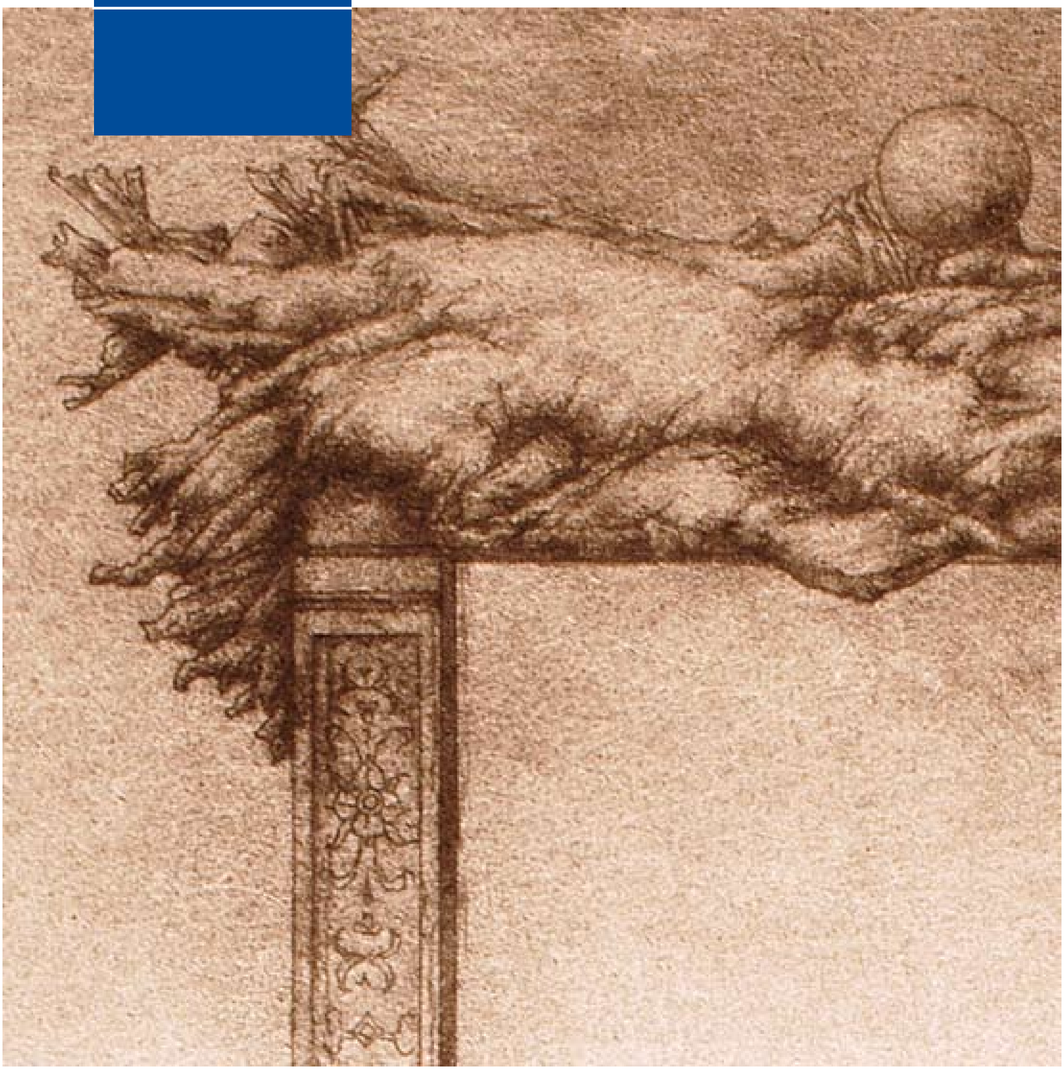
OFFSHORING IN THE GLOBAL ECONOMY

Management Practices and Welfare Implications

Joan E. Ricart (Ed.)

Fundación BBVA



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CATALOGUING-IN-PUBLICATION DATA

Offshoring in the global economy : management practices and welfare implications / edited by Joan E. Ricart ; Pablo Agnese, Niccolò Pisani, Tunji Adegbesan — 1.ª ed. — Bilbao : Fundación BBVA, 2011.
322 p. ; 24 cm
ISBN: 978-84-92937-03-5
1. Globalización 2. Estructura de producción
I. Ricart, Joan E., II. Agnese, Pablo, III. Pisani, Niccolò, IV. Adegbesan, Tunji, V. Fundación BBVA, ed.
338.33

First published in February 2011

ISBN: 978-84-92937-03-5
LEGAL DEPOSIT NO.: M-5222-2011

EDITION AND PRODUCTION: Grupo Ibersaf

PRINTED BY Ibersaf Industrial, S.A.

Printed in Spain

This book is produced with 100% recycled paper made from recovered fibres, in conformity with the environmental standards required by the current European legislation.

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Introduction

BROADLY defined, *offshoring* refers to a company's practice of migrating activities to offshore locations outside of its country of origin (Venkatraman 2004). Companies have traditionally adopted an offshore strategy for manufacturing work and blue-collar jobs, especially those in Western economies. However, recent advances in information and communication technologies (ICTs) have significantly lowered the so-called cost of distance (Ghemawat 2007) and provided new opportunities to create value remotely (Zaheer and Manrakhan 2001; Zaheer and Zaheer 2001), leading to the emergence of a novel type of offshoring. Companies now have the potential to relocate worldwide business processes that until recently were considered to be classic white-collar jobs performed exclusively in the home country. Among these business activities are call-center customer support, transaction processing, and data management, to name a few.

Although this second wave of offshoring was first limited to the migration of contact centers and administrative and IT functions, it now increasingly includes product development activities such as R&D, product design, and engineering services. The relocation of these activities, conventionally considered to be the critical value-generating activities of most enterprises, represents a major geography-related change in the organization of corporations (Venkatraman 2004). As a matter of fact, this increasing phenomenon has rapidly attracted the attention of the business world, wide media coverage, and diffuse political concern (Blinder 2006; Engardio, Bernstein and Kripalani 2003; Hamm 2007; Hubbard 2006; Mankiw and Swagel 2006; Taylor 2006).

Low-cost emerging economies provide competitive alternative destinations for Western companies to relocate many value activities that could previously only be performed in the home country (Farrell 2004; Karmarkar 2004). The more pessimistic Western analysts have suggested that the migration of these white-collar jobs to offshore countries is the beginning of an ill-fated service revolution that could hamper developed economies, both socially and economically (Levy 2005; Samuelson 2004). The more optimistic analysts, on the other hand, focus instead on the increasing opportunities available to Western companies to boost their profits, and to their Western workers to upgrade their capabilities and remain competitive in a globalized labor market (Bhagwati et al. 2004; Farrell 2005; Feenstra and Hanson 1996a, 1996b, 1999).

The offshoring of manufacturing facilities and blue-collar jobs has been extensively studied by management and economics scholars, and is central to several international business theories on the foreign direct investment of firms (Hennart 1982; Johanson and Vahlne 1977; Buckley and Casson 1976). With the current offshoring wave, after an initial period of limited consideration, scholars are now increasingly directing their research efforts towards this emerging phenomenon (Amiti and Wei 2005, 2006; Doh 2005; Farrell, Laboissière and Rosenfeld 2006; Parkhe 2007). In fact, a number of *Special Issues* focusing on this subject have recently appeared in leading journals. However, it has not been easy to develop a formal and widely accepted definition of offshoring. Let us now look at why this is.

The term *offshoring* is generally used to describe a multitude of scenarios, and different authors provide different definitions of the term (Jahns, Hartmann and Bals 2006). The lack of a widely accepted definition certainly represents a barrier to the development of homogeneous incremental contributions aimed at furthering our understanding of this new phenomenon. For instance, Farrell et al. (2006) call *offshoring* the business practice that focuses on the relocation of labor-intensive service industry functions to locations remote to the business center, while Robinson and Kalakota (2004) assert that offshoring is often used simply as a new term for outsourcing to very remote locations.

Three main areas of debate can be identified, especially in the managerial field. First, when talking about offshoring, some authors automatically exclude the relocation of manufacturing activities, restricting their focus to highly skilled service functions. While the majority of authors explain this restriction by providing a historical evolution of the international relocation of activities (Bunyaratavej, Hahn and Doh 2005; Dossani and Kenney 2003;

Stringfellow et al. 2008), others associate the term offshoring directly with the relocation of service activities (Farrell et al. 2006; Robinson and Kalakota 2004).

Second, scholars often talk about offshoring only when the activities being relocated migrate from high-cost Western countries to low-cost geographically distant regions (Blinder 2006; Farrell et al. 2006). Although recent research confirms that this represents the bulk of the migration occurring, we should remember that companies also relocate their activities to closer countries that offer comparatively lower costs or better resources and that such migration should be considered part of the current offshoring phenomenon. As for cost differentials, it is misleading to reduce the offshoring wave to a migration from high-cost to low-cost countries. Indian companies, for example, have already started reinvesting their earnings in foreign countries by opening subsidiaries in key areas of the United States in order to exploit potential knowledge spillovers, increase their legitimacy within the industry, and thus attract more U.S. clients. As for the European Union, Southern and Eastern European countries represent a near-shore competitive alternative for several Northern European companies that prefer to relocate their activities closer to their business centers (Marin 2006).

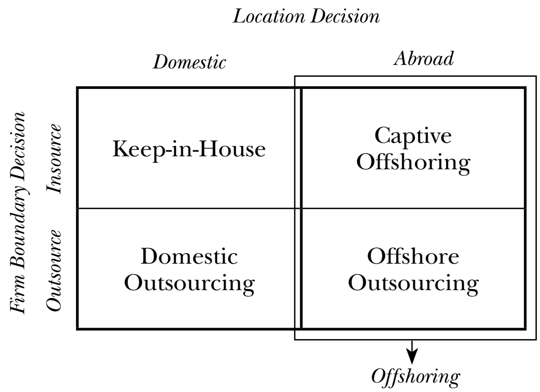
Third, many authors restrict offshoring to the international outsourcing of activities, thus excluding the *captive solution* as an offshoring alternative. It is true that the topic of *offshoring* is "deeply interrelated with the make-or-buy decision, as sourcing decisions in general have their origins in make/buy alternatives" (Jahns et al. 2006, 218). However, significant confusion arises from the lack of consensus on the terminology used. Outsourcing, a practice that currently represents a very important strategic option for companies (Gottfredson, Puryear and Phillips 2005; DiRomualdo and Gurbaxani 1998), basically consists of turning over selected parts of a firm's processes or functions to an external third-party provider for an agreed period of time, usually for at least few years, in exchange for monetary payments (Dutta and Roy 2005; Pfannenstein and Tsai 2004). When the third-party provider is located in a foreign country, the terms generally used to describe this case are *international outsourcing*, *offshoring out-*

sourcing, or *cross-border outsourcing* (Arons, Clemons and Reddy 2005; Doh 2005; Dutta and Roy 2005). Although limiting their research to the international outsourcing of services, some authors (Kedia and Lahiri 2007) acknowledge that the spectrum of alternatives includes the practice of firms of setting up their own centers in foreign countries through *captive offshoring*, while others simply define *offshoring* with the international outsourcing alternative (Pfannenstein and Tsai 2004). This is particularly common in the information systems and operations management literature.

In summary, there is currently a lack of consensus on the terminology used to describe the increasing phenomenon of offshoring, most likely as a direct consequence of the early stage of the offshoring literature. The hope is that as the field consolidates, scholars will increasingly adopt a uniform terminology that will ease the understanding of the different contributions on the subject and, most importantly, lead to comparability across studies.

As already stated, *offshoring* can be defined as a company's practice of migrating activities to offshore locations outside of its country of origin. This definition is usually found in most of the studies associated with both the managerial and economics fields. Later, we will see that from an empirical standpoint, there are some differences worth noting between these fields. Figure 1 offers a schematic representation of a general definition of the term that is shared by both fields.

FIGURE 1: Offshoring definition



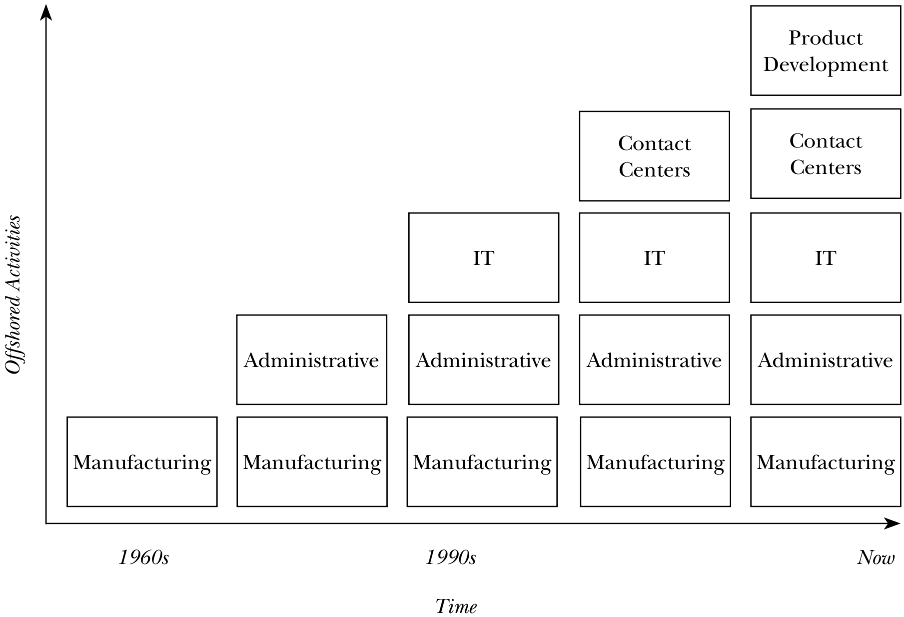
Clearly, offshoring *per se* does not represent anything new in the international business scenario. In fact, Western companies started migrating manufacturing work and blue-collar jobs long ago. What is more recent is the shift abroad of a series of white-collar business processes that until a few decades ago could only be carried out in the home country (Dossani and Kenney 2006).

Recent technological developments have provided companies with new opportunities to create value by globally relocating individual activities where they can be most efficiently executed (Zaheer and Manrakhan 2001; Zaheer and Zaheer 2001). Although functions like call-center customer support or transaction processing have been traditionally performed at home, recent technological advances have made it possible for companies to relocate them offshore. Foreign locations, such as India or China, were selected on the basis of their capacity to offer well-trained workers that perform these tasks as well as, if not even better than, the corresponding white-collar workers at home, while offering more competitive wages. The term *business process offshoring* (BPO) has thus been increasingly used to refer to the practice of moving ICT-enabled back-office business processes to offshore locations, usually at a low-cost (Dossani and Kenney 2003).

Starting with the relocation of fairly commoditized functions, companies soon discovered the potential of these unexploited pools of talents (Farrell 2004). Thus, they have rapidly started offshoring more complex and knowledge-intensive activities. Figure 2 summarizes insights from recent research (Dossani and Kenney 2003, 2006; Lewin and Peeters 2006b, 2006c) documenting the rapid inclusion of product development activities (i. e., R&D, product design, and engineering services) in the offshoring wave.

This finding is consistent with other studies by Dossani and Kenney (2007), Henley (2006) and Levy (2005) and corroborate that North American and Western European companies, which are responsible for most of the world's offshoring practices (Agrawal, Farrell and Remes 2003; Marin 2006), are increasingly moving higher-skilled knowledge-intensive activities abroad.

FIGURE 2: Offshoring activities



Main sources: Dossani and Kenney 2003, 2006; Lewin and Peeters 2006a, 2006b.

Parallel to these studies, other streams of the international management literature are increasingly focusing on the management of geographically distributed virtual teams (Metiu 2006; Hinds and Bailey 2003; Hinds and Mortensen 2005) and on the consequential creation of 24-hour knowledge factories (Gupta and Mukherji 2007), where high-talent professionals work on a project around the clock, taking advantage of the different time zones of their respective offshoring locations. The increase in offshoring of higher-value activities is also confirmed by anecdotal evidence regularly published in the general press (Anderson, Cienski and Condon 2006; Wighton 2006).

This book is organized into two parts. Part one presents an economic perspective on the subject of offshoring, while part two presents a management-oriented perspective.

The economic perspective section starts with some measurement observations in chapter 1. We will see here that it is not easy to measure offshoring directly, and may be more advisable to do so indirectly. Indeed, it is through the import content of trade that we usually get a comprehensive measurement of offshoring. Chapter 2 reviews the fundamental economic literature. Here we will show the heterogeneity of the contributions in the literature, and the ambiguity of the results. For the ease of exposition, we have divided contributions into those concerned with aggregate data (e. g., country, industry) and those dealing with disaggregate data (e. g., firms, individuals). Chapter 3 presents the evolution of materials and services offshoring over the past few decades. To do this, we rely on data from different countries using the Organisation for Economic Co-operation and Development (OECD) database (recently released) for the years 1995, 2000 and 2005. These data show that large economies have low-intensity indices on offshoring. First places are dominated by very small countries, but some special cases, such as Germany, Canada or Spain, are highlighted. As expected, offshoring is more consolidated in manufacturing industries than in service industries. Furthermore, service offshoring, while much smaller than material offshoring, is growing faster. Chapter 4 goes one step further and deals with the impact of offshoring on employment through econometric analysis.[1] Offshoring has a direct negative impact on employment but also has an indirect positive impact through improvements in productivity. The impact that ends up dominating is an empirical issue that we will look at in this chapter. Contrary to common belief, the net employment effects of offshoring are negligible. On the other hand, positive productivity effects are potentially achievable. We conclude the economic perspective in chapter 5, with some reflections on the underlying socioeconomic debate on offshoring.

The second part of the book deals with the management perspective. In chapter 6 we provide a review of the literature on this

[1] Here we present the case for Japan, since other works have already covered other major economies (e. g., the United States, Germany, France, United Kingdom or Spain).

phenomenon and, again, have found a world of diversity. We will see, however, that the case study approach has become a major methodology on the subject so far. In chapter 7 we report the main findings of the Offshoring Research Network (ORN) (an international network of researchers and practitioners to which our own group of researchers belongs) in a comparative fashion covering the United States and several major European economies. Chapters 8 and 9 study the drivers of service offshoring in the United States and European Union, respectively. U.S. data come from foreign direct investment *(FDI)* information and looks at the increasing role of knowledge seeking versus efficiency seeking in the rationale for offshoring. The E.U. data comes from the ORN and looks at the increasing scarcity of talent and the corresponding global sourcing as a motivation for offshoring of high-value-added service activities. Chapter 10 uses local data from the ORN survey to study the evolution and prospects of offshoring in Spain. We close the second part of the book with chapter 11, where we offer some reflections on the capability development needed in companies to effectively deal with the increasingly important phenomenon of the offshoring of service activities. Finally, we present some concluding thoughts about the book.

PART ONE

SOCIOECONOMIC EFFECTS OF OFFSHORING

1. Measurement and Effects

A new and innovative way of doing business has emerged in recent times: offshoring. Usually offshoring comes hand-in-hand with some degree of outsourcing, so it is common to find real-life combinations of both business practices. All too often, the mass media warns us of the dangers these new practices could bring to globalized economies. These widespread fears entail, above all, the millions of jobs soon to be moved from developed economies to less developed ones or, more frequently, from high-wage to low-wage countries. Consequently, the underlying perspective here coincides with that of labor economics. We are interested in dissecting the insights gained from specialized literature while trying to assess offshoring and its relationship with labor markets. But first we have to define the concept as understood within the economics discipline.

Offshoring, and its related counterpart, outsourcing, have long been in practice, mainly in the form of *comparative advantages*. If we define *offshoring* merely as the relocation of jobs outside of the national boundaries in search of lower wages, we can see how this eventually exploits comparative advantages through a cheaper workforce and cost savings. More precisely, *offshoring* refers to the geographic location where the service or production takes place, whereas *outsourcing* refers to the ownership of the means of production (in-house or third-party). In this context, we have become familiar with terms such as *offshore outsourcing* (or *international outsourcing*) and *in-house offshoring*. These can also be referred to as *offshoring* in the broad and narrow (or strict) sense, respectively.

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

These are interesting questions, but our focus lies mainly on labor issues. For this subject, empirical works have failed to provide a definite and clear answer. As proven by the relatively scarce, yet increasing, literature produced to date, the subject remains somewhat of a mystery. Therefore, a thorough review on the evolution of the offshoring phenomenon and the methodologies involved, as well as the controversies surrounding the issue, is needed. For instance, properly measuring offshoring is still a difficult task when it comes to applied research.

In recent times it has been customary to interpret offshoring in terms of international trade, particularly intermediate trade (inputs), whether at the industry or firm level. For this purpose, a series of indices have been developed to account for the phenomenon in an extensive and somewhat homogeneous way. Despite their limitations, all of these indices attempt to explain the process of offshoring through the import content of domestic variables such as total production or total inputs (Feenstra and Hanson 1996a, 1996b; Hummels et al. 2001, among many others). As a result, it is also possible to split the previous definition into the concepts of *material (or production) offshoring* and *service offshoring*. Both are, respectively, the imported content of materials and services in the total production or total use of inputs.

The main concerns within the economics literature have to do with potential dislocations within labor markets and the resulting social unease. So far, these effects have been analyzed in terms of employment and productivity, yet the evidence still proves to be lacking and inconclusive. With the implementation of homogeneous indices it is easy to overcome issues of comparability. However, as the subject reaches new horizons and different levels of aggregation are considered (e. g., industry, firm, establishment), the results become less and less comparable. This does not prevent, however, the realization that employment effects may not be so negative (or of a considerable size), while on the other hand productivity gains seem easily achievable.

It is therefore important to ask questions that could shed some light on the elusive subject of offshoring and its consequences. For instance, does the statement "bigger countries offshore the most" hold true (see Amiti and Wei 2005)? If we stick to our previously mentioned definition, we might discover that smaller countries are more dependent on intermediate trade. Furthermore, does the manufacturing sector hold more weight over the services sector when it comes to offshoring? And what about the different kinds of offshoring that are taking place? Do material and service offshoring differ much in their reach? Moreover, what is to be said about the prophecy that service offshoring is the messiah of a new technological revolution (Blinder 2006)? A statistical analysis of this sort will help us frame the issue more clearly for what comes next.

Additionally, an econometric analysis will provide solid ground for dissecting the employment and productivity effects of offshoring. For employment issues in particular, the literature has evolved towards different research interests. At first, studies focused on explaining the differences offshoring presented in terms of relative wages or employment shares of different skilled workers. Later, once offshoring was better defined, empirical efforts headed towards a more direct understanding of the phenomenon. What is the real impact of offshoring at the aggregate level? Should we expect productivity gains as a natural result? These two questions are the underlying riddle of the first part of this book.

1.1. Measurement

How should we define offshoring in empirical terms? In other words, how can we estimate the theoretical definition of offshoring in a quantitative manner? Roughly speaking, offshoring can be measured directly or indirectly, yet the lack of reliable official records suggests that indirect measures should be considered to a greater extent. Furthermore, given our research objectives and data constraints, we might want to look at data from a variety of levels including industry, firm, plant, or even individual. Of course, a somewhat *washed out* effect of offshoring is expected as we consider higher levels of aggregation, so the final effect would be the change in composition of employment among sectors. Conversely, the greater we look in detail (e. g., establishment level), the more offshoring would be negatively related to employment in the short term.

Media noise surrounding the subject of offshoring is constantly setting new trends and reshaping the way we do business. Occasionally, it even changes the way policymakers address the issue, out of fear of political backlash. News about millions of jobs moving abroad can set off alarms in the political arena, or cause *animal spirits* to shake the economy unnecessarily in the private sector. We have a legitimate reason to believe that numbers and estimates should be looked at with special care.

Indeed, with offshoring the observer can change the object he or she observes.[2]

1.1.1. A word about data quality

In the modern age of high-speed communications, words often lose their meaning and numbers can be misinterpreted. This is a pernicious yet natural side effect of globalization, and compels us to further analyze available data to get a clearer picture of the phenomenon. Raw data are sometimes difficult to access, and with the little we are able to obtain, relevant facts can often remain hidden. Before going over the different kinds of measures that could better approximate offshoring through indirect indicators, we will outline several data sources and their reliability.

Kirkegaard (2007) breaks down data sources for offshoring into three empirical hierarchies. The lowest tier encompasses the estimations and projections made by consulting companies. Although these reports (Forrester 2004; McKinsey 2003, for instance) seek to set new trends using continuous feedback with the private sector, they often have a limited scope and are lacking in methodology. These studies often show selection bias in the interviews, and a resulting lack of representation in those small samples. A notable example is that by Forrester Research (2004), which forecasts that 3.3 million U.S. jobs will move abroad by the

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

year 2015. But 3.3 million is peanuts compared to the 160 million U.S. jobs projected by the Bureau of Labor Statistics to be available for the same year, and the 35 million jobs already created over the last decade in the U.S. labor market.

The second tier of data includes estimates made by the press, usually using public and verifiable sources. Once a company makes a decision and is ready to implement it, it usually announces its plans publicly as part of its marketing campaign. However, in recent times and because of the negative connotation that equates offshoring with job loss, companies are more reluctant to publicize job shifts to foreign countries. In a related matter, politicians' attention to offshoring is closely connected to the electoral cycle. Mankiw and Swagel (2006, 1030) unearthed a clear pattern of the ups and downs of offshoring and outsourcing in four major U.S. newspapers. According to the study, interest sharply peaked before the 2004 election, only to drop to previous levels immediately afterward. In general, while not perfect, press releases represent 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 discussed in section 1.1.2 are at the top of this ranking. As shown, official country records and renowned international organizations like the International Monetary Fund (IMF) or the OECD, supply the raw data needed to develop a reliable indirect measure of offshoring. Although academic research to date lags behind that presented by the other two sources, it has recently been shown to be fairly productive and with many research possibilities. Let us now turn to studying the tricky issue of measurement.

1.1.2. Measuring offshoring: indirect indicators

Assessing the direct impact of offshoring on labor markets is a difficult, if not impossible, task. Just imagining what it would take to come up with a direct and comparable index for all industries (not to mention all firms) feels like a hopeless endeavor. A lack of official data and an ambiguous understanding of the subject pose the principal obstacles. The exhaustive OECD report (2007) lists most of the known direct and indirect measures of offshoring, yet as we will see, indirect measures may be more suitable (or feasible) for research purposes.

Proposed direct indicators of offshoring, using the 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 identify changes in any of these variables due to the relocation of workers. Keep in mind that creating new foreign jobs alone, without reducing domestic activity, is not a representation of 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 takes into account the many drawbacks in using direct measures to gauge the impact off offshoring on labor markets. Aside from the fact that some data might overlook drops in the number of jobs due to offshoring, other important limitations exist. According to the OECD, some of these are: changes in the classification of firms, problems with confidentiality, subcontractors that go abroad with their clients, and successive small-scale relocations.

Let us move on to examine the main indirect indicators proposed in the literature. An important decision researchers frequently face is choosing the level of aggregation to study. This is a bit arbitrary since, as mentioned previously, the more in depth we go the more we expect to find a negative relationship between employment and offshoring in the short-term. Furthermore, when looking at firm or establishment data, it is important not to lose sight of ownership status. As we later proceed to review major empirical contributions, we will see that offshoring measures are plentiful and not particularly homogeneous, especially at the disaggregate level. On the other hand, more aggregate figures may not take into account certain industries or companies that show a higher propensity to offshore. These phenomena are commonly referred to as *aggregation* and *sector bias.*[3] Nevertheless, most of the

[3] For sector bias see Arndt (1997, 1998, 1999). Factor bias is yet another idea that refers to the propensity (or bias) of certain production factors to be outsourced. For instance, low-skill activities are more prone to go offshore due to potential labor cost gains (Feenstra and Hanson 1996a, 1996b, 1997, 1999). Also, see Kohler (2001) for a specific-factors view on outsourcing. See also Krugman (2000) and Leamer

time the analysis is constrained by data availability, and the picture sometimes gets blurry when handling extremely disaggregated data. Next, we will consider in detail several industry-level measures. These measures were formerly conceived, display certain homogeneity, and set a trend for future empirical works, for any level of data.

A benchmark contribution in the literature is Feenstra and Hanson (1996a, 1996b, 1997, 1999). In their work, *offshoring* is defined as the share of intermediate inputs in the total purchase of nonenergy inputs. They combine U.S. import data from the four-digit Standard Industrial Classification (SIC) with data on material purchases from the *Census of Manufactures*. The census data crisscross the trade between industries of the same level and provide the basis for estimating the share of intermediate inputs in every industry. For a given industry, multiplying the industry's input purchases from each supplier industry by the ratio of imports to total consumption in the supplier industry, and then adding over, results in their offshoring measure. More formally, their formula can be written as follows:

$$OI_{it} = \sum_{j}^{n} \left(\frac{I_{jt}}{Q_j}\right)^{i} \left(\frac{M_{jt}}{D_{jt}}\right) \tag{1.1}$$

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. This would remove the trouble of developing a deflator for value-added activities.

Formula (1.1) provides an index of the offshoring intensity at the industry level. It indirectly measures the import content of intermediate trade of industries which, in turn, indirectly measures their offshoring intensity. Specifically, the first term in formula (1.1)

(1998) for studies on relative factor price adjustments due to either factor or sector bias.

stems from the census data (or input-output tables), while the second term, which is an economy-wide import share, is obtained from trade data. Conveniently, this expression serves as a measure for both the traditional offshoring of materials and the more fashionable offshoring of services (yet Feenstra and Hanson confine their analysis to the former).

It is also useful to split offshoring into narrow and broad measures. The narrow measure is restricted to imported intermediate inputs from the same two-digit industry, whereas the broad measure includes all other industries as well. In addition, the difference between broad and narrow measures, which represents all imported intermediate inputs from outside the two-digit purchasing industry, is an alternative when it comes to capturing the true nature of offshoring.

But why should we use this particular definition? Nowadays, importing trade represents an important amount of intra- and interfirm trade. It is then a fair proxy of offshoring while data are relatively easy to find. However, a common drawback to all measures relying on 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 drop in exports. Likewise, an increase in a country's imports due to more favorable terms of trade should not be linked in any way to an expansion of offshoring from local firms. In the next section, we will show that the analyses by Feenstra and Hanson have motivated many others in the years following their studies. The basic idea of their work is that it is the composition of trade, and the share of intermediate inputs in particular, that matters in the end for wages and employment. In their own words, "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, 1).

Many of the latest Heckscher-Ohlin type of trade models that consider a positive welfare effect of offshoring (yet ambiguous effects on factor prices) use Feenstra and Hanson's analysis as a starting point.[4] The debate here continues, as Feenstra and Hanson claim that wage differentials might follow after "factor-bias in technological change" has taken place. Other views hold sector bias as the driving force behind wage differentials (see Arndt 1997, 1998, 1999).

Campa and Goldberg (1997) put yet another spin on the story. They define an index of *vertical specialization* for several countries, underpinning the share of imported inputs embodied in production, but also remarking on 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.

$$VS^{l}_{it} = \sum_{j}^{n} \frac{m^{*}_{jt}(p_{jt}\, q_{jt})^{i}}{Y^{i}_{t}} \tag{1.2a}$$

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 developed the measure of vertical specialization to account for the imported input content of exports at a country level,[5] using the OECD input-output database for a sample of several countries. They conceived their definition as imported inputs used only to elaborate products to be exported later, which is tantamount to saying "the foreign value-added embodied in exports." A modified formula for the industry level would be, then:

$$VS^{2}_{it} = \sum_{j}^{n} \left(\frac{m_{jt}}{Y_{t}}\right)^{i} X_{jt} \tag{1.2b}$$

[4] 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). In these models factor-price effects are the result of factor intensity.

[5] A clear interpretation of the concept of vertical specialization is provided in figure 1, p. 26, of their paper.

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 matters, in the aggregate the expression is normalized by total exports. As is 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. Further, 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 considers 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:

$$OI_{it} = \underbrace{(Z_t^i)}_{A} \underbrace{\left(\frac{M_t^{world}}{Y_t}\right)^i}_{B} \underbrace{\left(\frac{M_t^{EE}}{Y_t^{world}}\right)^i}_{C} \tag{1.3}$$

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 Eastern 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, three categories of offshoring indices could be classified as follows: 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 of these measures are usually estimated at a certain level of aggregation (country or industry),[6] yet the literature has recently taken a widespread plunge into disaggregated data, which moves the analysis away from input-output tables. Of course, future research around these measures is expected to be more dehomogenized as a result of an increased sharing of studies being conducted at a disaggregated level. In these studies, evidence shows a pronounced heterogeneity about how to define offshoring.

Examples of these three indices are, respectively, equations (1.1), (1.2) and (1.3). Broadly speaking, all existing measures at the industry level would fall to some extent into one of the three groups. Horgos (2008) considers two additional measures that are not reproduced here: indices considering imported inputs in total imports, and those considering the value added in production. He shows that these two perform rather poorly in a comparative study that considers all five types of indices. We undertake a similar decomposition analysis in chapter 3 to gauge the suitability of the proposed indices.

In their simplest expressions, and upon availability of intermediate input data, equations (1.1) and (1.3) can easily be reduced to:

$$(a)\ OI_{it}^{Q} = \sum_{j}^{n} \left(\frac{m_{jt}}{Q_t} \right)^{i} \text{ and } (b)\ OI_{it}^{Y} = \sum_{j}^{n} \left(\frac{m_{jt}}{Y_t} \right)^{i} \tag{1.4}$$

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 (1.4) is simply the diagonal element of the import-use matrix. Most of the time it is not possible to use such simple expressions as in (1.4) 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

[6] 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 is undertaken in a later section.

intermediate inputs) so far. That is why the numerator in (1.4) is usually estimated through trade data, as in (1.1) and (1.3).

1.2. Possible effects of offshoring

Offshoring has been around to some degree since the concept of economic advantage was first mentioned by Adam Smith and then further elaborated by David Ricardo.[7] In fact, comparative advantages are believed to feed the *animal spirits* that eventually move Smith's invisible hand; this does not apply to local business-people alone but to international trade as well. Ricardo successfully showed how specialization and trade would allow two nations producing the same output in isolation to produce more output using the same factor inputs as before. The importance of Ricardo's argument about comparative advantages could be summarized as follows: in doing what they do best, individuals, businesses, and nations can trade for the rest, therefore achieving efficiency and securing economic growth.

So, how is offshoring related to the good old concept of comparative advantages? It is becoming evident with globalization that countries with less expensive labor are enjoying a comparative advantage in labor-intensive industries. On the other hand, countries displaying a larger pool of skilled workers, and thus higher relative wages, are prone to developing a comparative advantage in capital-intensive industries. In such a context, barriers to factor mobility, and especially to the labor factor, are surely to be expected because of friction between and within countries. Arguably, the subject goes beyond the realm of economics and touches both domestic and international politics. It therefore becomes very important for the political layer of international economies to size up the potential gains from offshoring. Accordingly, national governments could simply stay away and adopt a *hands off* policy in order to let the *invisible hand* lay out the basis for the countries' comparative advantages. Before going into depth about measurement

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[7] The quintessential references are, of course, "The Wealth of Nations" (1776) and "On the Principles of Political Economy and Taxation" (1817), respectively.

issues, let us spend a moment or two on the possible outcomes for employment and productivity.

1.2.1. Employment effects

Employment goals and unemployment reduction policies are at the top of government political agendas. Unemployment is one of the most important challenges an individual has to face. A person without a job is stripped of the skills that define him or her as a useful member of society. We believe that studying the channel through which employment is impacted by business decisions is well worth our while.

The 2007 OECD report describes offshoring as the result of the interactions between direct investment, subcontracting with nonaffiliated firms, and international trade. Furthermore, it lists all the known short-term employment effects, which can be negative or neutral, direct or indirect. Negative effects occur when a company stops any of its activities in the home country, only to create or subcontract them abroad. Neutral effects cover cases in which direct investment or subcontracting takes place independently of the company's operations at home. Direct effects, such as outright layoffs, are easy to identify, whereas indirect effects are more subtle. For instance, some local subcontractors might be compelled to follow their client abroad, thus potentially aggravating the downturn in domestic employment. Another important indirect effect is that generated by intrafirm trade between companies and their foreign branches. Cheaper intermediate inputs are now available and have come to replace the production previously carried out within national borders. As we will see later, this rationale is embedded in all indirect measures that try to estimate offshoring effects.

If we set a timeline the following premise holds true: the shorter the term considered, the greater the risk of job losses. As a result, this would likely have a negative impact on people's opinion about offshoring. The challenge, then, is to realize the full benefits of offshoring and to be explicit about them, since many of these benefits usually go unnoticed and are not necessarily related to people whose jobs have been lost. This is part of the current heated debate in politics, the big business arena, and the media. However, we might yet discover that offshoring has more to do with plain economics than with business strategies or political conundrums.

In fact, it is possible to conceive offshoring as the utmost modern expression of economic trade (Mankiw and Swagel 2006), and even in this light it still has a long way to go in order to grow to full maturity. There are, to date, a vast amount of services that would fall under the category of *potentially offshoreable.* It is indeed reasonable to think that a wider range of tradable goods and services means increased welfare one way or the other. Presumably then, there will be more social benefits to seize when offshoring *really* takes off. But this welfare improvement comes at the expense of short-run unemployment due to friction in the labor markets. In the immediate term, these social costs might even be greater than the benefits that stem from wage savings and a higher productivity rate.

So, the assumption that offshoring may increase welfare is a reasonable one as it makes previously nontraded services into tradable ones. This also provides opportunities for cheaper imported products and services to flood the economy, that is, the same products and services previously produced locally. The harmful effects of an expanding world supply of information technology for the terms of trade of the *source* country have often been argued. Bhagwati et al. (2004), for example, assert contrarily that this hardly describes the reality of offshoring. Countries like China and India are most likely to remain focused on low-end information technologies already exported to more developed countries.

Additionally, we can see how services are becoming a determinant player in this second-generation offshoring (which took over after a first generation chiefly centered on production), since they naturally represent a higher added value. Service activities also imply a considerable dynamic not seen with materials, and this might translate into employment opportunities being fulfilled more rapidly. But let us be clear, not all services can be offshored nor is every service bound to move abroad immediately.

On the other hand, we must not forget that the dynamics of globalization and offshoring is a two-way street or, rather, a multiple-lane highway linking far-off economies. Indeed, inshoring can occur at the same time with the expected positive employment effects. Relative comparative advantages lead us to believe that provided the country is (relatively) more developed, jobs created domestically would be higher-value and better paid jobs. As mentioned previously, this transition is not without a temporary adjustment, and if imperfect information or other imperfections should arise, frictional unemployment would follow. But, alas, structural unemployment would also sneak in as an uninvited guest. Not only might unemployment occur because of the movement of people between jobs, but also because of the mismatch between the types of jobs available and the skills of the people looking for them. It is then the structure of the economy that decides the extent and nature of the benefits of offshoring (see Bhagwati et al. 2004; and Samuelson 2004, for somewhat opposing views).

Would more flexible markets adjust more easily to exogenous shocks brought about by offshoring? Under this perspective we might presume that Anglo-Saxon labor markets with their flexible institutions and lenient employment laws ought to enjoy the benefits of offshoring more rapidly. On the other hand, continental European countries have more powerful institutions, such as larger labor unions and strict employment laws, both of which would deter the full potential of productivity gains.[8] Seemingly, labor institutions might affect comparative advantages and trade flows among countries (Helpman and Itskhoki 2009). Empirical evidence on this regard, however, is far from definitive.[9]

Therefore, we may ask ourselves if there is any role for the government, aside from unemployment insurance, to cope with the problem of unemployment in a more efficient and sophisticated way. In other words, how can we figure out the existing mismatch while easing the hardships faced by those workers displaced as a result of offshoring? We will discuss this in chapter 5.

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[8] See for instance the different measures of labor market flexibility developed by Botero et al. (2004).

[9] See, for example, the study by Jensen et al. (2006). A more formal approach is the one by Helpman and Itskhoki (2009), which builds on previous studies on trade and unemployment.

1.2.2. Productivity effects

This section focuses on the mid- to long-term, once companies begin to reap the harvest of offshoring. It is understandable to see why this stage of offshoring commonly escapes the news headlines, as positive effects on employment might take some time to take effect. But the truth is, employment gains and wage increases always follow productivity improvements, and the extent of the final effect would depend on the firms' wide array of determinants (the scale, the level of capital intensity, existing international links, and experience or know-how, to name a few). All of these determinants play their part in capitalizing on offshoring.

Employment creation in the shortest term (if any) as a result of productivity gains is understood as taking place in a different sector or, at least, a different activity undertaken by the same firm. Indeed, when firms become more productive they can produce with less (not more), be that capital or labor, while workers are faced with a real threat of unemployment. However, in the longer term, offshoring firms are faced with the scale effect. That is, offshoring-related productivity increases can make firms more efficient and competitive after a while, increasing the demand for output and exerting a positive effect on labor. See Olsen (2006) for a complete account of offshoring and productivity.

If we consider reducing wage costs as the main reason to offshore, we must seriously think about the price cuts likely to take place at home once savings abroad have been achieved. This can take a few months or even up to a couple of years, but it would eventually affect domestic demand and, as expected, the demand for labor. Other drivers of offshoring might exert some pressure on productivity—perhaps not as direct as with wage costs—yet in the end, it is all about improving efficiency and productivity. However, the technology channels through which further productivity gains are possible for offshoring companies remains, as these provide access to a larger variety of imported goods and services. Companies engaged in these practices can obtain more advanced technologies more rapidly through imported inputs. This transfer of technology could open new business opportunities, leading to an increase in domestic employment.

In particular, the demand for labor is a derived demand since it originates in the demand for the goods or services produced by a company. This means that the strength of the demand for any kind of labor depends on the ability to produce a product or service and its market value. The demand for labor depicts the relationship between the quantity of labor demanded by companies and the wage rate they have to pay, all other factors equal.[10] Additionally, profit maximization constitutes the primary goal for competitive companies and compels entrepreneurs to strive for the highest productivity rate. This implies finding productive and efficient workers who are willing to work for the least remuneration. Therefore the demand for labor increases, for labor as an input is necessary for production, as are other inputs.

Inefficient or expensive activities could then be offshored and made efficient and much less expensive, enabling companies back home to move to other business fields where comparative advantages are more important. The creation of new firms (and the destruction of old ones) as well as potential spillovers are often linked to Schumpeter's theory of *creative destruction*. Certain jobs, however, remain restricted to international mobility, as they have security issues that are difficult to cope with at a distance. But as long as there are inefficiencies or higher than bearable costs, offshoring is there to foster the needed gains in productivity.

The different features among world labor markets and their different capacities to absorb these productivity improvements deserve wider attention. Labor markets mainly adjust through wages and employment (price and quantity). In essence, the more flexible wages are, the quicker the adjustment. Since wages are usually inflexible, most of the adjustment happens by outright layoffs (quantity). This is often the case in most Western countries, where strong labor unions commit themselves to maintaining the wages of their members, in keeping up with the inflation brought about by government intervention. In this manner, wages are said to be downwardly rigid.[11] Thus, if the labor force displays great mobility,

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[10] A complete analysis on the demand side of the labor market is found in Hamermesh (1993).

[11] In general, labor market rigidities can be either nominal or real, and can be explained through several theories. Nominal rigidity theories are those concerning

the better the employment level in the economy. Also, a more educated and trained workforce clearly helps make workers more flexible and adaptable to occupational changes (Blinder 2006).

The lack of relative importance for wage flexibility should make policymakers focus intensely on *labor turnover costs*, which consist of hiring and firing costs. These are the in-and-out doors of the labor market, and, if not tended to adequately, could become rusty. Therefore, if economies let both costs grow significantly, it would hinder labor flexibility and possibly productivity and employment (Henry et al. 2000; Karanassou and Snower 1998).

It is now clear that concerns about employment and productivity cannot be separated when dealing with offshoring. This holy trinity, as we shall see in chapter 2, is becoming a new creed in the fields of international and labor economics and in many areas of management. For the latter, potential language and cultural short-circuits are particularly interesting. We will now review the major studies in economics.

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menu cost, wage-price staggering, and production lag models. Real wage rigidities cope with efficiency wage models (moral hazard and adverse selection) and insider-outsider models (individualistic and union bargaining). Both theories are known as "market nonclearing" theories, since according to their model labor markets do not clear and unemployment can rise involuntarily.

2. Making Sense of the Literature and Its Results

IN new the review presented here, we have attempted to provide the most important contributions on the subject of offshoring and outsourcing and their effects on the labor market, and as such, some studies have been excluded. A complete account on the subject would be impossible and would not make sense. We have identified several groups of studies: the earlier works concentrate on aggregate data alone, while the later contributions are broadly separated into aggregate and disaggregate evidence. Attention should be paid to the fact that all of the references cited below might belong to different strands of literature, perhaps with slightly different research goals and definitely with disparate data constraints. However, as we advance in this review, we will see how the evidence focuses on labor demand factors, since labor supply factors do not seem to play any major role in explaining, for instance, the relative changes in wages or employment as a result of offshoring.[12] Also, these relative changes in the labor market are thought to take place mostly within the same industry, and not between industries. Reasonably enough, displaced workers would expect to find related jobs within the same branch of activities as the posts held before. More recently, a more direct effect of offshoring on labor markets is being studied. As a result, only a small effect of offshoring is expected, if any, since it is total employment that occupies people's attention (see Bhagwati et al. 2004).

[12] This could refer to changes in the relative supply of skilled to unskilled labor. Evidence so far proves that a worldwide increase in this ratio is not reflected by a decline in relative wages, thus discarding the hypothesis of supply-side effects on wage inequality. See Strauss-Kahn (2004, 13).

2.1. First steps

Perhaps the first studies formalizing a link between offshoring (formerly *foreign outsourcing*) and employment are those by Berman et al. (1994), Krugman (1995), Lawrence and Slaughter (1993), Leamer (1994), Siegel and Griliches (1992), and Slaughter (1995). In fact, a great part of this literature attempts to explain shifts in labor demand and their composition through variables other than total factor productivity (TFP). Thus, it is possible to avoid an overstatement of TFP while explaining, for instance, wage inequality or changes from nonskilled toward skilled labor. One way to widen the scope is by taking into account previously overlooked variables, for example, purchased services, foreign outsourcing, or investments in computers, which can now be added to the analysis. Subsequently, the offshoring phenomenon and its relationship with employment (and unemployment) evolved to become a central issue in the trade and labor literature. Let us go then through some of these initial attempts. Tables 2.1 and 2.2 summarize the evidence presented in the next few sections.

Siegel and Griliches (1992) estimate foreign outsourcing using product and material data from the *Census of Manufactures* and trade data from the NBER. They calculate the shares of all products in the industry's total cost of materials, and multiply each share by its corresponding import share. The latter is the imports to domestic demand ratio. Next, they produce an estimate of foreign materials after adding these values. Their correlation analysis at both the industry (450) and establishment (20,000) level for the U.S. manufacturing sector alone, suggests that the recovery in measured productivity during the 1977–1982 period can hardly be attributed to foreign outsourcing. More generally, "an industry's propensity to outsource is unrelated to its acceleration in productivity" (Siegel 1992). They hint that the measured improvements in productivity overestimated real productivity growth because of trends in foreign outsourcing, among others.

