Offshoring: Facts and numbers at the country level

Agnese, Pablo and Joan Enric, Ricart

IESE Business School, Autonomous University of Barcelona

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Pablo Agnese†
IESE Business School and
Autonomous University of Barcelona

Joan Enric Ricart‡
IESE Business School

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Abstract

Offshoring has lately received wide attention. Its potential effects, mainly to be materialized in employment and productivity dislocations, are yet to be fully assessed. However, some consensus has been attained as to how to proxy its theoretical definition at an aggregate level. Here we review the most conventional indices the economic literature has so far produced, and employ them to provide an overview of the extent of the phenomenon for a group of countries. Contrary to common beliefs, our data reveal that offshoring is not exclusive of large developed economies. Further, we highlight the continuing prominence of the manufacturing over the services sector, and observe that while services offshoring is on the rise, it still represents a small fraction of total offshoring.

Keywords: offshoring, intermediate trade, aggregate data

JEL Classification: F14, F40

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†IESE Business School, Center for Globalization and Strategy, Pearson Av. 21, 08034, Spain; tel: +34 93 2534200 (4544); email: pagnese@iese.edu.

‡IESE Business School, Center for Globalization and Strategy, Pearson Av. 21, 08034, Spain; tel: +34 93 2534200 (4373); email: JERicart@iese.edu.

1 Introduction: Definitions and controversies

Recent times have been witness to a seemingly new and innovative way of doing business: offshoring. Usually offshoring presents itself with some degree of outsourcing, so it is not difficult to find real-life combinations of both business practices. Undeniably, all the media noise that exists is constantly trying to set new trends around the subject and reshape the way of doing business in general. Occasionally, it is even changing the way policy-makers address the issue in fear of political backlash. News about millions of jobs moving abroad can indistinctively cause alarms to go off clamorously in the political arena, or the animal spirits to start shaking the economy unnecessarily in the private sector. We have thus more than a serious reason to believe that numbers and estimates are to be looked on with special care. Indeed, with offshoring the observer can change the object he or she observes.[1]

Consequently, it is most important to measure offshoring properly, especially for what it might represent for labor markets around the world. We are then interested in producing several measures using different known indices at the country level for a significant group of countries, and for a recent period (1995-2005).

Yet new in its coinage, the truth is offshoring and its close cousin outsourcing have for long been among us. In fact, they can be traced back to an idea widely used in economics: comparative advantages. If we define offshoring merely as job relocation outside the national boundaries in search of lower wages, we can see how this comes eventually to exploiting comparative advantages through cheaper labor force and cost savings. More precisely, offshoring refers to the geographic location where the service or production takes place, whereas outsourcing responds to the ownership of the means of production (in-house or third-party). In this way we come to be familiar with such terms as "offshore outsourcing" (or international outsourcing) and "in-house offshoring". These can also be referred to as offshoring in the broad and narrow sense, respectively.

As policy-makers, if we were left to decide whether our national production should be carried out abroad while local workers move to the pool of unemployed, we might as well think twice. However, if we were to foresee increases in domestic productivity due to offshoring-related activities, we might face a more hopeful scenario instead. Indeed, productivity gains for those companies engaged in any form of offshoring could translate into price discounts and a boost in their product demands, thus affecting employment positively. But how long would it take for the companies to seize the benefits, if any? And more, would an early setback predispose people in general to see offshoring as a real threat?

Noticeably, the productivity and employment effects of offshoring have so far occupied most of the economics literature. On both these effects empirical works have successively

[1] Interestingly, Von Mises and the Austrian scholars would say the economic discipline is in general subject to this fallacy. Humans are too complex and far self-conscious not to have their behavior changed to some degree by the very act of observation.

failed in providing with definite and unambiguous answers. Even though the subject in general remains unsettled, some consensus has at least been reached when it comes to measuring offshoring to a certain level of aggregation. This is no easy task as we will show later.

We therefore address different questions that have been somehow covered by the literature. We first wonder about the relation between offshoring and country size. Are larger countries the bigger offshorers? Do they show a significant tendency towards this practice, globally? News reports put the stress on large developed economies like the US, and the huge amount of workers soon to become unemployed. But are these numbers really important for such countries? Apparently not, and more, relatively small countries find themselves among the bigger offshorers worldwide.[2] Further, what is the importance of offshoring depending on the economic sector? Are manufacturing industries more prone to go offshore than their services counterparts? This is very much related to the next question: what are the intensities of both materials and services offshoring? Has the first wave of production (materials) offshoring abated, just to make room for a second wave of services offshoring? The numbers do not seem to say so, at least for the moment. Even though growth rates in services offshoring are much larger than those of materials during the period 1995-2005, their levels are still far below of what one would judge as significant.

Here we set ourselves to the endeavor of bringing out to light a review about the most utilized indices in the literature, and their application to aggregate (country) data. The outline of the paper goes as follows: section 2 deals with the problems of measurement and describes a series of widely used indices; section 3 displays the statistical data on offshoring worldwide, making use of the indices and stressing the difference between industries (manufacturing or services) and between forms of offshoring (materials or services); section 4 concludes.

2 Measurement

How then to define offshoring when it comes to empirics? In other words, how to proxy its theoretical definition quantitatively? Roughly speaking, offshoring can be measured either directly or indirectly. Nevertheless, the lack of reliable official records should make us consider indirect measures to a greater extent. Similarly, given the research objective and the data constraints we might want to look at country, industry, firm, plant, or even individual worker level data.[3]

[2] Amiti and Wei (2005) develop a similar comparative study, covering a large group of countries but using trade data from the balance of payments instead of the offshoring indices discussed below. We use the OECD I-O database to extract these indices at the country level.

[3] It is to remark that when analyzing employment, for instance, we should expect a somehow washed out effect as we consider higher levels of aggregation. Conversely, the more in detail we look the more that offshoring would be significantly related to employment, at least in the short run.

2.1 A word about data quality

In this modern age of ultrafast communications words often lose their meanings and numbers can go wrongly interpreted. A pernicious yet natural side effect of globalization, it compels us to seek further into the available data and get a clearer picture of the phenomenon. Raw data are sometimes not easily accessible, and the little we may get usually hides certain relevant facts. Before going over the different kinds of measures that could better proxy offshoring through indirect indicators, we should mention the sources and their reliability.

Kirkegaard (2007) breaks down the sources into three empirical hierarchies. The lowest tier encompasses all the estimations and projections by consulting companies. These reports (Forrester, 2004, and McKinsey, 2003, for instance) seek to set up new trends thanks to their continuous feedback with the private sector, yet turn out wanting in their methodology and of limited scope most of times. Selection bias in the interviews conducted, and thus lack of representation of the small samples produced, are commonplace in these studies. A notable example is that by Forrester Research (2004), which forecasts the grandiloquent figure of 3.3 millions of US jobs to move abroad by the year 2015. But this is peanuts if compared with the 160 millions of jobs projected by the Bureau of Labor Statistics for the same year, and the 35 million already created during the last decade in the US labor market.

Second-class data belong to the estimates elaborated by the press, mostly resorting to public and verifiable sources. Once all is settled and ready to go companies normally announce it publicly as part of their marketing campaign. However, in later times and because of a higher negative reception that makes offshoring a synonymous of job loss, companies feel more reluctant to publicize job shifts to foreign countries. Related to this, politicians' attention also dims in close connection to the electoral cycle. Mankiw and Swagel (2006) unearth a clear pattern of the ups and downs of offshoring and outsourcing in the four major US newspapers (Fig. 1, p. 1030). Seemingly, interest awoke sharply before the 2004 election, just to go back to previous levels right afterwards. All in all, yet not perfect, press releases make up a more objective group in this data hierarchy. The report presented by the European Foundation for the Improvement of Living and Working Conditions (2004) is a good example.

Finally, the series of indirect measures we discuss below place at the top of this ranking. As shown there, official country records and international organizations of renown like the IMF or the OECD, all supply the raw data needed to develop a reliable indirect measure of offshoring. Although the academic research so far lags behind that presented by the other two sources, recent times have shown to be fairly productive and with many research possibilities.

2.2 Aggregate indirect indicators

Before jumping into the indirect indicators, a comment on measuring offshoring directly need be made. Gauging offshoring directly proves to be a hard task to take on, if not impossible. Just to imagine what it would take to come up with a direct *and* comparable index for all industries (not to mention all firms) conveys the feeling of an enterprise which is hopeless from the outset. The scarce official data and the ambiguous understanding of the subject pose the principal obstacles. The OECD exhaustive report (2007) lists most of the known measures, direct and indirect, yet as we will see the latter turn out more suitable (or feasible) for research purposes.

Proposed direct indicators of offshoring, either in its broad or narrow definition (and equally valid for production of goods and services), deal chiefly with data on production, number of employees, FDI, exports, and imports. The point is to make out the changes in any of these variables due to relocation of workers. We should keep in mind that creating new foreign jobs alone without reducing the domestic activity does not represent offshoring or outsourcing. Likewise, a job lost because of domestic outsourcing is necessarily gained in another sector of the domestic economy and, therefore, not part of the definition. This same report goes over a vast catalog of drawbacks in using direct measures to assess the impact on the labor markets. Apart from the fact that some data might overlook drops in the number of jobs accountable to offshoring, other important limitations do exist. According to the OECD, some of these might be: changes in the classification of firms, problems of confidentiality, subcontractors gone abroad with their clients, and successive small-scale relocations.

Now we move on to examine the main indirect indicators proposed in the literature. An important decision the researcher so often faces is that of choosing the aggregation of the study. This is a bit arbitrary since the more in detail we go the more we would expect, for example, to find a negative relation between employment and offshoring in the short run.[4] Further, more aggregate figures could hide certain industries or companies which show a higher inclination to offshore. These are commonly referred to as aggregation and sector bias, respectively. On the other hand, when looking at firm or establishment data it is important not to lose sight of the ownership status. We can see how, especially at this level, offshoring measures abound and are not that homogeneous.

Perhaps more than in other empirical ventures, data availability here poses a serious drawback. Especially if the goal is an international comparison of the reach of offshoring, then the homogeneity of the data remains of most importance. Therefore, we next consider the industry level measures, which can be easily aggregated to the national level. These

[4] This need not be so all times. Several factors can influence the final effect on employment as to make it positive (type of offshoring, sector to which the firm belongs, etc.). Notwithstanding its importance, this particular issue escapes the scope of the present work.

industry measures have been conceived in the first place, and somehow have set a trend in the recent literature.

A benchmark contribution is Feenstra and Hanson (1996a, 1996b, 1997, and 1999). There, offshoring is defined as the share of imported intermediate inputs in the total purchase of nonenergy inputs. They combine US import data from the four-digit SIC (Standard Industrial Classification) with data on material purchases from the *Census of Manufactures*. The census data crisscross the trade between industries of the same level and provides the base for estimating the share of intermediate inputs in every industry. For a given industry, multiplying its input purchases from each supplier industry times the ratio of imports to total consumption in the supplier industry, and then adding over, turns out in their offshoring measure. More formally, it can be written as follows:

$$OI_{it} = \sum_{j}^{n} \left(\frac{I_{jt}}{Q_t}\right)^{i} \left(\frac{M_{jt}}{D_{jt}}\right) \tag{1}$$

where I_j is purchases of (material) inputs j by industry i, Q is total inputs (excluding energy) used by i, M_j is total imports of goods j, and D_j their domestic demands. Here, domestic demand (or the consumption of goods and services j) can be measured as shipments + imports - exports, removing the trouble of developing a deflator for the value added. This formula provides an index of the offshoring intensity at the industry level. It proxies the import content of intermediate trade of industries which, in turn, proxies their offshoring intensity. Specifically, the first term in (1) stems from the census data (or input-output tables), while the second term, which is an economy-wide import share, is obtained from the trade data.

Conveniently, this expression serves as a measure for both the traditional offshoring of materials and the more fashionable offshoring of services, yet former works have confined their analysis to materials alone. Besides, it is useful to split offshoring into its narrow and broad measures. The narrow measure restricts to imported intermediate inputs from the same two-digit industry whereas the broad measure includes all other industries as well. Also the difference between the broad and narrow measures, which represents all imported intermediate inputs from outside the two-digit purchasing industry, appears as an alternative when it comes to capturing the true nature of offshoring.

Importing trade stands for an important amount of intra and interfirm trade nowadays. It is then a fair proxy of offshoring while data are relatively easy to find. However, a common drawback to all measures relying on imports and import shares is that offshoring does not necessarily imply an increase of imports, or vice versa. In effect, if a local exporting firm decides to move part of its production abroad and continues exporting it from a foreign country this would not translate into a drop in imports to the parent firm. Rather, it would represent a fall of its exports. Also, a rise in a country's imports due to more favorable

terms of trade should not be linked to an expansion of offshoring from local firms. Hence, it is the composition of trade and the share of intermediate inputs in particular, what matters in the end for such economic aggregates as wages and employment. Convincingly, "trade in intermediate inputs can have an impact on wages and employment that is much greater than for trade in final consumer goods" (Feenstra and Hanson, 2001, p.1). Remarkably, many of the latest Heckscher-Ohlin-type trade models with a positive welfare effect of offshoring (yet ambiguous effects on factor prices) take Feenstra and Hanson's analysis as a starting point.[5,6]

Campa and Goldberg (1997) put yet another spin to the story. They define an index of "vertical specialization" for several countries, underpinning the share of imported inputs embodied in production, but now remarking the increasing verticality in international trade. Through this they try to assess the extent to which multiple stages are traded for different products, using input-output tables that include sector-level data.

$$VS_{it}^{1} = \sum_{j}^{n} \frac{m_{jt}^{*} \left(p_{jt}\, q_{jt}\right)^{i}}{Y_{t}^{i}} \tag{2a}$$

with m_j^* being equal to the share of imports in consumption of industry j, $p_j\, q_j$ the value of inputs from industry j used in the production of industry i, and Y the value of total production of industry i.

