead>
<tr>
<th>Country 1</th>
<th>Country 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>(declaring country)</td>
<td>(offshoring country of destination)</td>
</tr>
<tr>
<td>Parent companies</td>
<td>A's affiliates</td>
</tr>
<tr>
<td>Foreign affiliates</td>
<td>Foreign affiliates (but not A's affiliates)</td>
</tr>
<tr>
<td>Non-multinational firms</td>
<td>Parent companies which have affiliates in country 1</td>
</tr>
<tr>
<td></td>
<td>Parent companies which have affiliates in other countries than country 1</td>
</tr>
<tr>
<td></td>
<td>Non-multinational firms</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>D</td>
<td>F</td>
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<td>E</td>
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<tr>
<td></td>
<td>H</td>
</tr>
<tr>
<td></td>
<td>K</td>
</tr>
</tbody>
</table>

110. The changes concerning the transactions described above for the firms in Figure 9 could be summarised in two ways. A first approach can be taken using data from individual firms, while a second could be a more macro-economic approach.

3.1.1 Approach based on individual firms’ data concerning a good or service relocated abroad

111. Relocation in the strict sense (relocation abroad of activities)

- Reduction in production and workers in firms A and possibly in firms D.
- Growth in foreign direct investment flows (FDI) from firms A to firms B and possibly from firms D to firms G.
- Growth in production in firms B and possibly in firms G.
- Decline in exports of firms A and possibly of firms D.
• Growth in imports of firms A from firms B and possibly of firms D from firms E.

112. Relocation in the broad sense (international subcontracting)
• Reduction in production and workforce in firms A, D and E.
• Decline in exports of firms A, D and E.
• Growth in imports by firms A from firms F, G, H and K.
• Growth in imports by firms D from firms B, F, H and K.
• Growth in imports by firms E from firms B, F, G, H and K.

113. To apply the approach described above assumes access to individual firms’ data in the relocating country, information on the activities of their own foreign affiliates and the status of foreign firms which are the source of the imports.

114. It should, however, be emphasised that only the approach which gives access to the individual firms’ data could give tangible results for presumptions of relocation. Moreover, when the approach based on individual firms’ data is adopted, it should be applied at “establishment” level, but without losing sight of the ownership links between these establishments and enterprises and groups of enterprises.

3.1.2 Sectoral approach

a) Relocation in the strict sense (relocation abroad of activities)

115. Between period $t$ and period $t + i$, $i = 1, \ldots, n$ and for a particular sector $k$
• Decline in production $P^k$ in sector $K$
$$\Delta P^k = P^k_{t+i} - P^k_t < 0$$  \hspace{1cm} (1)
• Decline in number of employees $L^k$ in sector $K$
$$\Delta L^k = L^k_{t+i} - L^k_t < 0$$  \hspace{1cm} (2)
• Decline in exports $X^k$ in sector $K$
$$\Delta X^k = X^k_{t+i} - X^k_t < 0$$  \hspace{1cm} (3)
• Growth in direct investment flows concerning sector $K$
$$\Delta FDI = FDI^k_{t+i} - FDI^k_t > 0$$  \hspace{1cm} (4)
• Growth in production of affiliates $PF^k$ in Country 1, in the countries of relocation and in sector $K$
$$\Delta PF^k = PF^k_{t+i} - PF^k_t > 0$$  \hspace{1cm} (5)
• Growth in exports of affiliates PF^k in Country 1, in the countries of relocation and in sector K

\[ \Delta X^F_k = X^F_{i+t} - X^F_i > 0 \]  \hspace{2cm} (6)

• Growth in imports M^k of Country 1 from affiliates located in the countries of relocation and concerning sector K

\[ \Delta M^k = M^k_{i+t} - M^k_i > 0 \]  \hspace{2cm} (7)

(essentially intra-firm imports)

b) Relocation in the broad sense (international subcontracting)

116. Between period \( t \) and period \( t+i, i=1, \ldots, n \) and for sector \( m \):

• Decline in production \( P^m \) in the sector \( m \)

\[ \Delta P^m = P^m_{i+t} - P^m_i < 0 \]  \hspace{2cm} (8)

• Decline in the number of employees \( L^m \) in the sector \( m \)

\[ \Delta L^m = L^m_{i+t} - L^m_i < 0 \]  \hspace{2cm} (9)

• Growth in total imports \( M^m \) of Country 1 concerning sector \( m \) less intra-firm imports for the same sector \((M^m, \text{intra})\).

\[ \Delta M^m = \left( M^m_{i+t} - M^m_{i+t, \text{intra}} \right) - \left( M^m_i - M^m_{i, \text{intra}} \right) > 0 \]  \hspace{2cm} (10)

117. When all the indicators suggested for a given sector pertain, it can be concluded that there is a strong presumption of relocation.

118. However, even in an unarguable case of relocation, for various reasons it is highly unlikely that all the indicators suggested above will converge. The reasons why they can give divergent results will be examined later. In principle, the suggested indicators are valid both for goods and services. However, while on a conceptual plane there is no difference, because the sources of the data used are not the same, the evaluation methods for services could be different (see also section 3.2.2).

3.2 Relevance and limitations of the suggested indicators

119. Assuming that the data needed is available, the question arises as to whether the suggested indicators can measure the impact of relocation on employment. Before proceeding to an evaluation and certain additional propositions, it is worth recalling here certain cases which do not constitute relocation.
Box 6. Cases that do not constitute relocation abroad

- Creation of a new production unit abroad without reducing activity and the domestic workforce.
- Growth of imports from foreign affiliates to satisfy additional domestic demand without a reduction in the domestic workforce.
- Imports from affiliates and subcontractors of products which are not identical to those no longer produced in the compiling country.
- Subcontracting abroad without reducing domestic production and workforce.
- Closure of production units due to poor competitiveness without imports to offset the decline in production.
- Reduced production and workforce in the compiling country and opening abroad by the same enterprise of activities different from those reduced in the compiling country.
- Temporary subcontracting abroad.

120. It has already been emphasised that the results which are most reliable and closest to the real situation concerning relocation can only be obtained at enterprise level. For that purpose the following is required:

- A list of establishments and enterprises.
- Customs and balance of payments data to provide information on the value of imports and exports according to the nature of goods and services and their origin and destination.
- Data from the firm’s records on employment trends.
- Sources constituted over time by groups and independent enterprises.

121. On the other hand, when sectoral data are used, the presumptions of relocation are more difficult if not impossible to establish. For that it is important to consider two questions:

- Is it possible in a case of relocation to have a reduction in the number of workers without a growth in imports?
- Can growth in imports be not accompanied by a reduction in the number of workers?
Box 7. Links between employment and imports based on sectoral data

a) Reductions in the number of workers without a growth in imports
   i) In cases of relocation abroad
      − The reduction in numbers of workers essentially concerns exports which are relocated.
      − The number of workers declines in a secondary activity while imports are recorded in the principal activity or another secondary activity.
      − The number of workers declines because of the disappearance of a foreign affiliate but imports can be made by other firms with other activities.
      − The number of workers declines because of the disappearance of a firm controlled by the residents of a country which nevertheless maintains activities abroad. Then imports may occur through trading firms but may not appear in the statistics if they are classified in another category.
   ii) In cases of non-relocation abroad
      − The number of workers declines due to domestic outsourcing.
      − The number of workers declines due to a strong rise in productivity or reduction in over-capacity.
      − Reduction in the number of workers due to poor competitiveness.

b) Growth of imports without a decline in the number of workers
   i) In cases of relocation abroad
      − The number of workers does not decline if there is job creation in secondary activities classified in the principal activity.
      − The number of workers may even increase if there is new foreign investment (new foreign affiliates) in the same sectors.
      − If there are new acquisitions in the domestic market by firms which relocate.
      − If the people who have lost their jobs are transferred to other activities or granted leave of absence.
   ii) In cases of non-relocation abroad
      − Imports increase to satisfy additional domestic demand which local producers cannot satisfy without a decline in the number of workers.
      − The growth in imports may be accompanied by the creation of new jobs in the same import sectors.