Using U.S. data drawn from the *Annual Survey of Manufacturers*, Berman et al. (1994) frame their definition to include only parts and items bought abroad, while excluding contract work. This definition limits itself to foreign activities of multinational companies and solely involves material offshoring. According to this measure, the real impact of offshoring could be at times underestimated. In investigating the shift in demand from unskilled to skilled labor in 450 four-digit U.S. manufacturing industries during 1979–1987, they discovered that foreign outsourcing does not explain the bulk of the observed change. Relying on a translog cost function estimation and direct evidence on R&D and computer investments, they concluded that biased technological change embedded in the massive introduction of computers during the 1980s explains much of the skill upgrading. Berman et al. (1997) updated their previous calculations to confirm that outsourcing cannot be responsible for the bulk of the observed changes in U.S. employment.

TABLE 2.1: Offshoring on employment, wages, and productivity
(selected works)

Work (year)	Country	Sample	Sector[a]	Period	F-H index[b]	Analytical framework[c]	Dependent variable	Effect OSS[d]	
Siegel and Griliches (1992)	U.S.	392 industries	M	1959–1986	✓	Correlation analysis	–	0	0
Berman et al. (1994)	U.S.	450 industries	M	1959–1987	0	Translog cost, share eq.	Relative employment	0	0
Slaughter (1995, 2000)	U.S.	32 industries	M	1977–1989	0	Translog cost, share eq.	Relative employment	0	0
Feenstra and Hanson (1996a)	U.S.	450 industries	M	1959–1987	✓	Translog cost, share eq.	Relative employment	✓	0
Feenstra and Hanson (1996b)	U.S.	450 industries	M	1972–1990	✓	Translog cost, share eq.	Relative employment	✓	0
Feenstra and Hanson (1999)	U.S.	447 industries	M	1979–1990	✓	Translog cost, share eq.	Relative employment	✓	0
Amiti and Wei (2006)	U.S.	450 industries	M and S	1992–2000	✓	Cobb-Douglas PF, LD	Productivity and Employment.	✓, 0	✓
Canals (2006)	U.S.	27 industries	M and S	1980–1999	✓	Translog cost, share eq.	Relative wages	✓	0
Crinò (2010)	U.S.	58 occupations	M and S	1997–2006	✓	Logit, Probit	Transition probabilities	✓	✓
Girma and Görg (2004)	U.K.	19,000 est.	M	1980–1992	0	Reduced form/PF	Offshoring/Productivity	✓	✓
Amiti and Wei (2005)	U.K.	78 industries	M and S	1995–2001	✓	LD	Employment	0	✓
Criscuolo and Leaver (2005)	U.K.	35,000 plants	M and S	2000–2003	✓	PF	Productivity	✓	✓
Hijzen et al. (2005)	U.K.	50 industries	M	1982–1996	✓	Translog cost, share eq.	Relative employment	✓	0
Egger et al. (2003)	Austria	38,000 wrkrs.	M	1988–2001	✓	Multinomial logit	Transition probabilities	✓	0
Egger and Egger (2003, 2005)	Austria	21 industries	M	1990–1998	✓	General equilibrium	Relative employment	✓	0
Strauss-Kahn (2004)	France	50 industries	M	1977–1993	✓	Translog cost, share eq.	Relative employment	✓	0

TABLE 2.1 *(cont.)*: **Offshoring on employment, wages, and productivity**

(selected works)

Work (year)	Country	Sample	Sector[a]	Period	F-H index[b]	Analytical framework[c]	Dependent variable	Effect	OSS[d]
Geishecker and Görg (2005)	Germany	1,612 wrkrs.	M	1991–2000	✓	Wage equation	Relative wages	✓	0
Görg and Hanley (2005)	Germany	80 plants	Elec.	1990–1995	✓	LD	Employment	✓	✓
Cadarso et al. (2008)	Spain	93 industries	M	1993–2003	✓	LD	Employment	✓, 0	0
Ekholm and Hakkala (2006)	Sweden	20 industries	M and S	1995–2000	✓	Translog cost, share eq.	Relative employment	✓, 0	0
Hakkala et al. (2007)	Sweden	15,000 firms	M and S	1990–2002	0	LD	Employment	0	0
Head and Ries (2002)	Japan	1,070 firms	M	1971–1989	0	Translog cost, share eq.	Relative employment	✓	0
Tomiura (2005)	Japan	118,300 firms	M	1998	0	Survey/Reduced form	Offshoring intensity	–	0
Hijzen et al. (2006)	Japan	12,564 firms	M	1994–2000	0	PF	Productivity	✓	0
Ito et al. (2007)	Japan	5,500 firms	M	2006	0	Survey	–	–	✓

[a]M: manufacturing; S: services; Elec.: electronics; [b]Feenstra-Hanson index or similar; [c]PF: production function; LD: labor demand; [d]Offshoring of services.

Note: The column labeled "Effect" refers to the effect of the offshoring variable on the dependent variable (✓ = significance; 0 = nonsignificance).
Source: Agnese (2010).

TABLE 2.2: Use of different indices of the Feenstra-Hanson type. Empirical evidence (selected works, mostly aggregate evidence)

Imported inputs in total inputs	Imported inputs in output	Vertical specialization
Feenstra and Hanson (1996a, 1996b)	Siegel and Griliches (1992)	Campa and Goldberg (1997)
Feenstra and Hanson (1999)	Egger and Egger (2003, 2005)	Hummels et al. (2001)
Amiti and Wei (2005, 2006)	Geishecker and Görg (2005)[a]	Strauss-Kahn (2004)
Criscuolo and Leaver (2005)[a]	Hijzen et al. (2005)	
Görg and Hanley (2005)[a]		
Canals (2006)		
Ekholm and Hakkala (2006)		
Cadarso et al. (2008)		
Crinò (2010)[a]		

[a] Disaggregate studies.

Slaughter (1995) focuses on inputs bought by U.S. manufacturing multinationals from their foreign subsidiaries alone. He employs data from the *Bureau of Economic Analysis* for the period 1977–1989, which tracks U.S. multinationals (from 1,300 to 1,800) and their foreign affiliates (6,500 to 9,500). Under the presumption that multinationals engage in a substantial amount of offshoring, this makes sense, but ignoring trade with independent foreign suppliers could be a little restrictive. The differentiation Slaughter makes between these practices and plain international trade is worth mentioning. Whereas the former entail the creation of new traded goods within industries (rather than across them), a large participation of multinational firms, and a strong involvement of *FDI,* the latter need not. His estimated cost functions dismiss the hypothesis that U.S. multinationals were strongly engaged in outsourcing practices during the 1980s and, therefore, that outsourcing contributed significantly to increasing income inequalities. Slaughter (2000) provides further evidence against the hypothesis that transfers by multinational enterprises contributed to U.S. skills upgrading within industries. This, he suggests, "is inconsistent with models of MNEs in which affiliate activities substitute for parent unskilled-labor-intensive activities" (Slaughter 2000, 467). A strong policy implication of this finding, he argues, is that restrictions on outward *FDI* would do little to deter skill upgrading within U.S. industries.[13]

2.2. A breakthrough

Feenstra and Hanson (1996b, 1997) produced evidence for the first time in favor of a shift towards skill-intensive activities within domestic industries due to foreign outsourcing. Their rationale is: if firms respond to import competition from low-wage countries by moving nonskilled intensive activities abroad, then trade has to shift employment toward skilled workers in the domestic economy. In contrast to previous efforts, the authors contend that former calculations might have underestimated the real extent of outsourcing. They provide several reasons for this in one of their papers (Feestra and Hanson 1996a, 19), yet conclude that the way one defines the concept remains most important. In another paper (Feestra and Hanson 1996b), in turn, estimations suggest that foreign outsourcing, as defined in equation (1.1), can explain up to 31 percent of the increases in nonproduction wage share during the 1980s for the 450 U.S. manufacturing industries. The methodology here is rather similar to that in Berman et al. (1994), yet with a more sophisticated definition of foreign outsourcing. Conveniently, Feenstra and Hanson (1999) go even further and break this measure down into narrow and broad variations. The use of these new measures delivers adjusted estimates on the effect of foreign outsourcing on the shift in labor demand. Total outsourcing (the narrow measure plus the difference between narrow and broad) now accounts for 13 to 23 percent of the shift toward nonproduction labor, which is still a significant number.

At the time of the Feenstra and Hanson analysis, several authors in the international trade literature chipped in with some interesting suggestions. For instance, Campa and Goldberg (1997) were interested in the role of exports, imports, and imported inputs, in

[13] Krugman (1995) was yet another economist at the time arguing that outsourcing and *FDI* through multinationals firms were too small to account for the observable changes in wages and employment.

the external orientation of a reduced group of countries during the 1980s and 1990s. Casting their doubts on the reliance of commonly used *openness to trade* indicators, they came up with their own measure of vertical specialization. Even though a little off the subject, their measure in equation (1.2a) is useful for checking (international) vertical integration at the industry level, within and across countries. In particular, *vertical integration* describes a type of managerial control where companies share a common owner while producing different products or services, or rather, are in charge of different production stages. Their empirical survey highlights the remarkable differences in the use of imported inputs among the industries of these countries which, they argue, can be explained by differences in the endowments of raw materials. For the four countries of the study, Canadian and U.K. industries display higher export shares and imported input shares than the United States. The Japanese economy, on the other hand, has fewer of these industries oriented to exporting, but these are rather intensive.

Along similar lines, Hummels et al. (2001) conceived a definition of vertical specialization, as in (1.2b), defined as imported inputs used only to produce products to be later exported. In other words, their measure picks up the foreign added value embodied in exports. This supports the idea of undertaking this business practice for cost-advantage reasons, since exporting sectors must remain competitive internationally. They present evidence for various countries based on OECD input-output tables and reveal that, as of 1990, vertical specialization represented 20 percent of exports in the OECD countries. This figure even reached 40 percent in smaller countries (Ireland, Korea and Taiwan). Their simulation analysis shows that smaller countries trade a larger share of output and vertically trade a larger share of total trade, concluding that country size can affect the extent and composition of trade. Not surprisingly then, the vertical specialization share of countries such as the United States and Japan are to be found among the smaller ones. In turn, a model of multi-stage production shows that for any given decline in trade barriers, trade and the gains from trade are greater with vertical specialization.

The selected evidence in section 2.3 refers to a series of studies that appeared in the following years, as inspired by their benchmark predecessors. It is by no means conclusive, but is elaborated empirically and with a wider research agenda.

2.3. Some aggregate evidence

Egger and Egger (2003) put forward the case of Austria, reasoning that, until now, the literature has neglected highly unionized economies. They assert that more pronounced employment effects are to be expected in continental Europe as a result of offshoring. The impact of trade liberalization between Western Europe and Eastern economies after the fall of the iron curtain are of special interest. Using a panel of 20 two-digit manufacturing industries for 1990–1998, they found that outsourcing to Eastern Europe was in search of low wages and due to decreasing trade barriers. In particular, their estimates resulted in a shift of relative employment of about 0.08 to 0.12 percent in favor of highly skilled workers, when considering a 1 percent increase in outsourcing to Eastern countries.[14] Furthermore, during the last decade, outsourcing to Eastern Europe explains one quarter of the changes in relative employment towards highly skilled workers.

Strauss-Kahn (2004) uses an index of vertical specialization for France in the spirit of Campa and Goldberg (1997). She uses data from the French National Institute of Statistics and Economic Studies (INSEE) for the period of 1977–1993. A cost-share equation of a translog function (e. g., Berman et al. 1994; Feenstra and Hanson 1996a, 1996b, 1999) is implemented to explain the decline in the within-industry share of unskilled workers in 50 French manufacturing sectors. When considering two subsamples, the data show that international verticalization explains 11 to 15 percent of the drop in the share of unskilled workers in manufacturing employment during 1977–1985, and 25 percent of the decline during 1985–1993.

[14] It is theoretically more appropriate to rely on relative wage changes, since it results from the cost-minimization problem of firms, usually embedded in a (translog) cost function. The focus on relative employment rather than relative wages could respond to particularly inflexible aspects of the labor market under study. See also, among others, the work by Strauss-Kahn (2004) for France.

Both benchmark contributions by Amiti and Wei (2005, 2006) build on the measure by Feenstra and Hanson on an industry basis. They put forth cases for the United Kingdom and the United States using conventional data from input-output tables and trade statistics from the IMF. Of note is the stress put on the increasing importance of service offshoring for both countries. Whereas material offshoring is still predominant, service offshoring displays a rather steep trend during the whole of the 1990s and early 2000s. They also produce an economy-wide measure for studying the cross-border pattern among a large list of countries, relying exclusively on the trade of computers (and information services) and other business services from the IMF *Balance of Payment Statistics Yearbook*. As the authors state, both of these trade categories are most likely to encompass offshoring activities. These measures provide interesting insights into the relative importance of the offshoring phenomenon worldwide, which are consistent with the analysis provided earlier by Hummels et al. (2001). In effect, when it comes to absolute numbers both the biggest outsourcers and insourcers are found among larger countries (United States, Germany, Japan, etc.). In turn, when relative figures are considered, smaller countries are at the top of the list (Luxemburg, Belgium, Ireland, to name a few). This leads the authors to ask what the biggest surplus countries are (net insourcing, or insourcing minus outsourcing), only to find that there is no clear pattern of countries being in net surplus or deficit for the business services considered. The United States, United Kingdom, India and China, among the larger, and Hong Kong, Singapore, among the smaller, all appear at the top of the list of net surplus countries.

Both studies by Amiti and Wei (2005, 2006) are among the first to introduce service offshoring into the econometric analysis, this time making use of a common empirical specification of labor demand (Hamermesh 1993) and taking into account its intrinsic endogeneity.[15] Amiti and Wei (2005) study the case of the United Kingdom, including data from 69 manufacturing industries and 9

[15] The final formulation can also be expressed in first-time differences to control for any time-invariant, industry-specific effects such as industry technology differences. However, concerns materialize when taking first-time differences, as they may induce measurement error, especially when variables are aggregated at the industry level.

service industries from 1995 to 2001. In general, after trying several specifications for both manufacturing and services industries taken separately, they discovered that the offshoring of materials and services do not have a negative effect on employment at the sectoral level. Nevertheless, in their companion paper Amiti and Wei (2006) show that if the U.S. economy is decomposed into 450 sectors, a negative effect on employment can be detected between the years of 1992 and 2000. When using a broader definition, they came up with 96 sectors and the effect of offshoring on employment disappeared. Furthermore, they found a positive effect of offshoring on productivity, ranging from 11 to 13 percent of the productivity growth accounted for by service offshoring and 3 to 6 percent by material offshoring. These two pieces of work discredit two common beliefs in the offshoring debate. First, most developed countries are not more outsourcing intensive (when adjusted by economic size) than many developing countries, and second, the effect of service and material offshoring (especially the former) on employment has been largely exaggerated.

Egger and Egger (2005) then tried to stress the interdependence among sectors of the economy in a general equilibrium setting. It is thus possible to find important feedback and spillover effects from specific industries engaged in offshoring towards those that are not. Decisions on whether to carry out an offshoring strategy depend on the production structure and factor intensities in other sectors. Therefore, if intersectoral multiplier effects are ignored, offshoring may be downward biased. They understand foreign outsourcing in a narrow sense (as described before), while spillovers of relative employment refer to the effects among industries due to changes in a particular industry. The transmission channels through which these effects might take place are specified through national input-output relationships that, in turn, enter the relative labor demand function as weights. These spillover effects can be of two kinds. First, international outsourcing practices by a certain industry that might cause an impact on another due to input-output linkages, and second, national labor flows across industries. Their estimations using a panel data set of 21 two-digit Austrian industries in the 1990s portray not only a significant and positive effect of offshoring towards highly skilled workers (9 to 10 percent), but an important role of intersectoral spillovers. The latter is argued to be of high importance in avoiding a substantial underestimation of the labor market effects of offshoring.

Hijzen et al. (2005) calculate their measure of international outsourcing directly from import-use matrices from U.K. input-output tables (*Office for National Statistics*). This provides a better estimation of offshoring compared with Feenstra and Hanson's estimation through trade data, since the measure is no longer driven by increased penetration of all goods, intermediates, and final goods. According to this, when a measure of offshoring includes final goods it may produce some bias. They argue too (like Feenstra and Hanson) that a narrow measure would be more suitable, as it comes closer to capturing the idea of fragmentation, which necessarily takes place within the industry. Since the shift in the demand for labor (from nonskilled to skilled) occurs largely within and not between industries, one should focus on changes of relative factor demand. Furthermore, the authors refer to the *New Earnings Survey Panel Data Set*, which allows a more accurate measure of skills than that often used in previous works. The authors used information directly linked to occupational classifications, as opposed to the standard division between production and nonproduction workers, which corresponds to the basic nonskilled/skilled classification. They extended the standard translog cost framework to analyze the impact of factor-biased technological change on relative labor demand for 50 manufacturing industries from 1982 to 1996.[16] In estimating a system of share equations (variable factor demands), the large set of elasticities produced show that international outsourcing has a strong negative impact on the demand for unskilled labor. Sometimes, the increase in the relative demand of skilled workers is bound to be interpreted as rising wage inequality, especially in highly flexible labor markets. In a related paper, Hijzen (2005) concentrates on the productivity effects of outsourcing on wages using the usual wage methodology.

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[16] Two measures of this factor-biased technological change are usually identified in translog function estimations: first, international outsourcing, and second, a measure of R&D intensity to ensure the international outsourcing variable does not pick up the effects of technical change.

To explain the relative increase in wages for highly skilled workers, Canals (2006) carried out an accounting decomposition that is analogous to the growth decomposition within the productivity literature. Therefore, this wage gap can be explained by shifts in international outsourcing (or outsourcing-biased technological change), shifts in biased technological change other than international outsourcing, and total technological change (which does not equal the sum of the former two). As opposed to the studies by Feenstra and Hanson, here offshoring or international outsourcing is a production factor and, thus, an endogenous variable. In spite of this, the author relies on Feenstra and Hanson's definition using data from the *Bureau of Economic Analysis* and the *Bureau of Labor Analysis* for both the U.S. manufacturing and services sectors. In a sample of 27 industries (18 manufactures and 9 services) the author finds that between 1980 and 1999, international outsourcing explained 28 percent of the observed wage change, while biased technological change explained 43 percent. These two forces, when considered together, explain 58 percent of the wage change, which is indeed a large share.

Ekholm and Hakkala (2006) elaborated the case for Sweden. Using direct information on imported inputs from input-output tables, combined with information from trade statistics, they developed indirect estimates of offshoring for different groups of countries. The authors considered both the narrow and broad measures developed earlier by Feenstra and Hanson. An innovative contribution turns out to be the additional use of a measure accounting for in-house offshoring or the transfer of production within multinationals. They produced a ratio between the number of employees in foreign affiliates of multinationals in a certain industry over the number of employees at the Swedish parent companies belonging to that same industry. A common short-term translog cost function is considered in the econometric analysis.[17] The results, using data from 20 industries for the 1995–2000 period, hint at an important contribution of offshoring (in particular in low-income countries) in the shift of relative

[17] Here, as in Hijzen et al. (2005), both international outsourcing and R&D intensity are used as the measures of factor-biased technological change.

labor demand away from the group of workers with a higher secondary education. They also found offshoring to high-income countries to be irrelevant and, most likely related to a more general fragmentation of production and not as the result of labor cost differentials.

Horgos (2008) discusses the case for Germany in a comparative study of different measures of offshoring: imported inputs in total inputs, imported inputs in gross output, vertical specialization, imported inputs in total imports, and value added in production. In essence, he assessed the performance of the most common measures in the literature in an applied study for Germany. The German Socio-Economic Panel and input-output tables of the Federal Statistical Office in Germany provided the data. Different estimations of a relative labor demand for 1991–2000 confirmed that results of different indices depend strongly on the level of industry aggregation. The wage differential per industry was used as an endogenous variable to estimate several regressions utilizing the five different indices. The regressions first considered the whole economy, then the manufacturing and service industries taken separately, and finally the high- and low-skill industries. The first three indices mentioned before perform much better than the other two when compared with previous evidence, yet the results provided were not significant.

Cadarso et al. (2008) come up with an empirical work for Spain and the employment effects of foreign outsourcing to Central and Eastern Europe (CEE). The authors in this study relied on domestic and import-use matrices of input-output tables to calculate Feenstra and Hanson's narrow measure of offshoring, in a straightforward fashion without using trade data. The narrow measure allowed for a two dimensional analysis, one related to global outsourcing for Spain and the other to outsourcing to different country groups. The narrow measure (in terms of output) was then further restricted to imports from CEE countries; in other words, it was weighted by the ratio of imports from CEE countries of a certain commodity relative to total imports of the same commodity. Several alternative estimations were presented of an augmented labor demand equation that comprises 93 industries for the 1993–2003 period. The findings suggest that the effect of outsourcing differs depending on the industry's characteristics and the country of origin. They also imply a negative effect on labor which was significant for medium- and high-tech industries (when outsourcing comes from CEE countries) while it is non-significant for other countries and low-tech sectors.

2.4. Some disaggregate evidence

The study by Head and Ries (2002) centers mainly around the influence of overseas production and offshore employment by Japanese multinationals on domestic skill intensity. They combine accounting data from the parent firm with information on foreign affiliates listed in *Japanese Overseas Investment* (Toyo Keizai, Inc.) in a panel of 1,070 firms between 1971 and 1989. To address the subject, they used data on foreign affiliate employment from companies in low-income countries. Purportedly, this type of outward *FDI* employment raises domestic skill intensity. Specifically, Head and Ries took the foreign affiliate share of firms' worldwide employment to come up with a definition of offshoring that can be plugged into a translog cost function equation. Results in a set of different specifications and samples show that changes in overseas employment shares can explain a 0.9 percentage point increase (9%) of the roughly 10 percent point increase in the share of nonproduction workers. Moreover, increasing domestic skill intensity proves to diminish as investment shifts towards high-income countries.

Egger et al. (2003) reviewed the effects of trade and outsourcing on the transition probabilities of employment between sectors. Data on Austrian male workers (around 30,000) between 1988 and 2001 are implemented in a dynamic multinomial logit framework, with a special focus on the short-term. Austrian social security records and trade data from Statistics Austria provided the data. This approach is useful for studying the transition probabilities of employment into other sectors, and accounts for intermediate steps into the pool of unemployed or out of the labor force. The results prove that international factors are important for labor market turnover, especially for what the authors call *industries with a comparative disadvantage* (net importing industries). They remark that increases in imports, terms of trade and, more importantly, the share of international outsourcing in total trade, negatively affect the probability of staying in or changing into the manufacturing sector.

Girma and Görg (2004) analyzed the decision to go offshore and the effect of this decision on the establishment's productivity in U.K. manufacturing industries. Since it is productivity they were interested in, the distinction between international and domestic outsourcing is superfluous. The *Annual Respondents Database* provided records of some 14,000–19,000 establishments in the United Kingdom for the period of 1980–1992. Here, offshoring is defined as the cost of industrial services received by every establishment in a certain period of time. This includes activities such as processing of inputs, which are sent back to the establishment for final assembly or sales, maintenance of production machinery, and engineering or drafting services. First, the authors looked at the determinants of outsourcing, and found a strong persistence in the decision to outsource and that foreign establishments outsource more than domestic ones, *ceteris paribus.* Second, the authors studied whether outsourcing indeed has a positive effect on the productivity of establishments. The estimation of both a labor productivity augmented function and a TFP function shows that outsourcing has significant as well as positive effects.

Similarly to Feenstra and Hanson, Criscuolo and Leaver (2005) chose to set their offshoring measure as the ratio of imported services to the total amount of nonenergy services purchased, leaving imported materials out for reasons of data availability. They use establishment data from the *Annual Respondents Database* and other official sources, for both the manufacturing and services sectors in the United Kingdom (approximately 35,000 plants) during a short span (2000–2003). It should be noted that the difficulty with their measure is that it is of a "catch-all" nature, which ignores heterogeneity in the services imported and heterogeneity across the countries where the services are imported from. In estimating an augmented production function, they determined that a 10 percent point increase in (service) offshoring intensity is associated with a 0.37 percent point increase in total factor productivity.

This effect comes mainly from domestic firms that are not globally engaged. Moreover, they found that multinationals are among the most productive firms, and the positive effects from offshoring obtained in the estimation cannot be deemed as driven by particular types of services or partner countries.

Geishecker and Görg (2005) discuss the common perception that growing globalization and particularly the increasing fragmentation of production, leads to wage for low-skilled workers. Defining offshoring (or international fragmentation) as the imported inputs share in the industry's output value, they carried out a study for the manufacturing sector including 1,612 individuals during the period between 1991 and 2000. Their data comes from the widely used German Socio-Economic Panel, which provides the means to estimate a log wage equation for all the individuals of the sample. The authors concluded that only low-skilled workers employed in low-skill intensive industries experience reductions in their real wages following fragmentation activity in those industries. The wage elasticity showed that a 1 percent point increase in fragmentation intensity leads to a reduction in average wages of 3.6 percent. On the contrary, highly skilled workers in high-skill-intensive industries might expect an increase of 2.7 percent in average wages due to a 1 percent point increase in fragmentation.

Relying on microdata from the *Irish Economy Expenditure Survey* (Forfás), Görg and Hanley (2005) take Feenstra and Hanson's ratio to the plant level. In this study, the measure of offshoring stands for the ratio of imported materials and the ratio of imported services inputs over total wages, for about 650 observations during 1990–1995. They employ this measure within the Irish Electronics sector alone, which, they argue, experienced rapid expansion in the last decade, with offshoring playing an important role. Their findings support the idea that this significantly decreases labor demand in the short-term, even though with "arguably some potential for employment switching among subsectors." Accordingly, the net effect of offshoring on employment is nonzero despite this potential intrasectoral employment switch. The estimation of labor demand functions provides evidence for this negative relation. The short-term elasticity of labor with respect to (total) offshoring suggests a fall of 0.27 percent in employment explained by a 1 percent increase in offshoring. They also report significant individual effects of material and service offshoring, with stronger effects seen with material offshoring. Elasticities were found to be –0.20 and –0.15, respectively.

Tomiura (2005) presents evidence for Japanese firms (a total of 118,300) in all manufacturing industries. He reasons that industry-level measures have contributed largely to the literature, yet reality shows that a vast majority of firms are not involved in offshoring at all. Deriving data from the *Basic Survey of Commercial and Manufacturing Structure and Activity*, it is possible to separate firms engaged in *international outsourcing* from those engaged in *domestic outsourcing*. The survey takes this into account with a direct question. Moreover, this powerful database does not impose any threshold on the firm sizes while covering all of the manufacturing industries. This work defines *foreign outsourcing* by the yen value outsourced to firms located overseas. The survey, despite its wide scope, reveals some flaws highlighted by the author. Among others, it is worth mentioning that the offshoring of nonproduction overhead services is not covered, and that contracting out to a company's own subsidiaries is not separated from plain outsourcing. However, this sample accounts for nearly 98 percent of all Japanese manufacturing firms that are not outsourcing any of their production overseas. The very few engaged in foreign outsourcing are those more likely to have a richer endowment of human skills or experience with *FDI*. Along the same lines, more productive firms or those whose products are more labor intensive, display more extensive outsourcing intensity across borders.

Hijzen et al. (2006) focus on the productivity effect in the Japanese economy. Offshoring intensity is represented in this study by the ratio of expenditure on the subcontracting of products, parts, and components to foreign providers to the value-added activities of the firm. Hence, they conclude that a 1 percent increase in offshoring intensity would increase productivity growth by 0.17 percent. Furthermore, for the average offshoring firm, this would imply a 1.8 percent increase in annual productivity growth that it would not have experienced had it not engaged in offshoring. They also found that the potential extent for productivity improvements depends negatively on the initial level of productivity of the firm. Thus, they suggest that "offshoring may be an effective channel in restoring the competitiveness of less productive firms" (Hijzen et al. 2006, 5). And also, "that specializing in skill-intensive production stages through offshoring generates higher growth in productivity due to larger learning-by-doing effects." (Hijzen et al. 2006, 7). On the same grounds, they found multinationals to be more important offshorers than purely domestic firms. Their study consists of firm-level data from 12,564 manufacturing firms during 1994–2000, taken from the *Basic Survey of Enterprise Activities*, and industry-level data from the Japan Industry Productivity Database 2006 (JIP 2006).

A study by Crinò (2010) is among the first empirical efforts to strongly commit to discerning the effects of service offshoring on U.S. white-collar workers. To estimate service offshoring, he relies on the share of each industry in the level of imports from a set of categories of private services. Under the restrictive assumption that this share is constant, it is then applied to the time series of imports of these services to produce a time-varying estimate of the level of services in certain industry. The services include: finance, management and consulting, insurance, industrial engineering, computer and information, maintenance of equipment, R&D, legal, business and technical, operational leasing, advertising, accounting, auditing and bookkeeping, telecommunication, and others. He presents a highly disaggregated set of estimated labor demand elasticities to services offshoring for 58 white-collar occupations in 144 U.S. industries for 1997–2002. This shows that service offshoring is skill-biased because, contrary to popular belief, it increases employment among highly-skilled occupations and lowers employment among medium- and low-skilled ones.

Hakkala et al. (2007) consider the ownership or change in the ownership of firms (from domestically owned to multinational, for example) as a major cause driving wage elasticities and employment in general. Indeed, there is a striking concern about how an increasing worldwide *FDI* is leading to a larger share of workers being employed by affiliates of foreign-owned multinational enterprises. They studied this *internationalization* of Swedish firms using official data from Statistics Sweden, and estimated the effects on employment and wage elasticities through dummy variables representing firm ownership, for a sample set of around 15,000 observations. Labor demand function estimations for 1990–2002 determined that are no differences between foreign and domestic firms, or between multinational and nonmultinational firms, with regards to wage elasticities in firms.

2.5. Main theoretical contributions

Kohler (2001) brings to light a theoretical attempt to step away from the series of Heckscher-Ohlin models and rely on a specific-factors model. Both Heckscher-Ohlin and specific-factors-type models show that the impact of international outsourcing on factor prices may be similar to the impact of sector- and factor-biased technological change. However, the assumption of perfect mobility for all factors in Heckscher-Ohlin models makes them more suited for long-term analysis. The paper highlights the costs of international fragmentation and thus the possibility of a reduction in welfare reduction in the home country. It also outlines the differences between outsourcing with and without *FDI* in terms of factor prices and income distribution. With *FDI,* domestic capital moves to work with foreign labor, thus creating the proper environment for domestic firms to capitalize on the cost advantage from offshoring. A two-sector model, one of which is a candidate for outsourcing, portrays an economy where labor is the mobile factor and capital is a sector-specific input. International fragmentation includes a fixed-cost element that implies that outsourcing may reduce welfare and that a discontinuity in domestic demand for foreign factors may arise; an equilibrium with outsourcing, therefore, may not exist.

Grossman and Helpman (2005) admit the difficulties and flaws implied by using indirect measures, although they assume that the trade of intermediate goods and business services is one of the most rapidly growing items in international trade. Thus, their definition of offshoring goes beyond the simple accounting exercise set by the purchase of raw materials and standardized intermediate goods. It also means finding the partners with which outsourcing or offshoring firms engage in bilateral relationships and all of the actions that come with it. They develop a framework to study firms' decisions about where to outsource using a two-country general equilibrium model. The choices for firms are either to seek partners in the technologically and legally advanced north or the low-wage south.[18] The main conclusion they draw is that uniform worldwide improvements in investment technologies have had, in general, no effect on foreign outsourcing. This is not so when disproportionate improvements in the south occur, where the model predicts shifts in outsourcing activity from the north to the south. These sorts of models embody hypotheses about the relationships among firms and partners, and are usually represented through the incomplete contract theory. Empirical results are still scarce in this line of research.

Bhagwati et al. (2004) outline three alternative models that reflect different aspects of trade in services. A first one-good two-factor model, where there is no initial motivation for trade, delivers the conventional welfare gains and distributive effects between the two factors when outsourcing is considered. In fact, outsourcing allows for trading labor services in exchange for the final goods. A second model with two goods and three factors shows that the country still wins from trade and outsourcing. The third model displays three goods and two factors, where two of the goods are traded and the third and nontraded good becomes tradable online. This results in welfare gains and both factors being better off, which opposes the tenet that outsourcing necessarily harms the real wages of particular production factors. In general, these models view offshoring as a trade phenomenon and, hence, beneficial overall. However, one cannot forget to take into account the potential effects of deterioration in the terms of trade and the concerns about displaced workers in certain sectors.

Davidson et al. (2006) discuss a narrow subject: the outsourcing of highly skilled jobs. Studying the differences in the wage levels for both types of workers, they focus on the relocation of highly skilled workers to low-tech jobs within the economy due to the

[18] Antràs and Helpman (2003) develop a similar model placing the stress on several organizational forms.

jobs being offshored to lower-wage countries. This switch in the behavior of these workers delivers interacting responses in their general equilibrium setting (consisting of a developed northern region and a not so developed south), with a favorable outcome to low-skill workers in the domestic economy. They also underline the proper modeling of labor market frictions, which should help in delivering such an outcome.

Karabay and McLaren (2010) describe globalization as, essentially, free trade plus outsourcing. The authors set up three different scenarios, each expanding on the previous one. Autarky, free trade (in which good markets are integrated but factor markets are not), and full integration (of good and factor markets) are the possibilities. Offshoring here refers to the passage from the second to the third state. Under a general-equilibrium perspective for a two-country model (United States and India), the authors investigated the volatility of wages and employment as an outcome of both free trade and outsourcing. In general, studies on how global outsourcing affects the volume of trade, wage levels, and environmental regulations abound. Nevertheless, little work exists on the implications of outsourcing for the variability (or volatility) of economic activity. Along more empirical lines, Bergin et al. (2007) study the case of the *maquiladora* outsourcing industries in Mexico and the relationships with their counterparts in the United States. The term *maquiladora* comes from the Mexican lingo for a foreign-owned factory in Mexico, at which, according to the Merriam-Webster dictionary, “imported parts are assembled by lower-paid workers into products for exports.” According to Bergin et al. (2007, 1), “the assembly plants, known as *maquiladoras*, are seen as a channel by which the U.S. exports to Mexico a portion of its employment fluctuations over the business cycle.” They were able to document a new empirical regularity: outsourcing industries in Mexico experience fluctuations in economic activity that are twice as volatile as the corresponding industries in the U.S.

Mitra and Ranjan (2007) analyze offshoring in a two-sector general equilibrium model. In this study, offshoring takes place when firms replace their home labor in production activities for imported inputs that happen to fulfill the same uses. With offshoring unemployment at the center of their study, the authors eventually found that contrary to the general perception, offshoring might produce the right conditions to bring about wage increases and a significant drop in sectoral unemployment, provided that there is labor mobility. They also hypothesized that sectoral unemployment might drop due to the entry of new firms brought about by offshoring.

Along very similar lines, the study by Rodríguez-Clare (2010) draws attention to the positive productivity effect associated with increased gains from trade, under a Ricardian analytical perspective. However, it also looks at the potential negative terms of trade effect linked to the vanishing effect of distance on wages. Also, the excess effects of fragmentation in the short-term, he concludes, lead to deterioration (improvement) in the real wage for the rich (poor) country. In contrast, the long-term analysis always proves to be beneficial for the rich country due to increased offshoring.

Egger and Kreickemeier (2008) introduced the idea of efficiency wages to a standard model of international fragmentation. Contrary to the general perception, their model suggests that outsourcing need not harm unskilled workers. In fact, it might reduce unemployment and at the same time reduce the skill premium if home production is sufficiently skill intensive overall. On policy implications, the study casts some doubts on the popular claim that increased international outsourcing makes scaling down the welfare state compulsory, to be sustainable in the global economy.

A further step in the theoretical literature considering the assumption of imperfect labor markets is that of Koskela and König (2008). In this study, the analysis mainly focuses on the concepts of strategic outsourcing and profit sharing, and the determination of equilibrium unemployment. Since profit sharing has been recently incorporated into compensation schemes and, curiously, follows the trend of increased international outsourcing, the authors deem it important to introduce the idea somehow. They show that the wage elasticity of labor demand depends positively on the amount of outsourcing and on the wage, but negatively on the size of profit sharing. Also, they argue that profit sharing could have ambiguous effects on equilibrium unemployment if the former constitutes an option for other outsourcing industries.

2.6. General appraisal

We will now comment on a few points. The first benchmark contributions appeared only at the industry level as a by-product of the trade and productivity-related literature. Unanimously, they found no decisive evidence of offshoring being a potential culprit of relative changes in employment composition or wage structure in the U.S. labor market. This was originally expected to have strong connotations for policymaking, since it encouraged a *laissez-faire* view on the subject, probably not to the liking of politicians.

The analysis by Feenstra and Hanson was the first to provide evidence suggesting that offshoring had some impact on the U.S. labor market. More precisely, they argued that international trade in intermediate inputs represents a possible candidate for explaining relative changes in the labor factor intensity. They developed a more sophisticated measure of offshoring that, according to them, avoids underestimating the possible (factor) bias towards highly skilled workers. In fact, their results suggest that an important part of the change in the employment of this type of worker can be explained by international outsourcing. This can also be interpreted as a factor-biased technological change, in the sense that high-skilled employment results favored after offshoring takes effect.

Particularly, Feenstra and Hanson draw their analysis from a Heckscher-Ohlin setting, seemingly defying the notion of cost-minimizing input substitution. Indeed, here an increase in the skill-intensity of production comes with an increase in the wage rate for highly skilled compared to low-skilled labor. Their answer for this is simple: offshoring. For example, if certain activities at the lower end in terms of skill intensity in the United States are offshored to Mexico, where they can be said to be in the upper end of the scale, then skill intensity increases in both countries. Therefore, an increased demand for highly skilled workers in both countries is accompanied by an increase in their relative wage, and offshoring becomes a form of factor-biased technological change.

Others measures of offshoring subsequently surfaced, especially in the international trade literature (Campa and Goldberg 1997; Hummels et al. 2001), which were later accepted in studies related to offshoring. All of these measures, along with Feenstra and Hanson's, showed some degree of reliability, yet emphasizing different features of intermediate trade as an indirect measure of *aggregate* offshoring. With a few exceptions, the aggregate evidence points to an influential role of offshoring (in a special form of trade) within the labor markets of developed economies. Also, evidence about a positive effect of offshoring on productivity has been produced.

Aggregation might yet hide the fact that even within the same industry there can be firms that engage in these practices more often than others (aggregation bias). Disaggregate evidence might therefore be helpful at this point, since it allows a more in-detail analysis. In general, these results confirm to a large extent the perception that low-skill workers are the most affected by offshoring practices, especially in low-skill intensive industries. One must be very careful at this point in defining the skill of the workers, since this too might disguise some relevant information. For instance, service offshoring is believed to affect high-skill employment, yet we might discover that that depends on what we consider to be highly skilled workers (see Crinò 2010). As with aggregate evidence, disaggregate evidence stresses the importance of offshoring for increases in productivity. However, even though the disaggregate analysis seems to provide a clearer picture of the phenomenon and its consequences over the labor market, some loss of homogeneity in the definition of offshoring is expected. *Offshoring,* as we can see, is defined slightly differently among research studies, and sometimes with little tangible consensus. Some disaggregate studies, however, still estimate *offshoring* as an aggregate measure (see for example, Geishecker and Görg 2005).

As for theoretical contributions, there still seems to be very few in comparison to empirical contributions. Furthermore, the literature is apparently veering off from original trade models like

Heckscher-Ohlin, to rely on more original or sophisticated general equilibrium models. There is an urgent need for more theoretical approaches which, even building on the simpler Heckscher-Ohlin model, could incorporate neglected particularities of the offshoring phenomenon and grasp the idea more closely. Another shortage in the literature is the lack of theoretical as well as empirical results concerning the offshoring of services, which has received much interest in recent years and is now being addressed empirically.

When using exhaustive databases, it is easier to carry out empirical exercises at a more disaggregate level. Attempts have even been made to assess the effect of offshoring on individual workers. These databases are not easily available, and when they are, they do not usually cover a long period. Despite the literature heading in this direction, there is still a long way to go before an unequivocal and solid conclusion is reached. Nevertheless, provided future evidence shows offshoring to be a major determinant of change in the labor market, it is not to say that as a consequence, government intervention should be required.

For the time being, in chapter 3 we will move on to an overview on the worldwide reach of the offshoring phenomenon at the aggregate level of the industry. We will review the most conventional indices the literature has produced so far, indirectly measuring offshoring intensities for a specific group of countries.

3. A World Overview

IT is now time to take a look at the data. In this chapter, we present country evidence from calculations based on the indices reviewed in chapter 1. As stated previously, aggregate figures can hide industries or companies showing a higher propensity to offshore. We are aware that this further aggregation (from an industry to country level) entails a higher degree of potential bias, but our aim is to produce data that are both reliable and comparable among countries, despite this empirical nuisance. We will now address several issues that have been touched upon in the literature. Our main focus will be the offshoring intensity among a representative sample of countries. The subject of *inshoring*, that is, foreign firms relocating subsidiaries domestically, will be excluded in the present study (see Amiti and Wei 2005).

The initial goal of this analysis is to see whether a pattern emerges with regards to offshoring and the relative sizes of countries, as done previously by Hummels et al. (2001) and Amiti and Wei (2005). At first, industries in larger and more industrialized economies would be expected to be relatively more prone to offshore. However, as found in both studies, here too offshoring intensity (as indirectly estimated by relative trade in intermediate goods) is inversely related to country size. Distinguishing the extent to which manufacturing and services industries engage in offshoring with a different intensity is also of interest. Traditionally, firms belonging to the manufacturing sector have been more inclined to offshore due to the kind of activities they undertake (i. e., manufacturing-related activities, which were initially easier to move abroad). Another step towards a further understanding of the offshoring phenomenon is the separation between materials and services offshoring. This directly relates back to the previous step, and the evidence to date suggests that services offshoring, while growing exponentially, is still in its first stages. We analyzed the evidence for these three empirical questions in the following sections. Additionally, we will 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 will provide a decomposition analysis to gauge the performance of the different indices.

3.1. Offshoring intensity and country size

We constructed a ranking system for the years 1995, 2000, and 2005, for a wide sample of countries, for which input-output tables from the OECD are available (tables 3.1 to 3.6). Three indices are reported, as defined earlier: imported inputs in total inputs, imported inputs in gross output, and a measure of vertical specialization.[19] The narrow measure considers only international trade among industries of the same classification as an indirect measure of in-house offshoring. This corresponds to the diagonal in the import use matrix. The broad measure, on the other hand, represents all trade, both intra- and inter-industry and, thus, is a rough approximation of offshore outsourcing or international outsourcing. It is generally believed that the narrow measure better captures the general idea of offshoring, yet the literature has reached no definite answer on this point. Needless to say, the broad measure is, by definition, always bigger than the narrow one, since its index numerator is always bigger.

As seen in the following tables, smaller economies (i. e., in GDP terms) rank among the first ten according to the three indices using both narrow and broad measures. Within this context, these countries would 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 good examples. On the other hand, some of the larger economies perform consistently at the bottom; most strikingly, the United

[19] The vertical specialization index by Hummels et al. (2001) is significantly higher than those presented here, in spite of both being calculated from the same data 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.

States, Japan, China, India and Brazil. In the middle of this ladder, we find a varied group of large countries among which Germany, Canada and Spain stand out. Italy and the United Kingdom fall within the average for all three indices.[20]

TABLE 3.1: Imported inputs in total inputs. Narrow measure.[1] World ranking (selected countries)
(percentage)

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 U.K.	4.33	19 Finland	5.42	19 France	3.33
20 Italy	4.23	20 Turkey	4.65	20 U.K.	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

[20] 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.

TABLE 3.1 *(cont.)*: **Imported inputs in total inputs. Narrow measure.**[1] **World ranking (selected countries)**
(percentage)

Year	1995	Year	2000	Year	2005
24 New Zealand	3.44	24 Russia	4.42	24 U.S.	1.81
25 Norway	3.13	25 Italy	4.17	25 Japan	1.81
26 Argentina	2.98	26 U.K.	3.57	26 Australia	1.65
27 Greece	2.75	27 France	3.39	27 Argentina	n/a
28 Poland	2.48	28 Norway	3.09	28 Canada	n/a
29 China	2.36	29 South Africa	2.85	29 India	n/a
30 Brazil	2.19	30 Greece	2.72	30 Ireland	n/a
31 Japan	1.90	31 China	2.64	31 Israel	n/a
32 South Africa	1.81	32 New Zealand	2.57	32 New Zealand	n/a
33 U.S.	1.47	33 Australia	2.42	33 Norway	n/a
34 India	1.47	34 U.S.	1.85	34 Russia	n/a
35 Australia	n/a	35 Japan	1.84	35 Slovak Republic	n/a
36 Czech Republic	n/a	36 Brazil	1.68	36 South Africa	n/a
37 Mexico	n/a	37 India	1.26	37 South Korea	n/a
38 Slovenia	n/a	38 Argentina	n/a	38 Switzerland	n/a
39 South Korea	n/a	39 Israel	n/a	39 Taiwan	n/a
40 Switzerland	n/a	40 Mexico	n/a	40 Turkey	n/a
w. mean	**3.06**		**3.39**		**3.41**
change (%)			**10.79**		**0.45**

[1] Formula (1.4a) in chapter 1, weighted average across all industries by industry (gross) output, $-i = j$.
Note: n/a = not considered for the weighted mean. All data in the last rows are comparable.
Sources: (tables 3.1-3.17): authors' calculations based on OECD I-O database. 2009.

TABLE 3.2: **Imported inputs in total inputs. Broad measure.**[1] **World ranking (selected countries)**
(percentage)

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

TABLE 3.2 *(cont.)*: **Imported inputs in total inputs. Broad measure.**[1]
World ranking (selected countries)
(percentage)

Year	1995	Year	2000	Year	2005
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 U.K	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 U.K.	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 U.S.	8.48
27 Israel	12.28	27 U.K.	15.56	27 Argentina	n/a
28 South Africa	9.99	28 Russia	15.51	28 Canada	n/a
29 India	9.15	29 New Zealand	15.22	29 India	n/a
30 China	8.64	30 South Africa	14.58	30 Ireland	n/a
31 Argentina	7.98	31 France	12.51	31 Israel	n/a
32 Brazil	6.80	32 Australia	12.47	32 New Zealand	n/a
33 Japan	5.78	33 India	10.73	33 Norway	n/a
34 U.S.	5.46	34 China	9.32	34 Russia	n/a
35 Australia	n/a	35 Brazil	9.00	35 Slovak Republic	n/a
36 Czech Republic	n/a	36 U.S.	7.40	36 South Africa	n/a

TABLE 3.2 *(cont.)*: **Imported inputs in total inputs. Broad measure.**[1]
World ranking (selected countries)
(percentage)

Year	1995	Year	2000	Year	2005
37 Mexico	n/a	37 Japan	5.79	37 South Korea	n/a
38 Slovenia	n/a	38 Argentina	n/a	38 Switzerland	n/a
39 South Korea	n/a	39 Israel	n/a	39 Taiwan	n/a
40 Switzerland	n/a	40 Mexico	n/a	40 Turkey	n/a
w. mean	**10.56**		**12.00**		**13.48**
change (%)			**13.65**		**12.30**

[1] Formula (1.4a) in chapter 1, weighted average across all industries by industry (gross) output.