Hummels *et al.* (2001) further develop the measure of vertical specialization just to account for the imported input content of exports at a country level, using the OECD input-output database for a sample of several countries. A clear interpretation of the concept of vertical specialization is provided in figure 1, p. 26, of their paper. Moreover, they employ for the first time the imported intermediates to be found in input-output tables, thus avoiding the estimation of the imports content of inputs (as in Feenstra and Hanson). This is what we do in our analysis below.

These authors conceive their definition as imported inputs used only to elaborate products to be exported afterwards, which is tantamount to say "the foreign value-added embodied in exports". A modified formula for the industry level would be then:

$$VS_{it}^{2} = \sum_{j}^{n} \left(\frac{m_{jt}}{Y_{t}}\right)^{i} X_{jt} \tag{2b}$$

where m_j represents imported inputs j by industry i, Y is the gross output of industry i, and X_j are total exports of goods and services j. So if industry i uses no imported inputs or if it does not export its output, $VS_i^2 = 0$. Moreover, since the composition of trade is what

[5]For an analysis of Heckscher-Ohlin models see Arndt (1997), Deardorff (1998, 2001), Egger (2002), Jones (2000), Jones and Kierkowski (1990, 2001), and Kohler (2004).

[6]In particular, Feenstra and Hanson claim that wage differentials might come after a "factor-biased technological change" has taken place. Other views hold sector-bias as the driving force behind the wage differentials (see here Arndt, 1997, 1998, 1999).

matters, in the aggregate the expression is normalized by total exports. As customary in the formulation of these measures, the authors make use of input-output tables distinguishing foreign and domestic sources, value-added, gross output, and exports. An extended version of VS^2 would also include imported inputs used indirectly in the production of goods and services, as in VS^1.

Another group of indices brings out the participation of imported inputs in total production. An example is the narrow measure by Egger and Egger (2003), which includes only intermediate goods imported from abroad and produced by the same industry classification back in the home country. They construct a measure of offshoring or "foreign outsourcing" from Austria to Eastern Europe, employing Austrian input-output matrices:

$$OI_{it} = \underbrace{(Z_t^i)}_{A} \underbrace{\left(\frac{M_t^{world}}{Y_t}\right)^i}_{B} \underbrace{\left(\frac{M_t^{EE}}{M_t^{world}}\right)^i}_{C} \tag{3}$$

where A is the total volume of national and international outsourcing of industry i, and both B and C appear as weighting terms for A. More precisely, A is the intraindustry trade in intermediate goods and services either from domestic or foreign suppliers. Meanwhile, B represents the imports openness of industry i while C stands for the share of imports from Easter European countries in overall imports. The "cross-border outsourcing" variable (OI_{it}) is then expressed as a ratio to the gross production of industry i, and not to total inputs purchased by industry as in Feenstra and Hanson.

To summarize, a clear-cut classification of offshoring indices into three categories could be the following: those considering the share of imported inputs in total inputs, those highlighting vertical specialization, and those considering the share of imported inputs in gross output. All these measures are usually estimated at certain level of aggregation (country or industry),[7] yet the literature has recently taken a widespread plunge into disaggregate data that takes the analysis away from input-output tables. Of course, it is to expect that future research around these measures will be more dehomogenized, as a result of an increasing share of studies being conducted at a rather disaggregate level.

Examples of these three indices are, respectively, equations (1), (2), and (3) above. Broadly speaking, all existing measures at the industry level would fall to some extent into one of the three groups mentioned. Horgos (2008) considers two additional measures that we do not reproduce here: indices considering imported inputs in total imports, and those considering the value added in production. He shows how, for Germany, these two perform rather poorly in a comparative study that takes all five types of indices. We undertake a similar decomposition analysis below to gauge the suitability of the proposed indices for our

[7] In order to aggregate to the country from the industry level, it is necessary to weight by industry output and then add over all the industries' (weighted) indices. This task we undertake below, in the next section.

country data.

In their simplest expressions, and upon availability of intermediate inputs data, equations (1) and (3) can easily be reduced to:

$$(a)\ OI_{it}^{Q} = \sum_{j}^{n} \left(\frac{m_{jt}}{Q_t} \right)^{i} \qquad and \qquad (b)\ OI_{it}^{Y} = \sum_{j}^{n} \left(\frac{m_{jt}}{Y_t} \right)^{i} \tag{4}$$

where OI_{it}^{Q} and OI_{it}^{Y} are the offshoring intensity indices expressed as ratios in terms of total purchases of intermediate nonenergy inputs and total production. In particular, when $i = j$ they become the narrow measures, and the numerator in (4) is simply the diagonal element of the import-use matrix.

Most of times it is not possible to use such simple expressions as in (4) in an extensive time period. Input-output tables are periodically published around every five years and remain one of the few direct sources for m (imported intermediate inputs) so far. That is why the numerator in (4) is usually estimated through trade data, as in (1) and (3). Despite this empirical shortcoming, we rely exclusively on variations of formula 4 to come up with our statistical analysis.

3 Statistical analysis: A world overview

We present country evidence from calculations based on the indices reviewed above, using the OECD input-output tables for the years 1995, 2000 and 2005 (the latest tables available). As stated before, aggregate figures could hide industries or companies showing a higher propensity to offshore. We are aware that this further aggregation (from the industry to the country level) entails a higher degree of potential bias, but our aim is to produce indices that are at the same time good proxies and comparable among countries. Since our main concern centers on offshoring, we should be noting that the subject of *inshoring*, that is, foreign firms relocating subsidiaries domestically, is left out of the present study (see here Amiti and Wei, 2005). Thus, we turn to answer several empirical questions.

The first step is to see if some pattern emerges as regards offshoring and countries' relative sizes, as done previously by Hummels *et al.* (2001) and Amiti and Wei (2005). At first we would suspect industries in larger and more industrialized economies to be relatively more prone to go offshore. However, as found in both mentioned references, here too offshoring intensity (as proxied by relative trade in intermediate goods) turns out inversely related to country size.

Distinguishing the extent to which manufacturing and services industries engage in offshoring with a different intensity proves also of interest. Traditionally, firms belonging to the manufacturing sector have been more inclined to offshoring due to the kind of activities they mostly undertake (e.g. manufacture-related activities which were initially easier to

move abroad).

Another step towards a further understanding of the phenomenon is the separation between materials and services offshoring. This connects directly with the previous point, and the evidence so far suggests that services offshoring, yet growing exponentially, is still on its first stages. This we corroborate below.

We analyze the evidence for these three empirical questions in the following sections. Additionally, we take a deeper look into services offshoring as it has been argued to be the ultimate manifestation of modern trade (Mankiw and Swagel, 2006). Finally, we provide a decomposition analysis that intends to compare the performance of the different indices.

3.1 Offshoring intensity and country size

We construct a ranking for the years 1995, 2000 and 2005, for a wide sample of countries, on which input-output tables from the OECD are available (tables A1 to A6). Three indices are reported, as defined earlier: imported inputs in total inputs, imported inputs in gross output, and a measure of vertical specialization.[8] The narrow measure considers only international trade among industries of the same classification as a proxy of in-house offshoring. This corresponds to the diagonal in the import use matrix. The broad measure stands in turn for all trade, intra and inter-industry and, thus, for a rough proxy of offshore outsourcing or international outsourcing. It is usually believed that the former better captures the general idea about offshoring, yet the literature has reached no definite answer on this point. Needless to say that the broad measure is, by definition, always bigger than the narrow one, since the numerator of the index is always bigger for the former.

As seen in these tables, smaller economies (e.g. in GDP terms) rank among the first ten according to the three indices, narrow and broad. This really comes as no surprise, since all these indices belong to the series of openness measures well known in economics, where larger countries display in general smaller indices. This is naturally so because larger economies produce a greater amount of inputs than smaller ones, thus curbing the relative extent to which the former are engaged in international trade. Therefore, smaller countries rely more strongly on offshoring as a form of international trade than their larger counterparts, in relative values. Countries like Luxemburg, Ireland, Hungary, Taiwan, Austria, Slovak Republic, Czech Republic, Estonia and Slovenia are some fine examples. On the other hand, some of the larger economies perform consistently at the bottom; namely, the US, Japan, China, India, and Brazil. Right in the middle of this ladder we find a varied group of large countries among which Germany, Canada and Spain stand out. It is also possible

[8] The vertical specialization index by Hummels *et al.* (2001) turns out significantly higher than those presented here, in spite of both being calculated from the same source (OECD), yet for slightly different years. The difference is that their index is weighted by merchandise exports alone, and ours is weighted by total exports.

to identify Italy and the UK swinging around the average for all three indices.[9]

Changes in the rankings are of little significance, either among indices or when moving from narrow to broad measures. This is not that much the case when we analyze the change, in relative terms, which took place from 1995 to 2005 (tables A7 to A9). A few of the larger economies now show themselves as having undergone a steep expansion of offshoring during that recent period, like in the US, Spain (only for 1995-2000), and Germany. Surprisingly, China, Brazil, and Japan portray a significant positive change during the period 2000-2005. We can see how, incidentally, the pattern shown by these latter countries coincides with a significant liberalization of their trade in recent times, most importantly for China.

It would not be reasonable however to try recognize a trend for the countries of the sample, since we only have data for three points in time. Despite the gained prominence in latest years, such larger economies as the US, China, Brazil, India, or Japan, are still far from compromising important shares of their intermediate trade to foreign sources (e.g. offshoring). Remarkably, though, Canada, Germany and Spain stand perceptibly aside.[10] The reason for this performance on these three countries remains veiled to us, yet we may venture a logical explanation. In all cases the country of origin (or source country) is right at the border of a vast and open market which is, either very close geographically, or culturally, or both. A trading partnership between Canada and the US dates back to the first days when both nations were born. One should presume that Canadian and US firms are easily relocating across the border, yet as it turns out it seems relatively more significant for Canada. Similarly, Germany and Spain find unbeatable opportunities in Eastern Europe and Northern Africa, respectively. More, one is not to forget about the tremendous business opportunities that Latin American countries offer to Spanish firms. Yet not sharing the same border, both territories do share a cultural background that for times allows a better entrepreneurial understanding.[11]

Generally speaking, we can see how global offshoring (the world weighted average) grew remarkably during the period 1995-2000 for any measure considered, yet less dramatically for the period 2000-2005. This loss of momentum was more strongly perceived among narrow measures (e.g. in-house offshoring), perhaps as a result of entrepreneurs being now more confident on working with specialized third-party providers. As we defined offshoring,

[9] Remember that all these indices are constructed assuming that both the values of the numerator and denominator refer to the same price level, thus avoiding the use of different price indices.

[10] The figures for Germany are very similar to those in Horgos (2008), who relies on German data alone, taken from the German Socio Economic Panel. For instance, his broad measure for 1995 and 2000, when weighting for total inputs, stands at 15 and 19 percent respectively. When weighting for output these indices are 6 and 8 percent. Our data shows the following: 14 and 18 percent (table A2), and 7 and 10 percent (table A4). Furthermore, growth rates in his data and ours are also alike.

[11] The weighted (world) means were calculated using the 2008 nominal GDP (US dollars) from the IMF database (2009). Remember that, previously, in order to come up with the indices for every country these had to be weighted according to the type of index, as defined at the bottom of the tables A1 to A6. See how the weighted mean is always lower than the mean, thus implying that larger economies tend to gather at the lower end of the ranking.

its recent upward trend should not be surprising, since trade is an ever-growing result of globalization and capitalism. All in all, offshoring appears as the natural outcome of international trade on which smaller countries seem to rely relatively more often, in order to survive and integrate into the world economy.

3.2 Offshoring intensity and economic sector

Here we would like to approach an answer to the following question: which economic sector (and by extension, what kind of firms) offshores the most? What we do again is sorting out the sample of countries for the same years as before, but now doing specific mention to two separate economic sectors. In particular, for every country we divide the whole set of industries of the OECD I-O database into manufacturing and services industries.[12] We resort to the same three aggregate indices, both in their narrow and broad versions, to account for this description.

We discover that the manufacturing industries are more heavily engaged in offshoring activities than the services industries (tables A10 and A11); the sample (weighted) mean gives us a clue. For some countries the difference is rather important as to make the services sector look like it does not engage in international trade at all. This is more easily seen for the narrow measure. For example, in Argentina, China, Greece, and the US, the offshoring intensity of the manufacturing sector is, in general, overwhelmingly superior to that of the services sector. When considering the broad measure the picture is now fairly homogeneous, with the intensity in manufacturing industries only doubling or tripling that of services industries, for the whole sample.

A reasonable explanation for this gap is that the services sector still lags behind (e.g. the three-sector hypothesis) in developing a proper infrastructure or the particular know-how, as it has for long being the case in the manufacturing industries. This sounds odd for developed economies with mature high-tech industries and a strong investment in R&D, but there, too, the growing services sector commits a tiny share of its intermediate trade to international providers. We must also not forget that most services have other services as their intermediates, and services are in general far less tradable than goods. Therefore, all three indices underlie the so-far less relevant importance of offshoring for services industries, something that holds true for both the narrow and broad measures. Nevertheless, as mentioned earlier, there are still a great number of potentially offshoreable services that might eventually account for larger figures. But when will this take place we cannot say.