122. The above description shows that when a relocation occurs in a particular sector with job losses, in many cases, the available data does not necessarily allow detection of reductions in the number of jobs nor significant rises in imports. Other limitations can be added to the above cases, the most important of which might be:
a) Changes in the classification or principal activity of firms

123. When there are changes in classification, an enterprise might be classified at the beginning of the period under consideration in one sector and in a sector in a different category at the end of the period. A similar phenomenon can arise with aggregated sectoral data, when a firm changes its principal activity between the beginning and the end of the period under consideration.

b) Problems of confidentiality

124. Identifying the country of relocation and the sector concerned, especially with regard to the activity of multinational firms, requires the use of tables which cross reference the countries of origin and destination to sectors. For reasons of confidentiality, these tables, where they exist, are much too aggregated to allow identification of the sectors and countries concerned.

c) Successive small-scale relocations abroad

125. Some enterprises may progressively relocate their activities in such a way that job losses, the decline in production and exports and the growth in imports are only significant over a long period. Some national surveys do not take account of job losses in a firm if they affect less than ten people.

d) Competition from exporting affiliates

126. Figure 8 shows that when activities with a high propensity to export are relocated, a significant part of the exports will be made by the affiliates located abroad. Thus these affiliates will be in direct competition with other domestic enterprises which export the same goods and services to the same markets. It is possible that these firms will reduce their workforce because they have difficulties in exporting.

e) Impact of relocation abroad on subcontractors

127. Often when large multinationals relocate certain activities, their subcontractors are forced to follow them abroad. When this happens, it is a classic case of relocation. However, if that is not the case, subcontracting firms may have to reduce their workforce, without that being accompanied by imports. Even if imports do occur, they may involve sectors other than those which relocated their activities.

f) Second or third-tier subcontracting

128. One of the characteristics of subcontracting is “cascade subcontracting”. The prime contractor contracts a first subcontractor who in turn contracts a second or even third-tier subcontractor. Thus a firm located in Country A may outsource one of its activities abroad to a firm located in Country B if it produces at a lower cost. However, the firm in Country B may regularly subcontract this activity to another firm located in Country C. The added value will then be shared between several firms. In some cases, the firm located in Country B may subcontract the activity to another firm also located in Country B. This second-tier subcontractor could be an affiliate of an enterprise located in Country A. In the latter case, Country A will be the double beneficiary. This example illustrates the objective difficulties in estimating the impact on employment of such complex transactions.

g) Competition between firms which have relocated abroad and those which have not

129. Certain firms may reduce their workforce because they are subject to strong competition from other firms in the same sector which have relocated abroad some of their activities. In general, a reduction in the number of workers due to poor competitiveness is not necessarily linked to the phenomenon of
relocation and should not be counted in job losses due to relocation. However, when the loss of competitiveness is due to competition from firms which have relocated certain of their activities, it would be hard not to establish a relationship between the two phenomena. But it should be recognised that this relationship is very hard to establish even with access to individual firms’ data.

3.2.1 Employment equivalent of imports

130. When it is possible to quantify imports resulting from relocation abroad and the decline in the value of exports due to relocation, it is important to relate these changes to the corresponding employment. As regards imports in particular, the equivalent in direct jobs implied by these imports is obtained by the formula (1):

$$L^m_{it} = \sum_i M_{it} \frac{L_{it}}{Y_{it}}$$  \hspace{1cm} (1)

where: $L^m_{it}$ is the employment equivalent of imports in sector $i$ for year $t$.

$M_{it}$: the flow of imports in sector $i$ for year $t$.

$Y_{it}$: the output by value in sector $i$ for year $t$.

131. In other words, this means calculating the number of jobs necessary if the imported goods and services were produced domestically.

132. Equation (1) only concerns direct jobs. To the extent that production of the goods and services concerned in sector $i$ requires the use of intermediate output, jobs indirectly involved in the production should be taken into account. To do that, input-output tables must be used, assuming that a given amount of imports replaces an identical amount of domestic production.

If $A = [aij]$ i, j = 1…. $n$ is the technical coefficients matrix where:

$Aij$: the quantity of consumption of intermediate goods $i$ required to manufacture one unit of a good $j$.

$n$ = the number of sectors.

If $Y = [y_i]$ i = 1, ... $n$ is the production vector of each sector and

$D = [d_i]$ i = 1, $n$ is the final demand vector for each sector

Then: $AY + D = Y$  \hspace{1cm} (2)

133. This equation shows the distribution of production between intermediate consumption and final consumption. The variation in final demand on production will be given by the following equation:

$$Y = (I - A)^{-1} D$$  \hspace{1cm} (3) (unit diagonal matrix)
134. The employment equivalent of imports is then determined in relation to the production structure of the domestic economy (Li/Yi would be the mean coefficients for each sector where employment L corresponds to the total of direct or indirect jobs).

Limitations

135. The fact of choosing the coefficients Li/Yi based on a country’s production structure and then applying them to imports (or exports) raises certain problems. First of all, it is implicitly assumed that the labour production structures are the same in the compiling country and its trading partners. This assumption may not be realistic. In reality the jobs content of imports from low-wage countries is higher than that of production in the compiling country. The jobs content of the foreign production, therefore, needs to be known. If the imported goods and services had been produced in the compiling country, the price of those goods and services would have been higher and thus demand for them weaker. Moreover, this approach implies the same labour productivity in enterprises in the same sector. But experience shows that the most export-oriented firms have higher labour productivity and use higher-skilled workers than the others. Thus imports of a given value will cause more job losses than exports of the same value will create jobs.

136. In addition, it should not be overlooked that in the case of imports of intermediate goods, part of the goods could be processed and then re-exported. The absence of such information will further complicate evaluation of the employment equivalent of imports.

137. Finally, substitution between imported and domestic goods implies that the unit prices of the imported and domestic goods are the same. Again, this assumption is not realistic in the case of trade between North and South. The imported goods are generally cheaper. Consequently, an import value is substituted for a considerably higher output volume in the compiling country corresponding to the same value of domestic production.

3.2.2 An alternative method of evaluating employment

138. Another indirect measure of the impact of relocation on employment could be achieved by means of an econometric estimation of demand for labour (L). In principle, relocation abroad means job losses in the compiling country. If there were perfect mobility between sectors in the labour market, job losses in one sector could be offset by gains in another. Because of the rigidities in the labour market, the result is a net loss of jobs, at least in the short term. It was seen above that relocation can be a source of job creation by improving firms’ competitiveness.

Thus demand for labour $L_i$ in an industry $i$ and year $t$ could be estimated as follows:

$$\ln L_i = a_0 + a_1 \ln W_i + \beta \ln \omega_i + \delta \ln y_i$$

(1)

where

$W$ = the wage rate

$\omega$ = vector for the price of other inputs

$y$ = level of production.

140. The question is what input prices to use for outsourcing abroad. A multinational firm can decide what labour to be used in the compiling country and abroad. However, not all forms of outsourcing involve multinationals and it is very difficult to identify wages for inputs from abroad, especially in the
case of imported services. The lower the prices of imported inputs, the greater the tendency towards outsourcing abroad.

141. In order to allow for this tendency to outsource abroad, an “outsourcing index” is suggested as an indicator. This indicator for a country is constructed from outsourcing abroad of an industry $i$ and refers to both services and material goods. Thus for an industry $i$ and for a set of categories of services $j$ (or material goods) the outsourcing index ($OI_i$) is measured thus:

$$ OI_i = \sum_i \left[ \frac{\text{purchases of inputs } j \text{ by industry } i}{\text{total inputs excluding energy used by } i} \right] \cdot \left[ \frac{M_j}{D_j} \right] $$

where $M_j = \text{imports of service } j$

$D_j = \text{domestic demand for services } j$

142. The services $j$ (or material goods) which constitute the inputs of industry $i$ must be defined in advance.

143. The first term of the outsourcing index is calculated from input-output tables. The second term, which is the rate of penetration of imports of services $j$ (or material goods) must be calculated from data for trade in services (or material goods). Unfortunately, this ratio is more difficult to calculate for services because of the lack of detailed data collected in relation to the balance of payments.