TABLE 3.3: Imported inputs in gross output. Narrow measure.[1]
World ranking (selected countries)
(percentage)

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 U.K.	2.56	18 Sweden	3.63	18 Spain	2.31
19 Denmark	2.49	19 Switzerland	3.27	19 France	2.20

TABLE 3.3 *(cont.)*: **Imported inputs in gross output. Narrow measure.**[1]
World ranking (selected countries)
(percentage)

Year	1995	Year	2000	Year	2005
20 Indonesia	2.40	20 Poland	2.85	20 U.K.	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 U.S.	1.11
26 Argentina	1.74	26 France	2.20	26 Australia	1.01
27 China	1.62	27 U.K.	2.07	27 Argentina	n/a
28 Greece	1.55	28 Norway	1.98	28 Canada	n/a
29 Poland	1.42	29 South Africa	1.84	29 India	n/a
30 Brazil	1.16	30 China	1.83	30 Ireland	n/a
31 South Africa	1.15	31 New Zealand	1.55	31 Israel	n/a
32 Japan	1.04	32 Australia	1.50	32 New Zealand	n/a
33 U.S.	0.89	33 Greece	1.40	33 Norway	n/a
34 India	0.88	34 U.S.	1.15	34 Russia	n/a
35 Australia	n/a	35 Japan	1.08	35 Slovak Republic	n/a
36 Czech Republic	n/a	36 Brazil	0.95	36 South Africa	n/a
37 Mexico	n/a	37 India	0.74	37 South Korea	n/a
38 Slovenia	n/a	38 Argentina	n/a	38 Switzerland	n/a
39 South Korea	n/a	39 Israel	n/a	39 Taiwan	n/a
40 Switzerland	n/a	40 Mexico	n/a	40 Turkey	n/a
w. mean	**1.83**		**2.11**		**2.12**
change (%)			**15.3**		**0.47**

[1] Formula (1.4b) in chapter 1, weighted average across all industries by industry (gross) output $-i = j$.

TABLE 3.4: Imported inputs in gross output. Broad measure.[1]
World ranking (selected countries)
(percentage)

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

TABLE 3.4 *(cont.)*: **Imported inputs in gross output. Broad measure.**[1] **World ranking (selected countries)**
(percentage)

Year	1995	Year	2000	Year	2005
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 U.K.	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 U.K.	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 U.S.	4.44
27 Russia	6.32	27 U.K.	8.20	27 Argentina	n/a
28 China	5.38	28 Turkey	7.78	28 Canada	n/a
29 South Africa	4.98	29 Russia	7.09	29 India	n/a
30 India	4.40	30 South Africa	6.98	30 Ireland	n/a
31 Argentina	4.14	31 France	6.85	31 Israel	n/a
32 Brazil	3.38	32 Australia	6.38	32 New Zealand	n/a
33 Japan	2.92	33 China	6.12	33 Norway	n/a
34 U.S.	2.78	34 India	5.18	34 Russia	n/a
35 Australia	n/a	35 Brazil	4.31	35 Slovak Republic	n/a
36 Czech Republic	n/a	36 U.S.	3.87	36 South Africa	n/a

TABLE 3.4 *(cont.)*: **Imported inputs in gross output. Broad measure.[1]**
World ranking (selected countries)
(percentage)

Year	1995	Year	2000	Year	2005
37 Mexico	n/a	37 Japan	3.35	37 South Korea	n/a
38 Slovenia	n/a	38 Argentina	n/a	38 Switzerland	n/a
39 South Korea	n/a	39 Israel	n/a	39 Taiwan	n/a
40 Switzerland	n/a	40 Mexico	n/a	40 Turkey	n/a
w. mean	**11.25**		**13.40**		**14.94**
change (%)			**19.08**		**11.52**

[1] Formula (1.4b) in chapter 1, weighted average across all industries by industry (gross) output.

TABLE 3.5: Vertical specialization index. Narrow measure.[1]
World ranking (selected countries)
(percentage)

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 U.K.	6.52	15 South Korea	8.97	15 Poland	7.66
16 Germany	6.34	16 Netherlands	8.90	16 Spain	7.39

TABLE 3.5 *(cont.)*: **Vertical specialization index. Narrow measure.**[1]
World ranking (selected countries)
(percentage)

Year	1995	Year	2000	Year	2005
17 Israel	6.34	17 Sweden	8.78	17 France	6.20
18 France	6.10	18 Germany	7.81	18 U.K.	5.70
19 Denmark	5.08	19 Poland	6.43	19 Denmark	4.92
20 Italy	5.08	20 U.K.	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 U.S.	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 U.S.	3.71	27 Argentina	n/a
28 Japan	2.83	28 Japan	3.51	28 Canada	n/a
29 Greece	2.81	29 China	3.42	29 India	n/a
30 U.S.	2.46	30 Norway	3.21	30 Ireland	n/a
31 Brazil	2.10	31 Russia	3.04	31 Israel	n/a
32 Poland	2.06	32 New Zealand	2.88	32 New Zealand	n/a
33 India	1.31	33 Brazil	2.70	33 Norway	n/a
34 South Africa	1.04	34 Australia	2.25	34 Russia	n/a
35 Australia	n/a	35 Greece	2.19	35 Slovak Republic	n/a
36 Czech Republic	n/a	36 South Africa	2.04	36 South Africa	n/a
37 Mexico	n/a	37 India	1.22	37 South Korea	n/a
38 Slovenia	n/a	38 Argentina	n/a	38 Switzerland	n/a
39 South Korea	n/a	39 Israel	n/a	39 Taiwan	n/a
40 Switzerland	n/a	40 Mexico	n/a	40 Turkey	n/a
w. mean	**4.47**		**5.32**		**5.51**
change (%)			**19.07**		**3.63**

[1] Formula (1.4b) in chapter 1, weighted average across all industries by industry's share in total exports, $-i = j$.

TABLE 3.6: Vertical specialization index. Broad measure.[1]
World ranking (selected countries)
(percentage)

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 U.K.	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 U.K.	13.16
22 Greece	10.41	22 U.K.	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 U.S.	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	n/a
28 Turkey	7.68	28 Greece	10.12	28 Canada	n/a
29 Russia	6.36	29 China	9.75	29 India	n/a
30 India	5.78	30 Turkey	9.56	30 Ireland	n/a
31 South Africa	5.71	31 South Africa	9.06	31 Israel	n/a
32 Brazil	5.62	32 Australia	8.58	32 New Zealand	n/a

TABLE 3.6 *(cont.)*: **Vertical specialization index. Broad measure.**[1]
World ranking (selected countries)
(percentage)

Year	1995	Year	2000	Year	2005
33 U.S.	5.27	33 India	7.55	33 Norway	n/a
34 Japan	4.91	34 U.S.	7.25	34 Russia	n/a
35 Australia	n/a	35 Brazil	6.61	35 Slovak Republic	n/a
36 Czech Republic	n/a	36 Russia	6.51	36 South Africa	n/a
37 Mexico	n/a	37 Japan	5.74	37 South Korea	n/a
38 Slovenia	n/a	38 Argentina	n/a	38 Switzerland	n/a
39 South Korea	n/a	39 Israel	n/a	39 Taiwan	n/a
40 Switzerland	n/a	40 Mexico	n/a	40 Turkey	n/a
w. mean	**19.69**		**23.58**		**25.67**
change (%)			**19.73**		**8.87**

[1] Formula (1.4b) in chapter 1, weighted average across all industries by industry's share in total exports.

Changes in the rankings, either among indices or when moving from narrow to broad measures, are of little significance. This is not the case when we analyze the change in relative terms that took place from 1995 to 2005 (tables 3.7 to 3.9). A few of the larger economies, such as the United States, Spain (only for 1995–2000) and Germany, underwent a steep expansion of offshoring during that period. Surprisingly, China, Brazil, and Japan showed significant positive changes. Incidentally, the pattern shown by these three countries coincides with a significant liberalization of their trade in recent times, most importantly for China.

It would be unreasonable, however, to try to recognize a trend for the countries in the sample, since we only have data for three points in time. Despite increased prominence in recent years, larger economies such as the United States, China, Brazil, India or Japan, are still far from compromising important shares of their intermediate trade to foreign sources (i. e., offshoring). Remarkably, though, Canada, Germany and Spain remain perceptibly in the margins.[21] The reason for this performance in the three countries remains unknown, 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 that is close geographically, culturally, or both. A trading partnership between Canada and the United States dates back to when both nations were born. One should presume that Canadian and U.S. 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. One should not to forget the tremendous business opportunities that Latin American countries offer Spanish firms. Although they do not share the same border, both territories share a cultural background that allows a meaningful entrepreneurial understanding.

[21] The figures for Germany are very similar to those in Horgos (2008), who relies on German data alone. 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 show the following: 14 and 18 percent (table 3.2), and 7 and 10 percent (table 3.4). Furthermore, growth rates in his data and ours are also similar.

TABLE 3.7: Imported inputs in total inputs, growth. Top ten
(percentage)

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

TABLE 3.8: Imported inputs in gross output, growth. Top ten
(percentage)

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

TABLE 3.9: Imported inputs in gross output, growth. Top ten
(percentage)

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

Generally speaking, global offshoring (the world weighted average)[22] 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 when using narrow measures (i. e., in-house offshoring), perhaps as a result of entrepreneurs being more confident in working with specialized third-party providers. With our definition of offshoring, the recent upward trend should not be surprising, since trade is an ever-growing result of globalization and capitalism. All in all, offshoring appears to be the natural outcome of international trade upon 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

In this section we address the following question: which economic sector (and by extension, what kind of firms) offshore the most? Using the sample of countries for the same years as before—1995, 2000 and 2005—, we will now look specifically at two separate economic sectors. In particular, for every country, we will divide the whole set of industries of the OECD I-O database into manufacturing and services industries.[23] We used the same three aggregate indices—imported inputs in total inputs, imported inputs in gross output, and a measure of vertical specialization—, both in their narrow and broad versions, to account for this description.

We have discovered that manufacturing industries are more heavily engaged in offshoring activities than services industries (tables 3.10 and 3.11); this was indicated by the sample (weighted) mean. For some countries, the difference is rather important and makes the services sector seem as if it does not engage in

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[22] The weighted (world) means were calculated using the 2008 nominal GDP (U.S. dollars) from the IMF database (2009). Recall that 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 tables 3.1 to 3.6. Note the weighted mean is always lower than the mean, thus implying that larger economies tend to cluster at the lower end of the ranking.

[23] This is done following the classification by the ISIC (rev. 3) or its equivalent in the OECD itself. See the reference provided in table 3.10.

international trade at all. This is seen more easily using the narrow measure. For example, in Argentina, China, Greece, and the United States, 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.

TABLE 3.10: Offshoring intensity and the economic sector. All three indices, narrow measure[1]

(percentage)

	Manufacturing industries									Services industries								
Year	**1995**			**2000**			**2005**			**1995**			**2000**			**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	n/a	n/a	n/a	n/a	n/a	n/a	0.35	0.13	0.19	n/a	n/a	n/a	n/a	n/a	n/a
Australia	n/a	n/a	n/a	9.37	6.12	5.28	7.51	4.83	3.82	n/a	n/a	n/a	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	n/a	n/a	n/a	2.97	2.53	0.46	1.82	0.76	1.02	n/a	n/a	n/a
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	n/a	n/a	n/a	22.68	16.41	18.53	23.68	17.92	21.26	n/a	n/a	n/a	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	n/a	n/a	n/a	0.54	0.16	0.21	0.14	0.05	0.09	n/a	n/a	n/a
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	n/a	n/a	n/a	5.49	2.10	3.83	11.98	5.42	10.32	n/a	n/a	n/a
Israel	9.99	6.53	6.41	n/a	n/a	n/a	n/a	n/a	n/a	4.25	1.89	7.17	n/a	n/a	n/a	n/a	n/a	n/a
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

TABLE 3.10 *(cont.)*: **Offshoring intensity and the economic sector. All three indices, narrow measure**[1]
(percentage)

	Manufacturing industries									Services industries								
Year	**1995**			**2000**			**2005**			**1995**			**2000**			**2005**		
	MII	**MIO**	**VS**	**MII**	**MIO**	**VS**	**MII**	**MIO**	**VS**	**MII**	**MIO**	**VS**	**MII**	**MIO**	**VS**	**MII**	**MIO**	**VS**
Mexico	n/a	n/a	n/a	n/a	n/a	n/a	27.19	20.61	20.98	n/a	n/a	n/a	n/a	n/a	n/a	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	n/a	n/a	n/a	1.68	0.73	1.13	1.04	0.53	1.16	n/a	n/a	n/a
Norway	11.47	7.67	11.50	12.55	8.47	12.42	n/a	n/a	n/a	0.76	0.36	0.34	1.01	0.51	0.65	n/a	n/a	n/a
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	n/a	n/a	n/a	1.49	0.39	0.62	0.87	0.27	0.30	n/a	n/a	n/a
Slovak Republic	15.95	10.66	12.10	26.83	18.85	22.03	n/a	n/a	n/a	4.86	1.91	2.99	2.58	1.36	1.53	n/a	n/a	n/a
Slovenia	n/a	n/a	n/a	25.81	17.64	19.37	24.68	16.92	18.45	n/a	n/a	n/a	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	n/a	n/a	n/a	0.31	0.10	0.13	0.66	0.24	0.25	n/a	n/a	n/a
South Korea	n/a	n/a	n/a	12.66	9.08	10.73	n/a	n/a	n/a	n/a	n/a	n/a	1.66	0.63	1.34	n/a	n/a	n/a
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	n/a	n/a	n/a	10.10	6.98	7.24	n/a	n/a	n/a	n/a	n/a	n/a	4.11	1.83	3.48	n/a	n/a	n/a
Taiwan	14.47	10.24	10.28	14.42	10.42	11.48	n/a	n/a	n/a	3.14	1.00	4.76	2.17	0.97	4.39	n/a	n/a	n/a
Turkey	9.07	5.05	5.67	10.06	6.09	7.70	n/a	n/a	n/a	0.53	0.16	0.20	1.85	0.71	1.31	n/a	n/a	n/a
U.K.	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
U.S.	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**

[1] 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, imported inputs in total inputs; MIO, imported inputs in output; VS, vertical specialization index; "n/a" countries not considered for the weighted mean.

TABLE 3.11: Offshoring intensity and the economic sector. All three indices, broad measure[1]
(percentage)

	Manufacturing industries									Services industries								
Year	**1995**			**2000**			**2005**			**1995**			**2000**			**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	n/a	n/a	n/a	n/a	n/a	n/a	3.50	1.11	1.97	n/a	n/a	n/a	n/a	n/a	n/a
Australia	n/a	n/a	n/a	22.01	14.65	14.69	20.66	14.12	12.45	n/a	n/a	n/a	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	n/a	n/a	n/a	13.56	8.13	4.31	13.93	5.40	6.75	n/a	n/a	n/a
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	n/a	n/a	n/a	52.16	38.11	41.47	48.07	36.38	39.97	n/a	n/a	n/a	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	n/a	n/a	n/a	11.24	3.35	4.63	9.15	2.68	3.51	n/a	n/a	n/a
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	n/a	n/a	n/a	37.97	13.03	16.77	35.74	14.87	23.24	n/a	n/a	n/a
Israel	19.34	12.59	12.66	n/a	n/a	n/a	n/a	n/a	n/a	10.00	5.48	29.50	n/a	n/a	n/a	n/a	n/a	n/a
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

TABLE 3.11 *(cont.)*: **Offshoring intensity and the economic sector. All three indices, broad measure**[1]
(percentage)

	Manufacturing industries									Services industries								
Year	**1995**			**2000**			**2005**			**1995**			**2000**			**2005**		
	MII	**MIO**	**VS**	**MII**	**MIO**	**VS**	**MII**	**MIO**	**VS**	**MII**	**MIO**	**VS**	**MII**	**MIO**	**VS**	**MII**	**MIO**	**VS**
Mexico	n/a	n/a	n/a	n/a	n/a	n/a	55.47	40.87	42.26	n/a	n/a	n/a	n/a	n/a	n/a	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	n/a	n/a	n/a	12.53	5.71	9.33	13.91	6.59	9.17	n/a	n/a	n/a
Norway	29.83	19.97	24.09	29.12	19.60	23.19	n/a	n/a	n/a	20.75	9.33	25.70	19.32	9.28	25.37	n/a	n/a	n/a
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	n/a	n/a	n/a	14.83	4.54	3.77	13.45	4.55	3.19	n/a	n/a	n/a
Slovak Republic	40.40	26.91	28.95	60.36	43.70	48.99	n/a	n/a	n/a	18.66	7.68	9.65	20.62	11.06	15.44	n/a	n/a	n/a
Slovenia	n/a	n/a	n/a	51.39	35.02	37.67	56.30	38.51	40.83	n/a	n/a	n/a	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	n/a	n/a	n/a	7.09	2.47	2.46	12.29	3.90	4.33	n/a	n/a	n/a
South Korea	n/a	n/a	n/a	30.31	22.69	25.74	n/a	n/a	n/a	n/a	n/a	n/a	10.33	5.44	25.72	n/a	n/a	n/a
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	n/a	n/a	n/a	26.63	17.96	18.44	n/a	n/a	n/a	n/a	n/a	n/a	14.67	5.78	7.33	n/a	n/a	n/a
Taiwan	34.40	24.34	26.33	35.44	25.75	28.52	n/a	n/a	n/a	16.43	5.31	11.83	14.69	4.78	11.52	n/a	n/a	n/a
Turkey	27.11	14.17	12.40	27.94	15.13	15.61	n/a	n/a	n/a	7.26	2.54	2.98	10.73	3.28	4.70	n/a	n/a	n/a
U.K.	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
U.S.	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**

[1] See table 4.10 for industry classification and notes.

A reasonable explanation for this gap is that the services sector still lags behind (per the three-sector hypothesis) in developing a proper infrastructure or the particular know-how, as has long been the case for manufacturing industries. This seems 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. Therefore, all three indices underlie the less relevant offshoring for services industries, something that holds true for both the narrow and broad measures. Nevertheless, as previously mentioned, there are still a great number of potentially offshoreable services that might eventually account for larger figures. When this will occur is unknown.

As for the relative country size, the same pattern emerges here as before, yet is less evident in the manufacturing sector. Small economies rank at the top in both the manufacturing and services sectors, and for both the narrow and broad measures. Also, several of the fully developed economies now appear among the most intensive offshorers in this detailed breakdown. Canada, Belgium, Austria, the Netherlands, and the Nordic countries are worth highlighting for the manufacturing sector using both the narrow and broad measures. The same countries can be highlighted for the services sector using the narrow measure (and adding Germany), whereas for the broad measure the display is less disperse. Among the larger economies, we should point some of the disappointing performances, namely: the United States, Japan, China, Brazil and India. Their indices are far 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 prevents us from making any further consideration on the evolution of the offshoring phenomenon. It is 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 in section 3.3, this differentiation between sectors is closely related to the classification of materials versus services offshoring. Naturally, manufacturing industries have been more concerned 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 analyzed in section 3.3.

3.3. Materials versus services offshoring

The differentiation between materials and services offshoring has not attracted economists' attention until very recently. Here we refer to the type of activities or functions offshored instead of the economic sector in which these practices originate. Services offshoring should be qualitatively different due to the relative impracticality it faced in the past. This was the result of, first, a lack of mobility of the resources involved, and later, a fear of the potential loss of control of activities relocated abroad. But new communication technologies (especially the Internet) are creating a whole new way of doing business, and thus available resources are being used more efficiently. Currently, white-collar workers do not seem particularly confident about the former impracticality of the prospect of having their jobs relocated.

Using similar indices to those in the previous sections, we will now calculate the import penetration in production of two types of inputs: materials and services. This is done according to the classification of industries, but is 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. To our knowledge, this specific index was first introduced by Amiti and Wei (2005, 2006). We are unable, however, to produce a narrow measure, since we need to account for the origin of the inputs in several foreign industries, for both manufacturing or services. The index reported in table 3.12 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.

TABLE 3.12: Materials and services offshoring, broad measure
(percentage)

	Materials offshoring			Services offshoring			Nominal GDP (2008)	
	1995	2000	2005	1995	2000	2005	Millions	Share
Argentina	6.26	n/a	n/a	0.93	n/a	n/a	326,474	–
Australia	n/a	9.25	8.29	n/a	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	n/a	4.12	4.44	n/a	1,510,957	–
China	7.62	7.79	9.77	0.18	0.33	1.22	4,401,614	10.22
Czech Republic	n/a	20.95	24.37	n/a	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	n/a	2.36	1.67	n/a	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	n/a	18.67	25.84	n/a	273,328	–
Israel	7.53	n/a	n/a	4.43	n/a	n/a	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	n/a	n/a	15.87	n/a	n/a	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	n/a	2.75	3.19	n/a	128,492	–
Norway	14.16	12.41	n/a	6.48	7.65	n/a	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	n/a	2.24	2.60	n/a	1,676,586	–
Slovak Republic	14.98	21.72	n/a	5.76	4.45	n/a	95,404	–
Slovenia	n/a	24.35	27.43	n/a	2.99	4.55	54,639	–
South Africa	7.00	10.48	n/a	1.34	2.79	n/a	277,188	–
South Korea	n/a	12.49	n/a	n/a	3.09	n/a	947,010	–

TABLE 3.12 *(cont.)*: **Materials and services offshoring, broad measure**
(percentage)

	Materials offshoring			Services offshoring			Nominal GDP (2008)	
	1995	**2000**	**2005**	**1995**	**2000**	**2005**	**Millions**	**Share**
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	n/a	11.75	n/a	n/a	5.29	n/a	492,595	–
Taiwan	15.49	16.87	n/a	5.94	4.13	n/a	392,552	–
Turkey	9.65	11.41	n/a	1.39	2.23	n/a	729,443	–
U.K.	12.42	15.20	9.83	3.36	4.39	3.74	2,674,085	6.21
U.S.	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**		

Note: Formula (1.4a) in chapter 1, but the origin of the imported inputs (m_{ji}) is restricted to the manufacturing and services sectors, according to the classification in table 3.10 (see Amiti and Wei 2005, 2006).

It is clear that services offshoring still represents, with very few exceptions, a small share of intermediate trade for a vast majority of countries (table 3.12). Again, country size (in GDP terms) is 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. With services, smaller countries like Luxembourg and Ireland take the lead, followed by the Slovak and Czech Republics, Estonia, and Hungary, among the lesser developed countries, and Austria, Belgium, the Netherlands, Taiwan and the Nordic countries, among the more developed ones. At the other end of the spectrum, the United States and China highlight the little relative weight that services offshoring signifies for the total economy.

As argued in the section 3.2, these numbers should not be surprising, since each sector of the economy is expected to focus more intensively on the offshoring of related activities. Despite the relative lack of significance of services offshoring, it is important to highlight the potential impact it could have in the long run. The larger positive change of the world (weighted) average shows the increasing importance of these practices usually associated with higher value-added activities.[24] 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 become offshoreable overnight. Every task that can be sent through a wire is now at risk for being moved abroad in search of comparative relative advantages. For this reason, it is of vital importance to look deeper into this kind of offshoring, which could affect a great many workers and their families. The future might otherwise bring 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 that have contributed the most over the past few years. We can expect that, *a priori*, services offshoring should be concentrated in industries belonging to the services sector. Presumably, services offshoring entails higher value-added activities, thus the fact that it originates in the services sector to a greater extent should come as no surprise. This is in fact what we observe (see table 3.13).

TABLE 3.13: Services offshoring and industries worldwide, broad measure[1]
(percentage)

	Year	1995		Year	2000
1	*Water transport*	15.41	1	*Water transport*	16.41
2	*Air transport*	8.27	2	*Air transport*	8.72
3	*Post and telecommunications*	5.43	3	*Post and telecommunications*	5.70
4	*Finance and insurance*	4.58	4	*Finance and insurance*	5.67
5	*Supporting and aux. transport activities; agencies*	3.93	5	*Computer and related activities*	5.18

[24] Canals (2006) finds a similar pattern for services offshoring for the United States.

TABLE 3.13 *(cont.)*: **Services offshoring and industries worldwide, broad measure**[1]
(percentage)

	Year	1995		Year	2000
6	*Other business activities*	3.42	6	*Other business activities*	5.03
7	*Other community, social, and personal services*	3.24	7	*Supporting and aux. transport activities; agencies*	4.42
8	*Computer and related activities*	3.15	8	*Other community, social, and personal services*	4.42
9	*Private households with employed persons*	2.99	9	*Research and development*	3.77
10	*Wholesale and retail trade; repairs*	2.99	10	*Wholesale and retail trade; repairs*	3.53
11	*Research and development*	2.87	11	Mining and quarrying (energy)	3.19
12	*Public admin. and defense; compulsory soc. security*	2.54	12	*Renting of machinery and equipment*	2.99
13	Mining and quarrying (energy)	2.48	13	Collection, purification, and distribution of water	2.79
14	*Land transport; transport via pipelines*	2.12	14	*Public admin. and defense; compulsory soc. security*	2.78
15	*Renting of machinery and equipment*	2.04	15	*Land transport; transport via pipelines*	2.72
16	*Education*	1.78	16	*Real estate activities*	2.25
17	*Real estate activities*	1.66	17	*Education*	2.05
18	Chemicals excluding pharmaceuticals	1.32	18	Office, accounting, and computing machinery	1.99
19	Office, accounting, and computing machinery	1.24	19	Chemicals excluding pharmaceuticals	1.84
20	Radio, television, and communication equipment	1.18	20	Mining and quarrying (non-energy)	1.78
21	Mining and quarrying (non-energy)	1.17	21	Pulp, paper, paper products, printing, and publishing	1.78
22	Medical, precision, and optical instruments	1.14	22	Medical, precision and optical instruments	1.65
23	Pulp, paper, paper products, printing, and publishing	1.09	23	Radio, television, and communication equipment	1.64
24	Collection, purification, and distribution of water	1.08	24	*Health and social work*	1.46

TABLE 3.13 *(cont.)*: **Services offshoring and industries worldwide, broad measure**[1]

(percentage)

	Year	1995		Year	2000
25	Other non-metallic mineral products	0.97	25	Pharmaceuticals	1.46
26	*Health and social work*	0.97	26	Production, collection, and distribution of electricity	1.34
27	Production, collection, and distribution of electricity	0.96	27	Other non-metallic mineral products	1.26
28	Manufacturing nec; recycling (incl. furniture)	0.93	28	*Hotels and restaurants*	1.24
29	Machinery and equipment, nec	0.87	29	Electrical machinery and apparatus, nec	1.14
30	*Hotels and restaurants*	0.86	30	Manufacturing nec; recycling (incl. furniture)	1.13
31	Electrical machinery and apparatus, nec	0.84	31	Machinery and equipment, nec	1.12
32	Construction	0.82	32	Building and repairing of ships and boats	1.10
33	Building and repairing of ships and boats	0.82	33	Iron and steel	1.06
34	Rubber and plastics products	0.79	34	Rubber and plastics products	1.06
35	Iron and steel	0.74	35	Construction	1.06
36	Textiles, textile products, leather, and footwear	0.70	36	Textiles, textile products, leather, and footwear	0.90
37	Fabricated metal prod., expt. machinery and eqment.	0.69	37	Motor vehicles, trailers, and semi-trailers	0.90
38	Wood and products of wood and cork	0.65	38	Wood and products of wood and cork	0.86
39	Food products, beverages, and tobacco	0.61	39	Fabricated metal prod., expt. machinery and eqment.	0.86
40	Motor vehicles, trailers, and semi-trailers	0.59	40	Food products, beverages, and tobacco	0.78
41	Coke, refined petroleum products, and nuclear fuel	0.54	41	Agriculture, hunting, forestry, and fishing	0.63
42	Agriculture, hunting, forestry, and fishing	0.48	42	Manuf. of gas; distribution through mains	0.63

TABLE 3.13 *(cont.)*: **Services offshoring and industries worldwide, broad measure**[1]
(percentage)

Year	1995	Year	2000
43 Pharmaceuticals	0.37	43 Coke, refined petroleum products, and nuclear fuel	0.61
44 Manuf. of gas; distribution through mains	0.28	44 Non-ferrous metals	0.54
45 Steam and hot water supply	0.24	45 *Private households with employed persons*	0.52
46 Aircraft and spacecraft	0.22	46 Aircraft and spacecraft	0.22
47 Railroad equipment and transport equip nec.	0.18	47 Steam and hot water supply	0.16
48 Non-ferrous metals	0.16	48 Railroad equipment and transport equip nec.	0.14

[1] Formula (1.4a), weighted means of industries (48) across sampled countries (37).
Note: Industry classification is two-digit ISIC, rev 3. In *italics*, services industries.

In general, indices are higher in the industries belonging to the services sector, for both years (1995 and 2000). The services offshoring indices for each industry are presented as the weighted mean taken among all the countries of the sample, thus providing an approximation of the offshoring phenomenon at the industry level worldwide. So if a revolution is to be expected, no matter what its extent, it will take place most certainly in the services sector. Note the particular importance of transport-related industries, followed by finance and insurance, post and telecommunications, computer services, and other business activities.

To determine the possible effect of this new prominence of services offshoring on the industries considered, we looked at the associated rates of employment growth in the period 1995–2000 (table 3.14). In doing this, we combined the OECD I-O data with the STAN (structural analysis) database, also from the OECD, and obtained a restricted sample. The countries for which data were available in both databases were: Australia, Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Korea, Luxembourg, Netherlands, Norway, Spain, Sweden, and the United States. This sample is nearly half of our previous sample. Because of this, we should be careful in drawing comparisons between tables 3.13 and 3.14. Whereas table 3.13 stresses the major role of services offshoring as a worldwide phenomenon, table 3.14 shows a possible pattern between the international growth rates of services offshoring and employment.

The little evidence we highlight in this section is by no means irrefutable proof of a positive effect of services offshoring resulting in employment gains in the medium term. We can postulate, however, that this new wave of offshoring that involves higher value-added activities does not pose an immediate and severe threat in terms of job loss. However, this uncertainty will be addressed as we develop the econometric section of the study later on. For now, we shall assess the indices studied up to this point to determine which one behaves best and, accordingly, which should be recommended for estimating purposes at the aggregate level. In tables 3.12 to 3.14, we chose to use formula (1.4a) from chapter 1; that is, the index which makes reference to imported inputs in total inputs. The next section will show that this index performs reasonably well.

TABLE 3.14: Services offshoring and employment growth across industries worldwide, 1995–2000[a]
(percentage)

	Services offshoring ratio, percentage change			**Employment (persons), percentage change**	
1	*Finance and insurance*	205.26	1	*Computer and related activities*	36.34
2	*Research and development*	88.35	2	*Finance and insurance*	25.37
3	*Other business activities*	88.06	3	Construction	15.70
4	*Computer and related activities*	80.06	4	*Health and social work*	13.99
5	*Renting of machinery and equipment*	73.68	5	*Hotels and restaurants*	13.75
6	Iron and steel	66.56	6	Rubber and plastics products	13.58
7	Office, accounting, and computing machinery	65.85	7	*Other business activities*	13.22

TABLE 3.14 *(cont.)*: **Services offshoring and employment growth across industries worldwide, 1995–2000**[a]

(percentage)

	Services offshoring ratio, percentage change			Employment (persons), percentage change	
8	*Health and social work*	57.58	8	Radio, television, and communication equipment	12.74
9	*Other community, social, and personal services*	45.44	9	*Other community, social, and personal services*	12.37
10	*Real estate activities*	39.76	10	*Renting of machinery and equipment*	10.22
11	Pulp, paper, paper products, printing, and publishing	37.03	11	*Post and 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 and restaurants*	27.22	14	*Wholesale and retail trade; repairs*	8.92
15	Fabricated metal prod., expt. machinery, and eqment.	26.98	15	Pharmaceuticals	7.04
16	Electrical machinery and apparatus, nec	26.33	16	*Air transport*	6.95
17	*Education*	22.85	17	*Research and development*	6.88
18	Textiles, textile products, leather, and footwear	18.99	18	Fabricated metal prod., expt. machinery and eqment.	6.50
19	*Wholesale and retail trade; repairs*	16.14	19	Machinery and equipment, nec	5.99
20	Manufacturing nec; recycling (incl. 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, and semi-trailers	5.28
23	Rubber and plastics products	10.92	23	Wood and products of wood and cork	4.33
24	Chemicals excluding pharmaceuticals	9.98	24	Electrical machinery and apparatus, nec	3.86
25	Motor vehicles, trailers, and semi-trailers	9.68	25	Medical, precision, and optical instruments	3.08

TABLE 3.14 *(cont.)*: **Services offshoring and employment growth across industries worldwide, 1995–2000[a]**
(percentage)

Services offshoring ratio, percentage change		Employment (persons), percentage change	
26 *Public admin. and defense; compulsory soc. security*	9.60	26 *Public admin. and defense; compulsory soc. security*	2.21
27 Machinery and equipment, nec	9.23	27 Pulp, paper, paper products, printing, and publishing	2.19
28 *Post and 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 and repairing of ships and boats	6.92	31 Aircraft and spacecraft	0.03
32 Other non-metallic mineral products	4.84	32 Iron and 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, and 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 and transport equip nec.	–3.07
39 *Air transport*	–37.99	39 *Water transport*	–3.19
40 Medical, precision, and 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 and repairing of ships and boats	–6.16

TABLE 3.14 *(cont.)*: **Services offshoring and employment growth across industries worldwide, 1995–2000[a]**
(percentage)

Services offshoring ratio, percentage change			Employment (persons), percentage change		
43	Aircraft and spacecraft	–47.00	43	Agriculture, hunting, forestry, and fishing	–9.40
44	Railroad equipment and transport equip nec.	–48.21	44	Mining and quarrying (non-energy)	–10.14
45	Radio, television, and 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

[a] Growth rate of the weighted means of industries (46) across countries in a restricted sample (18), using formula (1.4a).
Note: same classification of industries as in table 3.13, 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.

3.5. The quality of the indices

We will now carry out a decomposition analysis over time (1995–2005) and across countries of the indices studied using both the narrow and broad measures. This analysis involves following the conventional *within* and *between* exercise to account for variations in industries' offshoring intensity and their shares in total production, respectively.[25] We carried out 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 were able to isolate the changes in offshoring intensities within industries from the changes in their production shares. It is of interest, then, to see

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

that some of the industries that are strongly engaged in offshoring might alter the country indices more easily.

Therefore, to see to what extent the indices describe offshoring accurately, we extracted the growth sources behind all three indices using the data in tables 3.1 to 3.6 and the following expression:

$$\Delta\Phi = \Delta \sum_{i}^{n} \theta_i \delta_i = \sum_{i}^{n} \bar{\theta}_i \, \Delta \delta_i + \sum_{i}^{n} \bar{\delta}_i \, \Delta \theta_i; \ \Phi = MII, MIO, VS \qquad (3.1)$$

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),[26] to focus on the change in the offshoring intensity (δ). The latter, in contrast, fixes the offshoring component, thus capturing the contribution of the structural component to the change in the index. A bar over the variable defines the mean for the period under study.

Tables 3.15 to 3.17 display the results of the decomposition analysis. The within term corresponds to the first right-hand term in the decomposition formula above and the first column in the tables. The between term is, in turn, the second right-hand term and the second column in the tables. The overall change in the indices is presented in the column labeled as *total,* and is equal to the sum of the *within* and *between* terms, as shown in the decomposition formula. The overall change here coincides with the change, in percentage points, in the indices in tables 3.1 to 3.6. For example, let us consider the changes in the MII index for the United States during 1995–2005 (tables 3.1 and 3.2, narrow and broad measures, respectively). These changes amount to 0.34 percentage points (the difference in table 3.1) and 3.02 percentage

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

points (the difference in table 3.2), which are the values obtained in the column *total* of table 3.15. The same applies to the other two indices. For the United States the values are: 0.22 (table 3.3) and 1.66 (table 3.4) for the MIO index, both to be found in table 3.16; and 0.91 (table 3.5) and 2.51 (table 3.6) for the VS index, to be found in table 3.17.

Finally, the last column in these tables is the *within-to-total* ratio, and gives us an idea of how accurate the indices are. 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 indeed performs more accurately when considering the global average, that is, after removing 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.

We will see in the next chapter, though, how these indices serve well for our purpose of gauging labor market effects. Our simple methodology will help us determine both the employment and productivity effects of offshoring.

TABLE 3.15: Decomposition analysis, imported inputs in inputs, 1995–2005

	MII (narrow)				MII (broad)			
	Within	Between	Total	w/tot (%)	Within	Between	Total	w/tot (%)
Argentina[1]				na				na
Australia[2]	–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[2]	–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[2]	–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

TABLE 3.15 *(cont.)*: **Decomposition analysis, imported inputs in inputs, 1995–2005**

	MII (narrow)				MII (broad)			
	Within	**Between**	**Total**	**w/tot (%)**	**Within**	**Between**	**Total**	**w/tot (%)**
Hungary	0.0946	2.1231	2.2176	4	2.2605	2.5452	4.8057	47
India[2]	–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]	2.3752	0.9353	3.3105	72	2.5373	1.6003	4.1376	61
Israel[1]				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[1]				na				na
Netherlands	2.6726	–0.3182	2.3544	114	1.7583	–0.3303	1.4280	123
New Zealand[2]	–0.8413	–0.0243	–0.8656	97	1.1078	–0.1722	0.9356	118
Norway[2]	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[2]	–0.1652	0.2373	0.0721	–229	1.3342	–0.3195	1.0147	131
Slovak Republic[2]	1.9885	0.7908	2.7793	72	4.9146	1.4976	6.4122	77
Slovenia[2]	–0.1627	–0.1507	–0.3134	52	5.4632	–0.1662	5.2970	103
South Africa[2]	0.9699	0.0659	1.0358	94	4.6463	0.0572	4.7035	99
South Korea[1]				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[1]				na				na
Taiwan[2]	–0.8291	0.3663	–0.4628	179	–1.2351	1.1401	–0.0950	1300
Turkey[2]	0.9940	–0.3493	0.6447	154	1.8832	–0.2004	1.6828	112
U.K.	–0.0164	–1.0388	–1.0553	2	–0.7077	–1.5609	–2.2686	31
U.S.	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. 1)			**50**	**Mean (no outliers. 1)**			**75**
	Std. dv. (no outliers 1)			**90**	**Std. dv. (no outliers 1)**			**46**

[1] Data available for one year (analysis is not possible); [2] Data available for two years.
Note: Mean values are (tables 3.15 to 3.17): the simple mean and the mean discarding outliers outside the 1 range; percentages in the *within / total* column were rounded.

TABLE 3.16: Decomposition analysis, imported inputs in gross output, 1995–2005

	MIO (narrow)				MIO (broad)			
	Within	Between	Total	w/tot (%)	Within	Between	Total	w/tot (%)
Argentina[1]				na				na
Australia[2]	–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[2]	–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[2]	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[2]	–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[2]	1.2567	0.5220	1.7787	71	3.3005	0.9050	4.2056	78
Israel[1]				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[1]				na				na
Netherlands	1.3288	–0.3841	0.9447	141	1.1652	–0.3984	0.7668	152
New Zealand[2]	–0.3961	–0.0455	–0.4416	90	0.6338	–0.2869	0.3469	183
Norway[2]	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[2]	0.0292	0.0676	0.0968	30	0.9907	–0.2290	0.7617	130
Slovak Republic[2]	1.8324	0.7706	2.6030	70	5.2555	1.4077	6.6632	79
Slovenia[2]	–0.2289	–0.1350	–0.3639	63	2.2372	–0.1639	2.0733	108
South Africa[2]	0.6685	0.0272	0.6957	96	2.0515	–0.0553	1.9962	103
South Korea[1]				na				na
Spain	–0.2193	–0.3349	–0.5542	40	2.0372	–0.3398	1.6975	120

TABLE 3.16 *(cont.)*: **Decomposition analysis, imported inputs in gross output, 1995–2005**

	MIO (narrow)				MIO (broad)			
	Within	**Between**	**Total**	**w/tot (%)**	**Within**	**Between**	**Total**	**w/tot (%)**
Sweden	0.1161	0.1748	0.2909	40	1.2758	1.0856	2.3615	54
Switzerland[1]				na				na
Taiwan[2]	–0.1619	0.1850	0.0231	–701	–0.2897	0.6420	0.3523	–82
Turkey[2]	0.6287	–0.1877	0.4410	143	0.6018	–0.0742	0.5276	114
U.K.	–0.0240	–0.6698	–0.6938	3	0.0905	–1.1268	–1.0363	–9
U.S.	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. 1)			**14**	**Mean (no outliers. 1)**			**84**
	Std. dv. (no outliers 1)			**160**	**Std. dv. (no outliers 1)**			**28**

[1] Data available for one year (analysis is not possible); [2] Data available for two years.

TABLE 3.17: **Decomposition analysis. Vertical specialization index, 1995–2005**

	VS (narrow)				VS (broad)			
	Within	**Between**	**Total**	**w/tot (%)**	**Within**	**Between**	**Total**	**w/tot (%)**
Argentina[1]				na				na
Australia[2]	–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[2]	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[2]	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[2]	–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

TABLE 3.17 *(cont.)*: **Decomposition analysis. Vertical specialization index, 1995–2005**

	VS (narrow)				VS (broad)			
	Within	**Between**	**Total**	**w/tot (%)**	**Within**	**Between**	**Total**	**w/tot (%)**
Ireland[2]	0.9677	–0.2887	0.6790	143	8.3549	–0.2379	8.1170	103
Israel[1]				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[1]				na				na
Netherlands	1.9126	–1.0023	0.9103	210	1.5954	–0.4441	1.1513	139
New Zealand[2]	–0.4736	0.1910	–0.2826	168	0.2953	0.0549	0.3502	84
Norway[2]	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[2]	0.2678	–0.5154	–0.2476	–108	0.9281	–0.7812	0.1469	632
Slovak Republic[2]	3.7937	4.0369	7.8306	48	10.9572	6.9237	17.8809	61
Slovenia[2]	–0.9836	–0.3576	–1.3413	73	2.6694	–0.7388	1.9306	138
South Africa[2]	0.6078	0.3944	1.0022	61	3.0844	0.2665	3.3509	92
South Korea[1]				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[1]				na				na
Taiwan[2]	–0.0300	0.8174	0.7874	–4	–0.2774	1.7220	1.4446	–19
Turkey[2]	1.6307	–0.5740	1.0567	154	1.8637	0.0141	1.8778	99
U.K.	0.4444	–1.2659	–0.8215	–54	0.2490	–2.2562	–2.0072	–12
U.S.	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. 1)			**66**	**Mean (no outliers. 1)**			**69**
	Std. dv. (no outliers 1)			**46**	**Std. dv. (no outliers 1)**			**48**

[1] Data available for one year (analysis is not possible); [2] Data available for two years.

4. Effects on the Labor Market

NOW that we have studied the reach of the offshoring phenomenon, we must look at its socioeconomic implications. As stated in our introductory chapters, we are particularly interested in two kinds of effects on the labor market. First, we are interested in how domestic employment reacts to changes in the offshoring intensity, both of materials and services. In other words, how much *job destruction* are we to expect? Or, in contrast, can offshoring be seen as a source of new opportunities, both for workers and entrepreneurs? And moreover, is there any difference in the size (and direction) of the effects, according to the type of offshoring? Second, we will deal with the direct effects of offshoring on total factor productivity, further accounting for the possible ways of measuring the latter. That is, should we expect any improvements in the productivity level of industries after offshoring takes place? Let us now go over the usual econometric aspects found in the literature.

4.1. Analytical framework: employment

Departing from a Cobb-Douglas technology for the industry, we have:

$$Y_i = A(t)K_i^{\alpha} L_i^{\beta} \tag{4.1}$$

where K is capital and L is labor, and are the factor shares, and A is the Hicks-neutral technology shifter. Accepting that the industry can be represented as a single profit-maximizing firm, from our knowledge of the production function we can derive the cost function:

$$C_i = \phi r_i^{\alpha} w_i^{\beta} Z_i \tag{4.2}$$

ϕ being a constant, r and w the factor prices (the interest rate and wages, for instance), and Z a vector of other exogenous variables.

As we can see, the cost function and the production function are both sides of the same coin. With exogenous input prices, the production function and the cost function contain virtually the same information.

Keep in mind at this point that, particularly in former efforts, it was most appealing to specify a translog cost and production functions. This provided a more flexible framework with regards to cross elasticities that led to the estimation of a factor-share equation. We should also keep in mind, however, that the original debate was primarily focused on explaining the wage gap (i. e., the wage skill premium) or the shifts in relative employment of both nonskilled and skilled labor, due essentially to some form of technological change (see Berman et al. 1994; Feenstra and Hanson 1996b, most representatively). Some of the current efforts, however, try to make sense of a more direct incidence of offshoring on total employment as in, for example, Amiti and Wei (2005, 2006) or Cadarso et al. (2008), who implicitly assume a Cobb-Douglas technology. In this context, cost minimization, which entails the optimal demand for inputs given a certain level of output, is characterized by the conditional demand for labor augmented by other factor prices.

Following Hamermesh (1993), minimizing total costs in (4.2) subject to (4.1) and using Shephard's lemma (Hicks 1939; Samuelson 1947; Shephard 1953) yields the factor demand functions for K and L. For the labor factor we have:

$$L_i = \Gamma(w_i, p_i, Z_i) \tag{4.3}$$

where the demand for labor depends on wages w, other factor prices p, and a vector of controls Z. Among input prices other than r, we can identify the price of foreign labor services, following Amiti and Wei (2005, 2006). These pose as a substitute for domestic labor and enter the labor equation:

$$L_i = \Gamma(w_i, p_i^{'}, p_i^{os} Z_i) \tag{4.4}$$

where p' is a vector of factor prices other than those of foreign services. Since data on p_i^{os} are often hard to obtain, these authors propose the offshoring intensity indices as an inverse approximation of the price of these imported intermediate inputs. Equation (4.4) then becomes:

$$L_i = \Gamma(w_i, p_i, Z_i, OSS_i, OSM_i) \mid A(OSS_i, OSM_i) \qquad (4.5)$$

where OSS_i and OSM_i are the services and manufacturing offshoring indices, and is the technology shifter dependent on offshoring. Amiti and Wei (2005, 2006) identify three channels through which offshoring comes to shake the labor demand. First, a possible substitution effect between labor and prices of imported inputs (services or materials); a drop in the latter or, equivalently, an increase in the offshoring indices, would lead to a fall in the demand for labor. Second, a possible short-term productivity effect of offshoring negatively impacts employment. And third, the scale effect, which might positively affect labor, provided firms are more efficient and competitive in the long run due to previous productivity gains. Thus, log-linearizing (4.5), we are left with a widely used equation in the recent literature:

$$\ln L_{it} = \beta_o + \beta_1 L_{it-1} + \beta_2 OSS_{it} + \beta_3 OSM_{it} + \beta_4 \ln w_{it} + \\ + \beta_5 \ln p_{it} + \beta_6 \ln Z_{it} + \delta_i d_i + \delta_t d_t \qquad (4.6)$$

Labor is regressed on its lagged value and a set of variables which include, respectively: the services and materials offshoring intensity indices *OSS* and *OSM,* real wages *w,* other factor prices *p* (such as *r*), and a vector *Z* of other control variables among which we can consider an output variable (volume or value), the capital stock, or some measure of R&D investment. Industry and years fixed effects also enter the equation through the dummy variables, d_i and d_t. Error terms are omitted throughout for the benefit of exposition.