As for the countries' relative size, the same pattern emerges here as before, yet it turns out less evident in the manufacturing sector. Small economies stand at the top in both the manufacturing and services sectors, and for both the narrow and broad measures. Also,

[12] This is done following the classification by the ISIC (rev. 3) or its equivalent in the OECD itself. See the reference provided in table A10.

several of the fully developed economies now appear among the most intensive "offshorers" in this more in detail breakdown. It is worth mentioning Canada, Belgium, Austria, the Netherlands, and the Nordics for the manufacturing sector in both the narrow and broad measures. In turn, for the services sector, narrow measure, we should mention the same group but adding Germany, whereas for the broad measure the display is now less disperse. Among the larger economies we should point out how rather disappointingly turn out some of the performances, namely: the US, Japan, China, Brazil, and India. Their indices are way below the average.

If we look at the sample mean it is easy to recognize a positive change from 1995 to 2005, for all the measures considered. The short span of time for which we can produce the series of indices should prevent us to make any further consideration on the evolution of the phenomenon. Enough to say that, with the exception of some outlier, the presence of offshoring is consistently and significantly more important in the manufacturing than in the services sector. As we shall see below, this differentiation between sectors is tightly related with the classification of materials versus services offshoring. Naturally, manufacturing industries have occupied themselves more with materials offshoring, while services industries have followed suit with services offshoring. Here it is the "use" of the input we are interested in, as opposed to the "origin" of the input, which is what we study in the next section.

3.3 Materials versus services offshoring

The differentiation between materials and services offshoring has not attracted the economists' attention until very recently. Here we refer to the type of activities or functions offshored instead of the economic sector where these practices originate. Seemingly, services offshoring should be qualitatively different due to the relative impracticability it faced in the past. This was the outcome of, first, the lack of mobility of the resources involved, and later, the fear for the potential loss of control of the implementations relocated abroad. But new communication technologies (specially the Internet) are boosting a whole new way of doing business and thus using the available resources more efficiently. Right now, white-collar workers do not seem particularly confident about the former impracticability of a prospective relocation of their jobs.

We present similar indices to those used earlier, but now calculating the import penetration in production of two types of inputs: materials and services. This is done according to the classification of industries but now applied to the foreign industry where the input was produced. In particular, grouping all input contributions by foreign manufacturing industries to a domestic industry gives the material offshoring index for that industry. After weighting for each industry's output we have the country's index of materials offshoring. In the same manner, grouping all the foreign contributions in services provides the services

offshoring index which, after weighting, becomes the country's services offshoring index.[13]

It is clear that services offshoring still represents, with a very few exceptions, a small share of intermediate trade for a vast majority of countries (table A12). Again, country size (in GDP terms) appears as a determinant of offshoring intensity according to the differentiation between materials and services. As for materials offshoring we do not see a large dispersion of the indices. As for services, smaller countries like Luxemburg and Ireland take the lead, followed by far by the Slovak and Czech Republics, Estonia and Hungary, among the lesser developed, and Austria, Belgium, the Netherlands, Taiwan, and the Nordic countries, among the more developed ones. On the other end, the US and China call the attention for the little relative weight that services offshoring signifies for the total economy.

As argued in the previous section, we should not be surprised about these numbers, since it is to expect that each sector of the economy would focus more intensively on offshoring of related activities. Despite the relative lack of significance of services offshoring, we must point out the potential impact it could have in the longer run. The larger positive change of the world (weighted) average proves the increasing importance of these practices usually associated with higher value added activities.[14] Most of the countries experienced a real upgrade in this sense, independently of their level of development. Also, for some countries it is possible to observe that the rise in services was accompanied by a fall of materials offshoring (Luxemburg, Ireland, the Netherlands, among others).

As discussed earlier, as better and faster communications make their way in the globalized world economy, a growing number of jobs becomes offshoreable overnight. Every task that could be put through a wire is now at risk of being moved abroad in search of comparative relative advantages. For this reason, it is of major importance to look deeper into this kind of offshoring which might be determinant for so many workers and their families. The future might otherwise be giving us an unpleasant surprise, perhaps sooner than expected.

3.4 Services offshoring: Impending revolution?

If services offshoring really holds the key, we should be looking more seriously at the industries contributing the most during the past few years. Presumably, services offshoring entails higher value added activities, and thus, a greater potential for growth. We can expect that, *a priori*, services offshoring should be concentrated on industries belonging to the services sector. This is in fact what we observe for years 1995 and 2000 (see table A13).

The services offshoring indices for each industry are presented as the weighted mean taken

[13] To our knowledge this specific index was first introduced by Amiti and Wei (2005, 2006). We are unable to produce a narrow measure since we do need to account for the origin of the inputs in several foreign industries, either in the manufacturing or the services ones. The index reported in table A12 is therefore a broad measure of the Feenstra and Hanson type, meaning that it is not restricted to trade between firms of the same industry classification.

[14] Canals (2006) finds a similar pattern for services offshoring for the US.

among all the countries of the sample, thus providing an approximation to the phenomenon at the industry level worldwide. So if a revolution, whatever its extent, is to be expected, it will have to take place most certainly in the services sector. See how especially important turn out all the transport-related industries, followed by finance and insurance, post and telecommunications, computer services, and other business activities.

To check on the possible effect of this new prominence of services offshoring on the industries considered, we look at the associated rates of employment growth in the period 1995-2000 (table A14). In doing this, we combine the OECD I-O data with the STAN (structural analysis) database, also from the OECD, and obtain a restricted sample.[15] Because of this, we should be careful in drawing comparisons between tables A13 and A14. For whereas the former tries to stress the major role of services offshoring in services industries as a worldwide phenomenon, the latter speculates about a possible pattern between the international growth rates of services offshoring and employment.

Seemingly, the growth in services offshoring related positively to the growth in employment during the period 1995-2000. This is far evident in figure A1 (the counterpart of table A14), where we present the scatter plot and take the liberty to draw a regression line. Convincingly, five years appear as a reasonable time to capitalize the employment benefits. However, we ought to be a bit cautious about this. First, we only consider a limited sample on which data were available; therefore, we should cast some doubt on the representativity of the sample. Second, even though we weight the change in the industry means worldwide by the countries' outputs, these figures might yet hide some rather disparate data. And third, high aggregation of the industrial classification, as argued before, might as well obscure the picture even more.

The little evidence we air in this section is by no means an irrefutable proof of services offshoring to translate into employment gains in the midterm. We can risk, however, that this new wave of offshoring implying higher value added activities does not pose an immediate and severe threat in terms of job losses. We should now go over the assessment of the indices studied up to this point so we can decide which one behaves best.[16]

3.5 The quality of the indices

We now carry out a decomposition analysis over time (1995-2005) and across countries of the indices so far studied and for both the narrow and broad measures. This analysis involves following the conventional "within" and "between" exercise to account for variations in,

[15] The countries for which the data were available from both databases were: Australia, Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Korea, Luxembourg, Netherlands, Norway, Spain, Sweden, and the US. This is nearly as half as what we had previously.

[16] In tables A12 to A14 and in figure 1 we have already made up our minds and picked out the formula in (4a), that is, the index which makes reference to imported inputs in total inputs. In the next section we see how this index performs reasonably well.

respectively, industries' offshoring intensity and their shares in total production.[17] What we set out to do is a decomposition of the variance of the different indices: imported inputs in total inputs (MII), imported inputs in gross output (MIO), and the vertical specialization index (VS). Through this we should be able to isolate the changes in the offshoring intensities within industries from the changes in their production shares.

Therefore, to see to what extent the indices describe the phenomenon accurately, we proceed to extract the sources of growth behind all three indices making use of the data in tables A1 to A6 and the following expression:

$$\Delta\Phi = \Delta \sum_{i}^{n} \theta_i \delta_i = \sum_{i}^{n} \overline{\theta}_i \Delta\delta_i + \sum_{i}^{n} \overline{\delta}_i \Delta\theta_i \quad ; \quad \Phi = MII, MIO, VS \tag{5}$$

where the change in the offshoring index of countries (Φ) is decomposed, throughout industries (i), into the change in the offshoring intensity (the within term) and the change in the share of total production (the between term). The former fixes the structural component of industries, also the share of industry output to total output (θ),[18] to focus on the change in the offshoring intensity (δ). The latter, contrariwise, fixes the offshoring component, thus capturing the contribution of the structural component to the change in the index.[19]

Tables A15 to A17 display the results of the decomposition analysis. The within term corresponds to the first right-hand term in (5) and the first column in the tables. The between term is, in turn, the second right-hand term in (5) and the second column in the tables. The overall change in the indices ($\Delta\Phi$) is presented in the column labeled as "total", and is equal to the sum of the within and between terms, as shown in (5). The overall change here coincides with the change, in percentage points, in the indices in tables A1 to A6. For example, let us consider the changes in the MII index for the US during 1995-2005 (tables A1 and A2, narrow and broad measures respectively). These changes amount to 0.34 (the difference in table A1) and 3.02 (the difference in table A2) percentage points, which are the values we obtain in the column "total" of table A15. The same applies to the other two indices. For the US the values are: 0.22 (table A3) and 1.66 (table A4) for the MIO index, both to be found in table A16; and 0.91 (table A5) and 2.51 (table A6) for the VS index, to be found in table A17.

Finally, the last column in these tables is the "within to total" ratio, and gives us an idea of how accurate the indices turn out to be. The closer it gets to 100 percent, the more the change in the index is purely explained by offshoring. For all of them the broad specification performs indeed more accurately when considering the global average, that is, after taking

[17] See Hummels *et al.* (2001), Strauss-Kahn (2004), and Horgos (2008), who also undertake decomposition analyses along these lines.

[18] Output refers here to gross output, as often found in the literature for this kind of analysis (see Horgos, 2008, for instance). Moreover, for the vertical specialization index the structural component is different: the share of the industry's exports in total exports.

[19] A bar over the variable defines the mean for the period under study.

out possible outliers. We should however remain wary about these numbers since they are just rough averages, with the sole purpose of providing an intuitive understanding of the accuracy of the indices.

4 Concluding comments

Offshoring as a relative new phenomenon is not just some food for the media. Rather, it is a manifestation of the increased mobility of production factors and a reinterpretation of the concept of comparative advantages. Numbers on the subject abound, but most of times they are mindlessly brought onto the debate as though wanting to stir feelings of uneasiness among the audience. The predictions tend to be much the same: bad omens loom in a future not so far away. The truth is, however, that a consensus on what these numbers really mean has not yet been reached.

In the economics literature, at least, it has become usual to consider the intermediate trade as a ways of approaching a more rigorous definition. In fact, this sort of trade amounts to an important share of the current total trade for industries, to the point of affecting the relative demand for different kinds of labor more than the trade in final goods. This, for some (Feenstra and Hanson, most representatively), becomes a factor-bias technological change since it favors skilled employment over unskilled employment. With this as a background we have first reviewed the most common indices in the specialized literature, pointing out the exhaustiveness shared by all of them. Then we have used these same indices to produce a snapshot of the phenomenon worldwide during 1995-2005, at a country level.

Our empirical analysis throws some light on widely held preconceptions. First, offshoring is not all about large and highly developed economies relocating jobs in far-off countries. Despite the fears held by many in these large and influential economies, the evidence suggests that offshoring is a widespread phenomenon. Furthermore, according to all our indices, smaller economies rank consistently among the most intensive offshorers, in relative terms (tables A1 to A6). This is in part as a result of our proxying offshoring through intermediate trade. The growth rates show however a significant increment during 1995-2000 for some large economies (tables A7 to A9).

A second matter we address in the paper has to do with the difference in magnitude for two broad sectors of the economy: manufacturing and services. The numbers here make it clear that offshoring still holds a stronger grip in manufacturing industries. A first wave certainly took place in the manufacturing sector worldwide back in the 1960s and 1970s when it became necessary to compete with foreign producers. Moving production workers abroad was then possible as well as needed. But with the further improvement of communications and the birth of the Internet, a second wave of offshoring focused on the services sector has come to be. The evidence picks up this change somehow, especially for our broad measures

(tables A10 and A11). Nevertheless, offshoring intensity has increased independently of the sector, so it does not appear that offshoring in the services sector had proportionally gained much terrain.

The next point deals with the different kinds of offshoring. Naturally, this relates with the previous point. In terms of the indices here presented, we are now interested in the type of input being imported whereas, previously, we inquired about the destiny of the same input. However, here the growth rate of the world (weighted) average seems significantly higher for services offshoring (table A12).

We therefore need to take a closer look at services offshoring. For this we present a breakdown of the industries, noticing that in effect services offshoring concentrates in services industries (table A13). Moreover, industries at the top traditionally imply a relatively high value added that could eventually transform in growth and employment. In turn, we show the growth rates in the services offshoring intensities for every industry considered with their associated growth rates of employment (table A14 and figure A1). Not surprisingly, fast growing industries like "Finance and insurance", "Computer and related activities", or "Other business activities", experience high rates of both services offshoring and employment.

As a concluding exercise, we carry out a decomposition analysis on the reviewed indices that suggests a certain preference in their use (tables A15 to A17). In particular, broad measures perform better than narrow ones. On this account, we can recommend the use of any of the broad measures here discussed, which provide with a close approximation to the true nature of offshoring on highly aggregate data.