144. After calculating for industry $i$ the outsourcing index for both services ($OI_i^s$) and goods ($OI_i^g$) these can be introduced into equation (1) which determines changing demand for labour ($\Delta L$).

$$ \Delta \ln L_{it} = a_0 + a_1 \Delta \ln W_{it} + a_2 \Delta \ln OI_{it}^s + a_3 \Delta \ln OI_{it}^g + \beta \Delta \ln \omega_{it} + \gamma \Delta \ln Y_{it} + \delta D_t + \varepsilon_{it} $$

145. The term $D_t$ corresponds to the fixed effects for year $t$ which are common through all industries such as changes concerning the cost of capital.

146. Thus from equation (3) it could be said:

- That growth in wages $W_{it}$ would have a negative effect on employment.
- Faster growth in the outsourcing indices ($OI_{it}^s$ et $OI_{it}^g$) would also have a negative impact on employment.
- Growth in the price of other inputs $\omega_{it}$ would encourage firms to replace these inputs with labour.
- Finally, growth in production $Y_{it}$ would have a favourable effect on employment.

147. The greater the disaggregation of the level at which the estimate is calculated, the more outsourcing will be negatively related to employment. On the other hand, at a more aggregated level, it is the sectoral composition of employment that would change and not necessarily total employment.
3.3 **Other approaches adopted to measure the scale of relocation abroad and the impact on employment**

148. The approaches proposed in the preceding sections, concerning indirect measurements which allow a presumption of relocation abroad, suggest:

- Firstly, that only the suggested measurements applied to individual firms’ data could provide results closer to reality.
- Secondly, that the statistical units used must be establishments and not enterprises.

149. However, even when calculations are made on the basis of detailed data concerning individual firms, some evaluations cannot be made either because of the lack of certain categories of data or because of the difficulty of collecting them or because the changes are small and not detected by the surveys. If, for example, the survey sample only includes firms which abolish more than ten jobs at a time, firms which reduce less than ten jobs in many establishments and over a long period will not be included in the survey sample.

3.3.1 **General equilibrium models**

150. One of the major difficulties with the proposed approaches is to relate the factors that determine the location of a production unit abroad to the measurements used. In the majority of cases, the suggested measurements capture other phenomena as well and are not limited to the principal motive which is optimisation of factor costs.

151. On the other hand, the general equilibrium approach makes it possible to formalise the causes of the redistribution of capital and correct the measurement of relocation for phenomena external to the redistribution of capital. The general equilibrium models allow the possibility of testing empirically everything that was described in section 2.3, notably the remuneration of factors of production, skilled and unskilled labour, changes in the terms of trade, growth in exports and imports, etc. They also allow measurement of the gains achieved between partner countries.

**Limitations**

152. The principal limitation of these models is their complexity while the breakdown of the different elements that come into play is quite difficult. Moreover, the results are very sensitive to the many assumptions underlying the models.

3.3.2 **The foreign direct investment approach (FDI)**

153. Another approach consists of measuring the scale of relocation abroad through foreign direct investment. It was seen above that relocation in the strict sense involves a capital flow to the destination country where a new affiliate is established or the capacity of an existing affiliate is expanded. More precisely, it is the financing abroad of an activity identical to that which was stopped in the compiling country.

154. This method is generally applied to emerging countries with low labour costs. Thus the share of direct investment in emerging countries can be calculated.
Limitations

155. The direct investment approach, however, has a number of disadvantages. First, it does not take account of relocation in the broad sense, i.e. involving subcontracting. Then, not all direct investment in an emerging country is necessarily the result of relocation, because it does not have to mean the cessation of the same activity in the compiling country.

156. Moreover, financing of an affiliate abroad may take different forms, and, especially in the case of an existing production unit, it may involve a purely financial transaction (e.g. exchange of shares). It may also be financed by another affiliate in the same group located in another country, unless the statistics take account of the country which is the ultimate beneficiary.

157. Lastly, if the information is not supplemented by other indicators, notably those suggested in section 3.1, it will not be possible to relate them to employment.

3.3.3 Input-output models and exchange of intermediate inputs

158. This approach seeks to identify the foreign content of domestic output, by taking account of the share of intermediate inputs in the production process. These measurements are then used to evaluate how many domestic workers have been replaced by workers abroad.

159. It involves evaluating the elasticity of substitution of domestic added value in relation to imported intermediate inputs.

160. These measurements seek to capture international outsourcing, namely the decision by firms to replace domestic added value (internal to the country) by production abroad. They also show the impact of fragmentation of production on domestic output.

161. Some studies draw a distinction between outsourcing in the strict sense and the broad sense. Outsourcing in the broad sense takes account of intermediate inputs imported by an industry on behalf of all industries, while outsourcing in the strict sense takes account of intermediate inputs imported from the same industry.

162. Then to evaluate the impact on employment, a cost function is used (e.g. translog type). By using this approach, it is possible to analyse the impact of outsourcing abroad on the structure of skills in demand for labour.

Limitations

163. This approach which is one of the most rigorous seeks to measure the impact on employment of the outsourcing abroad of activities.

164. The chief disadvantage is that the concept of “outsourcing” is much broader than that of relocation abroad. Not every imported intermediate input necessarily relates to activities stopped in the compiling country and relocated abroad. From this point of view, the impact on employment is overestimated compared with that for relocation abroad.

3.3.4 Various approaches based on individual firms’ data

165. It was emphasised above that only the use of individual firms’ data allows a close approximation of the reality concerning the impact of relocation on employment. The use of individual firms’ data also offers other possibilities for analysis.
166. An alternative approach to measuring the impact of relocation abroad on employment would be to observe what would have happened if the firms had not relocated their activities. These approaches have not yet been developed and it is no doubt too early to discuss their limitations.

3.3.5 Employment potentially affected by relocation abroad

167. Another approach consists of evaluating jobs by occupation which would potentially be affected by relocation abroad. This approach is based on the links between skills in information and communication technology (ICT) and employment by occupation in different industrial sectors. It involves first identifying which jobs classified by occupation are intensive users of information technology (IT) and their share of total employment. The principle of this approach is based on the idea that the more a job classified by occupation is an intensive user of information technology, the more it will potentially be affected by relocation. This is because thanks to information technology, the output of such work can be distributed throughout the world, irrespective of the place of production.

168. To identify jobs by occupation in this category, four main criteria are used.

- Intensive use of information technology.
- The output of such work must be capable of being delivered with the aid of information technology (which means that it is part of a marketable service).
- The work must have a high information or “knowledge” content.
- The work does not require physical presence.

169. Other criteria could also be taken into account such as: (a) major wage differentials for the same job by occupation in the destination countries; (b) establishment of low set-up barriers; (c) low social networking requirements.

170. The criteria mentioned above make it possible to take account both of skilled and unskilled jobs by occupation and efforts have been made to make the classification of data by occupation as comparable as possible between countries.

171. Some authors have also tried to identify jobs by occupation which present a “risk of relocation” by classifying the jobs concerned as “high risk”, “low risk” or “no risk”. The results obtained give for each year the percentage of potentially relocatable jobs by occupation compared with total employment. Additional econometric studies also identify factors which influence these trend patterns.

Limitations

172. On the technical plane, one limitation concerns the differences in appraisal by countries in the evaluation of the information technology content of the same category of job by occupation. Other limitations relate to the approach itself and the significance of the results obtained.

173. One of the conclusions of these studies is that about 20% of total employment could be potentially affected by relocation abroad. On this point, the evaluation methods and the significance of the word “potentially” relocatable raise some questions. Certain jobs by occupation considered to be potentially non-relocatable abroad because of their need for physical presence can also be relocated. A car mechanic cannot do repairs at a distance. However, when his company is relocated abroad, his job will also be relocated. In fact, these cases are not taken into account in the calculations. Moreover, other jobs
by occupation such as teachers are considered as non-relocatable abroad to the extent that in the vast majority of cases these jobs require physical presence.

174. However, distance learning is developing very rapidly in all countries and in certain categories of higher education could very soon take on considerable significance. In reality, only a small percentage of occupations classified as potentially relocatable are in fact relocated abroad, and equally a small percentage of jobs classified as non-relocatable are in fact relocated. Given this volatility, the question arises of the relevance of distinguishing between jobs as potentially relocatable or non-relocatable abroad.