On the expected signs of the coefficients, we have that $\beta_4 < 0$ (a downward sloping demand curve), $\beta_5 > 0$ (if inputs are gross substitutes), or $\beta_5 < 0$ (if inputs are gross complements). As for β_2 and β_3 their signs are inconclusive, since it is not clear whether the scale effects are large enough to outweigh the substitution and productivity effects. As previously stated, the output may be increased in response to offshoring-related productivity gains.

We should reiterated a couple of remarks by Amiti and Wei (2006). First, relying on the assumption of perfect labor mobility across industries, we have seen that wages are exogenously determined. If that is not the case, then wages are endogenous. Provided that these potential rents are unchanged over time, we can assume that they would be absorbed by the industry fixed effects (δ_i and $\delta_i^{'}$), so the results would still be unbiased. And second, the price for other inputs (such as imported inputs and the rental on capital) are considered to be a function of time, so they are captured by the time fixed effects (δ_t and $\delta_t^{'}$).

A potential problem with equation (4.6) is the strong endogeneity of the output variable Y (in vector Z). Even though most empirical work employs this expression on a regular basis, it remains a doubtful interpretation, as the measured coefficient on the real wage represents a partial elasticity and not a total elasticity (Webster 2003).[27] For this reason, the exogenously determined capital stock variable is made explicit in our final estimating equation with no output variable (whether it is the volume or value version):

$$\ln L_{it} = \theta_o + \theta_1 L_{it-1} + \theta_2\ OSS_{it} + \theta_3\ OSM_{it} + \theta_4 \ln w_{it} + \theta_5 \ln K_{it} + \\ + \delta_i^*\ d_i + \delta_t^*\ d_t \qquad (4.7)$$

Notwithstanding the previous assumptions in the last two paragraphs, the estimation of equation (4.7) in its static or dynamic forms still entails potential endogeneity problems due to the offshoring variables. A potential bias in OLS estimates is expected and should make us consider the implementation of instrumental variables techniques.

[27] Webster (2003, 135, footnote 5) states: "A total elasticity includes the full effects on employment, once the effects on intermediate variables such as output have been worked through. Partial elasticities are the effects if one or more of these intermediate variables are artificially held constant. Partial elasticities are artificial 'thought experiments,' as in real life it is not possible to control most variables."

4.2. Analytical framework: productivity

Productivity can be measured in multiple ways. Fundamentally, it can be measured as a ratio of a volume measure of output to a volume measure of input, or as a measure depending on all types of inputs. In this way, it is possible to distinguish between labor and capital productivity on one hand (a single-factor measure), and total factor productivity (TFP) on the other (that is, a multi-factor measure). Different measures of outputs and inputs and, thus, of productivity, reflect different representations of the same production process in a particular industry (Zheng 2005). We are interested in estimating the TFP relying on two of these widely used measures and employing a two-stage estimation methodology.

First, we have a generalization of the gross value-added (or net output) representation of the production function. Gross value added is obtained by deducting intermediate consumption from gross output, and includes wages, consumption of fixed capital, pre-tax profits, and indirect taxes and subsidies. Such an output measure can be represented through the two primary inputs:

$$Y_i^V = F(K_i, L_i, t) = A(t)\, f(K_i, L_i) \tag{4.8}$$

where gross real value added Y_i^V depends on labor L, capital K, and the Hicks-neutral and time-dependent technological parameter $A(t)$.

Additionally, we can consider the gross output-based measure, which is a representation of the production function augmented by the consumption of materials and services inputs:

$$Y_i^G = G(K_i, L_i, M_i, S_i, t) = A'(t)\, g(K_i, L_i, M_i, S_i) \tag{4.9}$$

where gross real output Y_i^G depends on labor L, capital K, materials inputs M, services inputs S, and the neutral technological shifter $A(t)$.

Differentiating both expressions with respect to time, we get the contributions of the growth in inputs to the growth in both measures of output:

$$\dot{Y}_i^V = \zeta_K \dot{K} + \zeta_L \dot{L} + \tau_V \tag{4.10}$$

$$\dot{Y}_i^G = \eta_K \dot{K} + \eta_L \dot{L} + \eta_M \dot{M} + \eta_S \dot{S} + \tau_G \tag{4.11}$$

where $\dot{X} = \frac{d \ln X}{dt}$ is the growth rate for any variable in (4.10) and (4.11), $\zeta_Z = \frac{\partial F}{\partial Z} \frac{Z}{F}$ and $\eta_Z = \frac{\partial G}{\partial Z} \frac{Z}{G}$ (with inputs *Z*) are the elasticities of output to the different inputs, and $\tau_V = \frac{\partial \ln F}{\partial t} = A$ and $\tau_G = \frac{\partial \ln G}{\partial t} = A'$ correspond to the changes in the Hicks-neutral residuals. Under the simplifying assumptions of constant returns to scale and perfect competition in the market of both output and inputs, these equations can deliver growth in the TFP:

$$\tau_V = \dot{Y}_i^V - s_K \dot{K} - s_L \dot{L} \tag{4.12}$$

$$\tau_G = \dot{Y}_i^G - s'_K \dot{K} - s'_L L - s'_M \dot{M} - s'_S \dot{S} \tag{4.13}$$

This analysis is set aside from the debate over whether value added or gross output are more appropriate in measuring output and productivity.[28] Estimating both Cobb-Douglas production functions in formulas (4.8) and (4.9) will deliver, through formula (4.10) and (4.11), both productivity measures in formulas (4.12) and (4.13). These are two common measures of productivity growth widely used in the literature.[29]

Once our series and are constructed, we are able to estimate the effects of offshoring directly. Keep in mind, however, that since TFP growth measures are estimated relying on the real values

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[28] Zheng (2005, 16–17) states that, at the industry level, the value-added productivity measure might be more sensitive to offshoring than its gross output counterpart. See the example therein provided.

[29] See Griliches (1996) and Hulten (2001) for a bibliographical survey and Zheng (2005) for a review of the main indices (which are not considered here) that can be derived from the production function using a nonparametric approach. According to this author, these indices can account for the technological change of a more general nature (i. e., non-neutral Hicks). For instance, in a production function like $Y = H$ (AK, L), the residual affects capital but not labor; in $Y = H\ (K, AL)$ affects labor but not capital. These two cases can be described as Hicks-biased, and would account for a rotation of the isoquant curves (instead of a shift, which is our case). This is in line with Feenstra and Hanson's argument of a skill-biased technological change. For our purposes here, the derivation of our measures in equations (4.12) and (4.13) through the parametric estimation of the production functions in (4.8) and (4.9) will suffice.

of inputs and output, the cost-saving motive usually attached to offshoring is left out of the analysis. The second stage estimating equations are simply:

$$\tau_{Vit} = \Omega \,(OSS_{it}, OSM_{it}) \tag{4.14}$$

$$\tau_{Git} = \Lambda \,(OSS_{it}, OSM_{it}) \tag{4.15}$$

We expect the coefficients associated with both *OSS* and *OSM* to be positive in both specifications. According to Amiti and Wei (2006), offshoring can increase productivity due either to compositional or structural changes. First, relocating inefficient parts of the production process to another country could increase the productivity of the remaining workers. And second, due to access to new inputs, productivity increases are also likely, yet with larger effects arising from services offshoring.

As with employment, potential endogeneity of offshoring is also present in both of these equations. Either more productive industries self-select into offshoring or, conversely, industries that expect a fall in productivity growth increase their levels of offshoring in the hope of increasing their productivity (Amiti and Wei 2006). Here again, instrumental variables should be considered.

4.3. An empirical application

It is now time to gauge the effects of offshoring on labor markets. For this, we will review Japan's experience with the objective of determining, at the industry level, the effects of offshoring on both domestic employment and productivity.[30] We rely on the methodology laid out in previous sections and on the Japanese Industry

[30] Other than being a main subject of study in Pablo Agnese's doctoral thesis, the interest in Japan arises from the need to account for some interesting yet puzzling facts: (i) Japan is still the second largest economy in GDP terms, yet it has been badly represented in the research field; (ii) the slump during the 1990s is still felt even today, and we cannot help but wonder how this lost decade of growth came to represent a word of warning and anticipation with regards to the current world crisis; and (iii) the Japanese labor market displays quite distinctive characteristics when compared to the industrialized economies of the Western hemisphere.

Productivity database (JIP), which consists of 108 industries covering the whole economy. Due to data cleaning, we are left with 83 industries for 1980–2005.

Relatively little literature has been produced on the particular case of Japan. This is unfair, since Japan's economy entered the developed world many years ago and has held its highly esteemed status for decades. Still, while Japan is the second largest economy, its offshoring experience remains in the shadows, as is the case for much of the subject so far and much of Japan's puzzling performance in the 1990s.

Under our industry setting we should expect, a priori, that we are dealing with a heterogeneous dataset in the sense that there are perceptible differences between estimated cross-sections (i. e., different constants) that could be exploited. Heterogeneity bias usually implies the inclusion of either fixed or random effects, which can capture these differences better than a pooled estimation. Finally, addressing the endogeneity of the offshoring variable becomes important since the industries that engage more in this practice might not be random. If the same industries engage in offshoring all over the sample, then industry fixed effects should work fine. That is hardly the case though, and the endogeneity of the offshoring variable is further magnified due to the presence of measurement errors. For this reason, we deem it necessary to rely on GMM estimation since the former could be biased and inconsistent. Therefore, to remove these permanent industry-specific effects, we need to transform the equations into first-differences (Arellano and Bond 1991) or orthogonal deviations (Arellano and Bover 1995). Potential measurement problems underlying the offshoring index would lead us to opt for the latter, since first-differencing tends to amplify such problems through larger variances.

The GMM specifications have been re-parametrized to show the total effects concentrated in period t.[31] Furthermore, some equations include time dummies to control for period-specific shocks common to all industries. These time dummies are also

[31] Joint Wald tests are presented along all estimations in order to assure that this is possible.

used as additional instruments and, in addition to the predetermined instruments, we also consider exogenous ones.[32] The validity of the instrument set and of the overidentifying restrictions are tested using the conventional Sargan test. The consistency of the GMM estimates also depends on the absence of serial correlation in the errors. Using estimates from the model in orthogonal deviations, we tested the absence of second-order serial correlation in the residuals, as proposed by Arellano and Bond (1991).

4.3.1. Employment effects

In table 4.1 we present the results of the estimation of the labor demand equation in (4.7), which omits the output variables and includes the real stock of capital. The equation is characterized by a large persistence coefficient, indicating a strong inertia in the industries' aggregate level of employment.[33] Our variables of interest are *OSS* and *OSM*, and since these are not transformed into logarithms, they should be interpreted as semi-elasticities. We see that services offshoring affects employment positively in both estimations, without and with period dummies, with a short-term semi-elasticity of 1.03 and 0.53 percent, and long-term semi-elasticities of around 20 percent (no period dummies) and 10 percent (period dummies), respectively. On the other hand, materials offshoring affects employment with a negative sign. Short-term elasticities are –0.33 percent (no period dummies) and –0.23 (period dummies) percent, and long-run elasticities stand at –6.6 percent (no period dummies) and –4.6 percent (period dummies).

[32] Predetermined variables used as instruments for the labor demand equation were: L_{it-2}, L_{it-3}, w_{it-2}, w_{it-3}, K_{it-2}, K_{it-3}, all in logs. For total factor productivity we use TFP_{it-2}, TFP_{it-3}. Exogenous instruments for all GMM estimations were the office and production workers industry shares (also from the JIP database). Office workers are thought to be more related with services offshoring whereas production workers are often linked to materials offshoring.

[33] The Wald test for the lagged employment coefficient being equal to 1 is rejected. Moreover, Im-Pesaran-Shin tests for the existence of unitary roots were run individually on the cross-sections residuals, rejecting in most cases the null of a root process (the results of these tests are available on request). Related to this, Agnese and Sala (2009) estimate a system for Japan consisting of a labor demand and a labor supply equations. Even though offshoring is not considered there, the labor demand equation appears with a persistence coefficient of 0.89.

TABLE 4.1: Employment effects of offshoring, Japan (1980–2005). Whole economy (83 industries)

Dependent variable: ln L_{it}		
	(1)	**(2)**
	GMM	**GMM**
ln L_{it-1}	0.95†	0.95†
	(0.001)	(0.005)
ln w_{it}	–0.03†	–0.03†
	(0.001)	(0.002)
Δ ln w_{it}	–0.10†	–0.10†
	(0.002)	(0.01)
OSS_{it} **/ 100**	**1.03†**	**0.53‡**
	(0.06)	(0.25)
Δ OSS_{it} **/ 100**	–0.59†	*
	(0.13)	
OSM_{it} **/ 100**	**–0.33†**	**–0.23‡†**
	(0.01)	(0.13)
Δ OSM_{it} **/100**	–0.47†	*
	(0.03)	
ln K_{it}	*	*
Δ ln K_{it}	0.21†	0.17†
	(0.01)	(0.06)
Joint tests (Wald):		
ln L_{it-1} **= 1**	$^{2}(1) = 2{,}912$	$^{2}(1) = 73.25$
	p-value = 0.00	*p*-value = 0.00
ln w_{it} **+ ln** w_{it-1} **= 0**	$^{2}(1) = 1{,}013$	$^{2}(1) = 142.3$
	p-value = 0.00	*p*-value = 0.00
OSS_{it} **+** OSS_{it-1} **= 0**	$^{2}(1) = 276.9$	–
	p-value = 0.00	
OSM_{it} **+** OSM_{it-1} **= 0**	$^{2}(1) = 461.3$	–
	p-value = 0.00	
ln K_{it} **+ ln** K_{it-1} **= 0**	$^{2}(1) = 1.28$	$^{2}(1) = 1.98$
	p-value = 0.25	*p*-value = 0.16
Sargan test:	$^{2}(76) = 82.49$	$^{2}(53) = 66.24$
	p-value = 0.28	*p*-value = 0.10

TABLE 4.1 *(cont.)*: **Employment effects of offshoring, Japan (1980–2005). Whole economy (83 industries)**

Dependent variable: ln L_{it}	(1) GMM	(2) GMM
***m*2 test:**	z = 0.38	z = 1.68
	p-value = 0.70	*p*-value = 0.10
Period dummies	**no**	**yes**
s.e.	0.04	0.04
Adj. r^2	0.96	0.96
Observations	1,992	2,075

* Strongly nonsignificant, individually or jointly (variable removed).
Note: Both specifications estimated with Eviews and based on equation (4.7) using the Arellano-Bover (1995) estimator in orthogonal deviations. Both are estimated using the two-step method by Arellano and Bond (1991), so the standard errors may not be reliable. The offshoring indices (%) are divided by 100 so as to interpret the semi-elasticities directly. Standard errors in parentheses and †, ‡, and ‡† the usual levels of significance: 1%, 5% and 10%; Δ is the difference operator.

The level of employment in Japan for our restricted sample of 83 industries grew, on average, about 18 percent during 1980–2005 (around 100,000 workers). Multiplying the estimated long-run elasticities times the average change in the offshoring variables, and expressing that as a proportion of the average change in employment, allows us to get an idea of the size of the effect of offshoring on employment.

From the estimation in (1), this implies an increase, on average, of around 1,000 workers due to services offshoring and a loss of 2,900 workers due to materials offshoring. The net average loss is of approximately 1,900 workers during 1980–2005. From (2) we estimate an average increase of about 500 workers due to services offshoring and a loss of 2,000 due to materials offshoring, totaling a net average loss of nearly 1,500.[34] Since both total magnitudes are negative they should be interpreted as the number of jobs

[34] The average employment increase among industries during 1980–2005 was 101,425 workers.

that fail to open due to offshoring. Indeed, they only represent a small fraction of the total increase in employment: between 1.9 percent in specification formula (1) to 1.5 percent in formula (2). Aggregating these figures, our estimations suggest that, during 1980–2005, the total loss of jobs as a result of offshoring was negligible: from 160,000 in specification formula (1) to 125,000 in (2).

Furthermore, the results are robust to the presence of outliers whereas potential endogeneity issues are minimized not only by the use of the GMM technique, but by ruling out all output variables on the right-hand side of the equation. However, due to the high level of aggregation entailed in this empirical exercise, the results are to be treated with great caution. Indeed, preliminary results on an industry-by-industry basis seem to show that the final effects of offshoring on domestic employment may be rather disparate and ambiguous. A brief account follows.

Out of a total of 108 industries in the original database, we are left with 83 where the data behaves as expected. In 29 of these industries, the long-term elasticity of services offshoring (*OSS*) is positively signed, in 41, it is zero, and in 13 it is negative. On the other hand, for the coefficient of materials offshoring (*OSM*) we observe that long-term elasticities are positive in 14 industries, zero in 37, and negative in 32. In summary, according to our data for Japan, services offshoring appears to be much friendlier than materials offshoring with regards to employment creation domestically.

Out of those 29 industries with a positive effect of OSS on employment, we distinguish six industries from the services sector, three from the primary sector plus energy, and 20 from the manufacturing sector. Among these we should highlight the retail and the finance (services) industries, which account for relatively large shares of the GDP (5 percent and 3.35 percent according to JIP, ranking them fourth and seventh out of 108). Among those that have grown the most (i. e., compound annual growth rate) we have the following industries: semiconductor devices (first), office rental (third), information and internet services (sixth), and telegraph and telephone (10th). That is, one manufacturing and three services industries.

Of the 14 industries where OSM is positive, 10 are services and four are manufacturing industries. Among these the business services industry is the most representative (3 percent share of the GDP; ranks 10th). Among those which have grown the most, we should note the rental of office (third) and information and internet services (sixth) industries. As noted before, these two services industries also display positive effects of OSS.

Also, in general, negative effects of OSS are equally distributed among services (7) and manufacturing (6) industries. As for OSM, we find that negative effects are more important within the manufacturing sector (21 industries), compared with the services (7) or primary plus energy (4) sectors.

4.3.2. Productivity effects

Using equations (4.12) and (4.13) we extract the TFP measures and carry out the estimation of equations (4.14) and (4.15); results are presented in table 4.2. As previously argued, our variables of interest are believed to be determined endogenously. Moreover, to avoid omitted variables biases we follow Hijzen et al. (2006) and explicitly control for R&D expenditure, which is a natural driver of productivity growth. Since this variable does not come with the JIP database, we decide to use a proxy instead. This is the investment in information technologies; particularly, the real value of the investment in software by industries. Although this is expected to have a generally positive effect on the TFP growth rate, for our dataset it was not significant, so has been excluded.

TABLE 4.2: Productivity effects of offshoring, Japan (1980–2005). Whole economy (83 industries)

Dependent variable: ln L_{it}				
	Value-added based		**Gross output-based**	
	GMM	**GMM**	**GMM**	**GMM**
Δ ln TFP_{it-1}	0.0938[a]	0.0965[a]	0.0482[a]	0.0414[b]
	(0.0103)	(0.0140)	(0.0104)	(0.0171)
$OSS_{it}/100$	**1.2741[b]**	**0.8584**	**1.4237[a]**	**0.0692**
	(0.5351)	(0.9567)	(0.5342)	(0.5810)

TABLE 4.2 *(cont.)*: **Productivity effects of offshoring, Japan (1980–2005). Whole economy (83 industries)**

Dependent variable: ln L_{it}				
	Value-added based		**Gross output-based**	
	GMM	**GMM**	**GMM**	**GMM**
Δ OSS_{it}/100	3.5201[b]	–9.1400[a]	6.1018[a]	–2.7228
	(1.3816)	(3.5329)	(1.2103)	(2.2241)
OSM_{it}/100	**–0.2426**[b]	**0.3582**[b]	**–0.0649**	**0.3203**[c]
	(0.1012)	(0.1766)	(0.0962)	(0.1848)
Δ OSM_{it}/100	–4.9745[a]	–4.0102[a]	–2.8750[a]	–2.7278[a]
	(0.5377)	(0.8056)	(0.3957)	(0.6282)
Joint tests (Wald):				
$OSS_{it} + OSS_{it-1} = 0$	$\chi^2(1) = 5.66$	$\chi^2(1) = 0.80$	$\chi^2(1) = 7.10$	$\chi^2(1) = 0.01$
	p-value = 0.0173	p-value = 0.3696	p-value = 0.0077	p-value = 0.9052
$OSM_{it} + OSM_{it-1} = 0$	$\chi^2(1) = 5.74$	$\chi^2(1) = 4.11$	$\chi^2(1) = 0.45$	$\chi^2(1) = 3.00$
	p-value = 0.0165	p-value = 0.0426	p-value = 0.5001	p-value = 0.0831
Sargan test:	$\chi^2(41) = 55.15$	$\chi^2(41) = 48.57$	$\chi^2(41) = 59.85$	$\chi^2(41) = 45.49$
	p-value = 0.0689	p-value = 0.1941	p-value = 0.0287	p-value = 0.2903
m2 test:	z = –10.08	z = 0.94	z = –8.85	z = –0.69
	p-value = 0.0000	p-value = 0.3426	p-value = 0.0000	p-value = 0.4891
Period dummies	no	yes	no	yes
s.e.	0.0810	0.0842	0.0679	0.0581
Observations	1743	1743	1743	1743

Note: dependent variables are τ_{Vit} from the value-added-based equation (4.12), and τ_{Git} from the gross output-based equation (4.13). GMM is the Arellano-Bover estimator in orthogonal deviations with and without period dummies. Standard errors are in parentheses and [a], [b], [c] stand for significance at 1%, 5% and 10%. The Sargan test is a test on the validity of the instruments, while the m2 test by Arellano-Bond (1991) checks for the second-order autocorrelation in the residuals.
Source: JIP database (2006, 2008).

Both equations (gross value added and gross output, with period dummies) display a low level of persistence of the lagged dependent variable, so the growth rate of productivity is not strongly contingent on its past values. We should also note that both measures put the stress on different dimensions of the production process.[35]

In analyzing the estimation of the value-added measure through equation (4.14) we found that, for the specification without period effects, services offshoring is large and significant while materials offshoring shows a significant negative sign with a rather small net effect. If we add period dummies, we end up with both kinds of offshoring showing a positive effect on productivity growth, yet only materials offshoring was significant. Moreover, the estimation entertaining period dummies loosely passes both the Sargan and m2 test. Here, a 1 percentage point increase in materials offshoring index yields a 0.35 percent increase in the TFP growth rate.

In the estimation of the TFP output-based measure in equation (4.15) we have a similar picture. Services offshoring appears with a large positive effect in the specification without period effects, yet there is some evidence of second-order autocorrelation. As for the estimation considering period effects, materials offshoring is positive and significant and again, the data easily pass both the Sargan and m2 test. According to this, a 1 percentage point expansion in materials offshoring would bring about a 0.32 percent increase in the TFP growth rate.

Of course, these are very preliminary results on a rather aggregate level. A natural next step would be, as with employment, to look at the behavior of industries one by one. This disaggregation might yield interesting yet disparate results, depending on the industry. In the next chapter, we conclude the first part of the book, with some remarks about the socioeconomic impact of offshoring.

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[35] The correlation coefficient, however, is 0.90.

5. The Socioeconomic Debate on Offshoring

RECENT breakthroughs in telecommunications have opened doors to more dynamic business practices. Offshoring, which has been widely accepted in most of the business world owing to potential gains in productivity, stands out among these new practices. However, offshoring remains to be fully understood, both within and outside of the business world (especially within the political mainstream and in terms of public opinion).

Without a doubt, the expansion of the Internet has been a key factor in company relocation strategies over the past few decades. It is often said that every task that can now be put through a wire is liable to be moved abroad. In particular, a new or second-generation services-oriented offshoring has taken shape in more recent years. Even though the numbers are still far from those associated with materials (or production) offshoring, services offshoring is expected to take over very soon as a natural outcome of growth and globalization.

Offshoring in general and services offshoring in particular seem to be relatively new phenomena. But to what extent are they *really* new? After all, since the era of Smith and Ricardo entrepreneurs have been maximizing their profits through trade. And certainly the invisible hand is as in force today as it was back then. For this reason, should we not think of offshoring as a particular form of trade (i. e., intermediate trade)? In this regard, some modern economists have shed some light on the issue as they define offshoring as the ultimate manifestation of trade (Mankiw and Swagel 2006) from which the world as a whole cannot lose (Blinder 2006). And, as in basic Ricardian theory, it can be said that there are two sides (offshoring and hosting partners) that can mutually benefit from this particular exchange.

Of course, adjustment costs for some workers and firms are a harsh reality. It has been argued that widespread fears on the subject usually revolve around the *millions of jobs* soon to be relocated from developed economies into developing ones, resulting in a significant welfare cost in developed economies due to *employment destruction*. But the other side of the story is that productivity gains and price cuts could lead to a gradual stimulation of the domestic demand for goods and services.

Therefore, it might not be the quantity of workers that should worry economists and decision makers in the end. Perhaps, it is the employment composition across industries or sectors of the economy that we should focus on with more intensity. Shifts in this composition due to offshoring are commonly addressed as a form of sector bias (Arndt 1997, 1998, 1999).

Another alternative is to interpret offshoring as a factor-bias change within labor markets (Feenstra and Hanson 1996, 1999). Here, high-skilled employment results favored after offshoring takes place because low-skill activities are more prone to go offshore because of potential labor cost gains. This might result in an increase in the skill intensity of production that comes with an increase in the wage rate for high- to low-skilled labor. One way or the other, total numbers might be negligible when it comes to assessing the total *welfare loss* implied by offshoring practices.

Consequently, it remains of utter importance to measure offshoring properly, especially for what it might represent for labor markets. In this first part of the book we have seen that at least in the economics literature, it has become usual to consider intermediate trade as a way of approaching a more rigorous definition. This sort of trade represents an important share of the current total trade for industries, which is also said to affect the relative demand for different kinds of labor more than the trade in final goods (Feenstra and Hanson 2001).

Accordingly, using our empirical analysis above, we tried to produce a new understanding of widely held preconceptions. First, offshoring is not all about large and highly developed economies relocating jobs to far-off countries. Despite the fears held by many, the evidence suggests that offshoring is a widespread phenomenon. Furthermore, according to the indices presented, smaller economies rank consistently among the most intensive offshorers in relative terms. This is in part a result of our indirect estimations of offshoring through intermediate trade. The growth rates show, however, a significant increment in later times for some large economies.

Another issue we addressed is the difference in reach for the two broad sectors of the economy: manufacturing and services. The numbers here make it clear that offshoring still holds a stronger grip for manufacturing. A first wave of relocations around production activities took place in the manufacturing sector worldwide back in the 1960s and 1970s, when it became necessary to compete with foreign producers. At that time, moving production workers abroad was not only possible but necessary. But with improvements in communications and the Internet revolution, a second wave of offshoring focused on the services sector has recently gained more attention. The evidence here reflects this change.

Another point we raised deals with the different kinds of offshoring. This is certainly in close connection to the previous analysis. In terms of the indices produced, we are now interested in the type of input being imported, whereas previously, we inquired about the destiny of the same input. Here the growth rate of the world (weighted) average seems to be significantly higher for services offshoring. For this reason, we also carried out a detailed analysis on services offshoring.

For this we presented a breakdown of the industries engaged in services offshoring. We noticed that in effect services offshoring concentrates on services industries, and that the industries at the top traditionally imply relatively high value-added activities that could eventually result in higher growth and new employment opportunities. We showed the growth rates in the services offshoring intensities for every industry considered with their associated growth rates of employment. Not surprisingly, fast-growing industries like finance and insurance, computer and related activities, or business activities in general, experience high rates of both services offshoring and employment.

Later, and complementing the statistical analysis, we presented the case of Japan relying on widely used econometric techniques. Here we argued that the final effect of offshoring on employment could be positive as well as negative. It depends on whether the long-term productivity effect overcomes both the substitution and short-term productivity effects. Our results indicate that, at least at the aggregate level, positive elasticities can be expected when it comes to services offshoring. However, this simple exercise should be taken with caution, and only as a reference that the final effects of offshoring are ambiguous.

Throughout the debate on offshoring, inflated numbers have been reported both by consulting companies and the media. This usually influences politicians and the public (unions, most representatively) in the same direction. According to these agents, offshoring is necessarily bad for domestic employment, since those jobs previously performed within the national borders are now taken to other horizons (for them, one job offshored is one job lost). However, a short-sighted reading such as this could prevent a real understanding of the subject. Entrepreneurs, in reducing their costs (or maximizing their profits for that matter), are just fulfilling a social function. It is then natural that they look into the global pool of employment seeking to exploit the geographic comparative advantages (i. e., cheaper labor) whenever they deem it appropriate.

Politicians, employers, and workers must realize, once and for all, that economics is certainly not a zero-sum game. Negative as well as positive effects of offshoring are natural and offset forces that dwell in the realm of international trade. In opposing offshoring, hampering forces like unions and regulations would do nothing but harm the very individuals they are so intent on protecting.

Our empirical analysis seems to point towards the potential gains of offshoring. However, the current crisis predisposes economic agents to find scapegoats where there are none. As mentioned before, negative welfare effects for a group of people as a result of offshoring are certainly one gloomy possibility. But this also holds true for all entrepreneurial practices known to date and, by extension, all economic activities undertaken by rational individuals. Underlying our research, there is a compelling necessity to keep this discussion current and alive, for what it represents for all economic agents alike. Only by discussing it will our understanding of the offshoring phenomenon truly be expanded.

PART TWO

MANAGEMENT PRACTICES AND OFFSHORING

6. Business Process Offshoring: A Literature Review

As in part one of this book, we will start part II by providing a brief review of the state of the literature, as well as highlight the main frameworks and methodologies currently in use. We will also describe other topics of interest in the management field such as the effects of what has been called the *global race for talent* (i. e., competition for skilled workers) on labor markets.

This chapter thus surveys academic publications that focus on this recent wave of BPO, from the initial relocation of fairly commoditized back-office activities to the latest migration of sensitive knowledge-intensive functions such as R&D and engineering services.

As a natural consequence of the variety of issues related to the recent wave of BPO, the academic works published on the topic are scattered among very different streams of the wide range of management literature. Given that the offshoring phenomenon is by definition an international phenomenon, we restricted our analysis to articles that belong to purely international management research. In other words, we deliberately confined our analysis to those papers that focus on the international aspects of management that do not apply to domestic enterprises (Ricks 1991; Werner 2002). In particular, we investigated how the recent practice of offshoring represents a novel opportunity to manage firms in a multinational context. Obviously, the selected articles belong to very different streams of the international management literature, as they focus on different facets of the offshoring phenomenon, ranging from virtual teams to information systems, from industry drivers to firm-level considerations. The purpose of this chapter is to organize such contributions organically and highlight emerging trends.

6.1. Literature review

Table 6.1 schematically maps the 38 articles discussed in this literature review, ordered by year of publication. Given the academic emphasis of this review, we excluded books, book reviews, and editorials, as well as articles published in the *Harvard Business Review*, the *Sloan Management Review* and the *California Management Review* due to their lack of focus on academic research. In order to provide a comprehensive portrait of the current offshoring literature, we also excluded working papers as well as unpublished articles presented at international conferences.

Reddy's paper, published in 1997, can be rightly considered the first major contribution to the understanding of what we now call BPO. Though written over 10 years ago, the author already identified some of the key driving forces of what would become a wave of internationalization that many analysts now consider to be a true service revolution: the recent technological progress and its rapid international diffusion, the cost differentials among developed and developing countries, and the presence of a significant global mismatch between local output from institutes of higher education and the needs of local industries represent the conditions that fostered the emergence of a new offshoring model for multinational companies. In addition, Reddy also accurately anticipated that the forthcoming globalization was not only going to serve fairly commoditized back-office functions, but also higher-skilled core functions such as R&D. Reddy's particular focus on India as a privileged destination for the relocation of these high-value activities was also farsighted, evidenced by the fact that India today represents the most important recipient of offshored functions from U.S. and European companies (Lewin and Peeters 2006a).

As for the other 37 articles analyzed, we can clearly see an exponential growth in interest for the topic starting in 2003. Offshoring began to attract the attention of several scholars from a variety disciplines partly thanks to a number of special issues focused on the topic in leading management journals such as the *Journal of Management Studies*, the *Journal of Management Information Systems*, the *Journal of International Management*, and the *Journal of Operations Management*. A number of focused academic conferences organized by leading academic institutions[36] has also emerged in the past few years, further validating the increased attention on this important area of research. By analyzing the articles with specific consideration for the topics discussed and research methodologies used, as well as the works cited within each article, we reached several conclusions discussed below.

[36] Among others, in 2007 Duke University organized the first annual research conference and workshops on offshoring. That same year, the Indian Institute of Management in Bangalore hosted the second international conference on management of globally distributed work. In 2008 Bocconi University organized an international conference focused on offshoring and outsourcing.

TABLE 6.1: Mapping the offshoring literature

Authors (year)	Title	Literature of reference	Level of analysis	Methodology type	Key findings
Reddy (1997)	"New trends in globalization of corporate R&D and implications for innovation capability in host countries: a survey from India."	International business	Firm	Empirical survey – questionnaire	Primary driving force for locating R&D in India is technology-related. The availability of talent in the offshore location is also determinant in the decision to relocate R&D.
Dossani and Kenney (2003)	"Lift and shift: moving the back office to India."	Information systems	Industry – firm	Case studies	Overview of offshoring industry in India. Analysis of six key factors to be considered before offshoring.
Hinds and Bailey (2003)	"Out of sight, out of sync: understanding conflict in distributed teams."	Organization behavior	Team	Conceptual review	Develop a theory-based explanation of how geographically distributed virtual teams are different from traditional teams.
Pfannenstein and Tsai (2004)	"Offshore outsourcing: current and future effects on American IT industry."	Information systems	Industry	Review of previous reports	The main driver of IT outsourcing is lower labor costs, however companies also want to focus on their core businesses and create value for their shareholders.
Bunyaratavej, Hahn and Doh (2005)	"International offshoring of services: a parity study."	International business	Country	Empirical analysis – *FDI* data	Wage differences are not the only factors behind the offshoring decision. Cultural similarity, education level and potential service quality issues also matter.
Nachum and Zaheer (2005)	"The persistence of distance? The impact of technology on MNE motivations for foreign investment."	International business	Industry	Empirical analysis – *FDI* data	Offshoring (outward flow in highly information-intensive industries) is only about efficiency seeking, i. e., cost savings
Doh (2005)	"Offshore outsourcing: implications for international business and strategic management theory and practice."	RBV – dynamic capabilities -stages model	General – policy	Conceptual review	Offshoring challenges key management theories and calls for policy implications.

TABLE 6.1 *(cont.)*: **Mapping the offshoring literature**

Authors (year)	Title	Literature of reference	Level of analysis	Methodology type	Key findings
Farrell (2005)	"Offshoring: value creation through economic change."	McKinsey Global Institute's studies	General – policy	Case studies	Offshoring creates wealth in Western countries (cost savings, repatriated earnings, new revenues).
Levy (2005)	"Offshoring in the new global political economy."	Economic geography	General – policy	Conceptual review	Offshoring creates global commodity markets that destroy value in Western countries.
Aron, Clemons and Reddi (2005)	"Just right outsourcing; understanding and managing risk."	Information systems – TCE	Firm	Case studies	Develop a technique, called strategic chunkification, that allows companies to minimize offshore risks.
Lewin and Peeters (2006a)	"Offshoring work: business hype or the onset of fundamental transformation?"	International business	Firm	Empirical survey – questionnaire	Offshoring implications: commoditization, emerging global sourcing of human capital, bottom-up phenomenon.
Dossani and Kenney (2006)	"Reflections upon 'Sizing the emerging global labor market.'"	McKinsey Global Institute's studies	General – industry	Case studies	A profound transformation of the employment and wage structure in the U.S. is underway.
Farrell, Laboissiere and Rosenfeld (2006)	"Sizing the emerging global labor market."	McKinsey Global Institute's studies	General – industry	Case studies	Offshoring will impact a relatively small fraction of Western jobs. Offshore wages will rise but will not reach U.S. levels. There is inefficient matching.
Marin (2006)	"A new international division of labor in Europe: outsourcing and offshoring to Eastern Europe."	International economics	Firm	Empirical survey – questionnaire	Discussion of drivers of the new division of labor in Europe. Falling trade costs and reduced level of corruption are making it easier to offshore to Eastern Europe.

TABLE 6.1 *(cont.)*: **Mapping the offshoring literature**

Authors (year)	Title	Literature of reference	Level of analysis	Methodology type	Key findings
Jahns, Hartmann and Bals (2006)	"Offshoring: dimensions and diffusion of a new business concept."	International business	General	Conceptual review	Overview of offshoring studies. Geographic and contractual/legal dimensions are highlighted for defining offshoring. Environmental, political and socio-demographic factors are also considered.
Harrison and McMillan (2006)	"Dispelling some myths about offshoring."	International business	Firm	Empirical Survey – descriptive statistics	Review of results of previous studies plus the addition of new results show that increases in employment in low-income countries can hurt employment at home.
Blinder (2006)	"Offshoring: the next industrial revolution?"	International economics	General	Conceptual	Economists applying the principle of comparative advantage underestimate the importance of offshoring and its disruptive effects.
Mehta et al. (2006)	"Challenges and opportunities of business process outsourcing in India."	Strategic management – TCE, RBV and relational view	Industry	Case studies – interviews and content analysis	Human resources- and organization-related challenges are the most critical issues. Knowledge outsourcing is the main uncovered future opportunity. Secondary data support the findings.
Henley (2006)	"Outsourcing the provision of software and IT-enabled services to India."	Information systems	Industry	Review	Cost considerations are not the only relevant drivers. New business models, as well as the particular Indian context, should also be considered.

TABLE 6.1 *(cont.)*: **Mapping the offshoring literature**

Authors (year)	Title	Literature of reference	Level of analysis	Methodology type	Key findings
Dossani and Kenney (2007)	"The next wave of globalization: relocating service provision to India."	Information systems – strategic management	Firm	Case studies	A taxonomy of market participants is presented. Highlights the increasing offshoring of highly skilled positions and the active role of small entrepreneurial U.S. firms.
Gupta and Mukherji (2007)	"Offshoring: the transition from economic drivers toward strategic global partnership and 24-hour knowledge factory."	Information systems	Firm	Case studies	Description of the 24-hour knowledge factory: a sustainable global model to capture value through the offshoring of complex tasks.
Connaughton and Shuffler (2007)	"Multinational and multicultural distributed teams: a review and future agenda."	Organization behavior	Team	Conceptual review	Future research on the topic must broaden its conceptualization of culture, consider various complexities and investigate how culture and distribution affect performance.
Kedia and Lahiri (2007)	"International outsourcing of services: a partnership model."	International alliances – RBV – relational view	Firm	Theoretical	International outsourcing of services partnerships vary in terms of value proposition and degree of involvement. Trustworthiness and cultural distance significantly influence the partnership.
Kshetri (2007)	"Institutional factors affecting offshore business process and information technology outsourcing."	Institutional theory	Institutional – industry	Theoretical	Analysis of how the regulative, normative and cognitive institutions of home and host countries influence the patterns of global flow of offshore BP and IT outsourcing.

TABLE 6.1 *(cont.)*: **Mapping the offshoring literature**

Authors (year)	Title	Literature of reference	Level of analysis	Methodology type	Key findings
Grote and Taube (2007)	"When outsourcing is not an option: international relocation of investment bank research – or isn't it?"	TCE and modularity literature	Industry	Case studies interviews – newspaper survey	For the investment bank industry, there is little scope for outsourcing but more potential for low-level research activities to be offshored to low-cost countries.
Youngdahl and Ramaswamy (2008)	"Offshoring knowledge and service work: a conceptual model and research agenda."	Operations management	General	Conceptual	Two conceptual models are proposed to take into account the complexities of offshoring service and knowledge work.
Fifarek et al. (2008)	"Offshoring technology innovation: a case study of rare-earth technology ."	Strategic management	Country	Empirical – patents analysis	Offshoring practices have adverse effects on innovation at the national home base.
Aksin and Masini (2008)	"Effective strategies for internal outsourcing and offshoring of business services: an empirical investigation."	Operations management	Firm	Empirical – cluster analysis	The effectiveness of a shared services project depends on the degree of complementarity between the needs arising from the environment and the specific capabilities developed.
Li et al. (2008)	"Transformational offshore outsourcing: empirical evidence from alliances in China."	Knowledge management	Firm	Empirical survey – questionnaire	Examination of the relationship among the motive to acquire tacit knowledge from outsourcing partners, the control mechanisms and the innovation outcomes, finding that the first two predict incremental and radical innovation outcomes

TABLE 6.1 *(cont.)*: **Mapping the offshoring literature**

Authors (year)	Title	Literature of reference	Level of analysis	Methodology type	Key findings
Stratman (2008)	"Facilitating offshoring with enterprise technologies: reducing operational friction in the governance and production of services."	Strategic management – TCE, competitive capability	Firm	Conceptual	Proposals are developed on how the standardized transactional infrastructure of enterprise technologies can help lower transaction costs relative to the offshoring of service processes.
Balakrishnan et al. (2008)	"Outsourcing of front-end business processes: quality, information, and customer contact."	Strategic management – information systems	Firm	Conceptual	Using a mathematical model, the authors determine the factors that favor the outsourcing of front-end processes. Results find the vendor can forecast the task environment and gain sophistication in interpreting contract terms.
Metters and Verma (2008)	"History of offshoring knowledge services."	Offshoring literature	General	Conceptual	Review of service offshoring in the 1980s and analysis of the combination of factors that have created the specific services offshoring configuration of today.
Ellram et al. (2008)	"Offshore outsourcing of professional services: a transaction cost economics perspectives."	TCE	Firm	Case studies – interviews	Using the tenants of TCE, postulates that the fixed costs of establishing the relationship dominate the variable costs of day-to-day transactions, and that organizations will not offshore outsource areas where there is a high perceived level of risk.

TABLE 6.1 *(cont.)*: **Mapping the offshoring literature**

Authors (year)	Title	Literature of reference	Level of analysis	Methodology type	Key findings
Stringfellow et al. (2008)	"Invisible costs in offshoring services work."	Operations management	Firm	Conceptual	Development of a conceptual framework for understanding services offshoring, organized around interaction intensity and interaction distance. Invisible costs stem mainly from the unique characteristics of services.
Vivek et al. (2008)	"Analysis of interactions among core, transaction and relationship-specific investments: the case of offshoring."	TCE and RBV	Firm	Case studies (grounded – theory building approach)	Suggests that although the propositions of TCE might explain the offshoring alliances in their nascent stages, nature of investments in a matured offshoring alliance may be explicable more through the propositions made by the RBV.
Metters (2008)	"A typology of offshoring and outsourcing in electronically transmitted services."	Operations management	General – industry	Conceptual	Presentation of a typology to apply to offshoring processes. Such typology implies that while offshoring is a viable option for many firms, a proportion of the service processes now being offshored will remain in high-wage countries.

TABLE 6.1 *(cont.)*: **Mapping the offshoring literature**

Authors (year)	Title	Literature of reference	Level of analysis	Methodology type	Key findings
Aron et al. (2008)	"Monitoring process quality in offshore outsourcing: a model and findings from multi-country survey."	TCE – game theory	Firm	Empirical survey	Construction of a game-theoretic model of the dynamics of the buyer-supplier interaction in the presence of moral hazard and incomplete contracting: firms are more likely to inspect routine and less complex processes than the more complex ones with higher costs of inspection.
Bhalla et al. (2008)	"Is more IT offshoring better?: an exploratory study of Western companies offshoring to Southeast Asia."	Information systems	Firm	Empirical analysis of publicly available data – cluster analysis	No clear link between company performance and the extent of offshoring is found, thus suggesting that further study is needed to understand when and how to offshore.

6.2. Main theoretical frameworks used to investigate the offshoring phenomenon

The current offshoring wave is a complex phenomenon that can be approached from different angles using different levels of analysis. As a natural consequence of this complexity, we found a great variety of studies in terms of the sources of their references and branches of literature used within the previously defined international management field across the 38 articles reviewed. If we look at the most often cited theoretical frameworks used to address offshoring issues, we can make the following observations. First, transaction cost economics (TCE), the resource-based view of the firm, and international business theories appear most often as the dominant perspectives. Second, institutional theory and organizational behavior approaches are used to contextualize the offshoring phenomenon at the institutional and group levels, respectively. Finally, a considerable amount of research focuses on important operational issues relative to offshoring and mainly refers to the information systems and operations management literature.

Strategic management literature related to offshoring mostly deals with how two dominant theories are applied in the field: TCE and the resource-based view (RBV) of the firm. TCE represents an insightful approach for analyzing the transactional costs associated with the practice of offshoring and provides a basis for deciding the most appropriate organizational form to adopt in order to minimize those costs. In distinguishing between offshore outsourcing, the so-called *buy option* and *FDI,* the equivalent for the *captive option*, several authors have investigated the conditions under which one organizational form should be preferred over the other. In particular, the authors focus on the bilateral *hold-up* problem that can emerge if the local offshore vendor has to make an up-front investment in customization (e. g., asset specificity), as is generally the case when accepting to provide the buyer with a selected service. The core idea, which goes back to the heart of TCE (Williamson 1975), is that the parties cannot specify all possible future contingencies, especially when a Western firm is operating in an unfamiliar foreign environment, as could be the case with a country like India. The decision to offshore outsourcing or use *FDI* depends, then, on the degree of hold-up, which in turn mainly depends on the outside options available to the offshore service provider and on the quality of contract-enforcement institutions such as the legal system in the offshore country (Trefler 2005). Research by Mehta et al. (2006) and Stratman (2008) shows that the greater the process customization and complexity, the higher the associated transaction risks to generate the hold-up problem. Stratman (2008) also argues that certain enterprise technologies can significantly reduce offshore transaction costs by standardizing and structuring system processes between the Western client and the offshore vendor. Ellram et al. (2008) also utilize the TCE framework and show that the fixed costs of establishing the relationship dominate the variable costs of day-to-day transactions. Furthermore, they conclude, organizations will not outsource to offshore vendors located in areas where there is a perceived high degree of unmanageable risk. Aron et al. (2005) also focus on the potential risk of opportunistic behavior in the case of offshore outsourcing and use the TCE framework to develop a technique, called *strategic chunkification*, that allows companies to minimize such risk by dividing entire business processes into chunks that can be separately outsourced (or not) in a much more convenient and safe manner.