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A Appendix: Tables

Table A1: Imported inputs in total inputs. Narrow measure (%)*
World rank (selected countries)

	Year	1995		Year	2000		Year	2005
1	Luxemburg	21.59	1	Luxemburg	31.55	1	Luxemburg	31.70
2	Ireland	12.53	2	Ireland	15.84	2	Hungary	13.46
3	Hungary	11.25	3	Hungary	12.99	3	Czech Republic	10.53
4	Belgium	10.76	4	Belgium	12.39	4	Estonia	10.48
5	Slovak Republic	8.57	5	Slovak Republic	11.35	5	Slovenia	10.19
6	Estonia	8.22	6	Estonia	11.26	6	Netherlands	9.63
7	Taiwan	7.97	7	Slovenia	10.50	7	Belgium	8.42
8	Austria	7.73	8	Czech Republic	10.34	8	Austria	7.59
9	Canada	7.67	9	Austria	9.42	9	Germany	7.43
10	Netherlands	7.28	10	Canada	7.52	10	Finland	6.01
11	Portugal	5.40	11	Taiwan	7.51	11	Mexico	5.95
12	Israel	5.33	12	Netherlands	7.49	12	Sweden	5.55
13	Germany	5.11	13	Germany	6.66	13	Portugal	5.11
14	Sweden	5.07	14	South Korea	6.61	14	Indonesia	4.74
15	Finland	4.93	15	Spain	5.97	15	Poland	4.48
16	Spain	4.53	16	Switzerland	5.95	16	Denmark	4.42
17	Denmark	4.46	17	Portugal	5.62	17	China	4.00
18	Russia	4.35	18	Sweden	5.50	18	Spain	3.60
19	UK	4.33	19	Finland	5.42	19	France	3.33
20	Italy	4.23	20	Turkey	4.65	20	UK	3.27
21	Turkey	4.01	21	Denmark	4.54	21	Italy	2.90
22	Indonesia	3.99	22	Poland	4.53	22	Greece	2.52
23	France	3.89	23	Indonesia	4.53	23	Brazil	2.33
24	New Zealand	3.44	24	Russia	4.42	24	US	1.81
25	Norway	3.13	25	Italy	4.17	25	Japan	1.81
26	Argentina	2.98	26	UK	3.57	26	Australia	1.65
27	Greece	2.75	27	France	3.39	27	Argentina	na
28	Poland	2.48	28	Norway	3.09	28	Canada	na
29	China	2.36	29	South Africa	2.85	29	India	na
30	Brazil	2.19	30	Greece	2.72	30	Ireland	na
31	Japan	1.90	31	China	2.64	31	Israel	na
32	South Africa	1.81	32	New Zealand	2.57	32	New Zealand	na
33	US	1.47	33	Australia	2.42	33	Norway	na
34	India	1.47	34	US	1.85	34	Russia	na
35	Australia	na	35	Japan	1.84	35	Slovak Republic	na
36	Czech Republic	na	36	Brazil	1.68	36	South Africa	na
37	Mexico	na	37	India	1.26	37	South Korea	na
38	Slovenia	na	38	Argentina	na	38	Switzerland	na
39	South Korea	na	39	Israel	na	39	Taiwan	na
40	Switzerland	na	40	Mexico	na	40	Turkey	na
	w. mean	***3.06***			***3.39***			***3.41***
	change (%)				***10.79***			***0.45***

*: formula (4a), weighted avg. across all industries by industry (gross) output, $\forall\ i = j$.

Note: "na" not considered for the weighted mean, so all data in the last rows are comparable.

Sources (tables 1 to 17): authors' calculations based on OECD I-O database, 2009.

Table A2: Imported inputs in total inputs. Broad measure (%)*
World rank (selected countries)

	Year	1995		Year	2000		Year	2005
1	Ireland	48.50	1	Luxemburg	53.30	1	Luxemburg	57.33
2	Luxemburg	46.74	2	Ireland	52.64	2	Estonia	38.16
3	Estonia	37.29	3	Hungary	39.73	3	Hungary	37.47
4	Hungary	32.66	4	Estonia	37.99	4	Slovenia	34.57
5	Slovak Republic	27.76	5	Slovak Republic	34.18	5	Belgium	31.74
6	Belgium	27.27	6	Czech Republic	31.18	6	Czech Republic	31.60
7	Netherlands	25.73	7	Belgium	30.73	7	Austria	29.20
8	Taiwan	24.56	8	Slovenia	29.27	8	Netherlands	27.16
9	Austria	24.10	9	Austria	26.92	9	Sweden	25.36
10	Sweden	21.96	10	Netherlands	26.56	10	Denmark	25.06
11	Norway	21.58	11	Taiwan	24.46	11	Finland	23.61
12	Portugal	20.31	12	Sweden	24.38	12	Greece	23.61
13	Canada	20.15	13	Greece	23.26	13	Portugal	22.11
14	Denmark	19.63	14	Canada	23.05	14	Mexico	21.73
15	Greece	18.81	15	Portugal	21.86	15	Poland	20.45
16	Finland	17.69	16	Finland	21.79	16	Indonesia	19.50
17	Indonesia	17.66	17	Norway	20.76	17	Germany	19.21
18	UK	17.21	18	South Korea	19.83	18	Spain	18.77
19	Turkey	15.59	19	Denmark	19.83	19	France	16.03
20	Italy	15.00	20	Switzerland	19.24	20	UK	14.94
21	Spain	14.89	21	Spain	19.17	21	Italy	14.22
22	Russia	14.49	22	Indonesia	19.15	22	China	13.36
23	New Zealand	14.28	23	Germany	17.95	23	Australia	11.24
24	France	14.18	24	Turkey	17.27	24	Brazil	8.96
25	Germany	13.55	25	Poland	16.98	25	Japan	8.80
26	Poland	13.12	26	Italy	15.80	26	US	8.48
27	Israel	12.28	27	UK	15.56	27	Argentina	na
28	South Africa	9.99	28	Russia	15.51	28	Canada	na
29	India	9.15	29	New Zealand	15.22	29	India	na
30	China	8.64	30	South Africa	14.58	30	Ireland	na
31	Argentina	7.98	31	France	12.51	31	Israel	na
32	Brazil	6.80	32	Australia	12.47	32	New Zealand	na
33	Japan	5.78	33	India	10.73	33	Norway	na
34	US	5.46	34	China	9.32	34	Russia	na
35	Australia	na	35	Brazil	9.00	35	Slovak Republic	na
36	Czech Republic	na	36	US	7.40	36	South Africa	na
37	Mexico	na	37	Japan	5.79	37	South Korea	na
38	Slovenia	na	38	Argentina	na	38	Switzerland	na
39	South Korea	na	39	Israel	na	39	Taiwan	na
40	Switzerland	na	40	Mexico	na	40	Turkey	na
	w. mean	***10.56***			***12.00***			***13.48***
	change (%)				***13.65***			***12.30***

*: formula (4a), weighted avg. across all industries by industry (gross) output.

Table A3: Imported inputs in gross output. Narrow measure (%)* World rank (selected countries)

	Year	1995		Year	2000		Year	2005
1	Luxemburg	13.16	1	Luxemburg	23.91	1	Luxemburg	23.88
2	Ireland	8.13	2	Ireland	9.91	2	Hungary	9.62
3	Hungary	7.50	3	Hungary	9.65	3	Czech Republic	7.78
4	Belgium	7.27	4	Belgium	8.72	4	Estonia	7.71
5	Estonia	5.74	5	Estonia	8.56	5	Slovenia	6.68
6	Canada	5.48	6	Slovak Republic	7.71	6	Belgium	5.80
7	Slovak Republic	5.11	7	Czech Republic	7.22	7	Netherlands	5.26
8	Taiwan	5.07	8	Slovenia	7.04	8	Austria	4.39
9	Netherlands	4.31	9	Austria	5.35	9	Mexico	4.06
10	Austria	3.95	10	Taiwan	5.09	10	Germany	4.05
11	Portugal	3.43	11	Canada	4.87	11	Finland	3.96
12	Sweden	3.28	12	Netherlands	4.53	12	Sweden	3.57
13	Finland	3.15	13	South Korea	4.49	13	Portugal	3.26
14	Israel	2.95	14	Spain	3.92	14	Poland	3.03
15	Spain	2.86	15	Germany	3.72	15	China	2.99
16	Germany	2.73	16	Finland	3.64	16	Denmark	2.43
17	Italy	2.62	17	Portugal	3.63	17	Indonesia	2.42
18	UK	2.56	18	Sweden	3.63	18	Spain	2.31
19	Denmark	2.49	19	Switzerland	3.27	19	France	2.20
20	Indonesia	2.40	20	Poland	2.85	20	UK	1.87
21	France	2.38	21	Italy	2.71	21	Italy	1.85
22	Russia	2.31	22	Denmark	2.56	22	Brazil	1.36
23	Turkey	2.05	23	Turkey	2.49	23	Greece	1.30
24	Norway	2.00	24	Indonesia	2.45	24	Japan	1.19
25	New Zealand	1.99	25	Russia	2.41	25	US	1.11
26	Argentina	1.74	26	France	2.20	26	Australia	1.01
27	China	1.62	27	UK	2.07	27	Argentina	na
28	Greece	1.55	28	Norway	1.98	28	Canada	na
29	Poland	1.42	29	South Africa	1.84	29	India	na
30	Brazil	1.16	30	China	1.83	30	Ireland	na
31	South Africa	1.15	31	New Zealand	1.55	31	Israel	na
32	Japan	1.04	32	Australia	1.50	32	New Zealand	na
33	US	0.89	33	Greece	1.40	33	Norway	na
34	India	0.88	34	US	1.15	34	Russia	na
35	Australia	na	35	Japan	1.08	35	Slovak Republic	na
36	Czech Republic	na	36	Brazil	0.95	36	South Africa	na
37	Mexico	na	37	India	0.74	37	South Korea	na
38	Slovenia	na	38	Argentina	na	38	Switzerland	na
39	South Korea	na	39	Israel	na	39	Taiwan	na
40	Switzerland	na	40	Mexico	na	40	Turkey	na
	w. mean	***1.83***			***2.11***			***2.12***
	change (%)				***15.3***			***0.47***

*: formula (4b), weighted avg. across all industries by industry (gross) output, $\forall\ i = j$.

Table A4: Imported inputs in gross output. Broad measure (%)* World rank (selected countries)

	Year	1995		Year	2000		Year	2005
1	Ireland	26.73	1	Luxemburg	34.46	1	Luxemburg	37.14
2	Luxemburg	24.26	2	Ireland	30.94	2	Hungary	24.35
3	Estonia	23.13	3	Hungary	26.95	3	Estonia	24.00
4	Hungary	19.56	4	Estonia	24.61	4	Czech Republic	20.75
5	Belgium	16.78	5	Slovak Republic	22.42	5	Slovenia	20.04
6	Slovak Republic	15.76	6	Belgium	20.16	6	Belgium	19.20
7	Netherlands	14.23	7	Czech Republic	20.03	7	Netherlands	15.00
8	Taiwan	14.21	8	Slovenia	17.97	8	Austria	14.64
9	Canada	12.42	9	Netherlands	15.45	9	Sweden	14.06
10	Sweden	11.70	10	Taiwan	14.57	10	Denmark	13.55
11	Austria	11.52	11	Austria	14.22	11	Finland	13.45
12	Portugal	11.09	12	South Korea	13.61	12	Portugal	11.97
13	Norway	11.07	13	Sweden	13.55	13	Poland	11.38
14	Finland	10.13	14	Canada	12.78	14	Mexico	11.37
15	Denmark	9.69	15	Finland	12.74	15	Germany	10.52
16	UK	8.82	16	Portugal	12.09	16	Greece	10.31
17	Greece	8.46	17	Spain	11.26	17	Indonesia	9.97
18	Indonesia	8.35	18	Indonesia	10.31	18	Spain	9.94
19	Italy	8.35	19	Norway	10.22	19	China	8.90
20	Spain	8.25	20	Denmark	10.03	20	France	8.74
21	New Zealand	7.87	21	Switzerland	9.77	21	Italy	7.97
22	France	7.27	22	Germany	9.73	22	UK	7.78
23	Turkey	7.25	23	Poland	9.72	23	Australia	5.98
24	Israel	7.25	24	Italy	9.26	24	Japan	5.04
25	Germany	7.14	25	Greece	9.18	25	Brazil	4.71
26	Poland	7.02	26	New Zealand	8.22	26	US	4.44
27	Russia	6.32	27	UK	8.20	27	Argentina	na
28	China	5.38	28	Turkey	7.78	28	Canada	na
29	South Africa	4.98	29	Russia	7.09	29	India	na
30	India	4.40	30	South Africa	6.98	30	Ireland	na
31	Argentina	4.14	31	France	6.85	31	Israel	na
32	Brazil	3.38	32	Australia	6.38	32	New Zealand	na
33	Japan	2.92	33	China	6.12	33	Norway	na
34	US	2.78	34	India	5.18	34	Russia	na
35	Australia	na	35	Brazil	4.31	35	Slovak Republic	na
36	Czech Republic	na	36	US	3.87	36	South Africa	na
37	Mexico	na	37	Japan	3.35	37	South Korea	na
38	Slovenia	na	38	Argentina	na	38	Switzerland	na
39	South Korea	na	39	Israel	na	39	Taiwan	na
40	Switzerland	na	40	Mexico	na	40	Turkey	na
	w. mean	***11.25***			***13.40***			***14.94***
	change (%)				***19.08***			***11.52***

*: formula (4b), weighted avg. across all industries by industry (gross) output.