175. It should not be forgotten either that technology changes very rapidly and that in occupations where physical presence at a particular time was essential, that might no longer be so. At the same time, the objective of governments is that information technology should be introduced on a massive scale in all occupations. As this process advances, it might be imagined that the proportion of potentially relocatable jobs by occupation out of total employment would increase substantially.

176. The difficulty involved in attributing to each of the types of employment that are potentially vulnerable to relocate abroad a high rate of likelihood of relocation abroad means that the results that are obtained are difficult to use as a tool for measuring the magnitude of the relocation abroad phenomenon.
CHAPTER 4. PRELIMINARY RESULTS

177. The results that are shown in this chapter are provisional. As explained above, in view of the lack of survey findings, we must fall back on indirect measurements which constitute the presumption of relocation abroad. In most cases, these are results that derive from databases of the OECD Secretariat collected at the sectoral level, and which are not confidential in nature.

178. The findings shown here do not address the indirect impact of relocation abroad on employment, and do not deal with the most recent years. From this point of view they reflect all the constraints that are described in the preceding chapter.

179. The approach followed in this chapter is to examine the trends in the key mechanisms which pertain to relocate abroad, the phenomenon of outsourcing, the imported share of outsourced production and the development of employment.

4.1 The outsourcing of manufacturing and service activities

180. A general indicator for detecting the degree of outsourcing or "externalization" (E) in a sector is the share of value added (VA) in the turnover (TUR):

\[ E = \text{VA/TUR}. \]

181. In principle, the more a sector outsources its activities, the more likely the value added ratio/turnover is to be low and to have a tendency to decline.

Figure 10. The ratio of value added to turnover for the whole of the economy in certain OECD countries

1. Excluding agriculture and social and personal services.
2. Excluding agriculture, financial services and social and personal services.
Source: OECD, AFA and FATS databases.
1. Excluding agriculture and social and personal services.
2. Excluding agriculture, financial services and social and personal services.

Source: OECD, AFA and FATS databases.

182. Conversely, this ratio cannot distinguish between domestic outsourcing inside a country and outsourcing abroad. Figure 10 shows that generally speaking, for the whole of the economy and for the countries for which data is available, the countries that outsource most are Japan, Hungary and the Netherlands and those that outsource the least are the UK and the USA. Between 1995 and 2002 the ratio of value added/turnover has gone down in Austria, Finland, France, the Netherlands and Hungary which means that these countries have globally outsourced more. During the same period the outsourcing for the entire economy in other countries has declined.

183. Figure 11 measures the same ratio in 2002 for the manufacturing and services sectors. The results show that most of the countries outsource slightly more in service industries than in manufacturing industries with the sole exceptions of Spain and Germany. Nonetheless, for Germany it is likely that there is a higher degree of equilibrium between the outsourcing of services and of the manufacturing industry to the extent that financial and social services were not taken into account.

184. With regard to outsourcing, figures 12 and 13 distinguish firms controlled by the residents of reporting countries from firms that are foreign-owned. In almost all countries, the subsidiaries under foreign control outsource more than firms under the control of residents. With regard to manufacturing industry, Ireland and Turkey are exceptions inasmuch as the VA/TUR ratio is higher for foreign subsidiaries than for nationally-owned firms.
The above-described measurements cannot assess the relative shares of domestic and foreign outsourcing; for that, one must prepare a foreign outsourcing index of the type proposed in the preceding chapter. A summary of its preparation is shown in Box 8.

Figure 12. Ratio of value added to turnover in the manufacturing sector, 2002

1996 for Norway and Portugal.
1997 for United States, Hungary and the Czech Republic.
2001 for Japan, France, Ireland, Italy, Netherlands, Norway, Spain, Sweden and Turkey.
2000 for Portugal and Hungary.
1999 for Denmark and the United Kingdom.
Ireland: production instead of turnover.
Source: OECD, AFA and FATS databases.

Figure 13. Ratio of value added to turnover in the services sector, 2002

1997 for Netherlands and Sweden.
1998 for Hungary and Czech Republic.
2001 for Finland, France, Italy and Netherlands.
2000 for Sweden.
Source: OECD, FATS database.
Box 8. **Index of outsourcing abroad**

The index of outsourcing abroad \((OI_i)\) is constructed as follows:

For a sector \(i\) and for a set of goods and services \(j\) the index of outsourcing \((OI_i)\) is:

\[
OI_i = \sum_j \left[ \frac{\text{purchases of inputs } j \text{ by industry } i}{\text{total non-energy inputs used by } i} \right] \cdot \frac{M_j}{D_j}
\]

where \(M_j\): imports of goods or services \(j\)

\(D_j\): domestic demand for goods or services \(j\)

where \((D_j = Y_j - X_j + M_j)\) with:

\(Y_j\): production of goods or services \(j\)

\(X_j\): exports of goods or services \(j\)

In other words, the more imports of goods or services \(j\) are purchased by industry \(i\) as input for its production, the more the outsourcing of industry \(i\) is important.

These indices make it possible, firstly at an aggregate level (but also at the sectoral level), for a compiling country to measure the extent of outsourcing abroad of its manufacturing industry with respect to both goods and services, as well as the extent of outsourcing abroad of services with respect to both goods and services.

This presupposes that goods and services \(j\) are well defined. These calculations can be made from input-output tables and trade data.

186. The results of the index of outsourcing abroad as shown by Figure 14 applied to the totality of both the manufacturing and services sectors show that:

- For all the available countries, the outsourcing of goods by the manufacturing sector is the largest foreign type of outsourcing. In second position comes outsourcing of goods by the services sector.
- The outsourcing of services by the services sector is in third place, and the outsourcing of services by the manufacturing sector is in last place.
- The countries whose manufacturing industries outsource most goods are Belgium, the Netherlands, Denmark and Austria. The USA, the UK, Germany and France outsource their activities abroad to a lesser degree.
- Japan is the country whose manufacturing industry outsources the least abroad. This result contrasts with Japan’s general outsourcing indicator which is among the highest.
Figure 14. **Index of outsourcing abroad in selected OECD countries**

1995

- Manufacturing intermediate import ratio of manufacturing sector
- Manufacturing intermediate import ratio of services sector
- Services intermediate import ratio of manufacturing sector
- Services intermediate import ratio of services sector

Source: OECD, Input-Output database.
• Between 1990 and 2000, the outsourcing abroad of goods by the services sector and the outsourcing abroad of services by the services sector have shown the strongest growth. Despite these trends, the relative proportions of the forms of outsourcing abroad have not significantly changed in any of these countries.

4.2 Employment trends

187. Figures 15 and 16 show that net job losses in OECD countries between 1995 and 2000 have exclusively occurred in the manufacturing industry. During this time, 19 countries have lost jobs in this sector while 11 other countries have recorded net job creation.

Figure 15. Trends in total employment in the manufacturing sector, 1995-2000

Source: OECD, STAN and LFS databases.

188. Conversely in the services sector, all countries have benefited from net creation of jobs. Figure 17 also shows that, apart from three countries (Japan, Slovakia and the Czech Republic) all the others have compensated for the losses recorded in the manufacturing sector by the jobs created in the services sector. In Japan and Slovakia, jobs created in services have not offset the losses recorded by the manufacturing sector. In the case of the Czech Republic, the overall decline of manning levels is due exclusively to agriculture, mining and quarrying, and construction.

189. The only conclusions that can be drawn from the above figures in regard to relocation abroad is that in services the job losses attributable to relocation abroad are largely offset by the creation of new jobs.

190. With regard to the manufacturing sector, it could be said that in general there are no direct links between import penetration trends and employment trends (Figure 18). At this level of aggregation, if these
links are not established, it is going to be even more difficult to find them exclusively among imports that are attributable to relocation abroad.

Figure 16. Trends in total employment in services sector, 1995-2000

Figure 17. Trends in total employment in the whole economy, 1995-2000

Source: OECD, STAN and LFS databases.
Figure 18. Trends in employment and import penetration rate in the manufacturing sector, 1995-2002

Source: OECD, STAN database.
4.3 Some explanatory factors

191. In the second chapter of this document, we observed how certain factors play an important role in the relocation abroad process.