Vivek et al. (2008), on the other hand, utilize the TCE framework to investigate offshore alliances. Their study interestingly shows that the logic of TCE seems very well suited to explain investments in offshoring alliances in the initial stages. According to the classic TCE framework, alliances are generally seen as falling in the intermediate state between markets and hierarchies (Williamson 1991). Western clients that are aware of the risk of opportunism in offshore alliances make initial transactional investments, thus controlling the chances of negative consequences. However, as the alliance evolves, TCE appears to be limited in explaining the observed investment in offshore alliances, as it neglects the interdependent focus on the capabilities of the alliance. Consequently, for later evolved stages, the authors argue that the RBV perspective seems better equipped to explain the behavior of offshore alliances, as it "focuses on the ability of the firm to create core competencies through capabilities rather than avoid negative market conditions" (Vivek et al. 2008, 194). Mehta et al. (2006) and Kedia and Lahiri (2007) make very similar arguments for the necessity to integrate the TCE approach with more competence-based views in order to properly model the evolution of offshoring partnerships models.

RBV has emerged as a relevant new conceptualization in the field of strategic management, mainly thanks to the work of Wernerfelt (1984) and Barney (1991). Thus, it should not come as a surprise that many researchers have adopted the RBV framework to investigate how organizations strive to acquire and develop strategic resources through the practice of offshoring. From a theoretical standpoint, the founding idea (Penrose 1959) is that a firm can be conceptualized as a bundle of resources and that these resources are heterogeneously dispersed across firms. Based on this, RBV predicts that when companies create a pool of resources that are valuable, rare, inimitable and nonsubstitutable (e. g., the so-called VRIN attributes), they can achieve a sustainable competitive advantage given that their strategies based on such resources are difficult to imitate for competitors (Barney 1991). Applying RBV to strategic problems has rapidly become a standard approach in the mainstream strategic management field (Acedo, Barroso and Galan 2006), and insights gained from the concept have also been increasingly used in the international business domain to explain the sources of competitive advantage for multinational corporations (Peng 2001).

When framing the offshoring phenomenon through the RBV lens, Doh (2005, 700) argues that "offshoring, both as internal process and business strategy, could be an outcome of successful management or resources, and may itself represent a direct application of firm-level capabilities as envisioned by the RBV." However, scholars using RBV to explain offshoring processes unanimously agree that, within the realm of RBV, the more traditional concepts (Barney 1991) appear to have less power when it comes to understanding how offshoring can be used to achieve competitive advantage today. This is due, first of all, to the overall static nature of the original RBV theoretical framework, which pays scant attention to the mechanisms used to turn resources into competitive advantage, especially in dynamic markets (Eisenhardt and Martin 2000) where offshoring is having the biggest impact. Second, the offshoring scheme is often cited as one of the main causes of the commoditization of a number of white-collar productive functions that can now be more easily imitable and accessible by competitors on a global scale (Doh 2005; Levy 2005), and thus goes against the traditional RBV prescription to invest and focus on resources that are rare and inimitable. Third, because RBV explains very little about how to acquire and manage resources shared with other partners, it becomes difficult to apply to the offshore outsourcing and alliance alternatives. In response to such concerns, scholars have integrated the RBV perspective with other theoretical frameworks in order to provide more compelling models that better explain current offshoring practices. For instance, Doh (2005) argues that we should consider the dynamic capabilities view of competitive strategy (Teece et al. 1997) to fully understand how companies acquire and synthesize knowledge resources in rapidly changing offshore environments. Mehta et al. (2006), Li et al. (2008) and Kedia and Lahiri (2007) invoke a relational view (Dyer and Singh 1998) to explain how firms create value in their offshore ventures through different forms of partnerships. In their argument, those "relational rents" that are created "when partners share, combine, or invest their assets, knowledge, or capabilities, or employ effective governance to lower their transaction costs or improve synergies" (Mehta et al. 2006, 327), are critical for the success in later evolved stages of the offshore partnerships.

International business (IB) theories obviously represent proper frameworks for contextualizing offshoring. In fact, the articles reviewed exhibit a number of contributions that use IB concepts to frame the current offshoring wave. In particular, Doh (2005) reviews a variety of established IB theories and discusses the main implications of introducing offshoring practices. Most relevantly, Doh points to the need to reassess some of the applications of the OLI theory and the stages model of internationalization. Regarding the first paradigm, we can say that the emergence of the knowledge-based economy, the progress achieved by information technologies, and the subsequent spread of offshoring practices have been responsible for the changing character and boundaries of the advantages specific to ownership (Doh 2005; Dunning 2000). Since the 1960s three main kinds of firm- or ownership-specific competitive advantages have been identified: those relative to the control and exploitation of monopoly power (Hymer 1976; Porter 1980); those relative to the possession of a set of valuable, scarce, idiosyncratic and inimitable resources (Barney 1991); and those relative to a manager's skills to identify, evaluate, and exploit resources and capabilities on a global scale (Prahalad and Doz 1987; Bartlett and Ghoshal 1989). The recent emergence of a knowledge-based economy, where wealth-creating activities have become much more knowledge intensive than before (Santos, Doz and Williamson 2004), has altered the relative significance of these three kinds of firm-specific advantages in favor of the third one. Whereas 20 years ago the competitive advantage of firms was predominantly based on their capacity to internally produce and organize proprietary assets and purposefully match them to local market needs, in the past few years "the emphasis is more on their capabilities to access and organize knowledge intensive assets from throughout the world, and to integrate these not only with their existing competitive advantages, but with those of other firms engaging in complementary value added activities" (Dunning 2000, 169).

As for the challenges to the stages model of internationalization, we can argue that the current process of internationalization in conjunction with the offshoring of knowledge-intensive work presents important differences with the Uppsala stage model of internationalization (Johanson and Vahlne 1977), an established framework that has dominated the IB field in the last decades. Rooted in uncertainty reduction and experiential learning, the Uppsala stage model hypothesizes that firms incrementally increase their commitment to their foreign operations. This staged process interests a company's value chain and its partial relocation to foreign countries (from export to sales offices to production facilities to full value-chain subsidiaries), its mode of operations (from arm's length transactions through partnerships with locals to wholly-owned operations), and its geographical distribution (from more familiar to less familiar countries)

(Westney and Zaheer 2001). Recent research (Doh 2005; Dossani and Kenney 2006, 2007; Lewin and Peeters 2006a) on this matter shows that companies offshoring innovation work today are redistributing their value activities worldwide in a way that is radically different from the relocation of international activities that characterized previous waves of internationalization. Smaller entrepreneurial firms are entering into accelerated processes of internationalization in which they rapidly relocate their core knowledge-activities to offshore locations where those activities can be best performed.

Other IB studies also focus on the liabilities of foreignness —defined as the social, political and economic costs of doing business in a foreign country (Zaheer 1995)—and investigate how they affect choosing a location for offshore activities. Education and cultural distance emerge as important factors in determining the offshore location (Bunyaratavej et al. 2005; Kedia and Lahiri 2007). Other works concentrate on the driving factors that lie behind the decision of firms to pursue offshoring ventures. The results show that the vast majority of companies relocate activities in order to increase efficiency and save on labor costs (Lewin and Peeters 2006a; Marin 2006; Nachum and Zaheer 2005).

Out of the 38 articles surveyed, we found two studies that use institutional theory to analyze how the regulative, normative and cognitive institutions of home and host countries influence offshoring patterns, while two other research studies draw from the organization behavior literature to better understand group level dynamics and the organization of geographically distributed teams. As for the use of institutional theory to frame offshoring processes, its main implications are the following. Offshoring firms tend to prefer for their investments countries with similar institutional structures and regimes to the home country. In Western countries, messy political schemes and widespread concern related to offshoring have produced pressures against it. In developing regions, on the other hand, isomorphic pressures from client firms and professional organizations have brought important institutional changes that are contributing to an increase in offshoring investments in such countries (Bunyaratavej et al. 2005; Kshetri 2007).

As for the organizational behavior literature, two research studies investigate an important implication of the offshoring phenomenon: the exponential growth in multinational firms of geographically distributed teams. As a consequence of the rapid globalization of activities, multinational firms are now increasingly managed by multicultural teams whose members are geographically scattered and face highly heterogeneous cultural environments. The increasing standardization of technical knowledge and the predominance of the English language in a number of technical fields have played important roles in facilitating efficient interactions among individuals with different cultural backgrounds in remote locations. Many industries are now seeing a prevalence of teams that span multiple geographic and cultural boundaries. As a result, multinational multicultural distributed teams have become an integral part of numerous organizations and scholars have begun studying their peculiarities (Connaughton and Shuffler 2007; Hinds and Bailey 2003).

Finally, a number of reviewed articles belong to the information systems and operations management literature. As for the first type of literature of reference, most of the studies concentrate on the American IT industry and consider India to be a preferred location for outsourced activities. Dossani and Kenney (2003) provide an interesting overview of the offshoring industry structure in India and formulate a list of internal factors that should be considered before offshoring an activity, in addition to environmental considerations. Henley (2006) analyzes the origins and development of the Indian software and IT-enabled services sector, highlighting the political and socio-economic context that has favored its growth, such as the heavy investment in scientific and engineering manpower development. Pfannenstein and Tsai (2004) take a deeper look at the American IT industry and review the main benefits, costs and risks involved in offshore outsourcing. More operational in nature are the two other contributions to the information systems literature. Gupta and Mukherji (2007) develop an analytical model for achieving a strategic advantage from offshoring that results in an integrated 24-hour knowledge factory. Balakrishnan et al. (2008) use a mathematical model to determine how incomplete information, task assignment and managerial control systems contribute to the recent phenomenon of offshore outsourcing front-end business processes.

With regard to the operations management literature, the articles reviewed tackle different operational issues that arise with offshoring processes. Aksin and Masini (2008) consider the shared services initiatives and build upon the structure-environment perspective to uncover configurations that exhibit superior results. The model they propose and test suggests that the effectiveness of a shared services project is dependent on the degree of complementarity between the needs arising from the environment and the specific capabilities developed to address such needs. Stringfellow et al. (2008) investigate the drivers of invisible costs in offshore outsourcing, defined as hidden communication-related costs tied to the use of foreign services providers. Their results show that interaction intensity and interaction distance between customers and service providers can lead to invisible costs in providing offshored services. Youngdahl and Ramaswamy (2008) develop an evolutionary model of service offshoring that sheds light on how to conceptualize offshore services delivery processes. Contrary to those conceptualizations that consider offshoring to be a one-off decision, the proposed evolutionary model shows "pathways to sequentially building competence within an organization to develop centers of excellence that capture an array of benefits, both transactional and solution-based, that add significant value" (Youngdahl and Ramaswamy 2008, 221).

6.3. Methodology: current bias on conceptual and case-based research

Based on the 38 articles reviewed, we can make several observations regarding their methodology. Sixteen of the papers are conceptual, and either propose new theories/models to explain offshoring or review the existing contributions on such matters; 11 use the case study approach to validate their hypotheses; the remaining 11 are empirical and either use questionnaire results or publicly available data such as patents or *FDI* data.

The distribution of articles analyzed in this literature review confirms offshoring literature is in its early stages. It appears that the majority of scholars studying offshoring are still trying to make sense of the phenomenon using traditional theoretical frameworks and developing useful models to help conceptualize offshoring processes. That there are many review articles can also suggest an attempt to introduce offshoring as a legitimate topic in established literature.

Almost one third of the articles rely on case studies. Only one article makes an explicit link to grounded-theory building approach (Vivek et al. 2008), while most of the other articles do not seem to be as rigorous in their case selection. Interviews with senior executives provide information that reinforce arguments, or simply offer examples on particular offshoring issues. Since offshoring is still a nascent phenomenon—still unfamiliar or only partially implemented by companies—scholars are making an invaluable contribution to understanding this new wave of internationalization simply by offering real examples and testimonies from an industry level.

Finally, only 11 articles are empirical studies of the offshoring phenomenon. A few (five) of them use firm-level questionnaire results, while the other six utilize publicly available country- or industry-level data such as patents or *FDI* databases. These results confirm the current lack of research using fine-grained information to study the offshoring phenomenon. Country- and industry-level data are certainly useful in providing macro trends and in picturing the overall offshoring situation; however, they cannot be used to offer detailed analysis of the firm-level processes that take place when companies initiate and pursue offshoring ventures. This bias is most likely due to the early stage of the phenomenon and the resulting difficulty for scholars to collect accurate and extensive data.

On a final note, we should highlight that only two studies (Aksin and Masini 2008; Marin 2006) are fully based on European data. Despite the fact that European firms represent important and active players in the current offshoring wave, as of today we must acknowledge that the phenomenon seems understudied in Europe.

6.4. Offshoring and labor markets: the emerging global sourcing of talent

In a press conference for the *2004 Economic Report of the President,* Harvard Professor Gregory Mankiw pointed out that U.S. offshoring is good for the U.S. economy, as the increased hiring in the overseas affiliates of U.S. multinationals is associated with more employment in the U.S.-based parent companies. Not only that, he argued, but the recent offshoring phenomenon is nothing more than the latest manifestation of trade gains that have been studied by economists since the time of Adam Smith. Although "economists lined up to support his claim that offshoring is simply international business as usual" (Blinder 2006, 116), a number of scholars have discarded this analysis as a misleading oversimplification of reality (Blinder 2006). As for media coverage of the offshoring phenomenon, alarming perceptions of the offshoring trend have vastly dominated the public arena. Media coverage such as the article "Is Your Job Next?" by Engardio et al. (2003), which appeared on the cover of *Business Week,* have contributed to reinforcing the generalized fear of job loss in Western countries.

It is quite clear that offshoring has attracted considerable media attention not so much for its current dimension, since the practice is still relatively new and not widely used, but for its forecasted future impact on the global realignment of jobs (Blinder 2006; Doh 2005; Harrison and McMillan 2006; Karmarkar 2004). In the past few years, scholars have tried to estimate the nature of this impact, with different positions emerging. Farrell et al. (2006) concluded that offshoring will continue to create a relatively small global labor market, as only 11 percent of service jobs around the world can be carried out remotely. They also highlighted a potential mismatch between supply and demand for offshore talent, with demand outstripping supply only in a few developing regions where a significant rise in wages will occur. Their study also showed that, despite the fact that only about 10 percent of today's university graduates in low-wage nations are suitable for jobs in Western multinationals, supply in low-cost countries will continue to exceed demand in future years. Dossani and Kenney (2006) argued instead that a much more profound transformation of the employment and wage structure in the U.S. labor market will follow the diffusion of offshoring practices. According to the authors, U.S.-based college-educated engineers and accountants, among others, will have to compete with similarly trained graduates in low-wage economies, which will likely bring a remarkable turn of events in upcoming years.

Lewin and Peeters (2006a) also share a line of thought. They document how U.S. companies are increasingly relocating not only lower-skilled commoditized service functions to offshore locations, but also knowledge-intensive activities that require technical talent to be performed such as R&D and product design. The authors also showed that the current shortage of technical talent in the United States due to a 2003 cutback in H1B visas is one of the driving forces behind this emerging global race for talent. Such a rise in global sourcing of human capital is therefore considered to be the implication of offshoring that will have the most disruptive consequence on Western labor markets (Dossani and Kenney 2007).

In sum, it is difficult to accurately predict the future impact of offshoring, although it is clear there will be a significant redistribution of labor on a global scale. Using Blinder's (2006, 120) words:

> We are now in the early stages of a third Industrial Revolution, the information age. The cheap and easy flow of information around the globe has vastly expanded the scope of tradable services, and there is much more to come. Industrial revolutions are big deals. And just like the previous two, the third Industrial Revolution will require vast and unsettling adjustments in the way Americans and residents of other developed countries work, live, and educate their children.
>
> The kinds of jobs that can be moved offshore will not disappear entirely in high-cost developed countries, but their shares of the work force will substantially diminish. Offshoring will certainly not lead to massive unemployment, as it did not happen for agricultural and manufacturing works in the two previous industrial revolutions, however massive transitions across sectors in Western labor markets will likely occur.

6.5. Conclusion

The objective of this review was to organize the academic contributions that have been published to date in relation to the emerging phenomenon of BPO. As the total number of articles confirms, offshoring represents today an emerging international topic that is attracting increasing interest in the management scholar community. Thus, one of our main conclusions from the review is that the diversity of studies encountered in the literature demonstrates the complexity of the phenomenon.

Researchers have used different approaches and methodologies to try to make sense of a phenomenon whose peculiarities are still not fully understood. In fact, the prevalence of theoretical/conceptual articles supports the perception that management scholars are still working on a theoretical contextualization of this phenomenon, which in many ways challenges established paradigms. In addition, bias towards the case study approach and the resulting lack of valid empirical databases, especially for the European context, further places difficulty on researchers to collect sound and accurate information.

As previously discussed, the hope is to move towards a homogenized terminology. This would aid the creation of a sound theoretical framework that integrates the different contributions throughout the literature. Several aspects of the offshoring phenomenon have still not received proper attention in the literature. BPO today is the means by which companies are reorganizing their value activities on a global scale. The 38 articles identified in this review represent the first contributions in a stream of literature that is expected to grow exponentially in the coming years.

The next chapter discusses a comprehensive study developed by a consortium of universities and offshoring practitioners known as the Offshoring Research Network (ORN). This study was carried out to serve as an overview of the subject from a managerial perspective.

7. Main Findings of the Offshoring Research Network

7.1. Executive summary

For many corporations, offshoring has become a major strategic concern of top management. There has been a dramatic increase in the number of companies that responded positively to the question: "Has your company adopted a corporate-wide strategy for guiding offshoring and outsourcing decisions at the business unit and function level?" In the 2007/2008 survey, 53 percent of responding companies claimed to have a corporate strategy in place, up from 22 percent in 2005. Companies that have implemented a corporate-wide strategy have often achieved significantly better performance in terms of savings, meeting target service levels, improving relations with providers, overcoming internal resistance, etc.

The globalization of innovation has clearly emerged as a new strategic imperative for many companies.

- Of all the offshoring/outsourcing projects initiated in 2007, most implementations were related to product and software development.
- Speed to market and the domestic shortage of science and engineering talent are two key strategic drivers for offshoring innovation projects.
- Respondents said they view the loss of managerial control and employee turnover as the most important risks associated with the globalization of innovation through offshoring.

Authors: Ton Heijmen, Arie Y. Lewin, Stephan Manning, Nidthida Perm-Ajchariyawong, Jeff W. Russell. Name of Publication: *Offshoring Reaches the C-Suite* (R-1445-09-RR). Date of Original Publication: June 2009. "Reproduced with permission from The Conference Board, Inc. Offshoring Reaches the C-Suite (2009). © 2009, The Conference Board, Inc."

Small and midsized companies are increasingly sourcing innovation offshore.

- Small and midsized companies find it difficult to compete for highly qualified talent domestically.
- Time to market is the most important strategic driver for these companies.
- Small companies are more adept at identifying and accessing new geographical talent clusters (e. g., Brazil, Egypt, Sri Lanka) and other locations outside of China, India, and Eastern Europe.
- Small companies are sophisticated users of web-based collaboration technologies and prefer specialized small providers.

Companies are building new global organizational capabilities to optimize their corporate performance. As companies expand the scale and scope of their offshoring/outsourcing activities, there is a tendency for overall reported achieved savings to decline. In addition, few companies have been able to leverage their diverse experiences into new playbooks for executing offshoring initiatives. The leading-edge companies that have been able to adopt corporate-wide offshoring strategies are better able to direct their attention to risk management, train boundary spanners, establish a corporate-wide center for providing process owners with subject matter expertise, and avoid "reinventing the wheel" for each new offshoring initiative.

Survey results from the annual *Offshoring Research Network (ORN) Corporate Client Survey* reveal two important future intentions: plans to expand existing offshoring-outsourcing activities and plans for initiating new offshoring-outsourcing projects in light of the financial crisis.

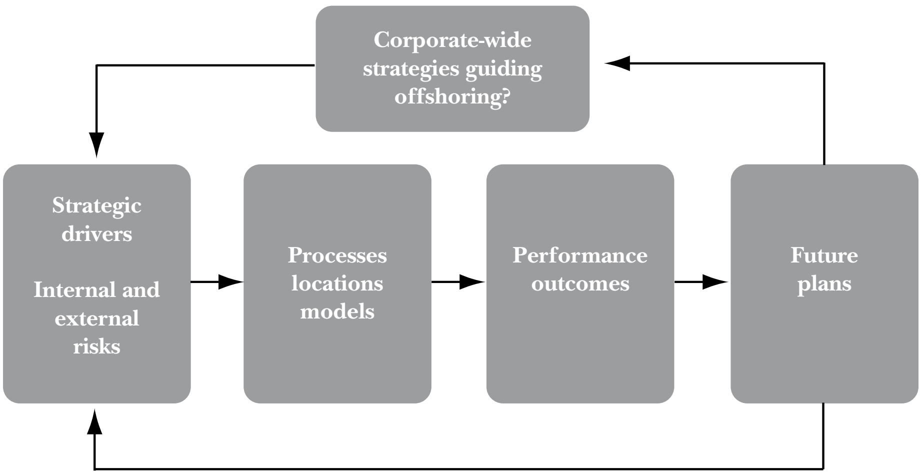
- Sixty percent of companies that had already offshored say they have aggressive plans to expand existing activities, and very few plan to relocate activities back to the United States.
- Respondent companies also have aggressive plans to initiate new offshoring projects, including strong across-the-board intentions to start new software development projects.

- Companies were planning to focus on the improvement of existing, offshoring initiatives by revamping internal processes: provider selection and monitoring of performance, coordination capabilities, sharing internal best practices, optimizing processes, and obtaining better terms from providers.
- Many said they would postpone new large BPO or ITO projects if they did not receive the required upfront investments from provider participation.
- Some companies are signaling their intentions to spin-off captive operations to providers and receive capital in exchange for long-term service contracts. The negotiations required for such deals, however, usually take some time.

7.2. Structure and demographics

The contents of this report are a distillation of findings and interpretations from the continuous survey work the Offshoring Research Network has conducted since 2004 with a range of companies across many industries. The survey covers all important aspects of offshoring, which are divided into five categories (figure 7.1).

FIGURE 7.1: Survey design



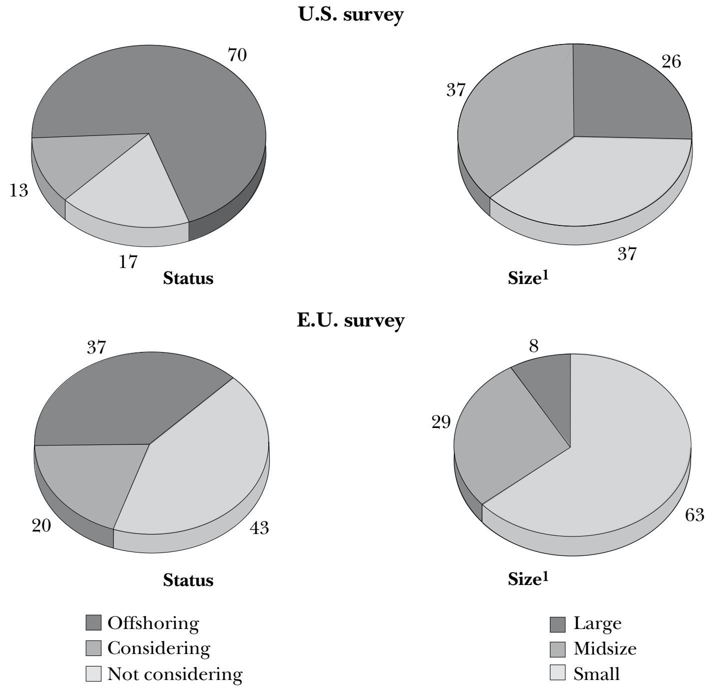
1. *Drivers.* Examples of strategic drivers include cost considerations (labor arbitrage as well as other costs), competitive position relative to other companies, and acquisition of a new skill or capability.
2. *Risks.* These include risks both internally (insufficient resources, inability to execute the offshoring plan, and lack of buy-in) and externally (the suitability of an offshoring service provider, the socioeconomic and political conditions of the target country, deteriorating labor force conditions, and weak intellectual property protection regimes).
3. *Location and Delivery Model.* In addition to inquiring about countries and regions, the survey asks respondents to describe and define their current service delivery arrangement—captive, third party, hybrid, etc. For example: Is the hybrid delivery model a joint venture? If the company chose a third-party service provider, what kind of provider is it? International or local? Is it a specialist in the company's business process domain?
4. *Performance Outcomes.* This section requests information about a variety of outcomes including the level of cost reductions the organizations expected, the savings they captured, and if they achieved the target levels they set.
5. *Future Plans.* Respondents are asked about their organizations' future plans for expanding existing offshoring applications as well as their plans for initiating entirely new offshoring projects. The responses to the questions in this section have proven very valuable in projecting new offshoring developments. For example, the Duke team was able to anticipate in the 2006 report the rapid acceleration of offshoring innovation work and the emerging global competition for science and engineering talent.

Survey profile

Unlike other offshoring studies, the ORN project tracks offshoring strategies and location and delivery model choices by size of company. The survey also includes responses from companies that are already offshoring, those that are just considering the practice, and those that have decided not to offshore (graph 7.1).

GRAPH 7.1: Corporate client survey demographics

(percentage)



[1] Large: over 20,000 employees; midsize: 500–20,000 employees; small: under 500 employees.

The survey also covers companies from all major industries (graph 7.2). For this reason, the ORN project has been able to follow the rise of offshoring as a mainstream business practice among manufacturing, software and financial services firms and track how other industries have sought to catch up.

7.3. Offshoring finally has the attention of the C-Suite

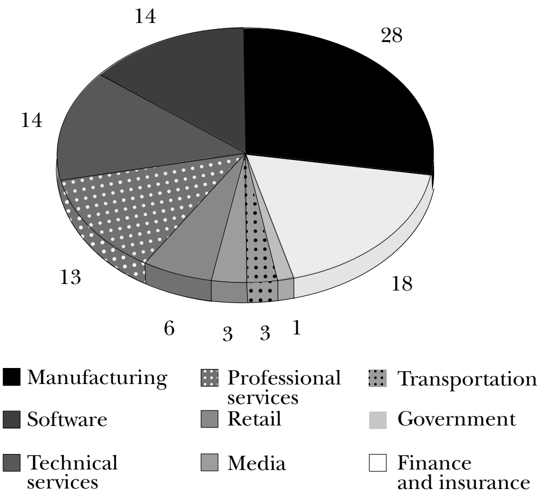
When the Duke ORN team fielded its first survey in 2004, executives at the corporate level were paying little attention to the offshoring phenomenon. The one exception was the outsourcing/

offshoring of IT infra- structure (IT centers, server farms, help desk support, etc.), which represented very large, long-term deals that required C-level attention and approval. For most companies with information technology outsourcing (ITO) deals, the objective was to decrease costs. ITO decisions, therefore, usually did not equate with corporate IT strategies. In general, most offshoring initiatives were bottom-up actions led by managers with oversight of specific business processes and back-office functions (call centers, accounting and finance, and human resources).

GRAPH 7.2: Composition of companies by industry

(North American Industrial Classification System)

(percentage)



Source: Duke University/Archstone Consulting Research Network 2005 Survey; Duke University/Booz Allen Hamilton Offshoring Research Network 2006 Survey; and Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

A corporate-wide strategic approach leads to improved results

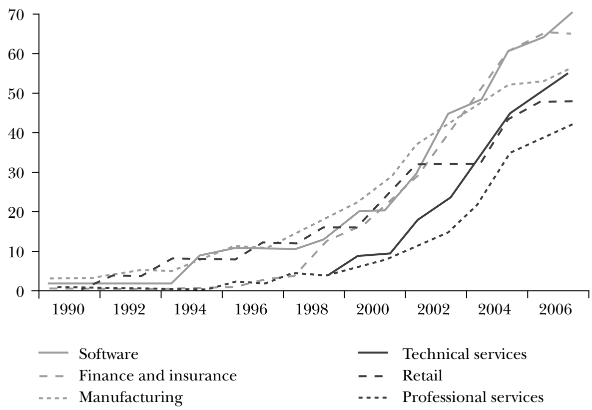
The unit-level approach is no longer the most common scenario, and members of senior management are expressing a growing interest in existing offshoring initiatives and future opportunities.

Responses to the 2007/2008 ORN survey find that the number of companies that have developed a corporate-wide strategy for guiding outsourcing/ offshoring decisions has grown significantly in the last three years (from 22 percent in 2005 to 53 percent of companies in the 2007/2008 survey).

The questions then arise: What constitutes a corporate-wide strategy for guiding outsourcing/offshoring decisions at the business unit and functional level? What corporate performance implications does it have? Although a fuller definition is offered in the discussion of global capabilities on table 7.2 at the end of this chapter, examples of such a strategy could include searching for the "low-hanging fruit" that will bring the company early wins and help build momentum for future success, expanding off-shoring into more complex tasks, ongoing evaluation of experience, and learning from successes across functions.

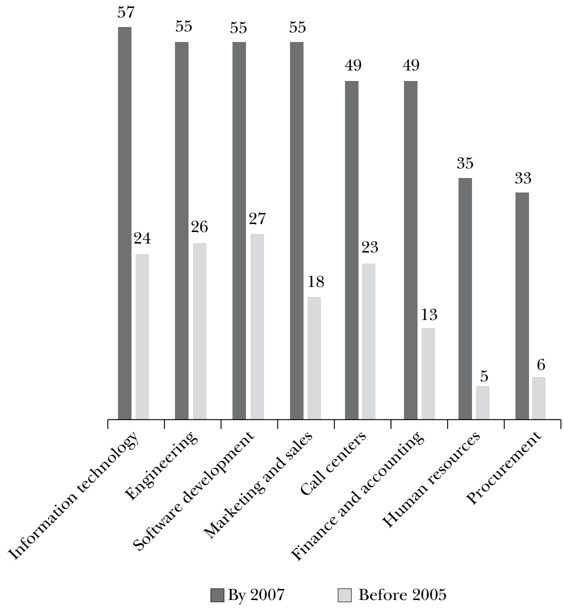
This turn toward strategy is not limited to the industries closely associated with outsourcing/offshoring, but is also happening in businesses responsible for a wide spectrum of processes and functions (graphs 7.3 and 7.4).

GRAPH 7.3: Cumulative percent of companies offshoring by industry over time



Source: Duke University/Archstone Consulting Offshoring Research Network 2005. Survey; Duke University/Booz Allen Hamilton Offshoring Research Network 2006. Survey; and Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

GRAPH 7.4: Percent of companies adopting corporate wide and functional strategies guiding offshoring decisions

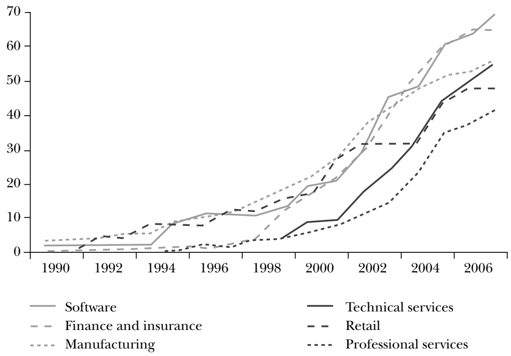


Source: Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

In the 2007/2008 survey, the financial services industry has the highest proportion of companies adopting corporate-wide offshoring strategies, which is not surprising considering the benefit such a transaction-intensive industry could receive from a focus on offshoring IT infrastructure, administrative processes, and customer contact centers (graph 7.5).

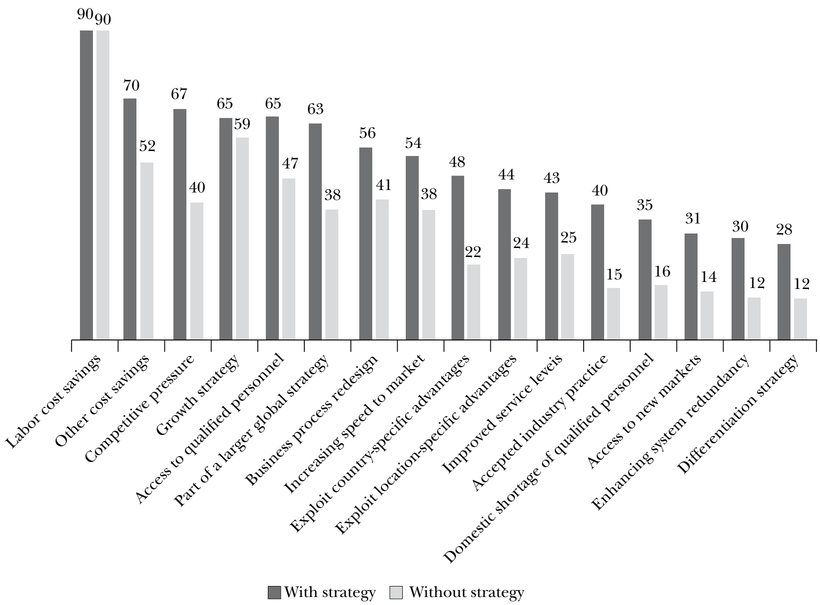
A corporate-wide strategy can direct management attention to a wider range of drivers, including the importance of making offshoring part of the organization's larger global strategy (graph 7.6). While attention to the potential for cost savings for labor and other expenses does not vary much between companies with or without a strategy, it is clear that a corporate sourcing strategy can increase management focus on the integration of offshoring strategy with the overall corporate growth strategy, inspire efforts to achieve significant efficiencies from end-to-end process reengineering, and support efforts to address the growing problem of employee attrition offshore.

GRAPH 7.5: Percent of companies adopting offshoring strategy by industry



Source: Duke University/Archstone Consulting Offshoring Research Network 2005. Survey; Duke University/Booz Allen Hamilton Offshoring Research Network 2006. Survey and Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

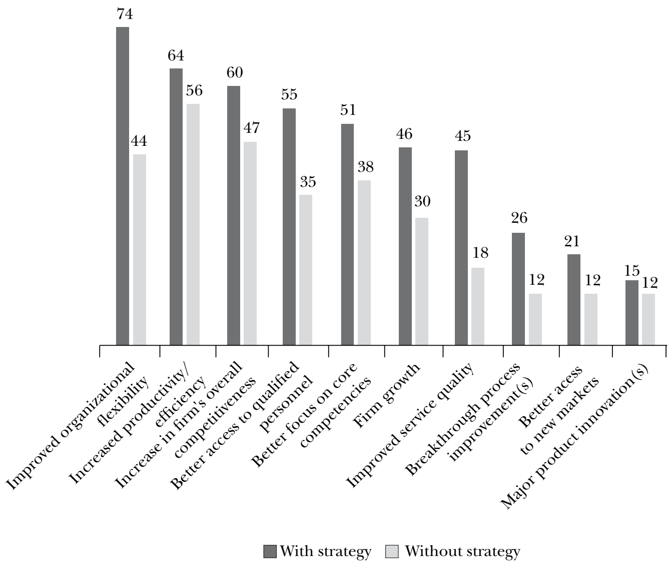
GRAPH 7.6: Percent of companies rating drivers as "important" or "very important"



Source: Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

Companies with a corporate-wide strategy participating in the survey are also more likely to agree that their offshoring efforts have led to increased organizational flexibility and improved service quality (graph 7.7).

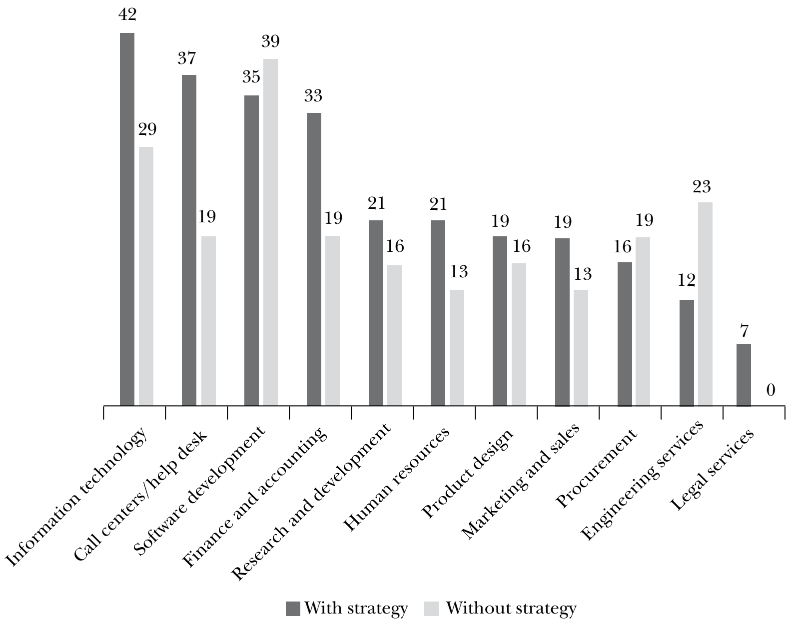
GRAPH 7.7: Percent of companies who agreed offshoring has led the following outcomes



Source: Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

An organizational emphasis on offshoring as part of the overall company strategy can also affect which functions companies decide to send offsite. Survey respondents who say their organization has a corporate-wide strategy are more likely to consider outsourcing/offshoring IT services, back office functions, and research and development than companies without an overall strategy (graph 7.8). Conversely, companies without an overall offshoring plan are more likely to consider alternative sourcing for software development, procurement, and engineering services than companies with a plan. The differences in emphasis may be due to the fact that companies that have adopted a unified strategy are also mostly large players primarily concerned with increasing operational efficiencies in the near future.

GRAPH 7.8: Percent of companies planning new functional implementations in the next 18 to 36 months



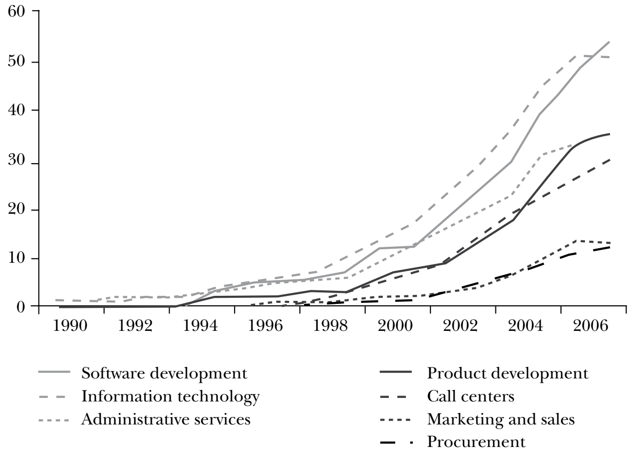
Source: Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

7.4. The globalization of innovation marches forward: ignore it at your peril

The globalization of innovation is an exciting yet risky development for many organizations. Companies that globalize their innovation activities can formulate and execute processes that drive new product development anywhere they choose.

The offshoring of innovation activities (defined in the survey as engineering, research and development [R&D], R&D support functions, product design, and software development) is accelerating (graph 7.9).

GRAPH 7.9: Cumulative percent of companies offshoring functions overtime

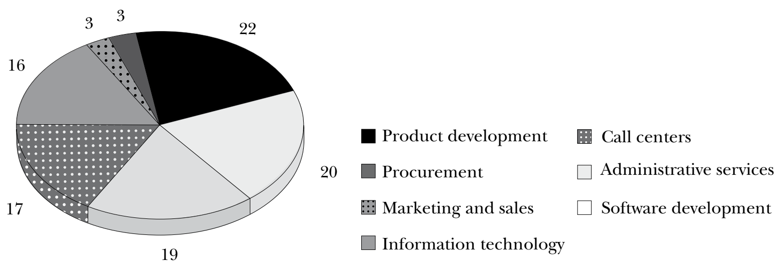


Source: Duke University/Archstone Consulting Offshoring Research Network 2005. Survey; Duke University/Booz Allen Hamilton Offshoring Research Network 2006. Survey and Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

Respondents reported that product and software development are the most frequently offshored applications, which is true for both the overall survey and industry-specific results (graphs 7.10 and 7.11).

GRAPH 7.10: Distribution of functional implementations initiated in 2007

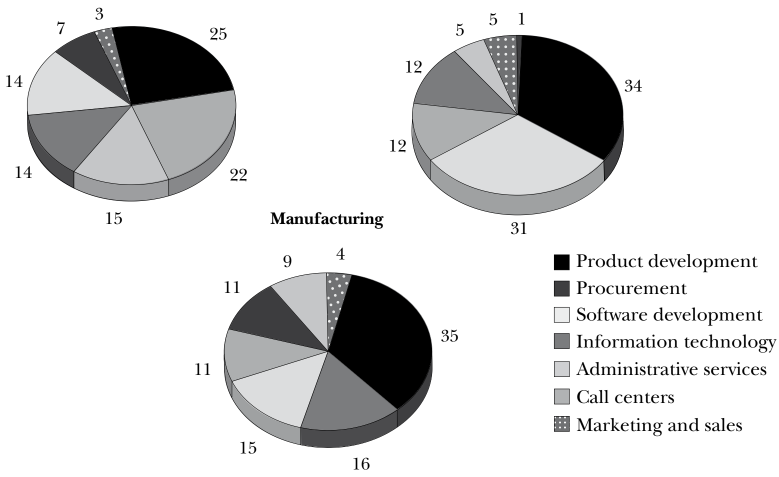
(percentage)



Source: Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

GRAPH 7.11: Distribution of functional implementations by industry

(percentage)

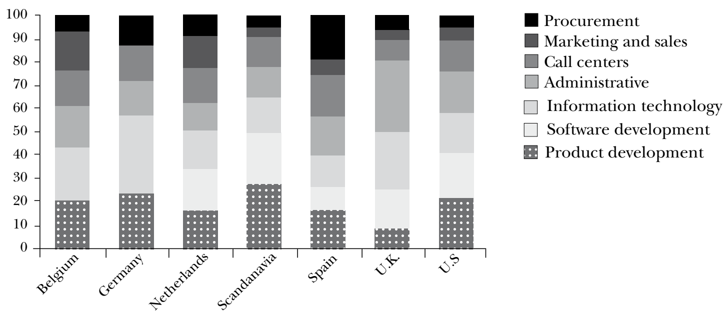


Source: Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

Companies across Europe and the United States reported offshoring highly skilled innovation activities (graph 7.12), including functions that require a high level of knowledge and expertise and involve none repetitive tasks (i. e., product design, R&D, engineering services, and software development).

GRAPH 7.12: Distribution of functional implementations by country of origin

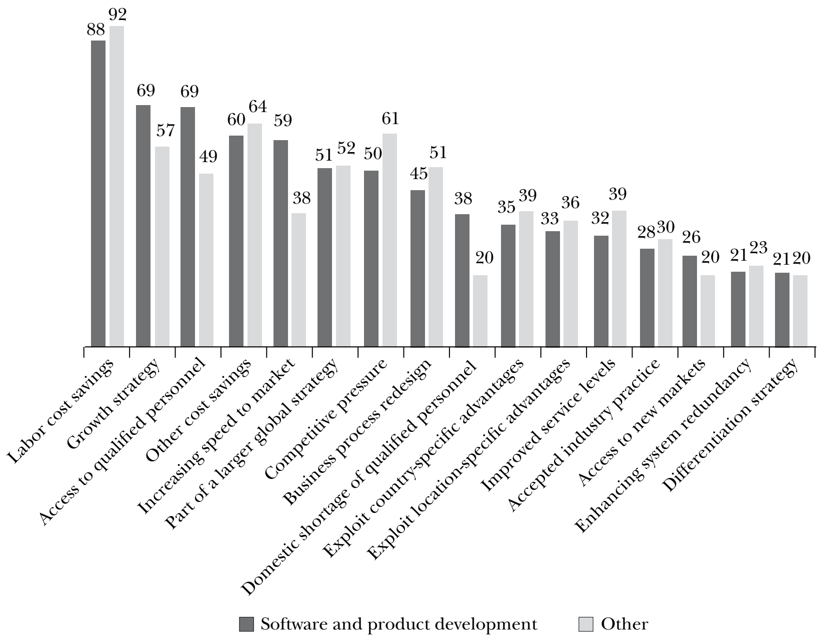
(percentage)



Source: Duke University//Archstone Consulting Offshoring Research Network 2005. Survey; Duke University/Booz Allen Hamilton Offshoring Research Network 2006. Survey and Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey. The Conference Board Offshoring Research Network 2007/2008 Survey.

Respondents increasingly considered growth strategy and domestic shortages of qualified personnel important strategic drivers for offshoring innovation and software development (graph 7.13).

GRAPH 7.13: Percent of respondents rating drivers as "important" or "very important"



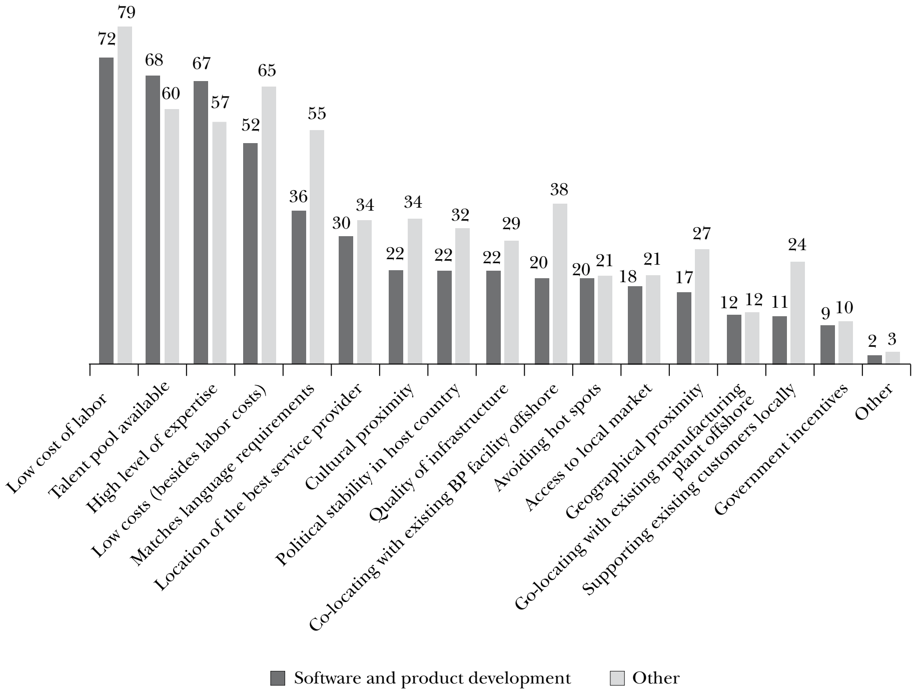
Source: Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

Apart from cost concerns, respondents said the most important location criteria for innovation and software development activities are talent availability and access to employees with a high level of expertise (graph 7.14).

The offshore destination for innovation activities depends on the firm's country of origin (graph 7.15).

Service quality and employee turnover offshore are considered two of the most important risks affecting innovation and software development applications (graph 7.16).