**Table A5: Vertical specialization index. Narrow measure (%)*
World rank (selected countries)**

	Year	1995		Year	2000		Year	2005
1	Luxemburg	21.24	1	Luxemburg	33.56	1	Luxemburg	32.47
2	Hungary	20.46	2	Estonia	23.29	2	Hungary	22.98
3	Ireland	16.41	3	Hungary	22.59	3	Estonia	18.71
4	Belgium	15.97	4	Belgium	17.89	4	Czech Republic	17.99
5	Canada	13.40	5	Ireland	17.09	5	Slovenia	15.55
6	Estonia	12.39	6	Slovenia	16.89	6	Mexico	15.48
7	Austria	11.49	7	Slovak Republic	16.57	7	Belgium	11.51
8	Portugal	9.31	8	Czech Republic	14.10	8	Finland	11.36
9	Taiwan	9.16	9	Austria	13.82	9	Portugal	10.69
10	Spain	8.83	10	Canada	12.56	10	Austria	10.02
11	Slovak Republic	8.74	11	Spain	11.24	11	Netherlands	9.52
12	Sweden	8.74	12	Portugal	11.03	12	China	8.20
13	Netherlands	8.61	13	Taiwan	9.95	13	Sweden	8.19
14	Finland	7.78	14	Finland	8.98	14	Germany	7.90
15	UK	6.52	15	South Korea	8.97	15	Poland	7.66
16	Germany	6.34	16	Netherlands	8.90	16	Spain	7.39
17	Israel	6.34	17	Sweden	8.78	17	France	6.20
18	France	6.10	18	Germany	7.81	18	UK	5.70
19	Denmark	5.08	19	Poland	6.43	19	Denmark	4.92
20	Italy	5.08	20	UK	6.23	20	Italy	4.84
21	Argentina	4.17	21	Italy	6.05	21	Japan	4.28
22	Indonesia	4.14	22	Switzerland	5.76	22	Indonesia	3.78
23	Norway	4.10	23	France	5.57	23	US	3.37
24	China	3.70	24	Denmark	4.98	24	Greece	3.08
25	Russia	3.29	25	Indonesia	4.75	25	Brazil	2.86
26	New Zealand	3.16	26	Turkey	4.05	26	Australia	1.55
27	Turkey	3.00	27	US	3.71	27	Argentina	na
28	Japan	2.83	28	Japan	3.51	28	Canada	na
29	Greece	2.81	29	China	3.42	29	India	na
30	US	2.46	30	Norway	3.21	30	Ireland	na
31	Brazil	2.10	31	Russia	3.04	31	Israel	na
32	Poland	2.06	32	New Zealand	2.88	32	New Zealand	na
33	India	1.31	33	Brazil	2.70	33	Norway	na
34	South Africa	1.04	34	Australia	2.25	34	Russia	na
35	Australia	na	35	Greece	2.19	35	Slovak Republic	na
36	Czech Republic	na	36	South Africa	2.04	36	South Africa	na
37	Mexico	na	37	India	1.22	37	South Korea	na
38	Slovenia	na	38	Argentina	na	38	Switzerland	na
39	South Korea	na	39	Israel	na	39	Taiwan	na
40	Switzerland	na	40	Mexico	na	40	Turkey	na
	w. mean	***4.47***			***5.32***			***5.51***
	change (%)				***19.07***			***3.63***

*: formula (4b), weighted avg. across all industries by industry's share in total exports, $\forall\ i = j$.

Table A6: Vertical specialization index. Broad measure (%)*
World rank (selected countries)

	Year	1995		Year	2000		Year	2005
1	Hungary	40.07	1	Hungary	51.09	1	Hungary	48.37
2	Ireland	40.03	2	Ireland	48.15	2	Luxemburg	44.40
3	Estonia	34.83	3	Estonia	46.42	3	Estonia	41.65
4	Luxemburg	31.39	4	Luxemburg	42.52	4	Slovenia	35.95
5	Belgium	29.65	5	Slovak Republic	39.83	5	Czech Republic	35.26
6	Netherlands	24.33	6	Slovenia	34.02	6	Mexico	32.25
7	Taiwan	23.44	7	Belgium	33.67	7	Belgium	28.18
8	Austria	22.91	8	Czech Republic	32.95	8	Denmark	27.62
9	Slovak Republic	21.95	9	Netherlands	26.91	9	Finland	25.94
10	Canada	21.11	10	Austria	26.90	10	Netherlands	25.48
11	Sweden	21.00	11	South Korea	25.64	11	Sweden	23.99
12	Finland	18.86	12	Taiwan	24.88	12	Greece	23.55
13	Portugal	18.59	13	Spain	23.87	13	Austria	23.18
14	Spain	17.98	14	Sweden	23.60	14	Portugal	22.32
15	Norway	17.04	15	Canada	23.57	15	Germany	18.62
16	Israel	16.21	16	Finland	22.23	16	Poland	18.59
17	Denmark	15.98	17	Portugal	21.57	17	Spain	17.35
18	UK	15.17	18	Germany	17.53	18	France	16.14
19	Germany	13.90	19	Poland	16.05	19	China	14.30
20	Italy	13.74	20	Italy	15.85	20	Italy	13.44
21	France	12.70	21	Denmark	14.93	21	UK	13.16
22	Greece	10.41	22	UK	14.42	22	Indonesia	12.45
23	Indonesia	10.25	23	Switzerland	14.15	23	Japan	8.71
24	New Zealand	9.99	24	Indonesia	13.74	24	Australia	8.00
25	Poland	8.59	25	Norway	13.56	25	US	7.78
26	Argentina	8.00	26	France	12.10	26	Brazil	7.53
27	China	7.68	27	New Zealand	10.34	27	Argentina	na
28	Turkey	7.68	28	Greece	10.12	28	Canada	na
29	Russia	6.36	29	China	9.75	29	India	na
30	India	5.78	30	Turkey	9.56	30	Ireland	na
31	South Africa	5.71	31	South Africa	9.06	31	Israel	na
32	Brazil	5.62	32	Australia	8.58	32	New Zealand	na
33	US	5.27	33	India	7.55	33	Norway	na
34	Japan	4.91	34	US	7.25	34	Russia	na
35	Australia	na	35	Brazil	6.61	35	Slovak Republic	na
36	Czech Republic	na	36	Russia	6.51	36	South Africa	na
37	Mexico	na	37	Japan	5.74	37	South Korea	na
38	Slovenia	na	38	Argentina	na	38	Switzerland	na
39	South Korea	na	39	Israel	na	39	Taiwan	na
40	Switzerland	na	40	Mexico	na	40	Turkey	na
	w. mean	***19.69***			***23.58***			***25.67***
	change (%)				***19.73***			***8.87***

*: formula (4b), weighted avg. across all industries by industry's share in total exports.

Table A7: Imported inputs in total inputs, growth
Top ten

	Narrow:				Broad:			
	change (%)	1995-2000	change (%)	2000-2005	change (%)	1995-2000	change (%)	2000-2005
1	Poland	82.93	China	51.67	South Africa	45.94	Japan	52.05
2	South Africa	57.12	Brazil	38.97	US	35.53	China	43.36
3	Luxemburg	46.18	Netherlands	28.52	Germany	32.46	France	28.17
4	Estonia	36.98	Germany	11.56	Brazil	32.26	Denmark	26.38
5	Slovak Republic	32.42	Finland	10.94	Poland	29.38	Poland	20.42
6	Spain	31.70	Indonesia	4.82	Spain	28.70	Slovenia	18.10
7	Germany	30.21	Hungary	3.63	Greece	23.64	US	14.59
8	Ireland	26.42	Czech Republic	1.80	Finland	23.15	Austria	8.47
9	US	25.49	Sweden	0.91	Slovak Republic	23.10	Finland	8.36
10	Austria	21.83	Luxemburg	0.46	Hungary	21.62	Luxemburg	7.57

Table A8: Imported inputs in output, growth
Top ten

	Narrow:				Broad:			
	change (%)	1995-2000	change (%)	2000-2005	change (%)	1995-2000	change (%)	2000-2005
1	Poland	100.70	China	63.39	Slovak Republic	42.29	Japan	50.55
2	Luxemburg	81.69	Brazil	43.16	Luxemburg	42.03	China	45.45
3	South Africa	60.00	Netherlands	16.11	South Africa	40.06	Denmark	35.05
4	Slovak Republic	50.88	Japan	10.19	US	39.20	France	27.56
5	Estonia	49.13	Germany	8.87	Poland	38.46	Poland	17.07
6	Spain	37.06	Finland	8.79	Hungary	37.77	US	14.91
7	Germany	36.26	Czech Republic	7.76	Spain	36.56	Greece	12.21
8	Austria	35.44	Poland	6.32	Germany	36.25	Slovenia	11.54
9	US	29.21	France	0.00	Brazil	27.62	Brazil	9.21
10	Hungary	28.67	Luxemburg	-0.13	Finland	25.82	Germany	8.10

Table A9: Vertical specialization index, growth
Top ten

	Narrow:				Broad:			
	change (%)	1995-2000	change (%)	2000-2005	change (%)	1995-2000	change (%)	2000-2005
1	Poland	212.14	China	139.79	Poland	86.85	Greece	132.74
2	South Africa	96.15	Greece	40.44	Slovak Republic	81.46	Denmark	85.03
3	Slovak Republic	89.59	Czech Republic	27.58	South Africa	58.67	Japan	51.74
4	Estonia	88.00	Finland	26.48	US	37.57	China	46.65
5	Luxemburg	58.00	Japan	21.83	Luxemburg	35.46	France	33.35
6	US	50.81	Poland	19.09	Indonesia	34.05	Finland	16.67
7	Turkey	35.00	France	11.32	Estonia	33.26	Poland	15.85
8	Brazil	28.57	Netherlands	6.93	Spain	32.76	Brazil	13.91
9	Spain	27.29	Brazil	5.85	India	30.62	US	7.34
10	Japan	24.03	Hungary	1.72	Hungary	27.50	Czech Republic	7.00

Table A10: Offshoring intensity and economic sector. All three indices, narrow measure (%)*