192. Three factors that can play an important role will be discussed here: wage costs, labour productivity and corporate taxation.

4.3.1 Wage costs

193. Table 4 gives an approximate idea of wage differences between OECD countries and the less developed countries in 2002.

194. First of all this data shows the considerable disparity in wages between workers inside the OECD zone. It is therefore not surprising to find that certain countries in Central and Eastern Europe are chosen for relocation abroad, and that these decisions are prompted by cost considerations.

Table 4. Average annual wage per worker (USD)

<table>
<thead>
<tr>
<th>OECD countries, 2002</th>
<th>Less developed countries, 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>4872 Indonesia</td>
</tr>
<tr>
<td>Netherlands (2000)</td>
<td>4811 Croatia</td>
</tr>
<tr>
<td>Switzerland</td>
<td>4481 Estonia</td>
</tr>
<tr>
<td>Norway</td>
<td>3964 Malaysia (2001)</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>3707 Chile</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>3046 Venezuela (1997)</td>
</tr>
<tr>
<td>Japan</td>
<td>2524 Lithuania</td>
</tr>
<tr>
<td>Belgium</td>
<td>2358 Morocco</td>
</tr>
<tr>
<td>Germany</td>
<td>2216 Latvia</td>
</tr>
<tr>
<td>Iceland</td>
<td>2215 Brazil</td>
</tr>
<tr>
<td>Finland</td>
<td>2154 Algeria (1996)</td>
</tr>
<tr>
<td>Sweden</td>
<td>2068 Colombia (2000)</td>
</tr>
<tr>
<td>Austria (2001)</td>
<td>2016 Romania</td>
</tr>
<tr>
<td>Australia</td>
<td>1945 Bulgaria</td>
</tr>
<tr>
<td>Ireland</td>
<td>1888 Russia</td>
</tr>
<tr>
<td>Canada</td>
<td>1735 Thailand (2001)</td>
</tr>
<tr>
<td>New Zealand</td>
<td>1594 China</td>
</tr>
<tr>
<td>Spain</td>
<td>1541 Ukrain</td>
</tr>
<tr>
<td>France</td>
<td>1405 India (2001)</td>
</tr>
<tr>
<td>Portugal (1998)</td>
<td>703</td>
</tr>
<tr>
<td>Poland</td>
<td>548</td>
</tr>
<tr>
<td>Hungary</td>
<td>543</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>533</td>
</tr>
<tr>
<td>Mexico (2001)</td>
<td>362</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>338</td>
</tr>
</tbody>
</table>

Source: International Labour Organization (ILO), Laborsta database.

195. With regard to those countries outside the OECD zone, China and India have lower wage costs than most countries, but they also have skilled labour. By way of comparison, Table 5 shows the differences in hourly wages in some occupations between India and the USA in 2002 and 2003.
Table 5. Hourly wage (in dollars) for selected occupations in the US and India in 2002-2003

<table>
<thead>
<tr>
<th>Occupations</th>
<th>Hourly wage in the United States</th>
<th>Hourly wage in India</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephone operator</td>
<td>12.57</td>
<td>1</td>
</tr>
<tr>
<td>Health record technologists / Medical transcriptionists</td>
<td>13.17</td>
<td>1.50 à 2</td>
</tr>
<tr>
<td>Payroll clerk</td>
<td>15.17</td>
<td>1.50 à 2</td>
</tr>
<tr>
<td>Accountant</td>
<td>23.35</td>
<td>6 à 15</td>
</tr>
<tr>
<td>Financial analyst</td>
<td>33 à 35</td>
<td>6 à 15</td>
</tr>
</tbody>
</table>


4.3.2. Labour productivity and corporate taxation

Data concerning the level of labour productivity and corporate taxation are only available at the moment for OECD countries. These can only go so far toward explaining some offshoring trends that have taken place in the OECD zone.

Table 6. Labour productivity and corporate taxation

<table>
<thead>
<tr>
<th>Labour productivity 2004 GDP per hour worked (USD)</th>
<th>Hours worked per year and per person 2003</th>
<th>Corporate taxation 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>34.7</td>
<td>1814</td>
</tr>
<tr>
<td>Austria</td>
<td>38.4</td>
<td>1550</td>
</tr>
<tr>
<td>Belgium</td>
<td>50.8</td>
<td>1542</td>
</tr>
<tr>
<td>Canada</td>
<td>36.2</td>
<td>1718</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>20.7</td>
<td>1972</td>
</tr>
<tr>
<td>Denmark</td>
<td>40.9</td>
<td>1475</td>
</tr>
<tr>
<td>Finland</td>
<td>39.2</td>
<td>1713</td>
</tr>
<tr>
<td>France</td>
<td>47.7</td>
<td>1431</td>
</tr>
<tr>
<td>Germany</td>
<td>42.1</td>
<td>1446</td>
</tr>
<tr>
<td>Greece</td>
<td>28.6</td>
<td>1938</td>
</tr>
<tr>
<td>Hungary</td>
<td>21.5</td>
<td>..</td>
</tr>
<tr>
<td>Iceland</td>
<td>33.7</td>
<td>..</td>
</tr>
<tr>
<td>Ireland</td>
<td>47.1</td>
<td>1614</td>
</tr>
<tr>
<td>Italy</td>
<td>36.3</td>
<td>1591</td>
</tr>
<tr>
<td>Japan</td>
<td>32.5</td>
<td>1801</td>
</tr>
<tr>
<td>Korea</td>
<td>18.6</td>
<td>2390</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>55.9</td>
<td>..</td>
</tr>
<tr>
<td>Mexico</td>
<td>13.5</td>
<td>1857</td>
</tr>
<tr>
<td>Netherlands</td>
<td>44.2</td>
<td>1354</td>
</tr>
<tr>
<td>New Zealand</td>
<td>26.4</td>
<td>1813</td>
</tr>
<tr>
<td>Norway</td>
<td>56.6</td>
<td>1337</td>
</tr>
<tr>
<td>Poland</td>
<td>17.7</td>
<td>1956</td>
</tr>
<tr>
<td>Portugal</td>
<td>23.9</td>
<td>1676</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>21.6</td>
<td>1814</td>
</tr>
<tr>
<td>Spain</td>
<td>36.5</td>
<td>1800</td>
</tr>
<tr>
<td>Sweden</td>
<td>39.9</td>
<td>1564</td>
</tr>
<tr>
<td>Switzerland</td>
<td>36.7</td>
<td>..</td>
</tr>
<tr>
<td>Turkey</td>
<td>12.7</td>
<td>..</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>39.6</td>
<td>1673</td>
</tr>
<tr>
<td>United States</td>
<td>46.3</td>
<td>1792</td>
</tr>
</tbody>
</table>

Source: OECD, Productivity database.
4.4 Results for each country

In principle, this section ought to present a short monograph for each country for which data is available. The main issue addressed in this paper is how to measure the magnitude of the relocation abroad and the number of jobs involved. The other consequences of relocation abroad are undoubtedly more significant than the mere number of jobs at stake. In any case, it will not be possible to carry out such analyses until an evaluation of the magnitude of the relocation abroad phenomenon has been made.

Without losing sight of the ultimate objective, in this preliminary version of the paper, only two countries—the USA and France—will be addressed, while for a number of other countries, the results for outsourcing abroad will be shown in Appendix 1. The USA has been chosen because of the wealth of data available in different areas, notably the activity of multinational companies.

Most work carried out in the USA, as well as a considerable number of public debates about relocation abroad, has focused on services. However, policymakers continue to ponder the future of the manufacturing industry and the consequences of relocation abroad for this sector.

France has also been chosen because it is the only OECD country in which policymakers have sought to evaluate assumptions concerning the direct impact of relocation abroad on employment in the following methodological approach recommended for one year now by the Secretariat. The results thus obtained deserve our special attention.

The method of calculating the indices for outsourcing abroad which have been calculated for the goods and services of fifteen countries is shown in Box 8. Figures 19 and 20 show that in general smaller countries outsource their activities abroad more than larger countries. Moreover, the level of outsourcing is a lot higher for goods than for services.