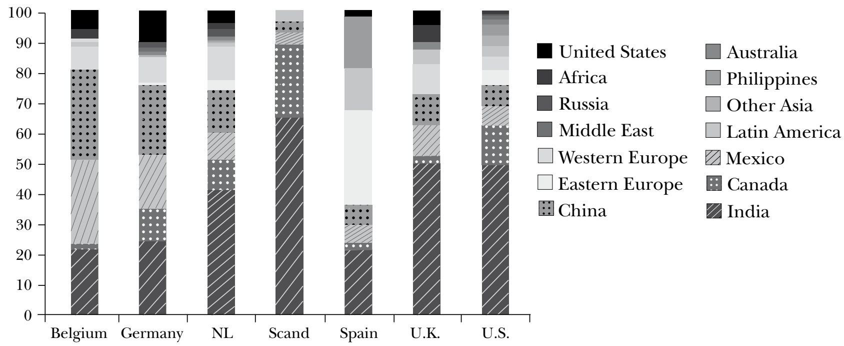
GRAPH 7.14: Percent of respondents rating location factors as "important" or "very important"



Source: Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

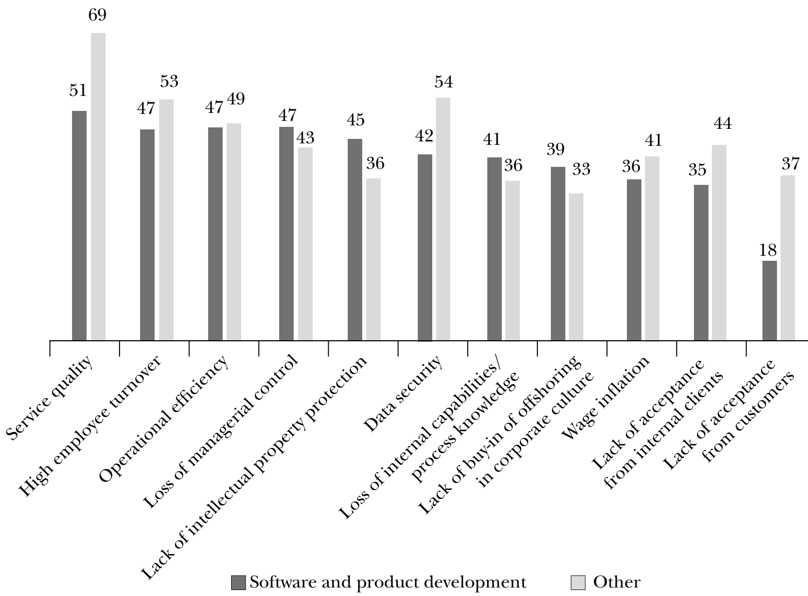
GRAPH 7.15: Location distribution of IT, software, and product development by country of origin

(percentage)



Source: Duke University//Archstone Consulting Offshoring Research Network 2005 Survey; Duke University/Booz Allen Hamilton Offshoring Research Network 2006 Survey; and Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey. The Conference Board Offshoring Research Network 2007/2008 Survey.

GRAPH 7.16: Percent of respondents rating risks as "important" or "very important"

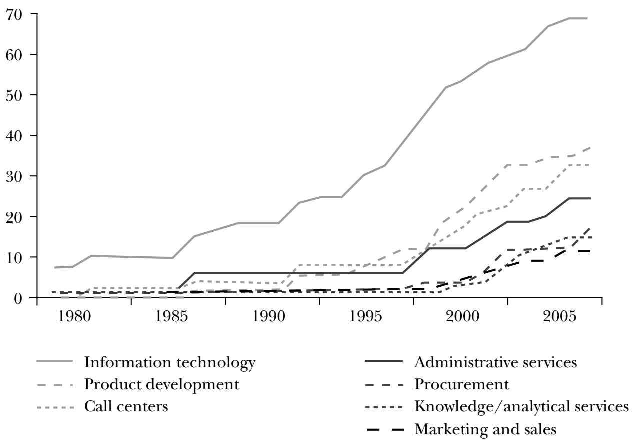


Source: Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

Not surprisingly, service providers have responded to the offshoring of innovation by increasing their product development and knowledge process outsourcing (KPO) offerings (graph 7.17).

GRAPH 7.17: Cumulative percent of providers offering classes of services

(percentage)



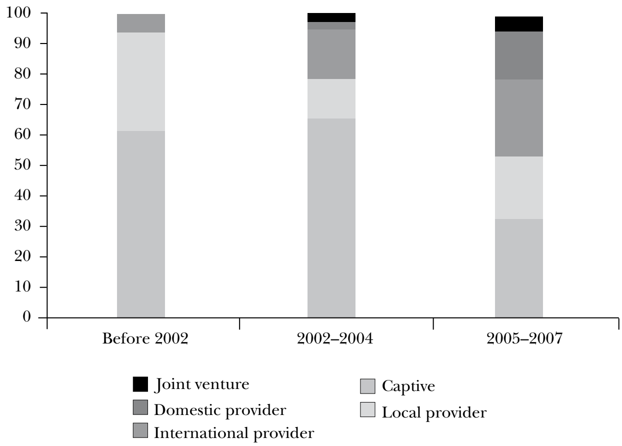
Source: Duke University/Booz Allen Hamilton Service Provider 2007 Survey.

7.5. Service providers are adapting their offerings to meet new demands

A comparison of service delivery model choices over time reveals that companies today are more likely to enter into relationships with external providers than was true several years ago (graph 7.18).

GRAPH 7.18: Distribution of service delivery model choices for product development over time

(percentage)



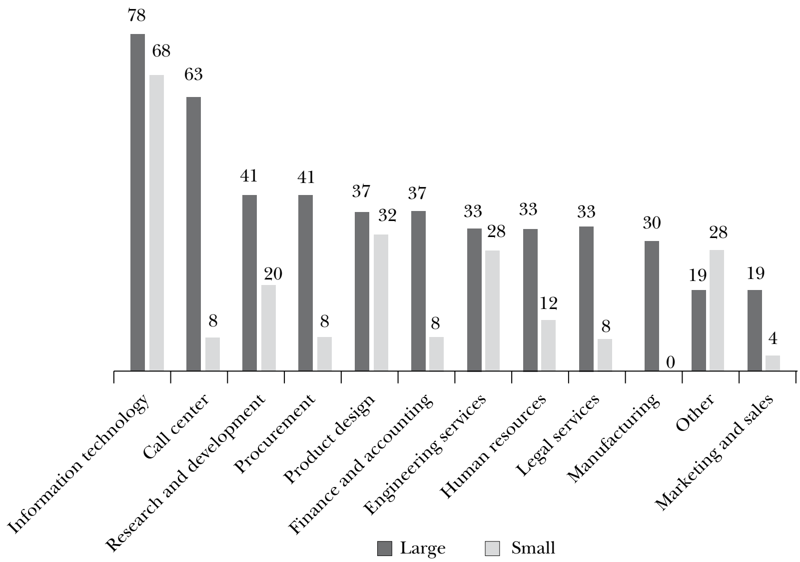
Source: Duke University/Booz Allen Hamilton Service Provider 2007 Survey.

If organizations cannot locate, recruit, or retain the intellectual capital needed to fulfil their innovation needs, they will enter into project-by-project relationships with service providers who can provide the right mix of skills for the tasks at hand. Companies will also enter into joint ventures with business partners who can fill intellectual capital gaps on the way to innovation success. However, joint ventures still represent only a fraction of the relationships organizations are forging for innovation activities. Current talent shortages at home will continue to push organizations to overcome cultural barriers and work with outsiders on highly strategic and proprietary business activities that meet critical innovation needs.

Many small service providers are specializing in areas related to software and product development services (graph 7.19).

GRAPH 7.19: Distribution of service delivery model choices for product development over time

(percentage)



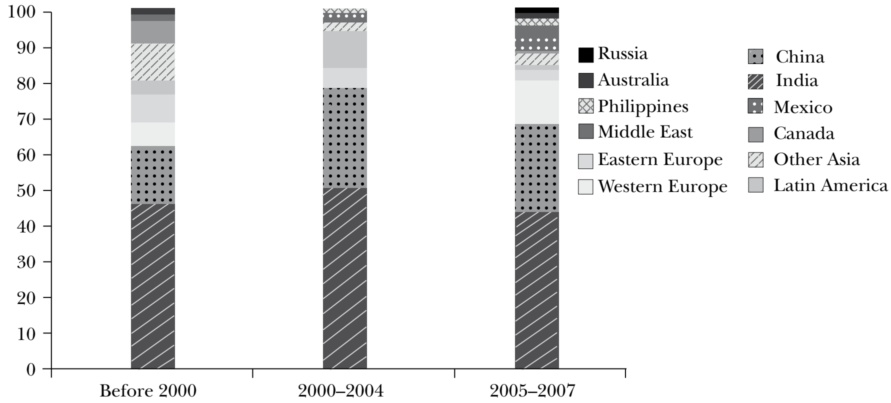
Because of wage inflation and worker attrition, India's popularity as the go-to location for product or software development work is declining, while many new destinations—Russia and the Middle East (Egypt, Jordan)—are emerging as new knowledge service clusters (graph 7.20).

Canada and Central America are increasingly popular destinations for product development work (graph 7.21).

In China and other countries where the protection of intellectual property is weak, companies greatly preferred a captive delivery model as a means of mitigating these offshoring risks (graph 7.22).

GRAPH 7.20: Distribution of location choices for product development implementations over time

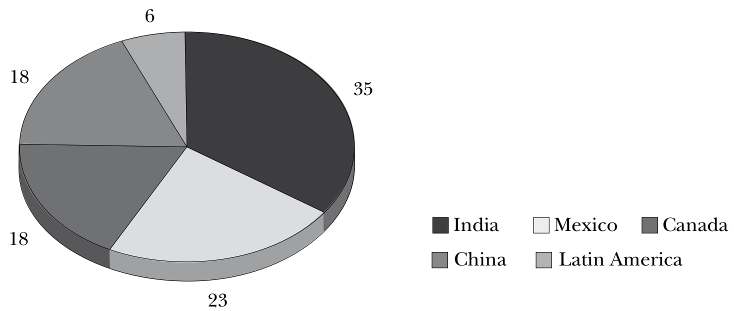
(percentage)



Source: Duke University//Archstone Consulting Offshoring Research Network 2005. Survey; Duke University/Booz Allen Hamilton Offshoring Research Network 2006. Survey and Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.The Conference Board Offshoring Research Network 2007/2008 Survey.

GRAPH 7.21: Regional distribution of planned implementations in product and software development by companies considering offshoring

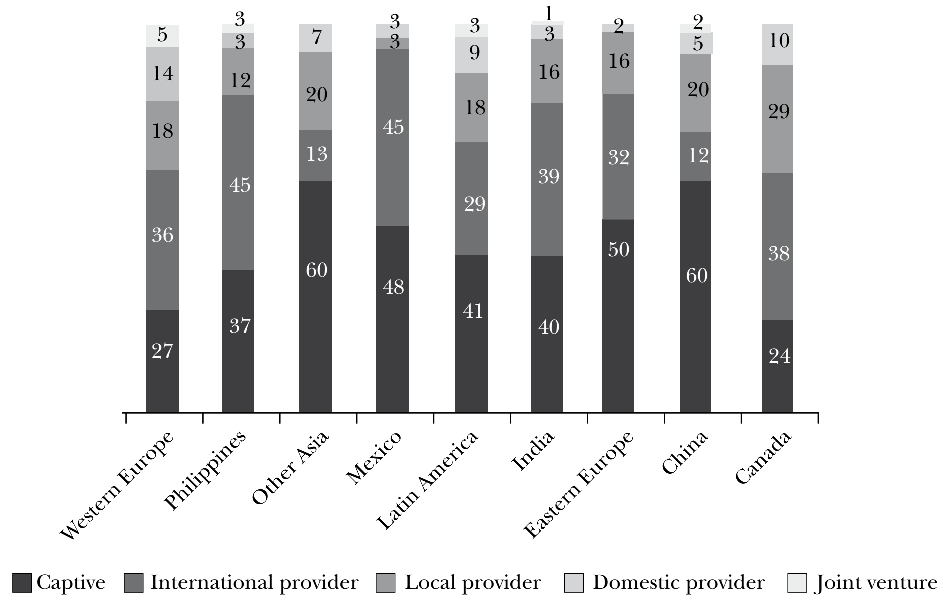
(percentage)



Source: Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

GRAPH 7.22: Distribution of service delivery models by region

(percentage)

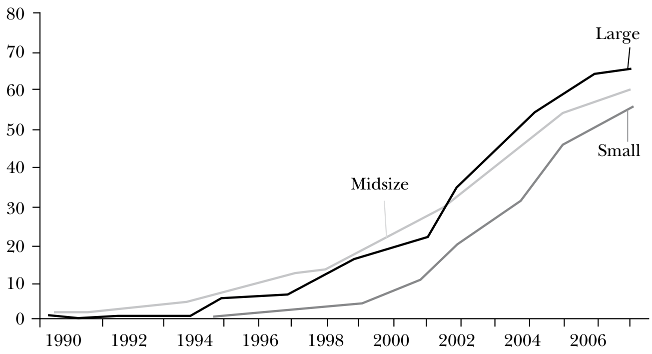


Percentages may not add to 100 due to rounding.
Source: Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

7.6. Small and medium businesses are increasingly outsourcing processes

In terms of both the number of organizations participating and the breadth of operational and process domains targeted, the size of the offshoring marketplace has increased dramatically over the past five years. Until recently, the use of offshoring as a business practice was limited to members of the Fortune 1000. This is no longer the case. Small and midsize companies have embraced offshoring on both a strategic and tactical level as a process that can meet a range of business needs (graph 7.23).

GRAPH 7.23: Cumulative percent of companies offshoring by company size

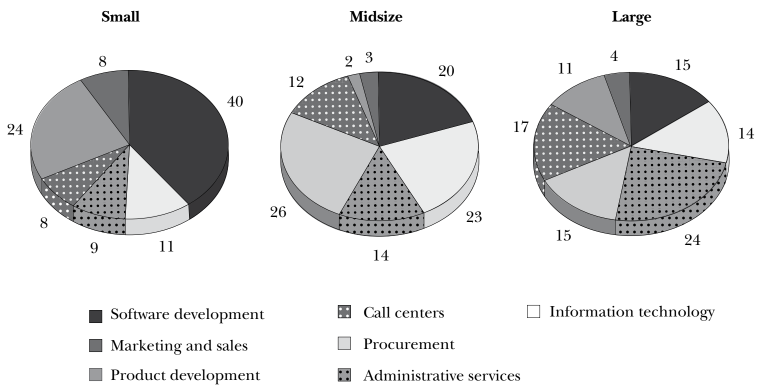


Source: Duke University/Archstone Consulting Offshoring Research Network 2005. Survey; Duke University/Booz Allen Hamilton Offshoring Research Network 2006. Survey and Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

While small companies started offshoring later than their larger counterparts, they have managed to skip several steps normally associated with standard offshoring evolution. To cite just one example from the survey, while most large organizations began their offshoring efforts with IT-related activities and then proceeded to move up the value scale, small firms have zoomed into offshoring product and software development projects (graph 7.24).

GRAPH 7.24: Distribution of functional implementations by company size

(percentage)

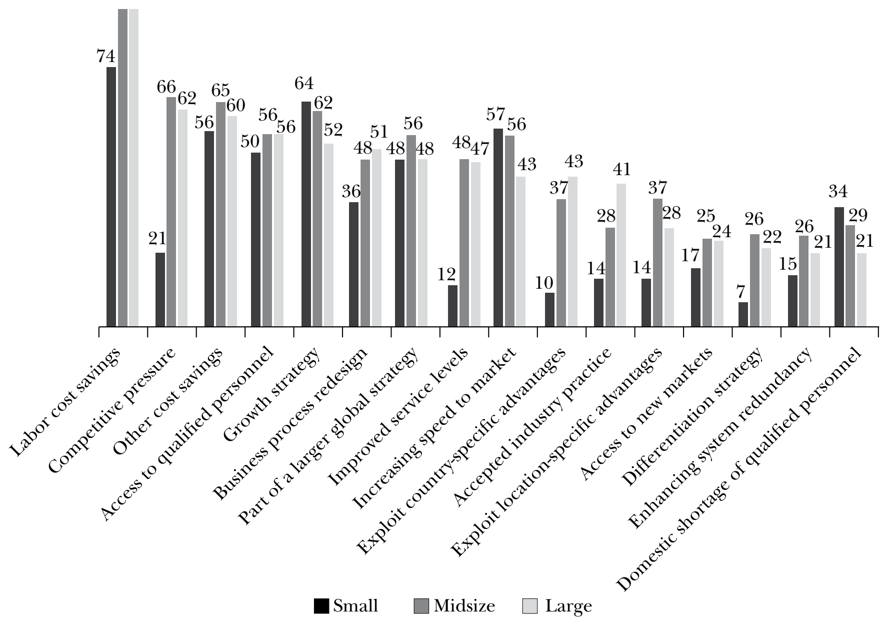


Source: Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

It should be noted, however, that one explanation for small companies' attraction to these areas may be that their back-office operations are usually too small to attract the interest of offshoring providers.

Another reason for increased offshoring by small companies may be their need to increase the pace of their production cycles. Since speed to market is directly related to the ability of small companies or start-ups to grow and is a crucial competitive advantage, it is not surprising that this issue is one of the top three offshoring drivers for small enterprises (graph 7.25). For some small companies, speed to market can mean nothing less than their very survival. By offshoring innovation-related product development, small companies can find creative ways to augment their innovation needs while also focusing on getting to market as quickly as possible with their new products or services.

GRAPH 7.25: Percent of respondents rating drivers as "important" or "very important"

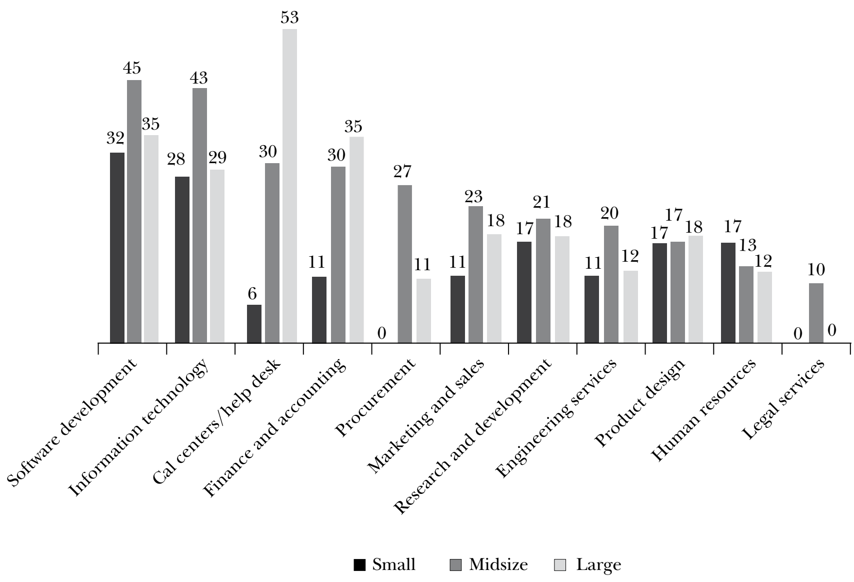


Source: Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

For small and medium-size businesses, therefore, finding new ways to execute critical business processes by leveraging offshoring is a managerial innovation in itself. Small businesses have been adept at identifying and using talent in previously overlooked countries and regions. Their ability to tap into these resources has been helped by collaboration tools that make it easier to organize and manage work efforts with globally dispersed talent. These tools also help smaller companies avoid travel expenses and some of the other added costs associated with offshoring.

Respondents from midsize companies said they are planning to initiate new offshoring projects across all functions and processes over the next 18 to 36 months (graph 7.26).

GRAPH 7.26: Percent of companies planning new implementations in the next 18 to 36 months by company size

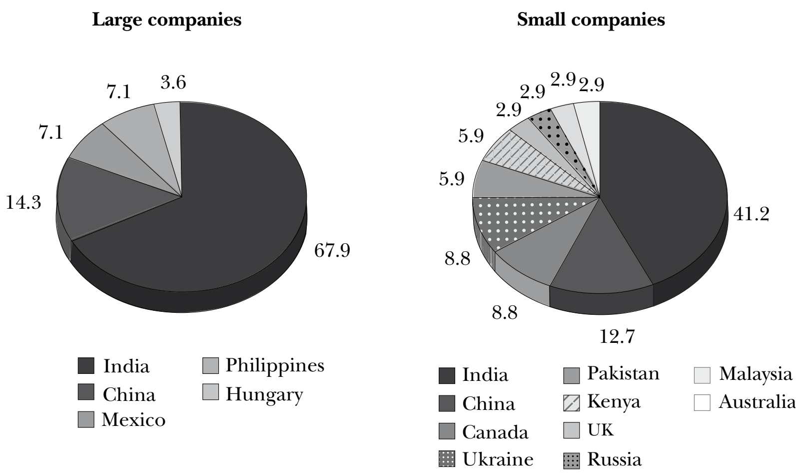


Source: Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

Driven by a need for talent, small companies are looking outside of standard offshoring locations (graph 7.27).

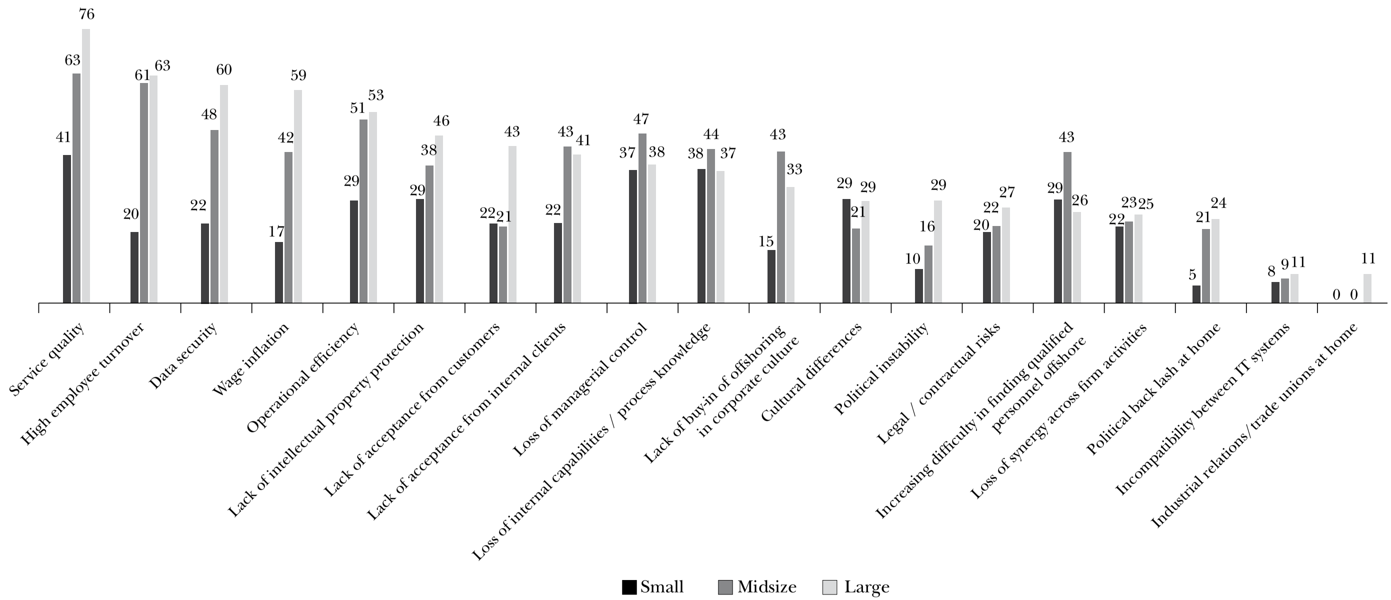
GRAPH 7.27: Distribution of location choices for product and software development implementations by company size

(percentage)



Regardless of size, companies are increasingly concerned with the risks associated with achieving and maintaining target service levels—service quality, workforce attrition and operational efficiency (graph 7.28). Small companies tend to prefer specialized local providers, and even large companies are increasingly using specialized external expertise to complement their in-house R&D capabilities (graph 7.29).

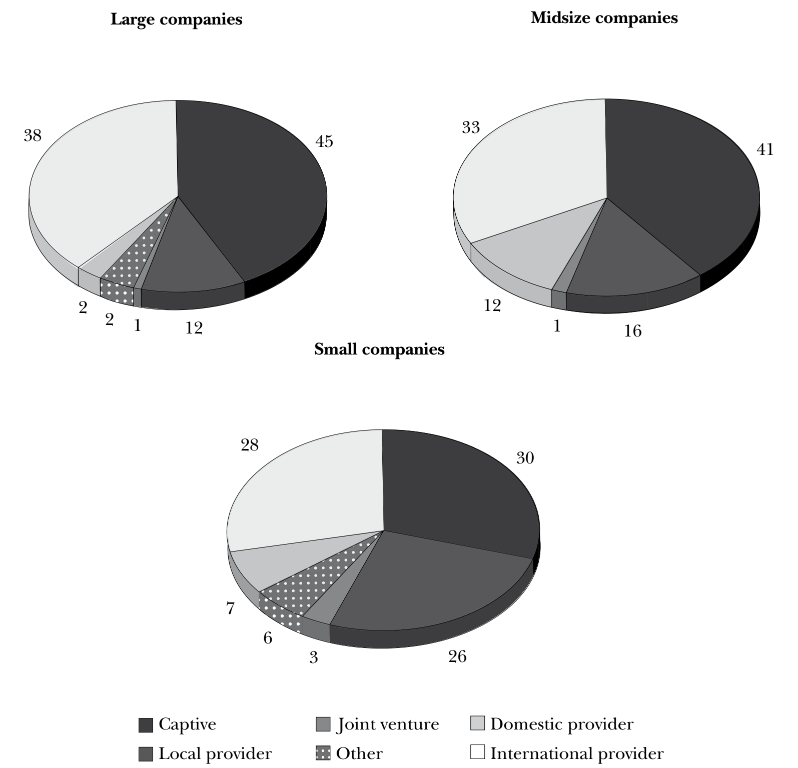
GRAPH 7.28: Percent of respondents rating risks as "important" or "very important" by company size



Source: Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

GRAPH 7.29: Distribution of service delivery

(percentage)



Source: Duke University/Archstone Consulting Offshoring Research Network 2005 Survey; Duke University/Booz Allen Hamilton Offshoring Research Network 2006 Survey; and Duke University/The Conference Board Offshoring Research Network 2007/2008 Survey.

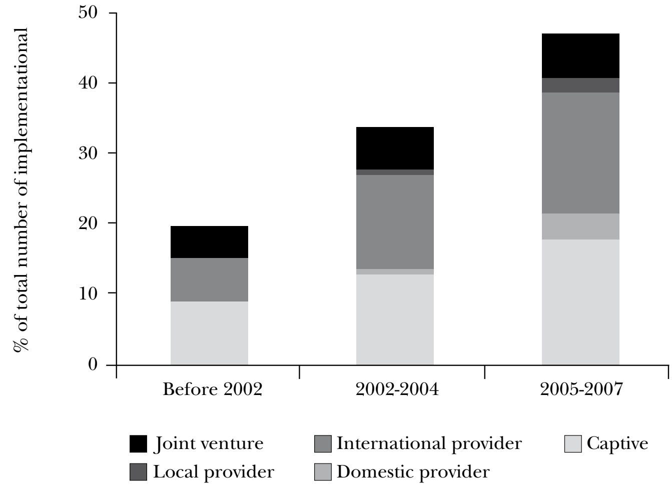
7.7. The changing constellation of service delivery models

The globalization of innovation is not the only dynamic phenomenon at work in the offshoring environment today. Companies and service providers must also adjust to ever-changing market conditions that can have a strong influence on where they choose to offshore and the delivery models they use. Captive scenarios are preferred in some locations, while international service providers are the norm in others. The wage inflation that is taking place in India and several other well-known markets has started to reduce their attractiveness as offshore destinations.

U.S. companies are contributing to the trend toward international providers and away from local providers (graph 7.30). The preference for local versus international providers does vary by industry, however, and financial services firms are most likely to pursue an international option (graph 7.31). This is primarily due to the fact that service providers with a global footprint can offer delivery centers in the major regions that correspond to the equally large global market presence of large companies. More and more service providers have come to the realization that because the industry is consolidating and business functions and services are commoditizing, new business models and areas of expertise are needed to compete in the future.

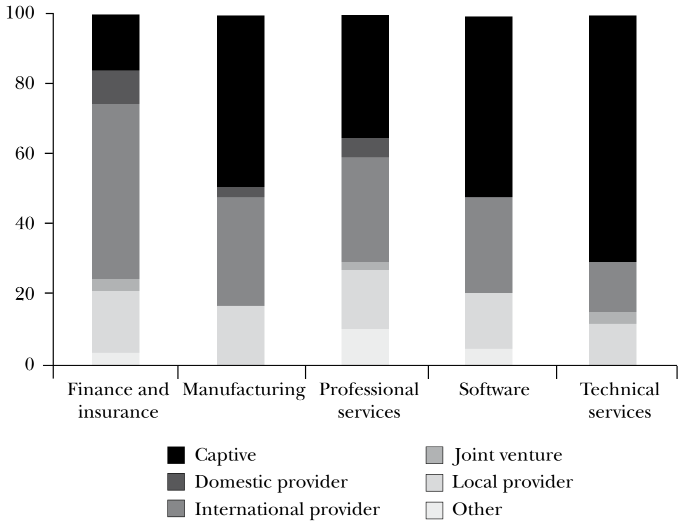
GRAPH 7.30: Distribution of service delivery model choices over time

(percentage)



Source: Duke University/Booz Allen Hamilton Service Provider 2007 Survey.

GRAPH 7.31: Distribution of service delivery model choices by industry
(percentage)



Source: Duke University/Booz Allen Hamilton Service Provider 2007 Survey.

As markets expand, service provider selection becomes increasingly complex

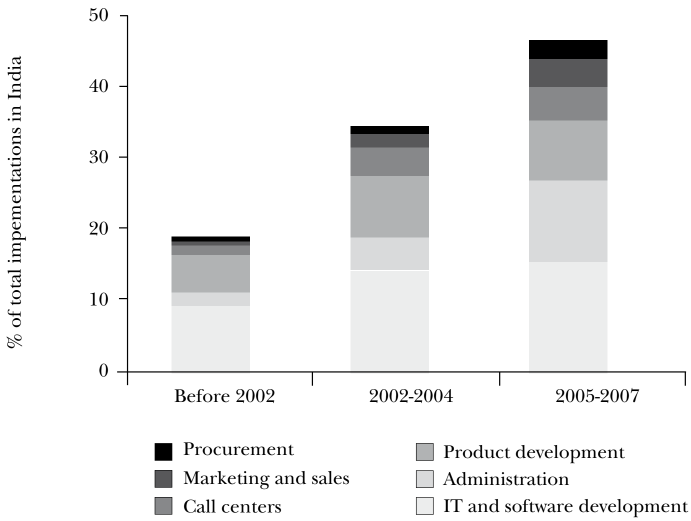
As the number of service providers and the tasks they cover increases and offshore locations multiply, the management of service provider selection becomes more complex. In order to thrive in this new environment, companies must acquire the global competence needed to manage the coordination and complexity of globally dispersed networks of activities, units, and functions. Systematic methodologies for service provider selection, development, and evaluation exist, but many organizations have yet to take advantage of them. These methodologies include, for example, creating a formalized template for service provider evaluation and setting up a corporate resource center to assist business units in selecting a service provider.

Indian providers face a paradox

The Indian outsourcing industry continues its expansion, as providers seek to meet client demand for near-shore locations through the establishment of delivery centers in major regions (e. g., Europe, the Middle East, and the United States). These centers also allow Indian providers to tap into near-shore talent pools in these territories. These changes are perhaps a reflection of a shift in the attitudes of companies toward India as an offshore destination. Companies may be sending more administrative functions to India, but they also increasingly indicate a preference for captive service delivery centers over local providers (graph 7.32). These are two positive signs that companies with successful approaches to offshoring see keeping offshore activities in-house as a viable way to create synergies and avoid the risks associated with external delivery models.

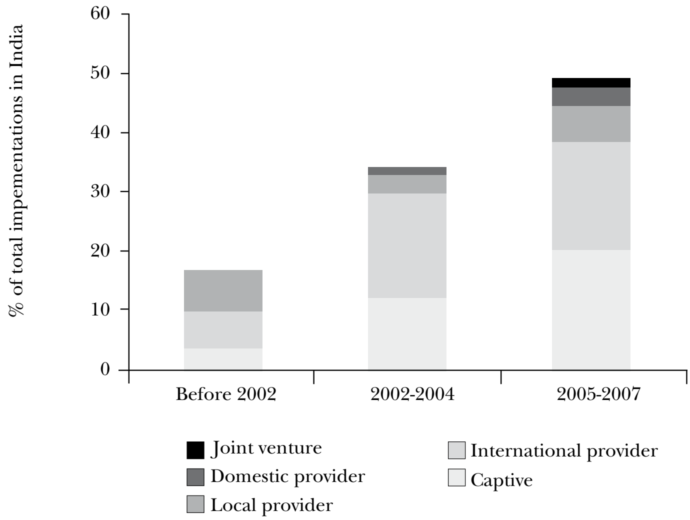
GRAPH 7.32: Distribution of service delivery model choices in India over time

(percentage)



GRAPH 7.32 *(cont.)*: **Distribution of service delivery model choices in India over time**

(percentage)

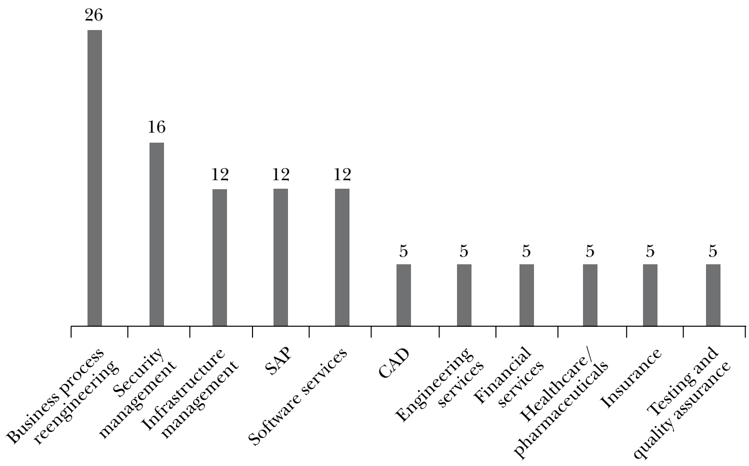


Source: Duke University/Booz Allen Hamilton Service Provider 2007 Survey.

The need for highly skilled workers is causing increased competition and wage inflation

While the growing wage inflation in India and other countries may have many causes, a major factor may be a shift in the type of operations being offshored. Respondents to a 2007 ORN survey of offshoring service providers revealed that they plan to offer business process reengineering and other services that demand workers with analytical skills (graph 7.33). Service providers are eager to enter these fields because of the higher margins these areas promise and the new types of revenue models these functions offer. As a result, they find themselves in a global competition with other vendors and client companies for science and engineering talent. This intensified competition for workers with specialized skills will likely add to current wage inflation. This situation is exacerbated by India's educational infra- structure, which has not expanded to meet these new demands, thus ensuring that the capacity-driven scarcity of educated workers will continue to drive wages upward. Educated workers are also contributing to this problem through their preference for careers in nontechnical and engineering professions, which has created a shift that will require long-term policy adjustments.

GRAPH 7.33: Percent of providers planning to develop special expertise



Source: Duke University/Booz Allen Hamilton Service Provider 2007 Survey.

Most companies are happy to stay put

Despite all of these pressures, most of the respondents to the 2007/2008 survey said they would expand their activities in their current offshore location, and only a handful of respondents reported they plan to relocate offshored activities back to the United States (table 7.1). These responses may be a reflection of the hesitance of many companies to invest the time and money required to find a new provider. They may also be an indication of the efforts of current providers to do everything in their power to satisfy clients and protect their reputations. The incidence of contract nonrenewal remains very low, with termination most commonly occurring during the first year of the contract, and any disputes that do arise are rarely litigated.

TABLE 7.1: Future plans with existing implementations in the next 18 to 36 months (percentage)

	Administrative services	Call centers	Information technology	Marketing and sales	Product development	Procurement	Software development
Expanding	**60**	**56**	**67**	**80**	**53**	**67**	**58**
Relocating to another offshore location	13	21	5	0	7	7	10
Relocating back to the United States	0	3	0	7	0	7	3
Transfer to third-party service provider	3	0	0	7	5	0	5
Transfer to wholly owned subsidiary	5	0	12	7	14	7	15
No change planned	28	24	18	7	25	27	21
Other	0	0	3	0	0	0	2

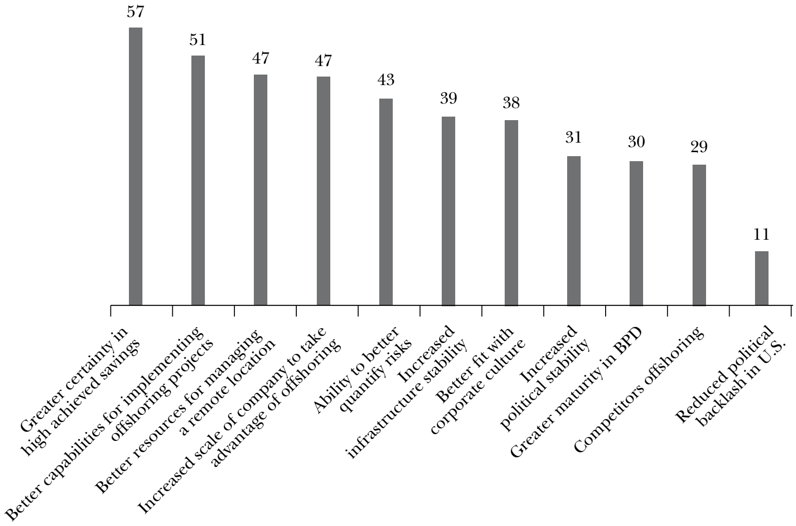
Source: Duke University/The Conference Board Offshoring Research Network 2007/2008 U.S. Survey.

7.8. Building global transformational capabilities

Even though companies continue to expand their offshoring activities, leaders at many companies do not have a clear understanding of the management principles that contribute to offshoring success and the factors that undermine offshoring value creation. One way to discern these attributes is a comparative analysis of the efforts of mature offshoring organizations and those of immature organizations who have only just begun to offshore.

1. *Lack of resources.* Over half of the companies surveyed say concerns about the capabilities and resources offshoring requires are "important" or "very important" considerations, and these may be the primary reasons many companies do not even consider offshoring (graph 7.34).

GRAPH 7.34: Percent of respondents rating factors "important" or "very important" to consider offshoring



Source: Duke University/Booz Allen Hamilton Service Provider 2007 Survey.

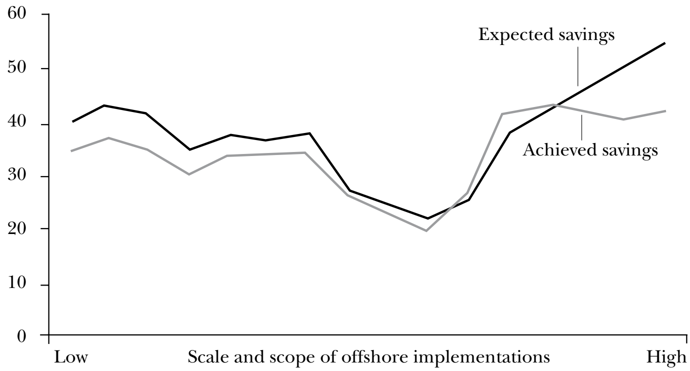
2. *Senior management.* Support the keen interest that senior managers in organizations with mature processes take in the execution and direction of offshoring initiatives is often not present in the leadership of companies with younger offshore operations, and the latter often launch their projects without organizational support and guidance from top management.
3. *Unrealistic expectations.* Companies new to offshoring often anticipate greater savings, reductions in headcount, or learning curves than they can achieve and are inflexible about the need to shift operations to other locations if needed.

The offshoring inefficiency trap

A surprising revelation from the cumulative ORN findings from 2005 to the 2007/2008 survey is that the savings achieved with the first few offshoring implementations, which are invariably followed by a rapid increase in scale and scope, were often followed by a steady decline in average achieved savings (graph 7.35). Although a few leading companies have been able to avoid this "inefficiency trap" or have been able to recover from it and achieve a dramatic and consistent increase in savings, this tendency is common to many companies in the ORN database.

GRAPH 7.35: "The efficiency trap" Average expected and achieved savings over time

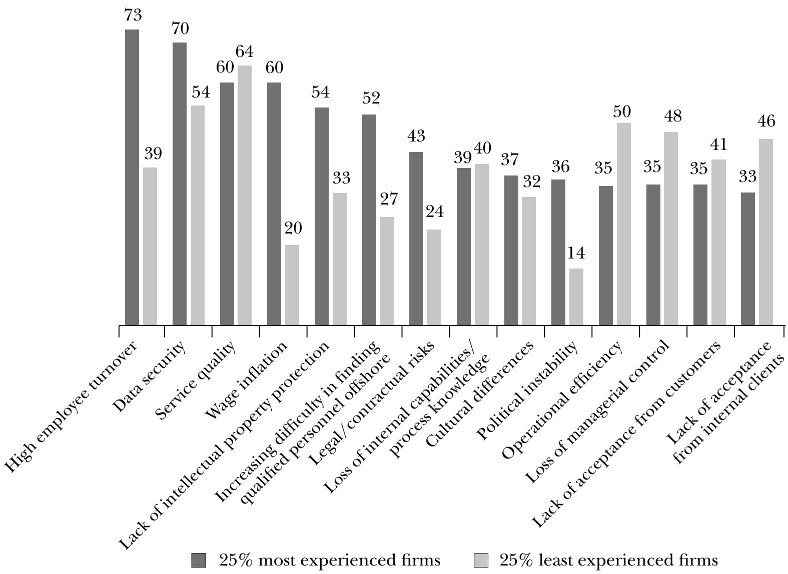
(percentage)



Source: Duke University/Booz Allen Hamilton Service Provider 2007 Survey.

When the survey results for highly experienced companies that have successfully avoided the inefficiency trap are compared with less experienced companies, the latter were much more concerned about the potential for the "loss of managerial control" than the former (graph 7.36).

GRAPH 7.36: Percent of respondents rating risks as "important" or "very important", by experience



More experienced companies are less bothered about oversight because they have built the organizational capabilities needed to coordinate and manage globally dispersed internal processes as well as integrate captive and third-party delivery models. They have also implemented new intellectual property safeguards as they increase their presence in countries with lower standards for intellectual property rights protection. Highly experienced companies are, however, much more concerned with the consequences of attrition offshore.

Neither group is very concerned with the risk of wage inflation, most likely because both groups anticipated it as a risk going in.

The curse of hidden costs

Many companies do not have a solid understanding of the following expenses until the expansion of offshoring that usually follows their initial success with the practice.

1. *Travel.* In addition to the travel of those directly involved, executives must often conduct on-site visits of potential service providers offshore to see the facilities themselves.
2. *Training.* This can include educating boundary spanners in cross-cultural communication effectiveness.
3. *Coordination.* These are expenses involved in establishing a local, focused organizational entity at either a country or regional level to recruit and retain staff and oversee relationships with government agencies and service providers.
4. *Expatriate staff.* Many companies feel the need to staff offshore top and second-level management positions with expatriates rather than local managers for an indefinite time period or even permanently.

What can be learned from successful companies?

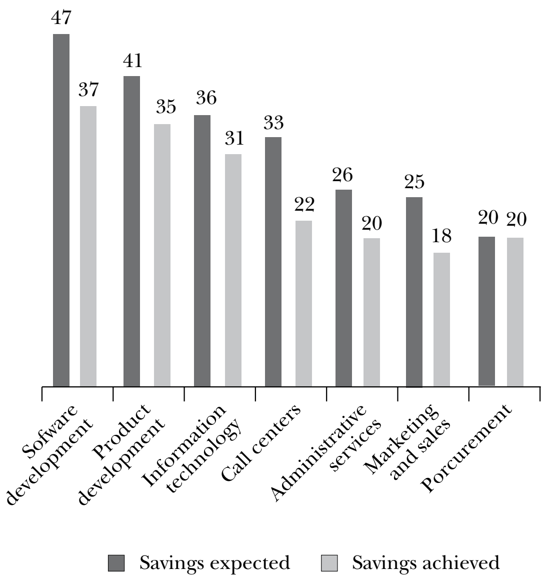
Organizations that understand and effectively implement offshoring share a number of attributes:

- A senior-level executive offshoring champion who receives explicit and total support from the CEO;
- Investment in the time needed to develop an offshoring operational plan and obtain advice from a consultant about how to construct a service provider selection model;
- Traveling to conduct regular on-site visits of offshore locations and meet with service providers;
- An understanding of the core elements of a master service agreement;
- A belief in the importance of obtaining crucial internal buy-in from critical stakeholders in the organization whose professional lives might change by virtue of business process offshoring; and
- The establishment and staffing of a global corporate offshoring resource center.

All of these qualities allow individual process owners (e. g., managers of the treasury function) to more closely focus on documenting and transferring a process, specifying appropriate metrics, and other critical tasks without the added burden of negotiating contracts, salaries, telephony rates, rents, etc. More efficient and systematic ways of planning and implementing offshore projects can also help companies create higher savings across functions in the long term and become more effective at estimating potential savings (graphs 7.37 and 7.38). Most companies have not been able to develop these strategies and organizational capabilities until after they have led their pilot offshore projects (e. g., IT or software development) and gained the necessary experience. Setting up a central organizational unit to coordinate and provide expertise and resources for guiding offshoring activities may facilitate this process. Yet, it requires continuous learning to become and remain successful in globalizing business services in a changing competitive environment (figure 7.2).

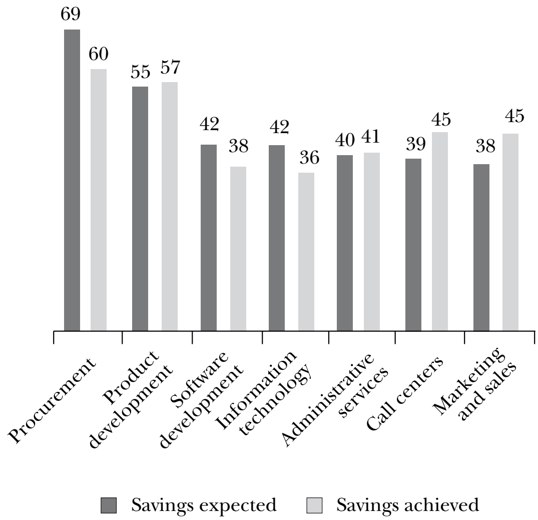
GRAPH 7.37: Average savings expected and achieved before implementing an offshoring strategy

(percentage)



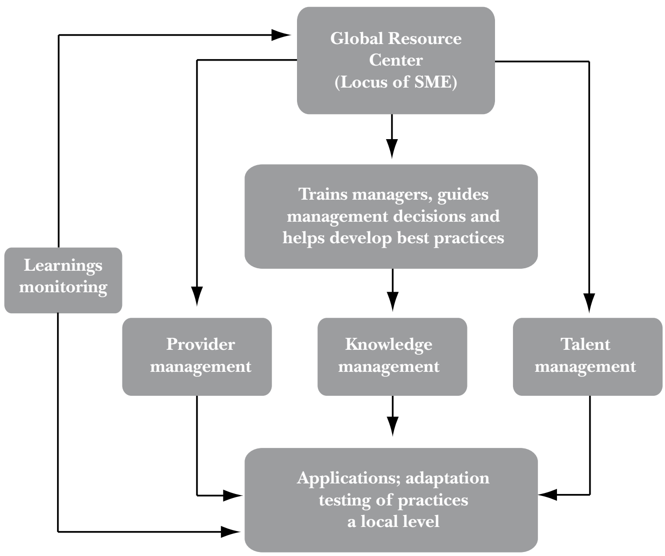
GRAPH 7.38: Average savings expected and achieved after implementing an offshoring strategy

(percentage)



Source: Duke University/Booz Allen Hamilton Service Provider 2007 Survey.