	Manufacturing Industries									*Services Industries*								
	Year 1995			Year 2000			Year 2005			Year 1995			Year 2000			Year 2005		
	MII	MIO	VS	MII	MIO	VS	MII	MIO	VS	MII	MIO	VS	MII	MIO	VS	MII	MIO	VS
Argentina	8.68	5.42	6.01	na	na	na	na	na	na	0.35	0.13	0.19	na	na	na	na	na	na
Australia	na	na	na	9.37	6.12	5.28	7.51	4.83	3.82	na	na	na	0.73	0.36	0.75	0.44	0.21	0.34
Austria	17.11	10.66	14.07	21.49	13.99	17.32	19.02	12.39	14.92	4.11	1.33	2.39	4.34	1.75	2.74	2.34	1.03	1.05
Belgium	26.94	19.08	21.73	30.44	22.54	24.82	21.10	15.51	18.07	3.12	1.71	2.73	3.53	2.02	3.15	2.83	1.51	1.90
Brazil	4.26	2.68	2.54	3.63	2.33	3.91	5.00	3.50	4.14	0.61	0.25	1.16	0.32	0.10	0.16	0.46	0.12	0.04
Canada	21.25	14.35	18.51	20.97	14.46	17.89	na	na	na	2.97	2.53	0.46	1.82	0.76	1.02	na	na	na
China	4.20	3.00	4.17	4.83	3.42	3.99	7.15	5.54	9.91	0.13	0.07	0.10	0.10	0.03	0.04	0.41	0.23	0.29
Czech Republic	na	na	na	22.68	16.41	18.53	23.68	17.92	21.26	na	na	na	2.81	1.48	1.77	1.58	0.88	1.84
Denmark	12.42	7.72	7.60	13.47	8.49	8.87	13.55	8.49	9.31	1.94	0.76	0.98	1.87	0.78	0.86	2.07	0.85	0.77
Estonia	23.35	16.79	19.92	31.02	24.81	33.32	28.85	22.47	27.26	2.67	1.21	1.92	2.49	1.26	1.98	2.74	1.41	1.92
Finland	11.14	7.48	8.32	12.21	8.46	9.26	14.73	10.12	12.24	1.10	0.49	4.35	0.99	0.48	6.55	1.27	0.56	4.49
France	9.90	6.58	8.10	9.12	6.29	7.29	9.83	6.92	8.39	1.27	0.52	1.34	0.78	0.33	0.57	0.92	0.43	1.03
Germany	10.18	6.43	7.53	12.24	8.08	9.28	12.93	8.50	9.45	2.99	0.99	0.84	4.06	1.50	1.31	4.33	1.56	1.27
Greece	10.22	6.17	6.88	9.78	5.79	6.83	9.84	5.85	8.62	0.16	0.03	0.02	0.76	0.20	0.10	0.73	0.22	0.14
Hungary	25.82	18.42	24.47	26.99	21.11	26.03	30.68	23.35	27.48	2.99	1.11	1.17	2.88	1.10	1.36	3.25	1.23	1.55
India	3.92	2.54	2.10	3.38	2.13	1.99	na	na	na	0.54	0.16	0.21	0.14	0.05	0.09	na	na	na
Indonesia	9.67	6.22	7.71	8.88	5.72	7.33	8.37	5.47	5.40	1.25	0.46	0.73	1.31	0.49	0.74	1.09	0.45	0.54
Ireland	23.38	16.55	18.42	24.10	17.05	18.72	na	na	na	5.49	2.10	3.83	11.98	5.42	10.32	na	na	na
Israel	9.99	6.53	6.41	na	na	na	na	na	na	4.25	1.89	7.17	na	na	na	na	na	na
Italy	9.59	6.47	6.36	10.07	6.99	7.53	7.34	5.03	5.76	0.94	0.36	0.39	0.96	0.42	0.50	0.77	0.36	0.54
Japan	3.79	2.36	2.28	4.06	2.66	3.01	4.45	2.99	3.86	1.11	0.44	5.21	0.96	0.43	5.62	0.49	0.30	5.98
Luxemburg	14.31	9.39	9.71	16.83	11.37	11.53	17.08	11.83	11.48	26.09	15.77	25.07	36.51	27.92	36.88	36.21	27.46	35.31
Mexico	na	na	na	na	na	na	27.19	20.61	20.98	na	na	na	na	na	na	0.91	0.31	0.13
Netherlands	17.03	11.50	12.10	16.61	11.78	12.55	18.32	12.94	14.01	3.47	1.46	2.68	3.92	1.80	2.96	6.39	2.83	4.05
New Zealand	8.42	5.41	4.65	7.34	4.73	4.46	na	na	na	1.68	0.73	1.13	1.04	0.53	1.16	na	na	na
Norway	11.47	7.67	11.50	12.55	8.47	12.42	na	na	na	0.76	0.36	0.34	1.01	0.51	0.65	na	na	na
Poland	4.90	2.96	2.91	12.43	8.02	10.01	12.13	8.55	11.27	0.35	0.20	0.84	0.84	0.44	0.92	0.64	0.28	0.47
Portugal	14.05	9.55	12.45	16.46	11.24	15.36	15.85	11.01	15.74	1.05	0.46	1.31	0.97	0.46	0.84	1.05	0.47	0.52
Russia	10.42	6.11	5.15	10.17	5.90	5.42	na	na	na	1.49	0.39	0.62	0.87	0.27	0.30	na	na	na
Slovak Republic	15.95	10.66	12.10	26.83	18.85	22.03	na	na	na	4.86	1.91	2.99	2.58	1.36	1.53	na	na	na
Slovenia	na	na	na	25.81	17.64	19.37	24.68	16.92	18.45	na	na	na	1.21	0.59	0.36	1.97	0.95	2.72
South Africa	4.81	3.21	3.00	7.87	5.42	5.11	na	na	na	0.31	0.10	0.13	0.66	0.24	0.25	na	na	na
South Korea	na	na	na	12.66	9.08	10.73	na	na	na	na	na	na	1.66	0.63	1.34	na	na	na
Spain	11.21	7.81	11.54	14.35	10.43	14.76	10.06	7.08	10.90	1.64	0.59	1.04	2.45	1.00	1.59	1.35	0.56	0.96
Sweden	13.07	8.67	10.04	12.94	9.05	10.43	13.83	9.62	10.73	1.20	0.66	4.31	1.77	0.89	3.19	1.86	0.83	1.87
Switzerland	na	na	na	10.10	6.98	7.24	na	na	na	na	na	na	4.11	1.83	3.48	na	na	na
Taiwan	14.47	10.24	10.28	14.42	10.42	11.48	na	na	na	3.14	1.00	4.76	2.17	0.97	4.39	na	na	na
Turkey	9.07	5.05	5.67	10.06	6.09	7.70	na	na	na	0.53	0.16	0.20	1.85	0.71	1.31	na	na	na
UK	12.35	7.69	9.08	11.23	7.06	10.12	11.50	7.13	9.85	1.00	0.47	0.89	1.10	0.53	1.08	1.24	0.58	1.08
US	4.81	2.97	3.68	6.59	4.26	5.64	6.44	4.32	5.47	0.04	0.02	0.11	0.11	0.05	0.06	0.20	0.08	0.11
Weighted mean	***7.45***	***4.83***	***5.75***	***8.50***	***5.70***	***7.06***	***8.52***	***5.83***	***7.51***	***0.94***	***0.38***	***1.22***	***1.08***	***0.47***	***1.26***	***1.10***	***0.49***	***1.30***

*: manufacturing industries correspond to codes 15 to 37, ISIC, rev. 3, or 4 to 25, OECD I-O database; for services industries is 50 to 99 (ISIC) or 31 to 48 (OECD).

Note: MII is imported inputs in total inputs, MIO is imported inputs in output, and VS is the vertical specialization index.

Table A11: Offshoring intensity and economic sector. All three indices, broad measure (%)*

	Manufacturing Industries									*Services Industries*								
	Year 1995			Year 2000			Year 2005			Year 1995			Year 2000			Year 2005		
	MII	MIO	VS	MII	MIO	VS	MII	MIO	VS	MII	MIO	VS	MII	MIO	VS	MII	MIO	VS
Argentina	16.97	10.55	10.82	na	na	na	na	na	na	3.50	1.11	1.97	na	na	na	na	na	na
Australia	na	na	na	22.01	14.65	14.69	20.66	14.12	12.45	na	na	na	9.54	3.93	4.65	9.09	3.99	6.02
Austria	37.35	23.21	26.92	45.76	29.27	32.36	43.91	28.29	30.45	16.34	5.73	8.35	16.76	6.94	9.15	19.64	8.00	9.63
Belgium	48.77	34.44	36.99	53.75	40.25	42.24	49.79	36.95	38.30	17.08	8.22	12.85	19.58	10.31	15.66	22.63	10.30	12.94
Brazil	10.27	6.53	6.18	10.56	6.79	7.94	14.05	9.70	9.89	4.76	1.68	5.03	7.89	2.87	3.63	5.21	1.68	1.57
Canada	35.01	23.46	27.49	39.51	27.27	31.01	na	na	na	13.56	8.13	4.31	13.93	5.40	6.75	na	na	na
China	10.20	7.22	8.24	12.65	9.07	11.01	16.23	12.23	16.26	6.89	3.26	3.80	6.01	2.92	2.40	11.26	5.75	5.37
Czech Republic	na	na	na	52.16	38.11	41.47	48.07	36.38	39.97	na	na	na	16.36	7.68	8.89	17.70	8.18	10.48
Denmark	35.97	22.19	22.36	38.09	23.88	24.31	38.38	24.26	25.09	12.99	4.48	5.05	13.11	4.93	4.96	21.33	10.62	34.00
Estonia	53.76	39.49	44.74	60.22	46.80	58.07	61.72	46.98	53.14	29.21	14.95	21.45	27.43	13.68	22.68	27.46	13.26	19.29
Finland	29.43	19.73	20.44	32.09	22.52	18.66	37.39	25.90	27.69	9.26	3.44	8.54	15.00	5.80	13.09	15.89	6.08	12.22
France	22.34	14.73	15.92	21.44	14.68	14.94	27.50	19.49	20.32	9.40	3.15	4.29	7.19	2.50	3.17	10.18	3.75	5.60
Germany	23.22	14.75	15.39	28.52	18.85	19.59	30.61	20.54	20.96	8.30	2.88	7.05	11.83	4.38	8.39	11.93	4.45	8.63
Greece	26.27	16.81	17.86	27.98	17.87	19.15	36.51	24.04	28.77	14.63	4.60	5.06	21.68	6.01	6.00	21.21	7.05	22.09
Hungary	53.87	37.45	46.39	62.81	48.78	57.43	63.60	47.68	55.69	17.52	6.80	8.78	19.06	7.96	10.87	18.73	7.65	13.25
India	11.65	7.97	7.14	15.30	10.09	10.67	na	na	na	11.24	3.35	4.63	9.15	2.68	3.51	na	na	na
Indonesia	21.01	13.42	16.07	24.63	15.86	20.04	26.27	15.72	17.23	16.58	5.36	5.64	16.64	7.18	8.89	14.59	6.34	7.98
Ireland	62.66	41.81	43.59	75.82	50.63	53.84	na	na	na	37.97	13.03	16.77	35.74	14.87	23.24	na	na	na
Israel	19.34	12.59	12.66	na	na	na	na	na	na	10.00	5.48	29.50	na	na	na	na	na	na
Italy	25.06	16.82	16.35	27.32	19.05	18.79	21.74	15.13	15.24	8.52	3.27	4.51	8.70	3.64	5.06	9.24	3.95	5.04
Japan	9.52	5.69	4.40	10.18	7.19	5.30	15.43	10.39	8.85	3.55	1.32	7.14	3.21	1.30	7.61	4.27	1.63	8.13
Luxemburg	48.19	30.24	31.35	50.05	32.46	32.90	56.40	38.20	38.15	46.63	23.02	31.49	54.41	35.60	43.97	57.78	37.60	45.22
Mexico	na	na	na	na	na	na	55.47	40.87	42.26	na	na	na	na	na	na	17.06	5.38	5.51
Netherlands	44.32	30.43	31.71	46.13	33.72	35.98	45.40	33.11	35.95	17.97	7.07	13.09	18.41	7.79	13.33	20.22	8.57	13.87
New Zealand	20.48	13.67	11.07	18.59	12.17	11.73	na	na	na	12.53	5.71	9.33	13.91	6.59	9.17	na	na	na
Norway	29.83	19.97	24.09	29.12	19.60	23.19	na	na	na	20.75	9.33	25.70	19.32	9.28	25.37	na	na	na
Poland	16.83	10.32	10.63	30.35	19.96	22.05	30.86	21.29	24.25	9.42	4.03	5.25	9.64	3.95	6.49	13.96	5.38	6.79
Portugal	30.44	21.49	23.23	36.55	25.93	27.78	38.75	27.88	29.90	14.43	5.46	6.74	14.05	5.44	6.92	14.14	5.37	7.03
Russia	16.47	9.49	8.14	18.08	10.40	9.35	na	na	na	14.83	4.54	3.77	13.45	4.55	3.19	na	na	na
Slovak Republic	40.40	26.91	28.95	60.36	43.70	48.99	na	na	na	18.66	7.68	9.65	20.62	11.06	15.44	na	na	na
Slovenia	na	na	na	51.39	35.02	37.67	56.30	38.51	40.83	na	na	na	14.45	6.20	9.55	21.92	8.73	14.36
South Africa	14.04	8.95	9.29	18.16	12.17	12.51	na	na	na	7.09	2.47	2.46	12.29	3.90	4.33	na	na	na
South Korea	na	na	na	30.31	22.69	25.74	na	na	na	na	na	na	10.33	5.44	25.72	na	na	na
Spain	26.14	18.05	22.38	33.51	24.23	29.86	28.61	19.89	22.89	9.04	2.97	5.45	11.13	3.94	7.32	15.25	5.63	6.97
Sweden	32.28	21.48	23.26	35.15	24.63	26.68	38.00	26.73	28.70	15.30	6.29	13.01	17.70	7.31	13.02	18.41	7.68	12.15
Switzerland	na	na	na	26.63	17.96	18.44	na	na	na	na	na	na	14.67	5.78	7.33	na	na	na
Taiwan	34.40	24.34	26.33	35.44	25.75	28.52	na	na	na	16.43	5.31	11.83	14.69	4.78	11.52	na	na	na
Turkey	27.11	14.17	12.40	27.94	15.13	15.61	na	na	na	7.26	2.54	2.98	10.73	3.28	4.70	na	na	na
UK	27.34	17.02	19.03	27.46	17.17	21.63	28.09	17.32	20.85	13.52	5.58	7.38	11.40	5.25	5.40	11.39	5.24	4.94
US	9.58	5.87	7.37	14.48	9.59	10.32	16.78	11.52	11.69	3.27	1.22	1.24	4.20	1.57	1.48	4.86	1.86	1.78
Weighted mean	***16.96***	***10.97***	***12.02***	***20.26***	***13.77***	***14.83***	***22.36***	***15.37***	***16.37***	***7.05***	***2.71***	***4.62***	***7.63***	***3.08***	***4.74***	***9.01***	***3.72***	***5.60***

*: see table 10 for industry classification and notes.