Figure 19. Index of outsourcing abroad of goods and services

Source: OECD, Input-Output database.
4.4.1 The United States

Between 1994 and 2001, the United States created 17.2 million net jobs but primarily in services (+15.8 millions). Conversely, the manufacturing industry in the course of the same period lost 723,000 jobs (Figures 21 and 22). The manufacturing sectors that have been the most affected by the reduction in manning levels are mainly low-technology industries, notably clothing (−291,000), textiles (−198,000), paper (−64,000) and publishing (−58,000).

However, certain high-technology sectors have also lost jobs, notably aircraft manufacturing (−57,000), office machines and computers (−38,000) and scientific instruments (−20,000).

In services, the strongest net creation of jobs relate to services rendered to businesses (4.4 million), wholesale and retail trade (3.9 millions), and health (2.2 millions). Extrapolating from these results indicates first that not all manufacturing jobs have been destroyed due to relocation abroad. Conversely, the fact that in services there is practically no sector (at least at the level of data aggregation available) which has lost jobs does not mean that services have lost no jobs, simply that in those sectors which have recorded declines there has been a net creation of jobs.

Consequently, the key question is how to identify the sectors which have lost jobs as the result of relocation abroad as well as the magnitude of those losses.

It has been emphasized above that such an analysis can only be conducted in a rigorous manner if it is based on data relating to individual firms. Nonetheless, in this paper, which uses only non-confidential sectoral data, our aim is to identify the most conspicuous cases which provide evidence concerning the presumptive impact of relocation abroad.
Figure 21. Trends relating to the number of employees in the manufacturing sector between 1994 and 2001

Source: OECD, STAN database.

Figure 22. Trends in the numbers of employees in services between 1994 and 2001

Source: OECD, STAN database.
The establishment of foreign outsourcing indices for the manufacturing and service industries (Figures 23 and 25) marks a first step.

These indices reveal the importance of imports that serve as the intermediary consumption for the manufacturing and service industries. Given the importance of imports originating from offshored activities, it is evident that these indices take no account of imports of finished goods that are resold unprocessed on the local market.

The indices for outsourcing of goods abroad show that certain sectors of goods are among the most heavily outsourced, such as clothing, shoes, office machinery and computers, construction, civil aviation, scientific instruments while ferrous and nonferrous ore mining has also cut back their manning levels.

Conversely, other sectors, such as automobile manufacture or radio, TV and other communications devices which have a relatively high index of outsourcing have recorded net job creation during the period under consideration.

In the case of services, financial intermediation, wholesale trade, information activities and other services to businesses are the sectors that outsource abroad but none of these sectors has recorded net job losses.

Figures 23 and 25 show moreover that the services sectors that outsource most services outsource the fewest activities linked to goods (services rendered to businesses and financial intermediation). In the same way, the goods sectors that outsource most goods, outsource very few of their service activities.

Presumptions of relocation abroad in the manufacturing industry

Table 7 facilitates the task of identifying those sectors that are likely to be the target of relocation abroad. In accordance with the definitions shown in the first part of this paper (Boxes 1 and 2), the relocation abroad that affects a particular sector can be expected to lead to the following results as a minimum:

- A decline in production
- A decrease in employment
- A decline in exports
- A rise in imports

In the case of relocation abroad (narrowly or broadly defined), the increase in imports should correspond to the share of domestic demand which was met beforehand by the domestic production prior to relocation abroad.

Given the highly aggregated nature of the data available to the Secretariat, the trends that are mentioned above can only be corroborated for a small number of sectors.

Table 7 identifies certain sectors (textiles, clothing, footwear, leather, ferrous and non-ferrous metals, office, accounting and computing machinery, aircraft manufacture etc.) for which there is a presumption of relocation abroad. The last column in the table also identifies the main countries which are the source of imports related to these sectors.
Figure 23. USA – Index of outsourcing of goods abroad by the goods and service industries

Figure 24. USA – Growth of employment 1996-2000

Source: OECD, Input-Output database.

Source: OECD, STAN database.
Figure 25. USA – Index of outsourcing of services abroad by the goods and services industries

Source: OECD, Input-Output database.

Figure 26. USA – Growth of employment 1996-2000

Source: OECD, STAN database.
Table 7. Simultaneous decline in production, employment and exports and growth in imports, by sector, in the manufacturing sector

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>15.16</td>
<td>Food products, beverages and tobacco</td>
<td>90</td>
<td>103</td>
<td>70</td>
<td>X</td>
<td>China, Mexico</td>
</tr>
<tr>
<td>17.19</td>
<td>Textiles, textile products, leather and footwear</td>
<td>73</td>
<td>64</td>
<td>77</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>20</td>
<td>Wood and products of wood and cork</td>
<td>66</td>
<td>50</td>
<td>120</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>21.22</td>
<td>Pulp, paper, paper products, printing and publishing</td>
<td>61</td>
<td>47</td>
<td>183</td>
<td>X</td>
<td>Mexico, China</td>
</tr>
<tr>
<td>23</td>
<td>Coke, refined petroleum products and nuclear fuel</td>
<td>140</td>
<td>161</td>
<td>121</td>
<td>X</td>
<td>Russia, Argentina, Brazil</td>
</tr>
<tr>
<td>24</td>
<td>Chemicals and chemical products</td>
<td>175</td>
<td>170</td>
<td>205</td>
<td>X</td>
<td>Ireland, China</td>
</tr>
<tr>
<td>24C3</td>
<td>Pharmaceuticals</td>
<td>459</td>
<td>448</td>
<td>586</td>
<td>X</td>
<td>Singapur, Ireland, France</td>
</tr>
<tr>
<td>25</td>
<td>Rubber and plastics products</td>
<td>103</td>
<td>89</td>
<td>131</td>
<td>X</td>
<td>China, Mexico</td>
</tr>
<tr>
<td>26</td>
<td>Other non-metallic mineral products</td>
<td>96</td>
<td>64</td>
<td>191</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>27</td>
<td>Basic metals</td>
<td>16</td>
<td>3</td>
<td>49</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>271</td>
<td>Iron and steel</td>
<td>-10</td>
<td>-20</td>
<td>22</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>272</td>
<td>Non-ferrous metals</td>
<td>43</td>
<td>31</td>
<td>70</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>28</td>
<td>Fabricated metal products, except machinery and equipment</td>
<td>107</td>
<td>83</td>
<td>152</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>29</td>
<td>Machinery and equipment, n.e.c.</td>
<td>66</td>
<td>50</td>
<td>170</td>
<td>X</td>
<td>Mexico, China</td>
</tr>
<tr>
<td>30</td>
<td>Office, accounting and computing machinery</td>
<td>55</td>
<td>-8</td>
<td>141</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>31</td>
<td>Electrical machinery and apparatus, nec</td>
<td>87</td>
<td>70</td>
<td>133</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>32</td>
<td>Radio, television and communication equipment</td>
<td>59</td>
<td>35</td>
<td>95</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>33</td>
<td>Medical, precision and optical instruments, watches and clocks</td>
<td>125</td>
<td>121</td>
<td>140</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>34</td>
<td>Motor vehicles, trailers and semi-trailers</td>
<td>76</td>
<td>74</td>
<td>236</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>35</td>
<td>Other transport equipment</td>
<td>102</td>
<td>85</td>
<td>260</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>35C</td>
<td>Aircraft and spacecraft</td>
<td>103</td>
<td>88</td>
<td>414</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>36.37</td>
<td>Manufacturing nec</td>
<td>122</td>
<td>69</td>
<td>159</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

1) Textile and clothing only.
217. The second and third columns specify whether most of the growth in imports comes from the OECD zone or from countries that do not belong to the OECD. The presumption of relocation abroad of sectors as indicated in Table 7 may be confirmed by Figure 23 which presents the index of outsourcing of goods abroad.

218. In theory a significant share of the imports attributable to relocation abroad involve intra-firm imports. Nonetheless, if one examines the trends in intra-firm imports (Figure 27), the results do not bear out this assertion for a number of reasons.

219. First, the available published data do not make it possible to cross-check the sectors and the countries of origin. When one identifies, for example, that for certain categories of goods there has been relocated to China, then intra-firm imports from U.S. parent companies originating from their subsidiaries in China apply to the totality of goods and are not broken down by sector.