FIGURE 7.2: Key functions of the global offshoring resource center



Key best practice capabilities for supporting corporate offshoring strategy

The following table summarizes some of the key organizational capabilities that support the implementation of corporate offshoring strategies at the business-unit and functional level. They represent a synthesis of organizational structures and processes identified from ORN survey findings, follow-up interviews, and case studies. While illustrative of critical features that can drive offshoring performance, the list is by no means comprehensive. Organizations must discover capabilities unique to themselves that support strategy execution and are not easily replicated by others.

TABLE 7.2: Key best practice capabilities for supporting corporate offshoring strategy

Capability	Action items	Further tactics to complete action items
Building and coordinating management processes	Integrating offshoring strategy with global strategy Managing internal resistance to change Selecting and training boundary spanners Managing remote organizations Communicating effectively cross culturally Controlling for political risks Complying with the regulatory environment (city, state, central) Aligning HR practices for each offshore location	Not applicable
Getting internal buy-in	Establishing common ground among key stakeholders	Raising awareness about company competitive pressures and offshoring/outsourcing opportunities (burning platform) Involving board of directors and key functional and business unit managers “Unfreezing” traditional thinking about “own and control” Organizing strategy workshops with key stakeholders

TABLE 7.2 *(cont.)*: **Key best practice capabilities for supporting corporate offshoring strategy**

Capability	Action items	Further tactics to complete action items
	Organizing site visits to offshore locations for key managers	Observing, discussing, and assessing local conditions and capabilities of service providers
		Learning from other companies at offshore location
	Counteracting fear of job loss	Retraining rather than "deskilling" domestic staff
		Orchestrating relocation of jobs offshore with "natural attrition"
Building global offshoring/outsourcing resource center	Selecting service providers	Using pilot projects to test service provider capabilities
		Using local trips to "get in touch" with service providers
		Creating/acquiring formal, repeatable selection methodology
	Executing contracts	Including contract specifications that have a positive effect on savings and longevity of the relationship with the service provider. Common features include:
		Wage inflation cap
		–Specifying dedicated personnel
		–Specifying staff experience
		–Turnover and selection policy
		–Defining performance metrics
		–Intellectual property protection
		–Client-specific investments
		–Service provider incentives
		–Exit provisions

TABLE 7.2 *(cont.)*: **Key best practice capabilities for supporting corporate offshoring strategy**

Capability	Action items	Further tactics to complete action items
Building global offshoring/outsourcing resource center (cont'd)	Executing contracts (cont'd)	Creating master service agreements to help develop strategic partnerships MSA needs to be developed for type of process and function
	Developing other capabilities	Analyzing offshoring/ outsourcing potential of business processes Scanning latest developments and practices involving outsourcing/offshoring –Evaluating offshore operations and locations –Supporting development of key organizational capabilities: •Knowledge transfer and communication •Talent management •Service provider management •Training of project managers
Knowledge transfer and communication	Defining and managing interfaces between tasks and processes across geographical locations	Developing communications channels
		Using web-based collaborative technologies Establishing informal communication channels, e. g. between engineers and managers Training interface managers (e. g. subsidiary and project managers) Enabling emergence of communities-of-practice

TABLE 7.2 *(cont.)*: **Key best practice capabilities for supporting corporate offshoring strategy**

Capability	Action items	Further tactics to complete action items
		Implementing knowledge management strategy, knowledge archives, and robust search
		Planning regular meetings between local managers
	Facilitating learning	Engaging in exchanges with other companies
Talent management	Recruiting	Identifying geographical knowledge clusters providing needed skills, while also learning to avoid "hot spot" locations
		Affiliating with local universities and technical institutes for access to talent
	Training	Offering ongoing opportunities for internal and external training in all formats (classroom, CBT, on-the-job)
		Offering mix of local training and training at headquarters/other locations
	Retaining talent	Developing regional and global career plans and incentives
		Adapting human resources practices (e. g. incentive, structure, training and development programs, certification)

7.9. About this report

The 2007/2008 annual survey was released November 2007 and preliminary results were presented February 18, 2008, at the International Association of Outsourcing Professionals Conference. The final data extraction was completed June 4, 2008, and additional fine-grained, cross-tabular analyses were conducted prior to the publication of this report.

The survey included respondent companies from the United States and the European Union. Copenhagen Business School (Denmark), WHU University (Germany), Rotterdam School of Management, Erasmus University (Netherlands), IESE (Spain), Solvay Business School (Belgium), and Manchester Business School (United Kingdom) were partner educational institutions that helped conduct the study in Europe.

The construction of the sample involved multiple strategies. Over the past four years, Duke ORN has developed an extensive network of research participants, which was the primary source of the sample. For companies not already involved in this research, Fuqua alumni were asked to identify and solicit responses from individuals within their companies who are responsible for offshoring strategy or for offshoring implementation. In addition, the following organizations invited their members to complete the survey:

- The Conference Board;
- International Association of Outsourcing Professionals (IAOP);
- Centers for International Business Education and Research (CIBER);
- Council for Entrepreneurial Development;
- Enterprise Software Roundtable;
- Information Technology Association of America (ITAA);
- Software Information Industry Association.

Finally, some participants found the survey via Internet searches. This overview was presented with the sole idea of illustrating the main concerns the entrepreneurs are now facing, both in the U.S. and Europe. Now it would be truly advantageous for our understanding of the phenomenon if we turn our attention to the particular case of the U.S., this time endorsing a more rigorous methodology. We do this in the next chapter.

8. The Rationale for Business Process Offshoring: The Case of U.S. Firms, 1999–2003

BUSINESS process offshoring (BPO) refers to the recent practice of firms to migrate selected ICT-enabled white-collar activities to offshore locations. What motivates firms to do so? In this chapter, we developed several hypotheses on the possible rationale for this type of foreign investment and tested them in a study of U.S. outward *FDI* in high information-intensive industries. The main findings illustrate an evolution of motivations over time. In the first offshoring wave during the 1990s *efficiency-seeking* was the only driver. In recent years, however, companies have begun searching for new knowledge when relocating activities to offshore destinations, predominantly in low-cost countries.

Companies, mainly in Western economies, have historically adopted an offshore strategy predominantly for manufacturing work and blue-collar jobs. Recent advances in ICT and the related decrease in telecommunication costs have significantly altered the competitive landscape, creating the opportunity for a novel type of offshoring (Farrell 2004). Nowadays, in fact, companies have the potential to relocate a number of business processes throughout the world, which, until a few decades ago, were performed exclusively at home (e. g., call-center customer support, transaction processing and data management) (Dossani and Kenney 2006).

This chapter is taken almost completely from Niccoló Pisani's doctoral thesis: "Offshoring and the global sourcing of talent: Three essays on the frontier of international management," defended in May 2008, IESE Business School, University of Navarra. The author is grateful to BBVA Foundation for financial support through project grant 162/06.

The term BPO[37] refers thus to the practice of firms to migrate selected ICT-enabled white-collar activities to offshore locations (usually low cost). This migration importantly differs from the previous manufacturing-oriented wave of internationalization. It requires the organizational and technological ability to orchestrate a geographically dispersed network of not only blue-collar jobs but also white-collar highly-skilled activities (Doh 2005; Levy 2005; Venkatraman 2004). This new kind of offshoring can be still considered a nascent phenomenon, as the proportion of *actual* versus *potential* offshored business processes remains small (Agrawal, Farrell and Remes 2003). Nevertheless, the forecasted future impact of offshoring on the global realignment of jobs (Doh 2005; Karmarkar 2004) urges us to investigate it thoroughly.

In this chapter, we focused on a particular aspect of BPO: its rationale. In other words, we concentrate on the motivations that drive firms to relocate selected business processes to offshore locations. More specifically, we examine whether such motivations have changed over time and whether they vary depending on the industry of the offshoring company and the selected country of destination. In building the hypotheses related to BPO motivations and their potential variations, we drew insights from international business theory on the rationale for foreign investment (Behrman 1974; Chung and Alcacer 2002; Dunning 1993; Graham 1998; Kobrin 1991; Kuemmerle 1999; Zaheer and Manrakhan 2001). A primary concern in international management research has always been to investigate the motivations for firms to expand internationally (Dunning 1993). Understanding the drivers behind any kind of international activity is essential to appreciate the activity's peculiarities, model it, and offer a better prediction on its future evolution. This is particularly relevant for the case of BPO, a rising phenomenon that still has little theoretical explanation, especially with regard to its current evolution and its future consequences on the organization of corporations.

This study contributes to the existing literature on two levels. First, we examined whether motivations behind BPO have

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[37] BPO generally stands for business process *outsourcing*. However, given the objective and focus of this paper, here it stands for business process *offshoring*.

changed over time. While previous studies addressing the rationale behind BPO did not provide a thorough analysis on its potential time variation, this chapter offers a complete examination of the BPO rationale over the past decade, highlighting changes over time. The second contribution is related to the focus on the variation in BPO motivations across industries and countries. The inclusion of these variables markedly improves our understanding of the BPO phenomenon and of its peculiarities with respect to previous waves of internationalization. Our findings confirm the relevance of including these motivations, and provide an insightful interpretation of how companies use offshoring solutions.

We tested our hypotheses as described below. For the study of the variation of BPO motivations over time, we used more recent data (1999–2003) to reproduce the same empirical specification developed by Nachum and Zaheer (2005). These two researchers examined how variations in the cost of distance due to technological developments affected U.S. firms' rationale for foreign investment in high information-intensive industries during the period 1990–1998. Their findings provide a detailed analysis on the key drivers behind BPO in the 1990s with regard to U.S. outward *FDI* in high information-intensive industries. By replicating the Nachum and Zaheer model with a more recent pool of information from the same source, we can compare results across the two studies and identify variations over time. In this way, we provide a complete longitudinal analysis of BPO motivations over a significant time period. For the second part of our research on possible variations across industries and countries, we tested an improved version of the Nachum and Zaheer model (2005) on the more recent dataset, and included additional variables to account for industry and country variations.

The results provide substantial corroborating evidence that efficiency seeking continues to be a key driver for BPO. As already shown by Nachum and Zaheer (2005), the search for efficiency and cost minimization is the main *raison d'être* of migrating ICT-enabled business processes to offshore locations. However, while the 1990–1998 Nachum and Zaheer (2005) study was only able to empirically prove that efficiency seeking was the relevant motivation, the refined model in the 1999–2003 panel revealed that *knowledge seeking* is also a significant motivation behind the decision to offshore business processes. This important empirical finding suggests that an evolution in motivations for pursuing offshoring initiatives is taking place. While the initial wave of offshoring documented by Nachum and Zaheer (2005) was characterized by a narrow cost-cutting perspective strictly in line with an efficiency-seeking motivation, the current wave is also increasingly driven by the search for new knowledge-intensive resources (Farrell 2004; Lewin and Peeters 2006a). As for the variation of BPO motivations across industries and countries, the usage of the refined model confirms the relevance of including these additional motivations, as they shed light on other aspects of BPO. The results show that efficiency seeking matters only to service-oriented industries, while knowledge seeking becomes significant only when the offshoring investment is directed to low-cost countries.

The global redistribution of labor shepherded through BPO significantly differs from any other previous wave of internationalization that the international research community has studied. This study illustrates some of BPO's novel elements by providing a rigorous conceptualization of its rationale, its particular evolution over time, and its variation across industries and countries. In section 8.1, we develop hypotheses on BPO motivations and its key variations. Next, we discuss the methods and results. Finally, we highlight the major findings, discuss future research, and form conclusions.

8.1. Development of hypotheses

The objective of this chapter is to develop and test a number of hypotheses on the current rationale for BPO and how it varies across industries and countries. The primary concern in *FDI* research has always been to investigate the motivations for firms to expand internationally (Dunning 1993). Scholars have identified five major motivations that drive firms to initiate international investments: resource seeking, market seeking, efficiency seeking, knowledge seeking and competitive pressure (Nachum and Zaheer 2005). Resource and market seeking can be contextualized as the more traditional motivations behind the first wave of internationalization that primarily interested manufacturing activities (Venkatraman 2004). As transportation infrastructures improved in an economy where the key determinant of success was the ownership of tangible assets, companies began expanding abroad in search, on one hand, for physical, immobile resources that were either missing or too expensive in their home countries and, on the other hand, for new markets to produce and sell their products (Dunning 1993).

Transnational intra-firm integration was subsequently recognized as a potential source for competitive advantage (Fayerweather 1969), leading to efficiency seeking being increasing cited as a possible alternative motivation for foreign investments (Kobrin 1991). Focusing instead on the strategic interdependence of firms, other researchers emphasized the role of external competitive pressures as determinants for international expansion (Graham 1998; Knickerbocker 1973; Yu and Ito 1988). The more recent maturation of the knowledge-based economy (Dunning 2000), together with the theoretical recognition of knowledge as a key determinant for the very existence of the multinational firm (Kogut and Zander 1993; Santos, Doz and Williamson, 2004), has led to an increasing number of studies showing that the search for new capabilities can also significantly motivate *FDI* (Chung and Alcacer 2002; Kuemmerle 1999).

In light of this literature, we will develop hypotheses related to these five foreign investment motivations. The first five hypotheses will focus on the motivations behind the current BPO wave of internationalization. The other two will investigate how such motivations vary depending on the industry and the offshore destination selected.

Resource seeking

International expansion driven by the resource-seeking motivation is designed to gain access to natural resources such as minerals, land or agricultural products (Dunning 2000). It is a supply-oriented investment, as its underlying rationale is to have access to tangible resources that are either missing or too expensive in the home country. The resource's immobility makes it necessary to invest in the foreign country in order to access them (Dunning 1993). From relocating basic contact centers to migrating the firm's more complex activities, firms investing in BPO are not driven by the simple quest for tangible resources that are lacking at home. As we will formally argue later on, in today's knowledge economy it is a host country's cultivated endowment that attracts BPO investments and not its supply of natural resources. Thus, we posit:

> *Hypothesis 1. Resource seeking is not a significant motivation for business process offshoring.*

Market seeking

While investment in resource seeking is supply oriented, market seeking motivates a demand-oriented foreign investment (Dunning 2000). Market-seeking investments are actually designed to serve a foreign market by means of local production and/or distribution. Thus, they typically involve "the physical location of downstream (e. g., marketing) and, in some cases, production activities in a particular country" (Zaheer and Manrakhan 2001, 673).

Demand-oriented foreign investment is driven by three main reasons (Nachum and Zaheer 2005), none of which are relevant to BPO. The first deals with market failures, for example, high tariff barriers on foreign-made goods. In order to avoid these tariffs, firms interested in entering a foreign market may be driven to invest in local activities. With regard to BPO, government intervention has had very little impact on market failure. On the contrary, several emerging countries are actually competing among themselves in order to attract offshoring initiatives from foreign companies by investing in education and training and by trying to create local clusters specialized in specific offshoring activities (Farrell 2006; Lewin and Peeters 2006a). The second reason for demand-oriented foreign investment is cost reduction, especially in transportation, which can motivate firms to invest in foreign activities closer to the targeted markets. As a matter of fact, BPO has arisen specifically as a consequence of the plummeting transportation costs thanks to information digitization; thus the need to reduce this type of costs cannot be a motivation. The third reason is the need for physical proximity to actual and potential customers, which can drive firms to invest in foreign local presence in order to acquire better customer knowledge and provide a more responsive after-sales service (Nachum and Zaheer 2005; Zaheer and Manrakhan 2001). This reason does not play a role in the decision to invest in BPO. In fact, the countries where business processes are being offshored are generally not the final targets for their products or services. Instead, such a practice is often responsible for certain activities to migrate away from final customers towards far-off locations that offer more competitive solutions for their efficient processing (Zaheer and Manrakhan 2001). Thus, we posit:

> *Hypothesis 2. Market seeking is not a significant motivation for business process offshoring.*

Efficiency seeking

"Efficiency-seeking investment is driven by the intention to spread value-adding activities geographically in order to take advantage of differences in the availability and cost of factor endowments in different locations" (Nachum and Zaheer 2005, 750). Accordingly, efficiency seeking entails the disaggregation of the value chain and the relocation of individual activities to where they can be most efficiently executed (Buckley and Mucchieli 1997; Leamer and Storper 2001). Such a globally dispersed network of highly interconnected capabilities and relationships (Venkatraman 2004) can represent an economically viable option for companies only if its coordination costs do not outweigh the savings that can be achieved by this more efficient global redistribution of labor. Recent ICT progress has precisely lowered such coordination costs, vastly increasing the potential for local specialization of value-adding activities (Zaheer and Manrakhan 2001). This is especially true for high information-intensive industries, where companies are most active in implementing offshoring strategies. In such industries both input and output can now be "transferred rapidly and reliably at negligible cost between distant locations, enabling firms to coordinate and control their geographically dispersed activities more effectively" (Nachum and Zaheer 2005, 751).

BPO has thus emerged as a strategic and economically viable alternative for firms to redistribute their activities more efficiently on a global scale. Recent survey-based studies confirm that the quest for superior efficiency and cost reduction is a key driver for BPO investments (Agrawal et al. 2003; Lewin and Peeters 2006a). Thus, we posit:

> *Hypothesis 3. Efficiency seeking is a significant motivation for business process offshoring.*

Knowledge seeking

Firms investing abroad who are motivated by knowledge seeking are in search of new resources that allow them to upgrade their own existing pool of capabilities. Thus, such firms will value locations close to potentially interesting knowledge sources. Such locations generally offer more technical activity, highly-skilled labor, patent generation or R&D intensity (Chung and Alcacer 2002; Kuemmerle 1999). Local foreign presence is required in these cases because part of the knowledge source is tacit and difficult to codify and thus in order to be accessed needs close and frequent interactions (Kogut and Zander 1993; Martin and Salomon 2003).

Initially, BPO was not driven by the quest for new knowledge. Companies started offshoring simple and codifiable business processes with a relatively low degree of knowledge intensity (e. g., data entry and transaction processing). However, in response to the high quality of the work in the offshore locations, companies quickly began to also offshore high-skilled knowledge-intensive activities such as R&D and engineering to low-wage countries (Farrell 2004; Lewin and Peeters 2006a). In consideration of this rapid evolution and given that a certain degree of knowledge intensity is by definition always present in any of the white-collar business processes offshored (Dossani and Kenney 2003), in particular in those high information-intensive industries where knowledge resources have replaced tangible assets as the most critical resource (Nachum and Zaheer 2005), we posit:

> *Hypothesis 4. Knowledge seeking is a significant motivation for business process offshoring.*

Competitive pressure

Companies can also decide to expand abroad as a response to competitors' moves. The decision to imitate a competitor's foreign investment strategy can be generally explained as an effort not to lose sight of rival activities and thus to hinder their access to new markets and/or low-cost resources (Graham 1998; Karnani and Wernerfelt 1985; Knickerbocker 1973). Competitors following industry pioneers in foreign market entry can also take advantage of the valuable information generated by a similar firm's initial expansion. The understanding of potential opportunities and threats in the host market emerges as especially valuable in those rapidly changing environments characterized by high levels of uncertainty (Head, Mayer and Ries 2002; Martin, Swaminathan and Mitchell 1998; Nachum and Zaheer 2005). The high information-intensive industries where BPO is currently taking place are undoubtedly representative of these uncertain competitive arenas (Karmarkar 2004) and therefore are appropriate backdrops for considering competitive pressure. Thus, we posit:

> *Hypothesis 5a. Competitive pressure is a significant motivation for business process offshoring.*

However, there seems to be a market attractiveness constraint on the number of firms that are likely to imitate industry pioneers in foreign expansion activities (Martin et al. 1998). As the number of domestic competitors that invest in a host country increases, the level of competition also increases, thus making potential entry less attractive. Studies on this matter have reported a wave-like pattern, with the number of new entrants first increasing and then decreasing as more domestic competitors expand (Knickerbocker 1973; Martin et al. 1998; Yu and Ito 1988). This is particularly applicable to the offshoring phenomenon. Offshoring pioneers of the early 1990s such as General Electric and British Airways located their activities in a handful of cities with optimal conditions for taking advantage of a high-skilled low-wage pool of workers. Once realizing the cost advantages of this strategy, competitors soon began investing in the same cities and regions. The recent *overheating* of these few very popular offshoring destinations

(e. g., Hyderabad, Bangalore, and Delhi) is turning them into less attractive offshore locations characterized by escalating wages and accelerating turnovers. As a consequence, companies are now starting to invest in new areas such as South Africa and Brazil, where better conditions and less local competitive pressures exist (Farrell 2006). Thus, we argue:

> *Hypothesis 5b. The relationship between the competitive pressure motivation and the business process offshoring intensity is U inverted.*

8.2. Industry and country impact on BPO rationale

The five hypotheses offered so far investigate the specific rationale for investing abroad using a BPO strategy. The main argument is that the mix of motivations behind this innovative kind of foreign investment is different from the one characterizing previous waves of internationalization, and thus requires specific treatment in the literature. The objective of this subsection is to take our knowledge of BPO motivations one step further, by investigating whether BPO motivations are influenced by a set of key variables. This kind of analysis has already been considered for other types of international expansion. Several other studies have investigated the similarities that are relevant in predicting behavior across firms following the same foreign investment strategy. Results have shown, for example, that companies belonging to the same business groups tend to invest in the same region (Chang 1995; Guillen 2002), or that firms in the same industry tend to share the same foreign expansion strategy (Martin et al. 1998). At the country level, research has shown that the relative strength and intensity of the science industry in both the home and host countries influence the foreign investment decision and the firm's motivation to either try to exploit existing firm-specific advantages or try to create new ones (Chung and Alcacer 2002; Kuemmerle 1999).

For the aim of this study, it is therefore relevant to present further variables in order to offer a thorough analysis of the motivations that drive BPO investments. Using this logic, there are two characteristics that are often cited as defining attributes of the

BPO phenomenon and that must be taken into account when arguing about the motivations behind offshoring. The first is the predominance of BPO in service sectors. BPO is clearly of interest to service firms. This is so because recent ICT progress has enabled the creation of authentic global information assembly lines where information can be conveniently and efficiently standardized, stored, sent, and produced in remote locations. This has given companies the opportunity to reconfigure entire processes behind their services. Examples of these radical reconfigurations range from the diagnostic imaging to the packaged software industries (Dossani and Kenney 2006; Karmarkar 2004). Therefore, building on the previous hypotheses that identified the search for efficiency and knowledge as the two key motivations behind BPO, we posit:

> *Hypothesis 6. Service-oriented firms, in contrast to manufacturing-oriented firms, offshore more and have a stronger focus on efficiency and knowledge seeking when relocating business processes.*

The second defining attribute of BPO is the selection of low-cost countries as destinations for their offshored activities. As an example, India is currently the leading recipient of offshored service jobs (Dossani and Kenney 2007; Lewin and Peeters 2006a). Thanks to its developed software sector, its relatively favorable regulatory and institutional environment, and the presence of a vast pool of well-educated English-speaking labor force, India has been the preferred and most competitive destination for the relocation of service work abroad (Dossani and Kenney 2007; Lewin and Peeters 2006a). Lower labor costs continue to be the major driver behind BPO. Following this same logic, India, China, the Philippines and Latin America currently represent the major suppliers of low-cost white-collar workers. Nonetheless, it is worth stressing that data preparation and information processing commoditized in the global information assembly line are not the only processes being offshored. Recent research shows that knowledge-intensive activities are also being relocated to offshore locations such as India and China (Dossani and Kenney 2007; Lewin and Peeters 2006a). Therefore, we posit:

Hypothesis 7. Firms offshore more to low-cost countries and have a stronger focus on efficiency and knowledge seeking when relocating business processes there.

8.3. Methods

We employed a few different methods to test the hypotheses. For the first five hypotheses, we replicated the same empirical specification developed by Nachum and Zaheer (2005) using more recent data (1999–2003). The two researchers previously used panel data from 1990–1998 to examine how variation in the cost of distance due to technological developments affected U.S. firms' rationale for foreign investment in high information-intensive industries. We replicated their work for two main reasons. First, they developed a sound methodology to identify the motivations for BPO, which can be appropriately related to the U.S. outward *FDI* flow in high information-intensive industries. Second, the replication allows a comparison between the two studies to thoroughly analyze how BPO motivations have changed over time.

For the last two hypotheses, which consider industry and country characteristics, we developed an improved version of the model used for the first part of the analysis and tested it using the 1999–2003 dataset. Since we replicated a previous study (Nachum and Zaheer 2005) for the first part of the analysis, we closely followed their methodology used for determining the setting and for constructing the variables. We will thus refer to their work each time we make use of concepts and assumptions formulated in their research.

8.4. Setting and data source

To create the dataset, we concentrated on information on the *FDI* of U.S. firms collected by the Bureau of Economic Analysis (Nachum and Zaheer 2005). American firms are a suitable empirical context because in 2003 they accounted, together with British firms, for about 70 percent of the global business process offshoring market (Agrawal et al. 2003). For the analysis we used outward *FDI,* which corresponds to U.S. controlling equity investments in foreign establishments. Although BPO also takes place through offshore outsourcing (Dutta and Roy 2005), the issue of restricting the study to *FDI* as foreign investment, because of data availability, does not seem to harm the generalizability of the findings. In fact, the majority of BPO implementations are run as captive centers owned by investing U.S. firms (Dossani and Kenney 2003; Lewin and Peeters 2006a).

The time range selected for the study is 1999–2003. The most recent year for which data was provided at the time of the analysis is 2003. In addition, 1999 is the first year that annual and benchmark survey data on U.S. direct investment abroad were collected using the new North American Industry Classification System (NAICS), which has supplanted the 1987 Standard Industrial Classification (SIC). The usage of data based on NAICS is especially appealing for this study, as its introduction theoretically provides a better reflection of new and emerging industries, such as those involved in the creation and handling of advanced technologies (U.S. Bureau of Economic Analysis 2004), which emerge as determinant for BPO. The data are collected at the industry level and majority-owned (i. e., more than 50 percent owned) non-bank affiliates of non-bank U.S. parents are used for the analysis. The combined number of observations of the panel is 100, that is, 20 industries observed over five years.

We should further explain the reasoning behind using industry-level data for exploring the motivations for what is fundamentally a firm-level decision, namely the choice of pursuing a foreign investment through BPO. While it is clear that there are firm-level heterogeneities that influence the decision to initiate BPO activities, it is also true that many of them can be captured at the industry-level, in consideration of the many similarities that characterize firms belonging to the same industry. Hence, industry averages can meaningfully "correspond to a 'representative' firm in the industry" (Nachum and Zaheer 2005, 753).

8.5. Industry selection

BPO is mostly of interest to high information-intensive industries. It is predominantly in such industries where, thanks to recent ICT progress, companies now have the strategic option to efficiently relocate business processes to more convenient offshore locations (Karmarkar 2004). Thus, the selection of the correct industries for analysis becomes a critical task for the validity of this study. To distinguish high information-intensive industries from the rest is not an easy task, given that all industries have some level of information intensity and that traditional industrial boundaries are becoming blurred in the current turbulent competitive arena. In order to overcome such challenges, we used an industry's ICT investment to approximate its level of information intensity (Nachum and Zaheer 2005). Because of data availability restrictions, we base the selection of industries on the capital flow data of 123 U.S. industries for 1997, made available by the Bureau of Economic Analysis.[38] The data provide information on which industries purchase what types of equipment, software, and structures. For each of the 123 private-sector industries we computed the same ICT ratio that Meade, Rzeznik and Robinson-Smith (2003) used to identify high information-intensive industries on the same dataset. The ratio is the following:

$$\frac{\text{Investment in computer and peripheral equipment + Investment in office and accounting equipment + Investment in software + Investment in communication equipment}}{\text{Total investment in equipment and software}}$$

Once all 123 industries were ranked according to this ratio, we matched them to the list of industries for which the Bureau of Economic Analysis provides detailed information on outward *FDI* on a yearly basis.[39] We eliminated the industry categories for which either ICT or yearly outward *FDI* data were missing. After also excluding the industries in which there is practically no *FDI* activity (e. g., health care and social assistance, agriculture, forestry, fishing and hunting, personal services), a total of 48 industries

[38] 1997 is the most recent year for which the Bureau of Economic Analysis makes available detailed capital flow data on U.S. industries based on the new categorization system (NAICS). Source: www.bea.gov/bea/dn2/home/benchmark.htm.

[39] Source: www.bea.gov/bea/ai/iidguide.htm#USDIA.

remained, from which we selected the top 20 with the highest ICT ratio. The final list of high information-intensive industries is reported in table 8.1 below, together with data obtained by Nachum and Zaheer (2005).

TABLE 8.1: Classification of industries by investment in ICT

High information-intensive industries			
This study (Top 20 industries-NAICS based)		**Nachum and Zaheer's (2005) study (Top 15 industries-SIC based)**	
Industries	**ICT ratio[1]**	**Industries**	**ICT ratio[2]**
Broadcasting, cable networks, and program distribution	0.84	Business services	0.895
Telecommunications	0.82	Insurance	0.876
Information services and data processing services	0.77	Communication	0.846
Finance (except depository institutions)	0.76	Information services and data processing	0.823
Management of non-bank companies and enterprises	0.69	Drugs	0.778
Publishing industries	0.66	Household audio and video and communication equipment	0.757
Computers and peripheral equipment	0.65	Motion pictures, including TV and film	0.723
Insurance carriers and related activities	0.63	Electric and electronic components and accessories	0.680
Navigational, measuring, and other instruments	0.55	Electronic and electric components n.e.c.	0.629
Magnetic and optical media	0.51	Printing and publishing	0.598
Communications equipment	0.49	Finance (except depository institutions)	0.590
Audio and video equipment	0.49	Transportation	0.565
Pharmaceuticals and medicines	0.43	Computer and office equipment	0.481
Motion pictures and sound recording industries	0.42	Instruments and related products	0.458

TABLE 8.1 *(cont.)*: **Classification of industries by investment in ICT**

High information-intensive industries			
This study (Top 20 industries-NAICS based)		**Nachum and Zaheer's (2005) study (Top 15 industries-SIC based)**	
Industries	**ICT ratio**[1]	**Industries**	**ICT ratio**[2]
Administration, support, and waste management	0.36	Industrial chemicals and synthetics	0.447
Transportation and warehousing	0.34		
Resins and synthetic rubber, fibers, and filaments	0.34		
Wholesale trade	0.34		
Other transportation and equipment-Manufacturing	0.33		
Basic chemicals	0.32		

[1] ICT ratio as calculated in above.
[2] ICT ratio = ICT investment as share of total investment, calculated as accumulated investment during 1990–1999. Source: Nachum and Zaheer (2005).

8.6. Measures

The dependent variable of this study is FDI_{it}, which corresponds to the total capital flow, including capital flow between parents and affiliates, intercompany loans, and reinvested earnings of industry i at time t; i ranges from 1 to 20; t ranges from 1 to 5 (Nachum and Zaheer 2005). The operationalization of the independent variables is as follows.

Resource seeking

Because of data availability, we operationalized the resource-seeking motivation differently from Nachum and Zaheer (2005). We used the investment in net property, plant, and equipment to indirectly measure the intention of accessing physical and tangible resources in the host country. As defined by the Bureau of

Economic Analysis,[40] net property, plant and equipment refers to land, mineral rights, building, structures, machinery and equipment. Thus, it well identifies the natural, tangible resources characteristic of the resource-seeking motivation (Dunning 2000). To control for the different magnitude of industries we divide it by total sales.

Market seeking

To operationalize the market-seeking motivation we used the total sales of affiliates to non-U.S. unaffiliated bodies as a share of their total sales. This sales-based operationalization is highly favorable (Nachum and Zaheer 2005) because it well captures the effort made by the affiliates to enter new foreign markets. While Nachum and Zaheer (2005) distinguish between market-seeking motivation (sales in the local foreign market where the affiliate is located) and export-seeking motivation (sales to a third market different from the U.S. and local foreign market where the affiliate is located), we opted for this unique operationalization, obtained by adding the two, which well synthesizes the intention of the affiliates to penetrate a new market.

Efficiency seeking

The efficiency-seeking motivation is generally operationalized using the magnitude of intra-firm transactions as a share of total sales of affiliates in an effort to measure the degree of internal linkages inside the multinational firm (Kobrin 1991). The same variation of Kobrin's index of integration (Kobrin 1991) used by Nachum and Zaheer (2005) is also employed here as follows:

$$\frac{\text{Sales of affiliates to parents + Sales of affiliates to other affiliated bodies + Sales of parents to affiliates}}{\text{Total sales of affiliates}}$$

[40] Source: http://bea.gov/bea/international/ii_web/beadynamicseriesdefn.cfm?seriesid=54&EntityTypeID=4andecontypeid=1.

Knowledge seeking

As in the study of Nachum and Zaheer (2005), the knowledge-seeking motivation is operationalized using two measures:

1. The level of compensation per employee. The argument generally cited here is that high salaries correspond to a reliance on highly skilled workers. Thus, we used the average compensation per employee across all countries (Nachum and Zaheer 2005).
2. R&D intensity, obtained dividing the R&D investment of affiliates by their total sales. This type of operationalization has been extensively used in extant research to estimate the search of knowledge in foreign locations (Chung and Alcacer 2002).

While the second measure seems to be a reliable predictor of the role of knowledge seeking as a driver behind the offshoring investment (Chung and Alcacer 2002), the first presents a major problem. The assumption that more skilled employees are paid more than less skilled employees makes sense. However, the measure used does not include any consideration of the major differences across average salaries paid to similar employees in different offshore regions. In other words, while U.S. $40,000 could be a high salary for an Indian engineer working in Bangalore, the same wage would be considered very low by a German engineer working on similar tasks in Munich. Thus, the simple inclusion of average salaries paid abroad by U.S. companies without including purchasing power considerations does not help identify the search for highly skilled employees. On the contrary, it can be better interpreted as an estimate for the efficiency-seeking motivation, for which the lower the wages paid in host countries, the more cost considerations drive BPO investment. That said, we decided to include both operationalizations of the knowledge-seeking motivations in order to properly replicate Nachum and Zaheer's (2005) work. Later, in the discussion on the significance of the corresponding coefficients, we will return to these considerations in order to properly interpret the findings.

Competitive pressure

To account for the role of competitive pressure as a possible determinant of BPO activities we used the same measures employed by Nachum and Zaheer (2005). Thus, we used the number of new affiliates entering foreign markets each year, expressed as a share of the total number of affiliates in an industry; we also included the quadratic form of this measure to account for the nonlinear relationship previously hypothesized.

When refining the Nachum and Zaheer (2005) model, we made use of the following two measures.

Service orientation

To account for the service orientation of the affiliates we created a dummy with the following tenet. Industries whose proportion of sales of services over total sales was at least 50 percent scored 1 on the dummy. All of the others, which thus sell more goods than services, scored 0.

Country destination

To investigate where offshored business processes are being relocated we created the following dummy. Industries which sold at least 25 percent of their services from low-cost countries scored 1 on the dummy, while all others scored 0. Given the availability of data provided by the Bureau of Economic Analysis, we considered sales coming from low-cost countries if they were made from the Asian Pacific area (excluding Australia and Japan), Brazil, Mexico or Africa.

We also included a series of *control variables*, following the Nachum and Zaheer (2005) model.

Ownership advantages

The advantages specific to the ownership of the enterprise seeking to engage in *FDI* are determinant when analyzing the propensity of certain firms relative to others to engage in international expansion (Dunning 2000). We used profitability to estimate the ownership of such advantages.

Size and growth

Extant research confirms that both size and growth influence *FDI* flow (Grubaugh 1987). We measured size by the number of employees in an industry and growth by its annual relative increment.

FDI *stocks*

In some industries more than in others, *FDI* is considered to be a viable strategic option available to companies. The inclusion of *FDI* stocks, defined by UNCTAD[41] as the value of the share of capital and reserves attributable to the parent enterprise plus the net indebtedness of affiliates to the parent enterprise, aims directly at controlling for this variation in the propensity of using *FDI*.

Market structure

Market structure influences the competitive pressure to invest overseas (Knickerbocker 1973). The total number of firms in an industry is generally employed to control for this. In this study we used the number of parent firms in an industry.

8.7. Model

In order to test the hypotheses, we reproduced the same empirical specification (Model 1) developed by Nachum and Zaheer (2005). By replicating their model with a more recent pool of information, we were able to compare results between the two studies and thus provide a complete analysis of BPO motivations and their variation over time. Then, we tested using the same data an improved version of the initial model (Model 2), obtained by adding more fine-grained distinctions across the industries involved. Such distinctions deal with a refinement of how motivations behind BPO can vary depending on two key characteristics, the industry and the selected country. Model 1 is the following:

$$FDI_{it} = \boldsymbol{\beta}\, \boldsymbol{M}_{it} + \boldsymbol{\gamma}\, \boldsymbol{X}_{it} + e_{it} \tag{8.1}$$

[41] Source: www.unctad.org/Templates/WebFlyer.asp?intItemID=2193 andlang=1.

As previously mentioned, *FDI* is the total capital flow; ***M*** is the vector of *FDI* motivations; ***X*** is the vector containing the control variables; *i* stands for industries and ranges from 1 to 20; *t* stands for time (years in this case) and ranges from 1 to 5; and *e* is the random error term.

Model 2 is obtained by adding the vector ***D***, which includes two dummies (service orientation and country destination), and the interactions between these two dummies and two of the five motivations, namely efficiency seeking and knowledge seeking. As previously clarified, knowledge seeking is operationalized with two different constructs. Thus, we generated interactions for both of them. Model 2 is therefore formalized as follows:

$$FDI_{it} = \boldsymbol{\beta}\, \boldsymbol{M}_{it} + \boldsymbol{\gamma}\, \boldsymbol{X}_{it} + \boldsymbol{\delta}\, \boldsymbol{D}_{i} + \boldsymbol{\alpha}_1\, \boldsymbol{D}_i\, EF_{it} + \\ + \boldsymbol{\alpha}_2\, \boldsymbol{D}_i\, KS1_{it} + \boldsymbol{\alpha}_3\, \boldsymbol{D}_i\, KS2_{it} + e_{it} \qquad (8.2)$$

To improve the symmetry of the distribution of some of the variables employed, we transformed them using power transformations. Among the variables in the *M* vector we transformed the resource seeking variable, taking the inverse of its square root. Among the variables in the *X* vector, we took the natural logarithm of size, *FDI* stocks and market structure. To increase the comparability among the coefficients of the variables relative to the BPO motivations, we used standardized coefficients. Table 8.2 shows the variables used, their non-standardized descriptive statistics and correlation coefficients.

TABLE 8.2: Descriptive statistics and correlation coefficients of the independent variables[a]

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Resource seeking[b]	2.57	1.13														
2. Market seeking	0.72	0.18	0.12													
3. Efficiency seeking	0.3	0.23	–0.02	–0.96												
4. Knowledge seeking 1[e]	42.19	18.73	0.04	–0.20	0.05											
5. Knowledge seeking 2	0.01	0.02	0.01	–0.42	0.44	–0.06										
6. Competitive pressure	0.02	0.06	–0.04	–0.21	0.22	0.29	0.28									
7. Competitive pressure[2]	0.00	0.01	–0.16	–0.07	0.07	–0.08	0.20	0.22								
8. Service oriented	0.5	0.50	–0.17	0.59	–0.68	0.18	–0.49	0.11	–0.05							
9. Country destination	0.3	0.46	–0.22	0.11	–0.05	–0.15	–0.25	–0.13	0.05	0.21						
10. Profitability[d]	7855.3	21361	–0.07	–0.27	–0.31	0.33	0.01	0.29	0.12	0.14	0.21					
11. Size[c, f]	4.40	1.02	0.49	0.09	–0.07	0.10	0.00	0.07	–0.27	–0.02	–0.30	–0.06				
12. Growth	3.26	16.71	0.04	0.22	–0.17	0.13	–0.01	0.31	0.01	0.10	–0.07	0.10	0.31			
13. FDI stocks[c, d]	9.16	1.63	0.04	–0.20	0.08	0.69	–0.12	0.34	–0.09	0.36	0.07	0.62	0.41	0.22		
14. Market structure[c]	3.44	0.86	0.47	–0.14	0.08	0.40	0.03	0.22	–0.21	0.01	–0.18	0.29	0.71	0.25	0.65	

[a] N = 100. Correlations greater than 0.22 or less than –0.22 are significant at $p < 0.05$; [b] Inverse of the square root; [c] Logarithm; [d] Millions of dollars; [e] Dollars; [f] Thousands of employees; [2] Square function.

Most of the correlation coefficients are low and do not exceed the cut-off point of 0.5. Thus, they present no harm in assuming independency among the different independent variables. The only problematic correlation coefficient that needs to be addressed is the one between efficiency seeking and market seeking (–0.96). It is worth noting that this high negative correlation makes sense from a theoretical standpoint, and is in line with the literature previously discussed and the hypotheses developed in this study. As a matter of fact, the more attention a firm pays to the internal efficient integration of activities among its affiliates and headquarters, the less likely it is to focus on external market considerations. For the analysis, we corrected this by regressing efficiency seeking on market seeking; we then calculated the residuals of this regression and introduced them into the final regression as a substitute for market seeking. These residuals represent an additional contribution of such variables that is not explained by efficiency seeking. Nachum and Zaheer (2005) used a similar methodology to correct for high correlation coefficients in their panel. That said, the results do not change in either model if market seeking is directly eliminated.

To deal with the missing values of the dataset, we performed an independent sample *t*-test and found that the missing values were not randomly scattered in the dataset. Next, we estimated the missing values using available observations, by testing a model based on all available observations and using it to estimate the missing values (Nachum and Zaheer 2005).[42]

The two models were estimated using STATA software, using a panel data analysis (Greene 2003). The advantage of a panel data analysis is that it allows for improvement of the estimation obtained by simply pooling the data and performing an OLS regression on them. It also allows for the introduction of different intercepts to test for industry and time effects. We tested the null hypothesis of no industry effects, performing an *F* test on the two following models: the pooled model with a single intercept and the least squares dummy

[42] To estimate the values we used the STATA command *impute*. This command fills in missing values using an OLS regression. It requires as a dependent variable the variable whose missing values are to be imputed and as independent variables those variables on which the imputation is to be based.

variable model, which corresponds to the pooled model with the addition of dummy variables for each industry (minus one) (Greene 2003). The hypothesis that the industry effects are the same is rejected for both models (Model 1: $p < 0.001$, $F =$ Model 2: 3.49; Model 2: $p < 0.001$, $F = 2.92$). We also included dummies for the different years of the study, thus accounting for possible time effects.

In a panel data analysis there are two different ways of modeling the presence of different intercepts accounting for industry effects, namely using *fixed effects* or the *random effects estimator*. For both empirical specifications (Model 1 and Model 2), a Hausman test was performed to see which one of the two alternatives would be more appropriate for this panel (Greene 2003). The test was not significant for either model (Model 1: $p = 0.77$, $\chi^2 = 0.08$; Model 2: $p = 0.99$, $\chi^2 = 0.00$), suggesting that the random effects estimate was not significantly different from the unbiased fixed effects estimate. Thus, these results allow the usage, for both models, of the random effects estimator, which appears to be more suitable, especially because it does not imply the loss of $i - 1$ degrees of freedom as does the fixed effects model (Kennedy 2003). The final coefficients for testing the hypotheses of this study are therefore obtained out of the random effects generalized least square regression. Table 8.3 reports the regression equations for both models.

TABLE 8.3: Motivations for business process offshoring[a]

Variable	Operation measure	Model 1	Model 2
BPO motivations			
Resource seeking[b]	Net property, plant and equipment / total sales (H1)	0.04	0.03
		(0.73)	(0.38)
Market seeking	Local sales of affiliates/total sales (H2)	–0.05	0.004
		(–0.97)	(0.07)
Efficiency seeking	Intra-firms transactions / total sales (H3)	0.14*	0.02
		(2.42)	(0.09)

TABLE 8.3 *(cont.)*: **Motivations for business process offshoring**[a]

Variable	Operation measure	Model 1	Model 2
Knowledge seeking 1	Compensation of employees (H4)	–0.21**	–0.31 +
		(–2.76)	(–1.64)
Knowledge seeking 2	R&D investment/total sales (H4)	–0.06	–0.07
		(–1.08)	(–1.09)
Competitive pressure	# of U.S. foreign affiliates (H5a)	0.02	–0.065
		(0.31)	(–1.00)
Competitive pressure[c]	(# of U.S. foreign affiliates)[c] (H5b)	–0.01	–0.02
		(–0.22)	(–0.62)
BPO attributes			
Service orientation (D1)	Dummy (H6)		0.45 +
			(1.69)
Country destination (D2)	Dummy (H7)		0.32
			(1.26)
Interaction terms			
Efficiency s. * D1	(H6)		0.54*
			(2.46)
Efficiency s. * D2	(H7)		–0.07
			(–0.35)
Knowledge s. 1 * D1	(H6)		0.19
			(0.89)
Knowledge s. 1 * D2	(H7)		0.35
			(1.42)
Knowledge s. 2 * D1	(H6)		0.09
			(0.31)
Knowledge s. 2 * D2	(H7)		0.67 +
			(1.73)
Control variables			
Profitability	Net income ($)	0.35***	0.25*
		(4.25)	(2.35)
Size[d]	# of employees ('000)	–0.44***	–0.28*
		(–4.91)	(–2.45)

TABLE 8.3 *(cont.)***: Motivations for business process offshoring**[a]

Variable	Operation measure	Model 1	Model 2
Growth	Annual change # of employees	0.10 +	0.14*
		(1.68)	(2.23)
FDI stocks[d]	($)	0.69***	0.41*
		(5.84)	(2.40)
Market structure[d]	# of parent firms	993.62	611.85
		(1.15)	(0.56)
Constant		–0.13	–0.12
		(–1.24)	(–0.73)
Wald χ^2		414.66	499.29
Prob. > χ^2		0.00	0.00
Number of observations		100	100

[a] Parameters estimates are shown, with z's in parentheses; [b] Inverse of the square root; [c] Square function; [d] Logarithm; $^{+}$ $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < .001$.