Table A12: Materials and services offshoring, broad measure (%)*

	Materials offshoring			*Services offshoring*			*nominal GDP* (2008)	
	1995	2000	2005	1995	2000	2005	millions	share (%)
Argentina	6.26	na	na	0.93	na	na	326,474	-
Australia	na	9.25	8.29	na	2.28	1.63	1,010,699	-
Austria	17.03	18.66	18.46	4.81	5.43	6.72	415,321	0.96
Belgium	17.92	19.17	18.26	6.25	7.84	8.78	506,392	1.18
Brazil	4.35	5.62	5.05	1.28	2.29	2.32	1,572,839	3.65
Canada	14.80	17.06	na	4.12	4.44	na	1,510,957	-
China	7.62	7.79	9.77	0.18	0.33	1.22	4,401,614	10.22
Czech Republic	na	20.95	24.37	na	6.29	3.71	217,077	-
Denmark	14.31	14.31	13.33	3.92	4.17	10.40	342,925	0.80
Estonia	28.53	28.43	28.57	6.40	7.27	7.37	23,232	0.05
Finland	11.55	14.59	15.05	3.97	4.24	5.06	273,980	0.64
France	10.39	8.84	10.88	2.33	1.64	3.04	2,865,737	6.65
Germany	9.11	11.23	11.56	3.04	4.77	4.96	3,667,513	8.52
Greece	15.30	14.55	14.43	1.31	4.50	6.14	357,549	0.83
Hungary	23.93	30.46	30.28	5.36	5.00	5.51	156,284	0.36
India	4.96	6.82	na	2.36	1.67	na	1,209,686	-
Indonesia	12.72	11.63	10.99	3.85	4.61	4.31	511,765	1.19
Ireland	28.65	25.70	na	18.67	25.84	na	273,328	-
Israel	7.53	na	na	4.43	na	na	201,761	-
Italy	9.57	13.19	8.75	3.23	4.96	2.94	2,313,893	5.37
Japan	2.79	3.07	4.80	1.36	1.25	1.11	4,923,761	11.43
Luxemburg	13.90	9.40	9.62	30.18	42.08	45.79	54,973	0.13
Mexico	na	na	15.87	na	na	1.27	1,088,128	-
Netherlands	16.62	15.94	12.44	5.85	6.51	9.72	868,940	2.02
New Zealand	10.29	10.10	na	2.75	3.19	na	128,492	-
Norway	14.16	12.41	na	6.48	7.65	na	456,226	-
Poland	9.35	12.17	15.70	1.32	2.12	2.05	525,735	1.22
Portugal	13.88	15.06	14.14	3.55	3.38	3.69	244,492	0.57
Russia	11.05	11.92	na	2.24	2.60	na	1,676,586	-
Slovak Republic	14.98	21.72	na	5.76	4.45	na	95,404	-
Slovenia	na	24.35	27.43	na	2.99	4.55	54,639	-
South Africa	7.00	10.48	na	1.34	2.79	na	277,188	-
South Korea	na	12.49	na	na	3.09	na	947,010	-
Spain	10.33	12.86	12.00	2.41	3.65	4.39	1,611,767	3.74
Sweden	16.05	16.66	15.91	4.53	5.85	7.41	484,550	1.13
Switzerland	na	11.75	na	na	5.29	na	492,595	-
Taiwan	15.49	16.87	na	5.94	4.13	na	392,552	-
Turkey	9.65	11.41	na	1.39	2.23	na	729,443	-
UK	12.42	15.20	9.83	3.36	4.39	3.74	2,674,085	6.21
US	4.84	5.82	6.18	0.22	0.38	0.47	14,264,600	33.13
							43,061,947	*100*
Weighted mean	***7.67***	***8.71***	***8.70***	***1.68***	***2.19***	***2.46***		

*: formula (4a), but the origin of the imported inputs (m_{jt}) is restricted to the manufacturing and services sectors, according to the classification in A10. See Amiti and Wei (2005, 2006).

Table A13: Services offshoring and industries worldwide, broad measure (%)*

	Year 1995		Year 2000	
1	*Water transport*	15,41	*Water transport*	16,41
2	*Air transport*	8,27	*Air transport*	8,72
3	*Post & telecommunications*	5,43	*Post & telecommunications*	5,70
4	*Finance & insurance*	4,58	*Finance & insurance*	5,67
5	*Supporting and aux. transport activities; agencies*	3,93	*Computer & related activities*	5,18
6	*Other Business Activities*	3,42	*Other Business Activities*	5,03
7	*Other community, social & personal services*	3,24	*Supporting and aux. transport activities; agencies*	4,42
8	*Computer & related activities*	3,15	*Other community, social & personal services*	4,42
9	*Private households with employed persons*	2,99	*Research & development*	3,77
10	*Wholesale & retail trade; repairs*	2,99	*Wholesale & retail trade; repairs*	3,53
11	*Research & development*	2,87	Mining and quarrying (energy)	3,19
12	*Public admin. & defense; compulsory soc. security*	2,54	*Renting of machinery & equipment*	2,99
13	Mining and quarrying (energy)	2,48	Collection, purification and distribution of water	2,79
14	*Land transport; transport via pipelines*	2,12	*Public admin. & defense; compulsory soc. security*	2,78
15	*Renting of machinery & equipment*	2,04	*Land transport; transport via pipelines*	2,72
16	*Education*	1,78	*Real estate activities*	2,25
17	*Real estate activities*	1,66	*Education*	2,05
18	Chemicals excluding pharmaceuticals	1,32	Office, accounting & computing machinery	1,99
19	Office, accounting & computing machinery	1,24	Chemicals excluding pharmaceuticals	1,84
20	Radio, television & communication equipment	1,18	Mining and quarrying (non-energy)	1,78
21	Mining and quarrying (non-energy)	1,17	Pulp, paper, paper products, printing and publishing	1,78
22	Medical, precision & optical instruments	1,14	Medical, precision & optical instruments	1,65
23	Pulp, paper, paper products, printing and publishing	1,09	Radio, television & communication equipment	1,64
24	Collection, purification and distribution of water	1,08	*Health & social work*	1,46
25	Other non-metallic mineral products	0,97	Pharmaceuticals	1,46
26	*Health & social work*	0,97	Production, collection and distribution of electricity	1,34
27	Production, collection and distribution of electricity	0,96	Other non-metallic mineral products	1,26
28	Manufacturing nec; recycling (include Furniture)	0,93	*Hotels & restaurants*	1,24
29	Machinery & equipment, nec	0,87	Electrical machinery & apparatus, nec	1,14
30	*Hotels & restaurants*	0,86	Manufacturing nec; recycling (include Furniture)	1,13
31	Electrical machinery & apparatus, nec	0,84	Machinery & equipment, nec	1,12
32	Construction	0,82	Building & repairing of ships & boats	1,10
33	Building & repairing of ships & boats	0,82	Iron & steel	1,06
34	Rubber & plastics products	0,79	Rubber & plastics products	1,06
35	Iron & steel	0,74	Construction	1,06
36	Textiles, textile products, leather and footwear	0,70	Textiles, textile products, leather and footwear	0,90
37	Fabricated metal prod., expt. machinery & eqment.	0,69	Motor vehicles, trailers & semi-trailers	0,90
38	Wood and products of wood and cork	0,65	Wood and products of wood and cork	0,86
39	Food products, beverages and tobacco	0,61	Fabricated metal prod., expt. machinery & eqment.	0,86
40	Motor vehicles, trailers & semi-trailers	0,59	Food products, beverages and tobacco	0,78
41	Coke, refined petroleum products and nuclear fuel	0,54	Agriculture, hunting, forestry and fishing	0,63
42	Agriculture, hunting, forestry and fishing	0,48	Manuf. of gas; distribution through mains	0,63
43	Pharmaceuticals	0,37	Coke, refined petroleum products and nuclear fuel	0,61
44	Manuf. of gas; distribution through mains	0,28	Non-ferrous metals	0,54
45	Steam and hot water supply	0,24	*Private households with employed persons*	0,52
46	Aircraft & spacecraft	0,22	Aircraft & spacecraft	0,22
47	Railroad equipment & transport equip nec.	0,18	Steam and hot water supply	0,16
48	Non-ferrous metals	0,16	Railroad equipment & transport equip nec.	0,14

*: formula (4a), weighted means of industries (48) across sampled countries (37).

Note: industry classification is 2-digit ISIC, rev 3. In *italics*, services industries.

Table A14: Services offshoring and employment growth across industries worldwide, 1995-2000 (%)*

	Services offshoring ratio (%), percentage change			Employment (persons), percentage change	
1	*Finance & insurance*	205,26	1	*Computer & related activities*	36,34
2	*Research & development*	88,35	2	*Finance & insurance*	25,37
3	*Other Business Activities*	88,06	3	Construction	15,70
4	*Computer & related activities*	80,06	4	*Health & social work*	13,99
5	*Renting of machinery & equipment*	73,68	5	*Hotels & restaurants*	13,75
6	Iron & steel	66,56	6	Rubber & plastics products	13,58
7	Office, accounting & computing machinery	65,85	7	*Other Business Activities*	13,22
8	*Health & social work*	57,58	8	Radio, television & communication equipment	12,74
9	*Other community, social & personal services*	45,44	9	*Other community, social & personal services*	12,37
10	*Real estate activities*	39,76	10	*Renting of machinery & equipment*	10,22
11	Pulp, paper, paper products, printing and publishing	37,03	11	*Post & telecommunications*	9,91
12	Food products, beverages and tobacco	35,93	12	*Real estate activities*	9,75
13	Coke, refined petroleum products and nuclear fuel	30,69	13	*Education*	9,45
14	*Hotels & restaurants*	27,22	14	*Wholesale & retail trade; repairs*	8,92
15	Fabricated metal prod., expt.machinery & eqment.	26,98	15	Pharmaceuticals	7,04
16	Electrical machinery & apparatus, nec	26,33	16	*Air transport*	6,95
17	*Education*	22,85	17	*Research & development*	6,88
18	Textiles, textile products, leather and footwear	18,99	18	Fabricated metal prod., expt.machinery & eqment.	6,50
19	*Wholesale & retail trade; repairs*	16,14	19	Machinery & equipment, nec	5,99
20	Manufacturing nec; recycling (include Furniture)	14,15	20	Manufacturing nec; recycling (include Furniture)	5,89
21	Construction	13,80	21	*Supporting and aux. transport activities; agencies*	5,63
22	*Land transport; transport via pipelines*	12,20	22	Motor vehicles, trailers & semi-trailers	5,28
23	Rubber & plastics products	10,92	23	Wood and products of wood and cork	4,33
24	Chemicals excluding pharmaceuticals	9,98	24	Electrical machinery & apparatus, nec	3,86
25	Motor vehicles, trailers & semi-trailers	9,68	25	Medical, precision & optical instruments	3,08
26	*Public admin. & defense; compulsory soc. security*	9,60	26	*Public admin. & defense; compulsory soc. security*	2,21
27	Machinery & equipment, nec	9,23	27	Pulp, paper, paper products, printing and publishing	2,19
28	*Post & telecommunications*	8,37	28	Collection, purification and distribution of water	1,58
29	*Water transport*	7,50	29	*Land transport; transport via pipelines*	1,24
30	Agriculture, hunting, forestry and fishing	7,29	30	Other non-metallic mineral products	0,76
31	Building & repairing of ships & boats	6,92	31	Aircraft & spacecraft	0,03
32	Other non-metallic mineral products	4,84	32	Iron & steel	-0,04
33	*Private households with employed persons*	0,00	33	Food products, beverages and tobacco	-1,53
34	Wood and products of wood and cork	-2,42	34	Office, accounting & computing machinery	-1,61
35	Mining and quarrying (energy)	-2,71	35	*Private households with employed persons*	-1,89
36	Mining and quarrying (non-energy)	-9,83	36	Electricity, gas, and hot water	-2,75
37	*Supporting and aux. transport activities; agencies*	-12,50	37	Chemicals excluding pharmaceuticals	-3,00
38	Electricity, gas, and hot water	-31,52	38	Railroad equipment & transport equip nec.	-3,07
39	*Air transport*	-37,99	39	*Water transport*	-3,19
40	Medical, precision & optical instruments	-40,23	40	Non-ferrous metals	-4,23
41	Collection, purification and distribution of water	-41,68	41	Mining and quarrying (energy)	-5,97
42	Pharmaceuticals	-43,45	42	Building & repairing of ships & boats	-6,16
43	Aircraft & spacecraft	-47,00	43	Agriculture, hunting, forestry and fishing	-9,40
44	Railroad equipment & transport equip nec.	-48,21	44	Mining and quarrying (non-energy)	-10,14
45	Radio, television & communication equipment	-48,23	45	Coke, refined petroleum products and nuclear fuel	-12,76
46	Non-ferrous metals	-52,99	46	Textiles, textile products, leather and footwear	-22,44

*: growth rate of the weighted means of industries (46) across countries in a restricted sample (18), using formula (4a). See figure 1, too.

Note: same classification of industries as in table 13, yet "Electricity, gas, and hot water" are now considered together. In *italics*, services industries.

Source: OECD I-O database, 2009, and STAN database, OECD, 2008.