Source: OECD, AFA and STAN databases, and International Trade by Commodity Statistics.
220. Another key reason is that for a sector the intra-firm imports do not necessarily reflect the nature of goods imported but rather reflect the main activity of the firms that make up the sector. Thus, the textile imports originating from U.S. subsidiaries abroad will not necessarily be made by firms in the same group whose main activity is textiles but rather by businesses whose main activities are wholesaling and distribution.

221. Figure 28 presents intra-firm imports of the American parent companies originating from their foreign subsidiaries. These are total imports as sector-by-sector data are confidential. The countries in question are the emerging countries, which are identified in Table 7 as delocalization countries. We observe the strong growth in intra-firm imports originating from Mexico (from 9 million dollars to 40 million dollars between 1990 and 2002) and the rise of imports originating from China, especially beginning from 1998, at a time when imports from Malaysia, Brazil and the Philippines were going down. However, if one compares these findings with the results in Table 8 we note that the intra-firm imports originating from American subsidiaries in Mexico are at present significantly more substantial than those originating from China. Consequently, this means that the manufacturing activities are more relocated in Mexico than in China.

Figure 28. Imports of goods by U.S. parent companies originating from their foreign subsidiaries

Source: OECD, AFA database.
Figure 29. **Import penetration rate**

Textile, clothing, leather

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ferrous metals

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: OECD, Bilateral Trade database.

**Table 8. United States: Trade balance, 2003**

<table>
<thead>
<tr>
<th></th>
<th>Imports</th>
<th>Exports</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Textile, clothing, leather</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>30703</td>
<td>773</td>
<td>-29930</td>
</tr>
<tr>
<td>Mexico</td>
<td>9146</td>
<td>5175</td>
<td>-3971</td>
</tr>
<tr>
<td>India</td>
<td>4194</td>
<td>34</td>
<td>-4160</td>
</tr>
<tr>
<td><strong>Ferrous metals</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>1385</td>
<td>1262</td>
<td>-123</td>
</tr>
<tr>
<td>China</td>
<td>534</td>
<td>452</td>
<td>-82</td>
</tr>
<tr>
<td><strong>Office machinery, computers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>24328</td>
<td>1274</td>
<td>-23054</td>
</tr>
<tr>
<td>Philippines</td>
<td>1910</td>
<td>141</td>
<td>-1769</td>
</tr>
<tr>
<td>Mexico</td>
<td>7543</td>
<td>6699</td>
<td>-844</td>
</tr>
<tr>
<td>Malaysia</td>
<td>10194</td>
<td>650</td>
<td>-9544</td>
</tr>
<tr>
<td><strong>Electrical machinery</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>10239</td>
<td>867</td>
<td>-9372</td>
</tr>
<tr>
<td>Mexico</td>
<td>16116</td>
<td>8489</td>
<td>-7627</td>
</tr>
</tbody>
</table>
222. The decline in jobs identified in Table 7 cannot be attributed solely to relocation abroad, and the same applies in sectors where there is strong prima facie evidence of relocation abroad.

223. In order to measure job losses linked to relocation abroad in the manufacturing industry, it will be necessary to evaluate the rise in imports with regard to those sectors for which there is a presumption of relocation abroad, as well as the changes in exports over the same period.

224. The next step is to calculate the jobs which are incorporated into net imports (imports-exports) using this equation:

\[
\text{US jobs embodied} = \left( \frac{\text{Change in US output necessary to replace}}{\text{US net imports}} \right) \times \left( \frac{\text{Employment US}}{\text{Output US}} \right)
\]

225. To calculate the first term, one must again use the input-output tables. It is as well to point out the limitations of these trends as discussed in the preceding chapter. For total trade, these calculations show (Figure 30) that approximately 2.6 million jobs were necessary in order to produce the equivalent of net American imports in 2003. Among these jobs, 2.5 million would be necessary to produce the equivalent of net imports of durable goods, and 1.3 million for non-durable goods. Conversely, given that services generate surpluses, the USA is exporting an output equivalent to 1.2 million jobs (these figures appear in Figure 30 as minuses).

Figure 30. **US jobs embodied in net imports**

![Figure 30](image-url)

Presumptions of relocation abroad in services

226. Figure 22 shows that between 1994 and 2001, all the services sectors were net job creators. Unfortunately, the employment data comes from industrial surveys and are classified according to ISIC Classification Rev. 3 while the data on trade are collected in the context of balances of payments and their disaggregation is not compatible with the breakdown for employment.

227. Moreover, Figures 25 and 26 show that there is no link between a strong outsourcing of services abroad and a decline in jobs.

228. However, the fact that in the USA all services sectors (at least at the level of data aggregation available) are net job creators, does not mean to say that there is no destruction of jobs or no relocation abroad.

Figure 31. Imports of services from the United States

![Graph showing imports of services from the United States from 1990 to 2004.](image)


229. Figure 31 shows that imports intended for businesses (finance, computing, communications, insurance etc.) some of which have a high foreign outsourcing rate, such as financial intermediation, account for relatively modest sums. At the same time, all the sectors except insurance generate trade surpluses (Figure 32) and are net job creators.
The computation of jobs, incorporated in the total of American imports in the sector of services to businesses is not expected to yield very high figures. To the extent that one party to these imports is directly or indirectly linked to relocation abroad, this means that the impact on employment of the relocation abroad of the services is expected to be fairly moderate.

As opposed to the situation with the manufacturing industry, the largest share of the relocation abroad of services has occurred with developed countries.

The emerging countries with their low manpower costs account for a more modest share of global import services (Figure 33). In addition, the Trade balance of commercial services themselves vis-à-vis developed countries is always positive, suggesting that relocation abroad of services could contribute more than manufacturing industry to the creation of jobs. This assumption undoubtedly deserves to be empirically verified and, to this end, more in-depth research is needed.
Figure 33. Imports and trade balance for other commercial services of the United States for each partner country in 2002


4.4.2 France

233. France is one of the rare countries in which policymakers (INSEE) have carried out research to measure the direct effect of relocation abroad on employment. The main results of these estimates based on individual company data will be summarized in due course. As for other countries, Figures 35 and 36 show rates of goods outsourced abroad for the goods and services industries and the outsourcing of services abroad. The growth in employment between 1995 and 2000 is associated with these indices. Figure 34 also presents the sectors which have lost the most jobs over the same period.

234. These results show that the sectors which most outsource their services abroad are not the sectors that have lost jobs. Besides, the sectors that have most reduced manning levels are not those which are the most relocated abroad. In fact, relocation abroad is not the sole cause of job losses, nor the sole consequence of international competition. Only the textile, clothing and footwear sectors are those that turn out to be among those which are simultaneously the most relocated abroad and that have recorded the heaviest job losses.

235. INSEE’s estimates (Auber-Sillard, 2005) concerning relocated abroad jobs have been made using the same method recommended by the OECD Secretariat. The virtue of the results which, in the absence of direct measurements, constitute presumptions of relocation abroad is that they have been calculated based on data relating to individual firms.
Figure 34. France – Index of outsourcing of goods abroad by the goods and services industries

Figure 35. France – Growth of employment 1995-2000

Source: OECD, Input-Output database.

Source: OECD, STAN database.
Source: OECD, Input-Output database.

Source: OECD, STAN database.
236. According to this study, approximately 95,000 manufacturing jobs were sacrificed in France between 1995 and 2001 as the result of relocation abroad, corresponding to 2.4% of the total manning levels of the manufacturing industry.

237. Relocation abroad in France may thus have come about as much because of downsizing as through the outright closure of businesses.

238. Among relocated abroad jobs, a little less than half are destined for countries with so-called “low wages” while the developed countries account for 53% of jobs. Relocation abroad toward the developed countries largely corresponds to restructurings and the refocusing of business groups in the heart of developed countries rather than an effort to cut production costs. Relocation abroad is most often made in capital-intensive sectors such as the civil aviation, automobile and pharmaceutical sectors.

239. Among emerging countries, China is the top destination of relocation with a third of relocated abroad jobs during the period 1995-2001. The three large groups, employing more than 5,000 employees in France, account for more than half of the relocated abroad jobs. This proportion is slightly lower among the relocation abroad in countries with low wages (47%).