Table A15: Decomposition analysis, imported inputs in inputs, 1995-2005*

	MII (Narrow)				MII (Broad)			
	within	between	total	w / tot (%)	within	between	total	w / tot (%)
Argentina**				na				na
Australia*	-0.4276	-0.3376	-0.7651	56	-0.8891	-0.3338	-1.2230	73
Austria	-0.9305	0.7880	-0.1425	653	4.2530	0.8466	5.0996	83
Belgium	-2.0097	-0.3335	-2.3431	86	4.3946	0.0660	4.4606	99
Brazil	-0.2141	0.3605	0.1464	-146	1.2409	0.9114	2.1523	58
Canada*	-0.0544	-0.0915	-0.1459	37	3.2453	-0.3440	2.9013	112
China	0.9154	0.7297	1.6451	56	3.6969	1.0297	4.7266	78
Czech Republic*	-0.2687	0.4525	0.1838	-146	-0.3707	0.7853	0.4146	-89
Denmark	0.2943	-0.3348	-0.0406	-725	4.9852	0.4417	5.4268	92
Estonia	1.9618	0.2952	2.2569	87	-0.1290	0.9988	0.8698	-15
Finland	0.6533	0.4242	1.0775	61	4.8929	1.0241	5.9170	83
France	-0.2214	-0.3443	-0.5658	39	2.0910	-0.2401	1.8509	113
Germany	1.9204	0.3938	2.3141	83	4.9201	0.7441	5.6642	87
Greece	0.6144	-0.8429	-0.2285	-269	3.5248	1.2724	4.7972	73
Hungary	0.0946	2.1231	2.2176	4	2.2605	2.5452	4.8057	47
India*	-0.1800	-0.0264	-0.2064	87	1.4969	0.0824	1.5794	95
Indonesia	-0.0616	0.8150	0.7534	-8	-0.6053	2.4459	1.8405	-33
Ireland*	2.3752	0.9353	3.3105	72	2.5373	1.6003	4.1376	61
Israel**				na				na
Italy	-0.8868	-0.4465	-1.3333	67	-0.3672	-0.4130	-0.7802	47
Japan	-0.1413	0.0522	-0.0891	159	2.6292	0.3950	3.0242	87
Luxemburg	3.0790	7.0335	10.1125	30	8.2673	2.3283	10.5956	78
Mexico**				na				na
Netherlands	2.6726	-0.3182	2.3544	114	1.7583	-0.3303	1.4280	123
New Zealand*	-0.8413	-0.0243	-0.8656	97	1.1078	-0.1722	0.9356	118
Norway*	0.3350	-0.3798	-0.0448	-748	-0.4192	-0.4071	-0.8263	51
Poland	2.4049	-0.4016	2.0032	120	8.2741	-0.9505	7.3235	113
Portugal	0.7931	-1.0879	-0.2948	-269	1.9661	-0.1669	1.7992	109
Russia*	-0.1652	0.2373	0.0721	-229	1.3342	-0.3195	1.0147	131
Slovak Republic*	1.9885	0.7908	2.7793	72	4.9146	1.4976	6.4122	77
Slovenia*	-0.1627	-0.1507	-0.3134	52	5.4632	-0.1662	5.2970	103
South Africa*	0.9699	0.0659	1.0358	94	4.6463	0.0572	4.7035	99
South Korea**				na				na
Spain	-0.5092	-0.4192	-0.9284	55	4.3517	-0.4777	3.8740	112
Sweden	0.1288	0.3467	0.4754	27	1.6560	1.7443	3.4003	49
Switzerland**				na				na
Taiwan*	-0.8291	0.3663	-0.4628	179	-1.2351	1.1401	-0.0950	1300
Turkey*	0.9940	-0.3493	0.6447	154	1.8832	-0.2004	1.6828	112
UK	-0.0164	-1.0388	-1.0553	2	-0.7077	-1.5609	-2.2686	31
US	0.5042	-0.1644	0.3399	148	2.8364	0.1826	3.0190	94
	Mean			*4*	*Mean*			*110*
	Std. dv.			*240*	*Std. dv.*			*212*
	Mean (no outliers. 1σ)			*50*	*Mean (no outliers. 1σ)*			*75*
	Std. dv. (no outliers 1σ)			*90*	*Std. dv. (no outliers 1σ)*			*46*

*: data available for two years, **: data available for one year (analysis is not possible).

Note: mean values are (tables 17 to 19): the simple mean and the mean discarding outliers outside the 1σ range; percentages in the "within / total" column were rounded.

Table A16: Decomposition analysis, imported inputs in gross output, 1995-2005

	MIO (Narrow)				MIO (Broad)			
	within	between	total	w / tot (%)	within	between	total	w / tot (%)
Argentina**				na				na
Australia*	-0.2672	-0.2160	-0.4832	55	-0.1796	-0.2156	-0.3952	45
Austria	-0.0429	0.4883	0.4453	-10	2.5112	0.6095	3.1208	80
Belgium	-1.1745	-0.2959	-1.4704	80	2.2255	0.1928	2.4183	92
Brazil	0.0644	0.1312	0.1956	33	0.8897	0.4413	1.3310	67
Canada*	-0.2977	-0.3082	-0.6059	49	1.0678	-0.7065	0.3613	296
China	0.7355	0.6363	1.3718	54	2.6370	0.8762	3.5132	75
Czech Republic*	0.0871	0.4709	0.5580	16	-0.3193	1.0384	0.7191	-44
Denmark	0.1768	-0.2437	-0.0670	-264	3.7374	0.1176	3.8550	97
Estonia	1.5938	0.3710	1.9647	81	-0.1055	0.9811	0.8756	-12
Finland	0.5196	0.2819	0.8015	65	2.5917	0.7332	3.3249	78
France	0.0474	-0.2301	-0.1828	-26	1.6425	-0.1701	1.4725	112
Germany	1.0697	0.2506	1.3203	81	2.7496	0.6273	3.3770	81
Greece	0.2000	-0.4566	-0.2567	-78	1.1283	0.7172	1.8456	61
Hungary	0.4385	1.6879	2.1264	21	2.7318	2.0631	4.7949	57
India*	-0.1195	-0.0208	-0.1403	85	0.7070	0.0808	0.7878	90
Indonesia	-0.4470	0.4611	0.0141	-3172	0.2209	1.3942	1.6151	14
Ireland*	1.2567	0.5220	1.7787	71	3.3005	0.9050	4.2056	78
Israel**				na				na
Italy	-0.4576	-0.3142	-0.7717	59	0.0495	-0.4254	-0.3760	-13
Japan	0.1187	0.0346	0.1532	77	1.8999	0.2158	2.1156	90
Luxemburg	5.5735	5.1407	10.7142	52	9.7033	3.1731	12.8765	75
Mexico**				na				na
Netherlands	1.3288	-0.3841	0.9447	141	1.1652	-0.3984	0.7668	152
New Zealand*	-0.3961	-0.0455	-0.4416	90	0.6338	-0.2869	0.3469	183
Norway*	0.2409	-0.2540	-0.0131	-1839	-0.2645	-0.5874	-0.8519	31
Poland	1.7977	-0.1880	1.6097	112	4.8272	-0.4694	4.3577	111
Portugal	0.5271	-0.6944	-0.1673	-315	1.0612	-0.1807	0.8805	121
Russia*	0.0292	0.0676	0.0968	30	0.9907	-0.2290	0.7617	130
Slovak Republic*	1.8324	0.7706	2.6030	70	5.2555	1.4077	6.6632	79
Slovenia*	-0.2289	-0.1350	-0.3639	63	2.2372	-0.1639	2.0733	108
South Africa*	0.6685	0.0272	0.6957	96	2.0515	-0.0553	1.9962	103
South Korea**				na				na
Spain	-0.2193	-0.3349	-0.5542	40	2.0372	-0.3398	1.6975	120
Sweden	0.1161	0.1748	0.2909	40	1.2758	1.0856	2.3615	54
Switzerland**				na				na
Taiwan*	-0.1619	0.1850	0.0231	-701	-0.2897	0.6420	0.3523	-82
Turkey*	0.6287	-0.1877	0.4410	143	0.6018	-0.0742	0.5276	114
UK	-0.0240	-0.6698	-0.6938	3	0.0905	-1.1268	-1.0363	-9
US	0.3110	-0.0942	0.2169	143	1.5500	0.1156	1.6656	93
	Mean			*-130*	*Mean*			*78*
	Std. dv.			*634*	*Std. dv.*			*66*
	Mean (no outliers. 1σ)			*14*	*Mean (no outliers. 1σ)*			*84*
	Std. dv. (no outliers 1σ)			*160*	*Std. dv. (no outliers 1σ)*			*28*

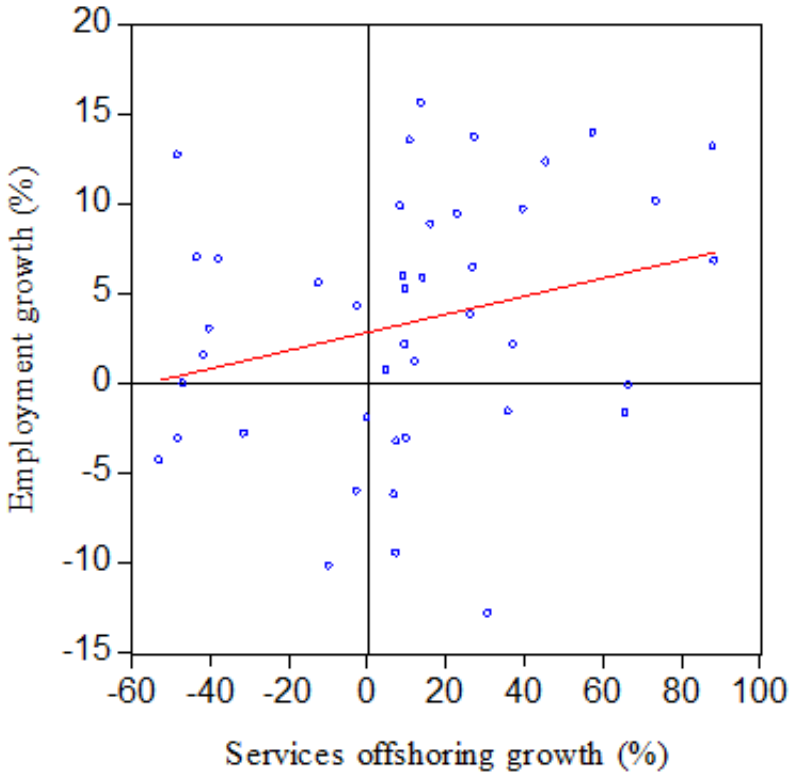
*: data available for two years, **: data available for one year (analysis is not possible).

Table A17: Decomposition analysis, vertical specialization index, 1995-2005

	VS (Narrow)				VS (Broad)			
	within	between	total	w / tot (%)	within	between	total	w / tot (%)
Argentina**				na				na
Australia*	-0.5108	-0.1905	-0.7013	73	-0.6594	0.0751	-0.5844	113
Austria	-0.0453	-1.4306	-1.4759	3	2.1175	-1.8478	0.2697	785
Belgium	-2.2944	-2.1671	-4.4615	51	0.7353	-2.2069	-1.4715	-50
Brazil	0.5007	0.2532	0.7539	66	1.4871	0.4190	1.9060	78
Canada*	0.4811	-1.3220	-0.8409	-57	3.6740	-1.2130	2.4610	149
China	2.9832	3.5949	6.5781	45	5.0992	3.8155	8.9147	57
Czech Republic*	1.2764	2.6085	3.8849	33	-2.6268	4.9281	2.3013	-114
Denmark	0.3208	-0.4816	-0.1608	-200	10.8362	0.8056	11.6418	93
Estonia	3.5333	2.7930	6.3262	56	2.1908	4.6265	6.8172	32
Finland	1.1170	2.4645	3.5815	31	3.0967	3.9795	7.0762	44
France	0.2772	-0.1769	0.1003	276	2.7779	0.6595	3.4374	81
Germany	1.8038	-0.2454	1.5584	116	4.2324	0.4893	4.7217	90
Greece	0.5575	-0.2882	0.2693	207	6.8463	6.2969	13.1432	52
Hungary	-0.4698	2.9915	2.5216	-19	5.6152	2.6838	8.2990	68
India*	-0.2771	0.1931	-0.0840	330	1.8100	-0.0452	1.7648	103
Indonesia	-0.8917	0.5330	-0.3587	249	0.0956	2.1048	2.2003	4
Ireland*	0.9677	-0.2887	0.6790	143	8.3549	-0.2379	8.1170	103
Israel**				na				na
Italy	-0.5799	0.3443	-0.2356	246	-1.3823	1.0836	-0.2987	463
Japan	1.2546	0.1892	1.4438	87	4.0419	-0.2432	3.7987	106
Luxemburg	8.1131	3.1232	11.2363	72	11.5174	1.4987	13.0161	88
Mexico**				na				na
Netherlands	1.9126	-1.0023	0.9103	210	1.5954	-0.4441	1.1513	139
New Zealand*	-0.4736	0.1910	-0.2826	168	0.2953	0.0549	0.3502	84
Norway*	0.3226	-1.2092	-0.8866	-36	0.1486	-3.6288	-3.4802	-4
Poland	4.6428	0.9592	5.6019	83	8.8862	1.1156	10.0018	89
Portugal	1.1508	0.2301	1.3808	83	2.3076	1.4303	3.7379	62
Russia*	0.2678	-0.5154	-0.2476	-108	0.9281	-0.7812	0.1469	632
Slovak Republic*	3.7937	4.0369	7.8306	48	10.9572	6.9237	17.8809	61
Slovenia*	-0.9836	-0.3576	-1.3413	73	2.6694	-0.7388	1.9306	138
South Africa*	0.6078	0.3944	1.0022	61	3.0844	0.2665	3.3509	92
South Korea**				na				na
Spain	-0.2415	-1.2003	-1.4418	17	1.1465	-1.7745	-0.6280	-183
Sweden	-0.3771	-0.1786	-0.5557	68	1.5458	1.4426	2.9884	52
Switzerland**				na				na
Taiwan*	-0.0300	0.8174	0.7874	-4	-0.2774	1.7220	1.4446	-19
Turkey*	1.6307	-0.5740	1.0567	154	1.8637	0.0141	1.8778	99
UK	0.4444	-1.2659	-0.8215	-54	0.2490	-2.2562	-2.0072	-12
US	0.5739	0.3364	0.9102	63	1.6329	0.8781	2.5110	65
	Mean			*75*	*Mean*			*104*
	Std. dv.			*110*	*Std. dv.*			*180*
	Mean (no outliers. 1σ)			*66*	*Mean (no outliers. 1σ)*			*69*
	Std. dv. (no outliers 1σ)			*46*	*Std. dv. (no outliers 1σ)*			*48*

*: data available for two years, **: data available for one year (analysis is not possible).

Figure A1: Services offshoring and employment growth worldwide, 1995-2000



Note: weighted values across industries worldwide. Three outliers removed (2σ range).