240. Over the same period, ten large groups between them accounted for almost a quarter of labour shedding. Excluding these ten groups, the relocation abroad would account for 10,500 jobs a year on average.

241. The foreign groups would relocated abroad a bit more than the French groups, especially when the relocation abroad is made toward a developed country. However, regarding relocation abroad toward countries with low wages, there is minimal difference between French and foreign groups. The European groups that are not French would offshore least toward these countries.

242. Relocation abroad toward developed countries is most often achieved by subsidiaries of companies. Conversely, when low-wage countries are involved, subcontracting is the method most heavily favored.

243. Relocation abroad toward low-wage countries is more frequent in low technology sectors that tend to employ manpower that is not very skilled (clothing, leather, textiles etc). However, it is also found in high-tech sectors (e.g. electronics), but such relocation abroad accounts for activities with low value added, whereas those operations involving substantial value added stay in France.

244. The individualized data on businesses which has been used reveals that practically all sectors have been affected by relocating abroad, notably toward developed countries. The relocation abroad has occurred in the context of the restructurings of groups. Table 9 presents the sectors which are affected by relocating abroad and also identifies the main destinations of relocation.

245. The main limitation of this paper is that it does not take into account the role of exports in relocation abroad due to the fact that that there is no flow of imports which corresponds to these exports. Other constraints that also apply to this paper have been outlined in section 3.2 of this report.
<table>
<thead>
<tr>
<th>Sector</th>
<th>Industrial employment</th>
<th>Jobs losses, annual average 1995-2001</th>
<th>Main destinations of offshoring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In 1994</td>
<td>Average annual change in %</td>
<td>Toward developed countries</td>
</tr>
<tr>
<td>Clothing, leather</td>
<td>197</td>
<td>-5.8</td>
<td>0.1</td>
</tr>
<tr>
<td>Textile</td>
<td>140</td>
<td>-3.2</td>
<td>0.1</td>
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<tr>
<td>Electrical and electronic equipment</td>
<td>265</td>
<td>-1.0</td>
<td>0.3</td>
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<td>Pharmaceuticals, perfumes and cleaning</td>
<td>151</td>
<td>-0.9</td>
<td>0.6</td>
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<td>Mineral products</td>
<td>186</td>
<td>-0.9</td>
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<td>Printing, publishing, reproduction</td>
<td>222</td>
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<td>0.1</td>
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<td>-0.4</td>
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<td>Shipbuilding, aerospace, railroad equipment</td>
<td>134</td>
<td>-0.3</td>
<td>0.4</td>
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<td>Motor vehicles</td>
<td>286</td>
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<td>0.2</td>
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<tr>
<td>Mechanical equipment</td>
<td>422</td>
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<td>0.1</td>
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<tr>
<td>Basic and fabricated metal products</td>
<td>432</td>
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<td>Chemicals, rubber and plastics</td>
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<td>Food and beverages</td>
<td>569</td>
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<td>0.2</td>
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<tr>
<td>Electrical and electronic components</td>
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<td>0.4</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3934</td>
<td>-0.1</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Source: INSEE, Auber-Sillard, 2005.
CONCLUSIONS

246. The foregoing analysis has demonstrated the complexity of the phenomenon of relocation abroad while illustrating the difficulties involved in measuring its impact on employment. The main difficulty relates to the absence of research and direct measurements. This paper has proposed methods for quantifying the presumptive impact of relocation abroad indirectly.

247. The proposed measures come up against two other more serious difficulties. Firstly, the non-availability for many countries of certain categories of data (e.g. intra-firm trade), whether because this data is not collected by national authorities or because they are confidential for statistical reasons (e.g. growth of activity sectors by country of destination of relocation).

248. The second difficulty concerns the high degree of aggregation of available data due to classifications currently in force and the impossibility of identifying trends, for example, in production, employment or trade as these are counteracted by trends in the opposite direction. Under these circumstances only, access to individual data of groups and establishments could facilitate effective implementation of the proposed measures. It would consequently be desirable that in each OECD country those who have the power to authorize access to individual data of firms should apply the recommended methods and communicate the results obtained immediately to the Secretariat. However, in addition to the data problems mentioned, there are also other methodological difficulties involved in quantifying inter alia the indirect effects of relocation abroad on short and medium-term employment.

249. With regard to the benefits of relocation abroad for the economic activity of the countries concerned, the task of quantification is immense. The evaluation of each target category mentioned in this document will require an appropriate methodology.

250. As far as political considerations are concerned, there is still important work to do so as to complement the measures that directly or indirectly affect relocation abroad decisions and policies concerned with workers affected by this relocation, notably their skills and their employability.
BIBLIOGRAPHY


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Görzig, B. and Andreas Stephan (2002), “Outsourcing and Firm-level Performance”, *DIW Berlin Discussion Paper* 309, German Institute for Economic Research (DIW Berlin), Germany. This version: 15 October 2002 (bgorziz@diw.de) (astephan@diw.de)


ANNEX 1

INDEX OF OUTSOURCING ABROAD AND GROWTH OF EMPLOYMENT

1. Japan
2. Germany
3. United Kingdom
4. Italy
5. Netherlands
6. Spain
7. Sweden
8. Belgium
9. Austria
10. Finland
11. Denmark
Germany - Index of outsourcing of goods abroad by the goods and services industries

1995 2000

Source: OECD, Input-Output database

Germany - Growth of employment 1995-2000

Source: OECD, STAN database.
Germany - Index of outsourcing of services abroad by the goods and services industries

Germany - Growth of employment 1995-2000

Source: OECD, Input-Output database

Source: OECD, STAN database.
United Kingdom - Index of outsourcing of goods abroad by the goods and services industries

1995
2000

Office machinery and computers
Radio, TV, communication equip.
Shipbuilding
Scientific instruments
Electrical machinery, nec
Motor vehicles
Machinery and equipment nec
Iron and steel
Chemicals excl. pharmaceuticals
Fabricated metal products
Manufacturing nec
Rubber and plastics
Wood
Textiles, clothing and footwear
Public administration and defence
Post and telecommunications
Non-metallic mineral products
Construction
Agriculture, forestry and fishing
Coke, refined petroleum
Electricity, gas and water supply
Paper, printing and publishing
Food, beverages and tobacco
Health and social work
Mining and quarrying
Hotels and restaurants
Transport and storage
Wholesale and retail trade
Education
Community, soc., personal serv.
Real estate activities
Finance, insurance

United Kingdom - Growth of employment 1995-2000

Office machinery and computers
Radio, TV, communication equip.
Shipbuilding
Scientific instruments
Electrical machinery, nec
Motor vehicles
Machinery and equipment nec
Iron and steel
Chemicals excl. pharmaceuticals
Fabricated metal products
Manufacturing nec
Rubber and plastics
Wood
Textiles, clothing and footwear
Public administration and defence
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Coke, refined petroleum
Electricity, gas and water supply
Paper, printing and publishing
Food, beverages and tobacco
Health and social work
Mining and quarrying
Hotels and restaurants
Transport and storage
Wholesale and retail trade
Education
Community, soc., personal serv.
Real estate activities
Finance, insurance

Source: OECD, Input-Output database

Source: OECD, STAN database.
Italy - Index of outsourcing of services abroad by the goods and services industries

Source: OECD, Input-Output database

Italy - Growth of employment 1995-2000

Source: OECD, STAN database.
Netherlands - Index of outsourcing of goods abroad by the goods and services industries

Source: OECD, Input-Output database

Netherlands - Growth of employment 1995-2000

Source: OECD, STAN database.
### Netherlands - Index of outsourcing of services abroad by the goods and services industries

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<td>Other business activities</td>
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</table>

**Source:** OECD, Input-Output database

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<td>Rubber and plastics</td>
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</table>

**Source:** OECD, STAN database.

89
Spain - Index of outsourcing of services abroad by the goods and services industries

Spain - Growth of employment 1995-2000

Source: OECD, Input-Output database

Source: OECD, STAN database.
Sweden - Index of outsourcing of goods abroad by the goods and services industries

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