8.8. Results and discussion

Hypothesis 1, that resource seeking is not a significant motivation for business process offshoring, received support in the analysis. The coefficient of resource seeking motivation was not significant at the 5% level in either model. This result, in line with Nachum and Zaheer (2005), corroborates the theoretical argument that BPO is not driven by the quest for tangible and immobile resources in the host country.

Hypothesis 2, that market seeking is not a significant motivation for business process offshoring, received support in the analysis. The relative coefficient was not significant at the 5% level in either model. It is thus confirmed that BPO is not a demand oriented type of foreign investment. Such a result is strongly aligned with the findings of Nachum and Zaheer (2005), who also obtained a lack of statistical significance for both coefficients of market and export seeking in their outward analysis of high information-intensive industries.

Hypothesis 3, that efficiency seeking is a significant motivation for business process offshoring, received support in the analysis. The coefficient relative to the efficiency seeking motivation was significant at the 5% level and positive in Model 1, thus corroborating the theoretical argument that companies initiate BPO investments in order to increase internal efficiency and minimize costs. In Model 2, the insertion of the interaction terms proved that efficiency seeking is highly significant only for service oriented enterprises. This result is extremely important in confirming the generalized perception that companies practice BPO, predominantly in the service sector, in order to reduce costs by taking advantage of a more efficient global redistribution of labor. This finding is also consistent with that of Nachum and Zaheer (2005), who found in their panel that efficiency seeking was the only significant motivation explaining the outward flow of *FDI* in high information-intensive industries. The strong homogeneity of the results obtained across the two studies leads to the conclusion that efficiency seeking is a key determinant for the rise of BPO as a strategic option for international expansion.

Hypothesis 4, that knowledge seeking is a significant motivation for business process offshoring, received mixed support in the analysis. In Model 1, only the first of the two coefficients related to knowledge seeking motivation was significant, with a very small p-value (0.006). The significant coefficient is related to the average salaries paid in host countries and is thus subject to the critiques already discussed in the methods section. In line with such considerations, the significance of its negative sign should be interpreted as a confirmation of the efficiency seeking motivation, as it focuses on the arbitrage opportunities that emerge with decreasing average salaries in offshore countries. When refining the empirical specification using Model 2, the results offer a different analysis of the 1999–2003 period. While the two standard coefficients of knowledge seeking continue to show one to be negative and significant and the other to be nonsignificant, interaction of the R&D-based measure of knowledge seeking with the country selection is positive and significant, showing that the search for new capabilities really matters when deciding to pursue a BPO strategy.

The interpretation of the findings substantiates that knowledge seeking represents a critical motivation behind BPO, primarily when investing in low-cost countries. This result is important for two reasons. First, it shows an important evolution in terms of motivations for initiating BPO. While for the first wave of BPO, documented in the study of Nachum and Zaheer (2005), the only significant driver was to increase efficiency and minimize costs, in this more recent wave knowledge seeking also significantly influences the decision of companies to practice BPO. Second, it goes against the generalized perception that companies mainly relocate white-collar jobs to developing countries exclusively to cut costs. The results show in fact that the more companies want to access new capabilities, the more they decide to offshore to low-cost regions. This finding corroborates some of the latest studies (Lewin, Massini, and Peeters 2007) assessing the recent emergence of vast unexploited pools of highly-skilled talent in developing countries that are increasingly being targeted by Western companies.

Hypotheses 5a and 5b, that competitive pressure is a significant motivation for business process offshoring, received no support in the analysis. Both the linear and quadratic measures of this motivation were highly insignificant in the analysis in both models. Nachum and Zaheer's (2005) results with respect to this motivation for the outward analysis of high information-intensive industries are also insignificant. The fact that both studies failed to provide empirical support to the hypothesis in terms of competitive pressure further opens the question raised by Nachum and Zaheer (2005) of whether the operationalization employed is accurate for testing such hypotheses. The operationalization generally used for the competitive pressure motivation is traditionally centered on the structure of the home market (Knickerbocker 1973). Accordingly, in both studies the number of new U.S. affiliates entering foreign markets each year was employed to measure this construct. However, as competition is increasingly taking place on a global rather than a domestic basis, including only local rivals in the home country, in this case the U.S., in the analysis will likely oversimplify the picture. Firms' most relevant competitors are in fact often located in different countries. If the moves of these global rivals are not taken into account, the entire analysis of the competitive pressure faced by single companies could be jeopardized.

Hypothesis 6, that service oriented firms, as opposed to manufacturing oriented firms, offshore more and have a stronger focus on efficiency and *knowledge seeking when relocating business processes, received support in the analysis.* In Model 2, the coefficient of the dummy variable that distinguishes service oriented firms from manufacturing oriented firms was positive and significant at the 10% level. This categorization is also highly relevant when discussing the efficiency seeking motivation, with service oriented firms offshoring considerably more for this reason.

Hypothesis 7, that firms offshore more to low-cost countries and have a stronger focus on efficiency and knowledge seeking when relocating business processes there, received weak support in the analysis. The coefficient of the dummy variable that distinguishes firms that substantially offshore to low-cost countries from firms that do so only marginally was positive, but not significant. However, this categorization is relevant and statistically significant when investigating the knowledge seeking motivation. According to the findings, firms that offshore to low-cost countries are the ones that invest more in knowledge seeking motivation, specifically by relocating processes related to their R&D activities. As previously mentioned when discussing knowledge seeking motivation, this happens to be a major finding that substantiates the presence of an evolution of BPO motivations over time and confirms the rising role of developing countries as a source of talent for U.S. companies.

8.9. Conclusion

The objective of this study was to develop and test hypotheses on the rationale for BPO using the United States as an example. The starting point of this study was the acknowledgment of the emergence of BPO as a radically new and yet understudied strategic option available to companies seeking to expand internationally (Venkatraman 2004). In light of this, the objective of this chapter was to center the debate on offshoring and focus on the motivations that lay behind it. In particular, the purpose was to determine whether the drivers behind this flow of international investments have changed over time and to understand the role of industries and selected countries in influencing them. To test the hypotheses formulated, we first replicated the same methodology of Nachum and Zaheer (2005) using a more recent pool of data in order to compare results and offer a complete analysis of BPO motivations over a significant time period. Then, using the same dataset, we tested an improved version of the initial model, obtained by adding more fine-grained distinctions across the industries and countries involved.

The key finding of this study is that BPO is currently motivated not only by the search for efficiency but also by the quest for new knowledge. Academic works as well as general press articles on BPO (Dossani and Kenney 2003; Engardio, Bernstein, and Kripalani 2003; Farrell 2004; Lewin and Peeters 2006a) often identify the quest for cost minimization through a more efficient global redistribution of labor as the key motivation behind the rise of BPO. Consistent with this generalized perception and with the findings of Nachum and Zaheer (2005), the results of this study provide substantial corroborating evidence that efficiency seeking is indeed the key significant driver for BPO. That said, the findings obtained also showed something that Nachum and Zaheer (2005) failed to empirically prove: knowledge seeking is also a significant motivation behind the decision to offshore business processes. This important empirical finding confirms that an evolution in terms of motivations for BPO is currently taking place. While the initial wave of offshoring (1990–1998) documented by Nachum and Zaheer (2005) was characterized by a narrow cost-cutting perspective strictly in line with an efficiency seeking motivation, the more recent wave (1999–2003) shown in this study is also increasingly driven by the search for new knowledge intensive resources. Furthermore, the additional analysis integrated in this study allowed a detailed appreciation of the knowledge seeking motivation. Results show that when searching for new knowledge, companies invest mainly in developing countries. While in the past, low-cost countries were only considered for their supply of cheap blue-collar labor, the results of this study show that companies are now migrating their knowledge-intensive activities. The appreciation of this change in the international flow of these high-value activities is crucial to understanding the potential major impact that BPO can have on the geographical reorganization of Western corporations.

The findings obtained have important theoretical implications and open up relevant avenues for future research. They substantiates that BPO represents a new type of international expansion. The results that resource and market motivations fail to be significant drivers behind BPO confirms that this current wave of internationalization radically differs from previous waves of geography-related changes in the organization of corporations (Venkatraman 2004). Recent ICT progress is deeply altering the way companies globally organize their activities (Zaheer and Manrakhan 2001), and are modifying the rationale for foreign investment across industries and countries (Nachum and Zaheer 2005). BPO thus emerges as an innovative practice in the international business scenario that responds to specific new competitive dynamics and requires a different theoretical contextualization from previous waves of internationalization. By explicitly assessing the rationale for BPO, this study is the first step towards a more complete understanding of this emerging phenomenon.

Different scholars have already argued that competitive advantage is incrementally based on how companies globally source single activities in the value chain (Gottfredson, Puryear and Phillips 2005) and on how they innovate global learning by leveraging diverse skills and capabilities across dispersed subsidiaries (Santos et al. 2004). BPO represents the means by which this global redistribution of labor is currently taking place. Future research should focus on deepening our understanding of this new strategic alternative of international expansion through a more complete and rigorous theoretical conceptualization. A first effort in this direction is presented in chapter 9.

9. Offshoring and the Global Sourcing of Talent: Understanding the New Frontier of Internationalization

In this chapter we discuss important theoretical novelties that arise from the current process of internationalization and by the offshoring of innovation work. The extensive collection of international management (IM) literature, most of which is based on the stages model of internationalization (Johanson and Vahlne 1977), examines the rationale behind a firm's international expansion and the key variables influencing this process. In this study, we seek to add to this literature by offering insights into how the recent practice of product development offshoring (PDO) currently functions. We make this extension because firms that currently offshore innovation work globally redistribute their value activities differently from how they did so in the past (Venkatraman 2004).

The purpose of this study, therefore, is to investigate why and how firms currently offshore product development activities. We deliberately focused on the relocation of knowledge-intensive functions that require technical talent because it represents the latest and most innovative evolution of offshoring (Lewin and Peeters 2006c). It is also the change in the international organization of corporations that is expected to have the most significant impact on the global realignment of qualified jobs (Karmarkar 2004). We developed hypotheses on this specific international redistribution of activities and tested them using a fine-grained database containing 262 offshore implementations initiated by 71 Western European companies.

This study contributes to the existing literature on two levels. First, we examined the motivations behind the current offshoring of product development activities and show that companies relocate higher-skilled knowledge-intensive functions with the sole objective of accessing talent and thus expanding their pool of capabilities (Chung and Alcacer 2002). Labor cost arbitrage is not a relevant driver in this decision, contrary to generalized perception, which views the search for efficiency and cost reduction as its only *raison d'être* when migrating ICT-enabled functions to offshore locations (Lewin et al. 2007). We speculate on the current shortage of technical talent in Western Europe as a possible determining factor of these results. The second contribution is related to the process model currently used by firms that source higher-skilled talent abroad. The dominant stages model of internationalization (Johanson and Vahlne 1977) suggests that firms gradually increase their international commitment. As a result of the large amount of uncertainty linked to their international operations, firms tend to increasingly build on their international investment experience in two main ways: starting from culturally and geographically close countries and then moving to more distant ones; and following a staged investment path that begins with exporting and ends with a wholly-owned production facility (Davidson 1980). We argue that the global competitive landscape is changing and that firms are now following innovative dynamic models when internationalizing their activities. Recent technological advances have significantly modified how firms evaluate distances and the related costs of operating remotely. As a result, the decision to offshore product development activities is no longer the product of a linear model. Firms look at cultural and geographic distances differently from the past; international experience and firm size are no longer reliable predictors of high-value foreign investments. Companies continuously search for agile and flexible innovation processes. Recent technological advances have given them the opportunity to disaggregate their value chain and redistribute single activities, leveraging diverse skills and capabilities across dispersed locations (Santos et al. 2004). This study aims to investigate why and how Western firms do this.

Section 9.1 develops hypotheses related to the rationale behind PDO and the process used for internationalization. We then present the methods and results of our research. Finally, we highlight the major findings obtained, discuss areas for future research and discuss our conclusions.

9.1. Hypotheses development

The extensive IM literature examines the rationale behind a firm's international expansion and the key variables influencing this process. Over the years, scholars have proposed, tested, and expanded on models describing the internationalization process of firms. Among this vast amount of research, two sub-strands can be identified. One focuses on the motivations that drive the decision to invest abroad. The other is more process oriented and concentrates on the foreign investment path followed by firms and on the key variables that influence it. We will keep these two strands separated when developing our hypotheses relative to PDO.

Motivations for product development offshoring

IM scholars have identified five major motivations that can drive firms to initiate international investments: resource seeking, market seeking, efficiency seeking, knowledge seeking and competitive pressure (Nachum and Zaheer 2005). Resource and market seeking can be contextualized as the more traditional motivations, mostly explaining the first wave of internationalization that predominantly interested manufacturing activities (Venkatraman 2004). With improvements in transportation infrastructures, companies began expanding abroad to search, on one hand, for tangible resources that were either missing or too expensive at home and, on the other hand, for new markets to produce and sell their products (Dunning 1993). The recognition of transnational intra-firm integration as a potential source for competitive advantage (Fayerweather 1969) led to the increasing inclusion of efficiency seeking as an alternative motivation for foreign investments (Kobrin 1991). Concentrating on the strategic interdependences of firms, other researchers emphasized the role of external competitive pressures as determinants for international expansion (Knickerbocker 1973). The recognition of knowledge as a key determinant for the very existence of the multinational firm (Kogut and Zander 1993) has led to several studies that showed the search for new capabilities can also represent the main motivation behind international investments (Chung and Alcacer 2002; Kuemmerle 1999).

Recent studies have already advanced hypotheses regarding the main drivers behind the current wave of offshoring (Lewin et al. 2007; Nachum and Zaheer 2005; Pisani 2007). Their findings prove that resource and market seeking are clearly not significant motivations behind the current offshoring of business processes (Nachum and Zaheer 2005; Pisani 2007). Companies relocating white-collar activities abroad are not in search of tangible resources, such as land or minerals, or new geographic areas to produce and sell their products. By focusing on PDO and the search for new markets, we can hypothesize that the search for local customers does not represent a key driver behind offshoring innovation work. Hence, we posit:

> *Hypothesis 1. Market seeking is not a significant motivation in the decision to offshore product development activities.*

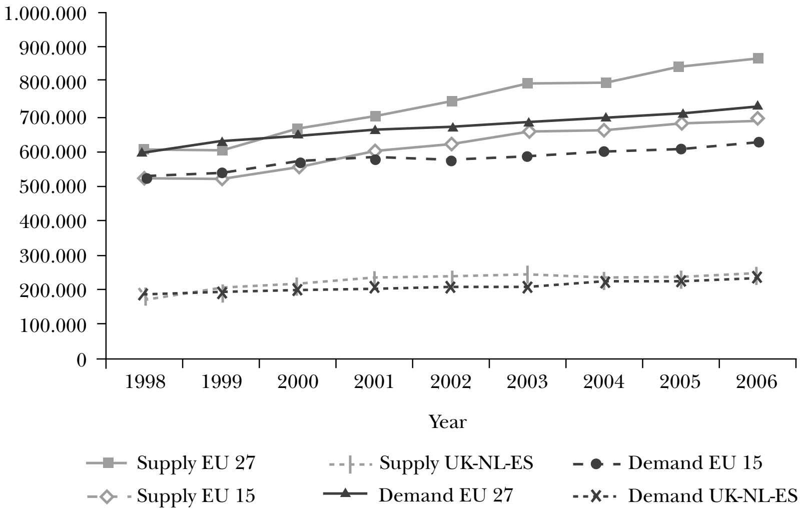
Labor cost differentials have always been cited as the major motivation behind the impressive increase of offshoring to low-cost economies (Agrawal et al. 2003; Aron and Singh 2005). Previous studies corroborate that efficiency seeking is the determinant driver behind the relocation of white-collar activities (Nachum and Zaheer 2005; Pisani 2007). However, these studies do not differentiate between lower- and higher-skilled offshored activities. In other words, no distinction is made between the relocation of fairly commoditized activities, like administrative functions, and more knowledge-intensive activities, like product development tasks that require specific technical talent. Building on such a distinction, Lewin et al. (2007) argue that, while labor cost arbitrage remains a fundamental driver for the migration of IT, administrative and other back-office functions, it does not play a role when relocating innovation work abroad. Building on their argument (Lewin et al. 2007), we hypothesize that labor cost differentials do not drive the decision to initiate PDO. Therefore, we hypothesize:

Hypothesis 2. Efficiency seeking is not a significant motivation in the decision to offshore product development activities.

The relocation of innovation work is generally linked to the search for new knowledge (Cantwell 1989). Firms motivated by knowledge seeking that invest abroad are searching for new resources in order to upgrade their own existing pool of capabilities. These firms will primarily value locations close to sources of relevant knowledge. The chosen locations generally offer a competitive mix of highly-skilled labor, greater R&D intensity and a constant production of new patents in the region (Almeida and Kogut 1999; Chung and Alcacer 2002; Kuemmerle 1999). A local presence is required in these areas in order to access the specific knowledge resources. Since a proportion of knowledge remains tacit and difficult to codify, close and frequent interactions are necessary in order to acquire it (Kogut and Zander 1993; Martin and Salomon 2003). Local proximity is thus considered to be a key facilitator for acquiring such new knowledge.

PDO is clearly motivated by the search for new knowledge. The decision to relocate product development activities abroad such as R&D, product design or engineering services, indicates the desire to access new capabilities that can help improve a company's innovation processes. Firms initiating PDO highly value the presence of a competitive and diverse pool of technical talent in the offshoring region. The possibility of hiring new technical talent offshore can become particularly necessary when there is a corresponding shortage at home. Lewin et al. (2007) document that this is precisely the case in the United States. The 2003 cutback in H1B visas created a shortage of talented higher-skilled employees entering the country. A similar investigation in several of the key members of the European Union (e. g., United Kingdom, Netherlands and Spain) confirms that the supply of Master and PhD graduates in mathematics, science and technology has never consistently exceeded demand over the past few years. Graph 9.1 illustrates the market for talent in these countries. The graph shows how the situation radically changes when considering the recent expansion of the European Union.

GRAPH 9.1: Technical talent in Europe



Note: Technical talent refers here to the yearly number of graduates (Master and PhD level) in mathematics, science and technology. The demand for graduates is computed starting from the supply in 1998 and using the annual GDP growth rate as an indirect measure for its annual growth. The supply of graduates is simply the number of graduates adjusted for the corresponding annual GDP growth. Supply data were not available for 2005 and 2006 and were therefore estimated using the internal growth rate experienced in previous years.
Data source: EuroStat.

This finding highlights that in some Western European countries there has been a shortage of technical talent. As figure 9.1 shows, Eastern European countries have offered a nearshore solution to address this shortage (Anderson et al. 2006; Marin 2006). Other developing economies have offered a more remote option as a solution. India, currently the leading recipient of offshored service jobs, represents the most illustrative example. Thanks to its well-developed software sector, its relatively favorable institutional environment and the presence of a developed education system, over the years it has consistently offered a vast well-educated, English-speaking labor force (Dossani and Kenney 2003, 2007; Lewin and Peeters 2006b, 2006c). We thus hypothesize that one of the key drivers behind the international relocation of product development activities is the search for technical talent.

Hypothesis 3. Knowledge seeking is a significant motivation in the decision to offshore product development activities.

Companies can also decide to offshore product development functions as a reaction to competitors' moves. The main objective behind the decision to imitate a competitor's foreign investment strategy is to not lose sight of rivals' activities, thus depriving them of problem-free access to new markets and/or low-cost resources (Karnani and Wernerfelt 1985; Knickerbocker 1973; Nachum and Zaheer 2005). Companies following their competitors can also take advantage of the positive externalities generated by the industry pioneers in the offshore destinations. These arguments seem particularly pertinent when analyzing the decision to offshore product development activities. Therefore, we hypothesize:

Hypothesis 4: Competitive pressure is a significant motivation in the decision to offshore product development activities.

The process of product development offshoring

The extensive literature based on the stages model of internationalization (Johanson and Vahlne 1977) examines the international expansion process of firms. The theoretical base of the model, also called the Uppsala stage model, is in the behavioral theory of the firm (Cyert and March 1963). Rooted in uncertainty reduction and experiential learning, the model stages of internationalization hypothesizes that firms incrementally increase their commitment to their foreign operations. This staged process interests the company's value chain and its partial relocation to foreign countries (beginning from export and progressing to sales offices, then production facilities, and finally, full value-chain subsidiaries), its mode of operations (from arm's length transaction through partnerships with locals to wholly-owned operations), and its geographical distribution (from more familiar to less familiar countries) (Westney and Zaheer 2001). The model has been extensively tested. Several studies focused on the incremental commitment hypothesized in the model and tested whether international experience is a reliable predictor of the international commitment of firms. Johanson and Wiedersheim-Paul (1975), Juul and Walters (1987), Chang (1995), and Chang and Rosenzweig (2001) confirmed that inexperienced firms make limited resource commitments in early expansion operations and that such firms tend to commit more resources in their successive international investments. However, various other studies (Nordstrom 1991; Sullivan and Bauerschmidt 1990; Turnbull 1987; Welch and Loustarinen 1988) found exceptions to the model's general rule that commitment increases in successive stages.

Other scholars concentrated on testing the geographic implications of the model, which predicts that companies tend to invest first in proximate countries and then move to less familiar ones. Geographic, cultural, linguistic and institutional factors have been considered in defining the relative proximity of regions. While Barkema et al. (1996), Davidson (1980, 1983), and Denis and Depelteau (1985) found empirical support for this hypothesis, other studies (Engwall and Wallenstål 1988; Sullivan and Bauerschmidt 1990) were not able to reach the same conclusion.

Over time scholars have extended the model in order to incorporate other relevant factors and thus improve its empirical validity. Among other issues, the level of competition of the host country (Vahlne and Nordström 1993), changes in government regulation (Sullivan 1994), cultural entry barriers (Kwon and Hu 1995), initial firm size (Oviatt and McDougall 1994), and political environment (Delios and Henisz 2003) have been included in the stages model of internationalization. Although quantitative empirical evidence has not always supported the model (Kalnins 2007), the stages model of internationalization remains an intuitively appealing model (Delios and Henisz 2003) in which qualitative work has proved insightful in terms of understanding a firm's decisions with regard to international expansion (Sullivan and Bauerschmidt 1990). The model's overall relevance is confirmed by the fact that as of November 2007 it has been cited 502 times in the Institute for Scientific Information's (ISI) *Web of Knowledge* database.

The current process of internationalization and a firm's subsequent offshoring of innovation work presents important theoretical novelties when compared to the Uppsala stage model of internationalization. Companies that currently offshore innovation work are globally redistributing their value activities in a way that is radically different from the relocation of international activities characterized by previous waves of internationalization (Venkatraman 2004). We thus hypothesize that, while some of the insights of the stage model of internationalization still hold, others aspects need to be reassessed in order to properly model this current offshoring wave.

First of all, we argue that the current process of internationalization is no longer linear as hypothesized by the stage model. Recent technological advances have markedly reduced the costs of operating remotely (Zaheer and Manrakhan 2001; Zaheer and Zaheer 2001). Companies competing in turbulent environments have entered into processes of accelerated internationalization that have led to a rapid relocation of strategic functions to offshore locations (Gottfredson et al. 2005). The notion of a *born-global* firm, which is defined as the "business organization that, from inception, seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries," has been increasingly cited in the mainstream IM literature (Oviatt and McDougall 1994, 31). The born-global firm's capacity to succeed stems from their entrepreneurial use of those technological advances that have dramatically increased the speed, quality and efficiency of international communications and on the firm's superior organizational capacity to manage and coordinate knowledge-based resources (Knight and Cavusgil 2004; Oviatt and McDougall 1994). Hence, we posit:

> *Hypothesis 5. International experience is not a significant factor in the decision to offshore product development activities.*

The reduction of the costs of distance, made possible by the introduction of new information technologies, has also altered the perception of geographic distances. While in the past, the physical proximity of a familiar country was a major factor in being selected for offshoring, significant improvements in the transportation sector and in communication technologies have greatly altered the perception of distance. The introduction of broadband technologies has enabled authentic information assembly lines to be created where information can be easily and efficiently standardized, stored, sent and processed in remote locations (Karmarkar 2004). Improvements in the transportation sector have greatly facilitated the relocation of resources and employees around the world.

Improved offshore location accessibility has also altered the perception of cultural distances. Multinational firms are increasingly managed by multicultural teams whose members are used to working in highly heterogeneous cultural environments. Teams that span multiple geographic and cultural boundaries have in fact become prevalent in many industries. As a result, multinational, multicultural distributed teams have become an integral part of numerous organizations (Connaughton and Shuffler 2007). The increasing standardization of technical knowledge and the predominance of the English language in a number of technical fields have played important roles in facilitating efficient interaction among individuals with different cultural backgrounds. It is worth stressing that cultural differences continue to matter, especially in low-wage economies, where only a small percentage of university graduates are suitable for jobs in Western multinationals (Farrell et al. 2006). However, we argue that in the decision to offshore product development activities, cultural issues are not as significant as they were in the past for foreign expansion strategies. Given a sufficient supply of technical talent prepared to work at international standards in the offshore environment, we hypothesize that cultural differences do not represent a major factor in determining the PDO process:

> *Hypothesis 6. Geographic and cultural distances are not significant factors in the decision to offshore product development activities.*

What continues to be significant in defining a firm's international expansion strategy is the public policy environment of the offshore country. A host government's ability to credibly commit to a set of policies is important for those companies willing to enter the country. It has been shown that in those countries where policy credibility is low, firms tend to minimize commitments or even avoid investment altogether (Henisz and Delios 2001). As a matter of fact, when there is a high uncertainty in the policymaking structure of a country, difficulties emerge in terms of collecting and organizing the information needed for a successful venture, and the level of regulatory safeguards guaranteed to foreign investors is greatly reduced. In those environments, often defined as politically hazardous, policies are extremely volatile in response to exogenous shocks, to changes in the identity of policymakers and to the direct lobbying of host country local competitors or incumbents. A recent study (Delios and Henisz 2003) confirms that political hazards matter in the stage model and should therefore be considered when studying the process of firm internationalization.

In line with such findings, the political environment deeply influences a firm's PDO process. The political stability of the offshore country is critical in securing a healthy regulative environment where the most critical knowledge-intensive activities can be safely relocated. Indeed, some of the strongest environmental pressures that a foreign company faces in the offshore country are the host country's legal regulations (Rosenzweig and Singh 1991). We expect firms investing in PDO to be particularly sensitive to the potential lack of appropriate intellectual property protection in the offshore country. Policy uncertainty with regard to intellectual property rights could in fact deeply jeopardize the entire PDO investment. Hence:

> *Hypothesis 7. Uncertainty in an offshore country's policies is a significant factor in the decision to offshore product development activities.*

Finally, we argue that the stage model still holds when predicting that, as firms increase their commitment in the foreign country, they will tend to increasingly internalize their operations (Johanson and Vahlne 1977; Westney and Zaheer 2001).

We posit that this is especially the case for PDO, which focuses on the relocation of strategic knowledge-intensive activities whose externalization presents intrinsic hold-up problems (Trefler 2005). Extensive literature on the transaction-cost based theory of the firm (Williamson 1975) has studied the different costs of organizing international interdependencies through captive offshoring or offshore outsourcing. In particular, several studies have addressed the potential risks of opportunistic behavior in the case of offshore outsourcing (Aron et al. 2005; Trefler 2005). Those risks are of particular concern when externalizing product development activities. Local external providers can in fact opportunistically exploit the know-how shared by the buyer as a legitimate part of the contract, for example, by reverse engineering critical proprietary processes (Aron et al. 2005).

Although they criticize the transaction cost model, Kogut and Zander (1993) arrive at the same conclusion, claiming that multinationals arise out of their superior efficiency as organizational vehicles by which to transfer knowledge across borders, especially when it is tacit. The existence of multinationals is thus considered the result of their specialization in the creation and internal transfer of knowledge. Captive offshoring is confirmed to be the only reasonable way of relocating knowledge-intensive activities abroad. Therefore, we posit:

> *Hypothesis 8. When offshoring product development activities, firms organize their international interdependencies through captive offshoring rather than through offshore outsourcing.*

9.2. Methods

Setting and data source

To test the eight hypotheses we used data collected through the Offshoring Research Network (ORN) project, an international research program launched by Duke University in 2004. In 2004 and 2005, the project focused on surveying the offshoring practices of U.S.-based companies. In 2006, the survey broadened the research to Europe by involving six European Universities.[43] The key unique features of this research project are the following. First, we utilized contextual commonality and a centralized online administration for a high degree of comparability across surveys collected in the different countries involved. Second, the level of the analysis is limited to specific offshore implementation, not a company's broad experience with offshoring. This results in an extremely fine-grained and unique database, which enables key differences across individual implementations to be grasped, even when initiated from the same company. Furthermore, the survey includes not only companies that are already offshoring, but also those that are considering offshoring but have not started yet. For the purposes of this study, we use the 2006 ORN surveys of three European countries, namely the United Kingdom, the Netherlands and Spain. These three countries were selected out of the six available in Europe owing to their accessible and comprehensive corresponding records at the time of the analysis. After eliminating single incomplete surveys, a total of 262 implementations executed by a total of 71 companies were left.

Measures

The dependent variable of this study is product development activity, expressed as PD_i, which is a dummy that scores 1 when implementation i involves a product development activity (e. g., R&D, product design and engineering services) and 0 otherwise. As for the independent variables:

1. *Market seeking*. We operationalized market seeking using the answers to the survey question in which respondents were asked to rate, using a five-point Likert scale, the degree to which access to new markets for products and services mattered as a strategic driver for their offshore implementation.

[43] Partner Universities include Copenhagen Business School, Otto Beisheim School of Management, RSM Erasmus University, IESE Business School, Manchester Business School and Solvay Business School.

2. *Efficiency seeking*. To operationalize the efficiency seeking motivation we used the answers to the survey question in which respondents were asked to rate, using a five-point Likert scale, how much labor cost savings mattered as strategic driver for their offshore implementation.
3. *Knowledge seeking*. We operationalized knowledge seeking using the answers to the survey question in which respondents were asked to rate, using a five-point Likert scale, to what degree access to qualified personnel mattered as a strategic driver for their offshore implementation.
4. *Competitive pressure*. To operationalize the competitive pressure motivation we used the answers to the survey question in which respondents were asked to rate, using a five-point Likert scale, to what degree competitive pressure mattered as a strategic driver for their offshore implementation.
5. *International experience*. To operationalize the level of international experience of a firm pursuing implementation *i* we measured it with the total number of implementations of the company. The higher this number, the more the company is committed in foreign markets.
6. *Cultural and geographic distances*. To operationalize cultural distance we used the answers to the survey question in which respondents were asked to rate, using a five-point Likert scale, to what degree cultural differences with employees in an offshore location were considered a risk for implementing offshoring activities. We operationalized geographic distance using four dummies related to four key offshoring destinations (India, China, Latin America and Eastern Europe). Each dummy scores 1 when activities were relocated to one of the four corresponding regions and 0 otherwise.
7. *Policy uncertainty*. We operationalized policy uncertainty using the answers to two survey questions. In the first, respondents were asked to rate, using a five-point Likert scale, to what degree the political instability of the host country is considered a risk for implementing offshore activities (POLICY1). In the second, respondents were asked to rate, using a five-point Likert scale, to what degree the

lack of intellectual property protection in the host country is considered a risk for implementing offshoring activities (POLICY2).

8. *Offshoring model.* To take into account the offshoring model, we used a dummy that scores 1 when the implementation is done through a captive subsidiary and 0 otherwise.

We also included a series of control variables for the size of the companies, their country of origin (dummies included for the United Kingdom, the Netherlands and Spain) and their main industry categorization (dummies included for telecommunications, IT and service providers).

9.3. Model

To test our hypotheses we ran the following logit model:

$$PD_i = \beta_0 + \beta_1\ MARKET_I + \beta_2\ EFFICIENCY_I + \beta_3\ KNOWLEDGE_I + \\ + \beta_4\ COMPETITION_I + \beta_5\ INTEXP_I + \beta_6\ CULTURE_I + \\ + \beta_7\ POLICY1_I + \beta_8\ POLICY2_I + \beta_9\ MODEL_I + \beta_{10}\ SIZE_I + \\ + \boldsymbol{\delta}\ \boldsymbol{DCOUDESTINATION}_i + \boldsymbol{\gamma}\ \boldsymbol{DCOUORIGIN}_i + \boldsymbol{\eta}\ \boldsymbol{DINDUSTRY}_i + e_i$$

Table 9.1 reports the variables used, their descriptive statistics, and correlation coefficients.

TABLE 9.1: Descriptive statistics and correlation coefficients of the independent variables[a]

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. *MARKET*[b]	7.10	5.14	1.00													
2. *EFFICIENCY*[b]	12.56	3.97	–0.28	1.00												
3. *KNOWLEDGE*[b]	8.25	4.34	0.37	–0.15	1.00											
4. *COMPETITION*[b]	8.89	4.16	0.22	0.25	0.36	1.00										
5. *INTEXP*	11.87	11.02	0.22	0.31	–0.16	0.02	1.00									
6. *CULTURE*[b]	7.61	3.71	–0.22	0.34	–0.18	0.03	0.13	1.00								
7. *POLICY1*[b]	4.98	3.53	0.01	0.16	0.12	0.21	–0.09	0.17	1.00							
8. *POLICY2*[b]	7.72	5.01	0.50	0.16	0.39	0.37	0.31	0.06	0.24	1.00						
9. *MODEL*[c]	0.50	0.50	–0.17	–0.04	–0.28	–0.13	0.08	0.00	0.11	–0.38	1.00					
10. *SIZE*[d]	56,728	106,814	–0.29	0.28	–0.37	0.09	0.61	0.27	0.16	–0.12	0.37	1.00				
11. *DEASTEUROPE*	0.11	0.31	0.02	0.08	0.08	–0.01	–0.01	0.04	0.05	0.09	–0.05	–0.07	1.00			
12. *DLATAM*	0.09	0.28	–0.14	0.04	–0.10	–0.11	–0.10	–0.04	0.01	–0.22	0.09	0.04	–0.11	1.00		
13. *DINDIA*	0.24	0.43	–0.24	0.09	–0.01	0.01	–0.12	0.17	0.09	–0.05	–0.13	0.00	–0.19	–0.17	1.00	
14. *DCHINA*	0.10	0.30	–0.04	0.09	–0.01	0.12	0.05	0.03	0.06	0.06	–0.04	0.14	–0.12	–0.11	–0.19	1.00

[a] N = 262. Correlations greater than 0.12 or less than –0.12 are significant at $p < 0.05$; [b] Linear additive transformation of 1-5 score; e. g., A score of 3 out of 5 in a 5-point Likert scale is transformed as 1 + 2 + 3 = 6; [c] Dummy = 1 for captive implementations, 0 otherwise; [d] Number of company employees.

Most correlation coefficients are low and there is no danger in assuming independency among the independent variables. To deal with the very few missing values of the dataset, we estimated them using available observations, by testing a model based on all observations for which there were no missing values, and using it to estimate them.

Since the dependent variable is dichotomous, we made use of the logit model. The coefficients of the independent variables offer a very straightforward interpretation. Each unit increase of the independent variable *X* multiplies the odds favoring PD = 1 by e^x if all the other variables stay the same. Thus, the resulting coefficients are very useful in determining the relevance (i. e., statistical significance) of the independent variable in question, the nature (i. e., positive or negative) of the relationship under scrutiny, and its intensity (i. e., the bigger the coefficient the bigger the influence of the variable on the probability that PD scores 1). Furthermore, as most of the independent variables shared the same scale, it was possible to compare their magnitudes (Kennedy 2003). Table 9.2 reflects the estimation results. The levels of significance of the individual coefficients, the result of the chi-square test, and the pseudo R-square are also reported.

TABLE 9.2: Estimation results

Dependent variable = PD		
Variables	**Model coefficients**	***P*-value**
Motivation variables		
MARKET	0.07	0.25
EFFICIENCY	0.03	0.68
KNOWLEDGE	0.14*	0.02
COMPETITION	–0.01	0.86
Process variables		
INTEXP	–0.18**	0.003
CULTURE	–0.18**	0.008
POLICY1	–0.12	0.13
POLICY2	0.28***	0.000

TABLE 9.2 *(cont.)*: **Estimation results**

Dependent variable = PD		
Variables	**Model coefficients**	***P*-value**
MODEL	1.43**	0.007
DEASTEUROPE	1.36^{+}	0.06
DLATAM	–1.15	0.33
DINDIA	1.72**	0.003
DCHINA	1.62**	0.015
Control Variables		
SIZE	0.00**	0.011
COUNTRY OF ORIGIN		
DSPAIN	2.54**	0.001
DNETHERLANDS	1.82**	0.009
Industry categorization		
DTELECOM	0.18	0.81
DIT	–0.37	0.67
DSERVPROV	1.21	0.19
Constant	–5.85***	0.000
Prob. > ^{2}	0.00	
Pseudo R^2	0.3840	
Number of observations	262	

$^{+}$ $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

9.4. Results and discussion

- Hypothesis 1, that market seeking is not a significant motivation in the decision to offshore product development activities, was strongly supported in the analysis.
- Hypothesis 2, that efficiency seeking is not a significant motivation in the decision to offshore product development activities, was strongly supported in the analysis.
- Hypothesis 3, that knowledge seeking is a significant motivation in the decision to offshore product development activities, was strongly supported in the analysis.

- Hypothesis 4, that competitive pressure is a significant motivation in the decision to offshore product development activities, was not supported in the analysis.
- Hypothesis 5, that international experience is not a significant factor in the decision to offshore product development activities, was strongly supported in the analysis.
- Hypothesis 6, that geographic and cultural distances are not significant factors in the decision to offshore product development activities, was strongly supported in the analysis.
- Hypothesis 7, that uncertainty in an offshore country's policies is a significant factor in the decision to offshore product development activities, was somewhat supported in the analysis.
- Hypothesis 8, which predicts that when offshoring product development activities, firms organize their international interdependencies through captive offshoring rather than through offshore outsourcing, was strongly supported in the analysis.

The results related to the control variables used also offer some interesting insights. The variable accounting for company size has a significant coefficient of zero. This means that bigger firms do not manifest any higher propensity to initiate PDO than smaller ones. This result is worth stressing because established models of internationalization have often hypothesized that bigger firms were more likely to expand internationally (Chandler 1986; Dunning 1981). The high positive correlation found between the size and international experience of firms (0.61) would seem to support this argument. However, the results obtained clearly show that these two variables do not have a significant role in the process of relocating innovation work abroad. While in the past large experienced companies were commonly considered to be the best candidates for managing complex international activities, nowadays smaller, younger and more agile firms seem to also be at the forefront of the internationalization process (Oviatt and McDougall 1994). Regarding the other control variables, those related to industry categorizations were not significant, while those related to the countries of origin of the companies surveyed were both positive and significant. For instance, Spanish companies seem to have a higher propensity to initiate PDO than Dutch companies.

This study has some limitations. For instance, both dependent and independent variables come from the same survey. In order to limit potential common method bias, we used fairly objective information provided by the respondents as the dependent variable. As a matter of fact, for each implementation, the survey asked to specify the kind of activities being relocated offshore using a provided list. The dummy used as dependent variable assigned 1 to the R&D, product design and engineering services categories, and 0 otherwise. We reckon that the level of subjectivity in answering this question is very limited. We cannot double check the entries obtained using an alternative source of data as the implementation level is so specific that no other publicly available database offers the same detailed information. However, we feel confident that the query was very straightforward with very little room for ambiguity in understanding and answering the question with the desired information.

Another limitation of this study is the lack of information regarding other important Western European countries. For Germany we had to exclude the data because of a large amount of missing data, while in France and Italy the survey has not been launched yet. The information collected in these countries will be extremely useful for testing the hypotheses formulated in this study, offering a more complete analysis of the European context. The survey's commonality presents a great advantage when comparing results and understanding similarities across regions relative to the current offshoring wave. As a matter of fact, our focus on European companies presents interesting considerations when compared with the results of another study (Lewin et al. 2007) that investigates the offshoring of product development activities in the United States using data from the same ORN project. Interestingly, although Lewin et al.'s model presents differences from the one used in our study, some of their results confirm key findings obtained here. Access to talent, that is, our operationalization for the knowledge seeking motivation, was also the key driver behind PDO in the U.S. sample; labor cost savings, on the other hand, did not have a significant role behind the relocation of innovation work. Furthermore, U.S. companies vastly preferred captive solutions when offshoring product development activities; finally, international experience and size were not good predictors of PDO propensity compared with other factors, in the U.S. sample.

As a result, Western companies seem to be following a similar pattern when pursuing their offshore initiatives related to knowledge-intensive activities. These findings are significant in that the process model currently followed by firms sourcing higher-skilled talent abroad presents important commonalities across regions. In addition, the process is significantly different from the relocation of international activities that characterized previous waves of internationalization. Future research should concentrate on the important theoretical novelties that underlie the actual offshoring wave, incorporating insights and extending established models. It is our hope that the research presented here has opened the way to a proliferation in studies that will critically reassess the dominant models of internationalization in order to evaluate their usefulness in representing the current international relocation of value activities undertaken by Western firms.

9.5. Conclusion

Companies in developed, high-cost economies are increasingly migrating white-collar activities to offshore locations. Recent studies consistently show that enterprises are progressively sourcing higher-skilled technical, engineering, and scientific jobs abroad. The purpose of this chapter was to investigate why and how Western firms currently offshore product development activities. Our main argument is that the current process of offshoring innovation work radically differs from previous waves of internationalization. Thus, this study contributes to the existing IM literature on two grounds. First, it shows that the only driver for the actual offshoring of knowledge-intensive activities is the search for talent. Contrary to the general perception that offshoring is gaining popularity as a means to take advantage of labor cost differentials, the results obtained clearly show that Western companies, when engaging in PDO, are seeking new talent to expand their skill pool and not as a way to cut labor costs. This finding corroborates the hypothesis that accessing global talent pools and reducing costs are two different offshoring strategies that companies pursue in different circumstances (Lewin et al. 2007). While labor cost arbitrage remains a fundamental driver in migration related to IT, and administrative and other back office functions (Nachum and Zaheer 2005; Pisani 2007), it does not play a role when relocating higher-skilled innovation work.

The second contribution of this study is related to the process model currently followed by firms engaging in PDO. While the dominant model of internationalization (Johanson and Vahlne 1977) predicts that firms gradually increase their international commitment based on their international investment experience, and thus on their increasing magnitude of operations in less familiar environments, we showed that the current process of offshoring follows a different pattern. While some of the insights of the stages model still hold nowadays, others need to be reassessed. For instance, international experience is no longer a reliable predictor for understanding the level of international commitment of a company. Younger, relatively inexperienced firms that are characterized by high levels of flexibility and propensity to innovation (Knight and Cavusgil 2004) are leveraging current technological advances to source, locate, and organize human capital on a global scale. Cultural differences are also no longer a source of major concern for those firms willing to create geographically distributed teams of talented professionals. Moreover, our findings show that the size of the company does not influence the complexity of its international activities as it did in the past (Chandler 1986). On the other hand, policy uncertainty of the offshore environment continues to play a major role in shaping the offshoring of innovation work. Furthermore, companies involved in the creation and transfer of knowledge across borders also continue to choose captive models for their international activities.

A final note: how should we interpret these findings in terms of policy implications for the Western labor market? Developing regions are becoming competitive sources of talent for Western companies. High-cost developed countries need to focus on the creation and retention of talent at home if they want to remain competitive in the production of innovation work. The generalized perception that higher-skilled jobs are being relocated offshore for an arbitrage opportunity on labor cost differentials is dangerously misleading. This study shows that cost is not a major factor for companies relocating product development activities abroad. Those companies that invest in a global source of talent do so with the goal of creating new knowledge and not to merely substitute workers at home. In other words, the offshoring of higher-skilled talent initiated by Western companies should not be classified simply as negative for the home economies. Rather, it should be considered an important opportunity to update and improve the ability to innovate at home.

For this reason, in chapter 10 we discuss the Spanish case as drawn from the ORN study. This is an issue of significant domestic concern, both for Spanish entrepreneurs and policymakers alike.

10. Offshoring in Spain: Evolution and Prospects of Service Offshoring in 2008

THE offshoring phenomenon[44] is continually growing as an important practice for businesses, workers and governments, and Spain is not a passive player in the game. Companies are increasingly moving their operations and functions to locations far away from their headquarters. This process covers progressively higher value-added activities, from product design to research and development.

Globalization is one of the driving forces behind this *second wave* of offshoring jobs with a certain added value. The *first wave,* on the other hand, consisted of offshoring posts that were solely dedicated to production activities.

Due to the magnitude of this phenomenon in recent years, in both the corporate and academic environments, two years ago at IESE Business School we began to discuss the need to conduct local research on offshoring services and their so-called *white-collar workers*. The outcome of this was the study *"El offshoring en España: causas y consecuencias de la deslocalización de servicios"* ["Offshoring in Spain: Causes and Consequences of Service Offshoring"] (IESE 2006), which highlighted the importance of this phenomenon in Spain.

This chapter presents the second edition of this study, titled *"El offshoring en España. Evolución y perspectivas de la deslocalización de servicios en 2008"* ["Offshoring in Spain. Evolution and prospects of service offshoring"]. This second report shows how many businesses presently engage in this practice or are

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[44] From this point forward, we will use the concepts of offshoring and relocation interchangeably, referring in all cases to jobs related to services (i. e., white collar jobs) and not production.

contemplating doing so, as well as their motivations and perceived risk. It also indicates which processes, functions, and operations are being outsourced, as well as the geographic regions being chosen.

In addition, we included a comparison of the two editions of this report, which enables us to identify changes and trends observed in the practice of offshoring among Spanish companies. Moreover, there are comparisons with other countries represented in the Offshoring Research Network (ORN).

The ORN is an international project launched four years ago and led by a team at Duke University's Fuqua School of Business (Durham, North Carolina, United States), under the direction of Professor Arie Lewin. Its objective is to bring together business and academia to share experiences about offshoring among various countries.

Duke University also collaborates with IESE Business School, the school's research partner in Spain, as well as other business schools across Europe: Copenhagen Business School (Denmark),[45] Manchester Business School (United Kingdom), Rotterdam School of Management (Netherlands), Otto Beisheim School of Management (Vallendar, Germany) and Free University of Brussels–Solvay Business School (Belgium).[46]

10.1. The ORN study

The study was based on an online survey conducted by Duke University on the perceptions of business leaders with regard to offshoring. The variables were:

- Engaging in offshoring.
- Not currently offshoring, but foresee doing so.
- Not currently offshoring nor considering doing so.

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[45] The Danish team is conducting a study that covers all of the Nordic countries.
[46] The Belgian team is coordinating a study on the Benelux region.

All of the countries taking part in the ORN study were given the same survey. This allowed us to make comparisons at the international level and gain insight into the differences between countries and cultures. The ultimate goal was to provide business leaders residing in Spain with a frame of reference for making decisions about offshoring.

This year's edition includes comparisons with studies performed in the United States and Belgium in 2007 and 2008. In some cases data are provided for Germany from 2007. Though the study's findings do not reflect the situation of those three countries, but rather that of the companies surveyed, certain differences can be observed between Spain and the others.

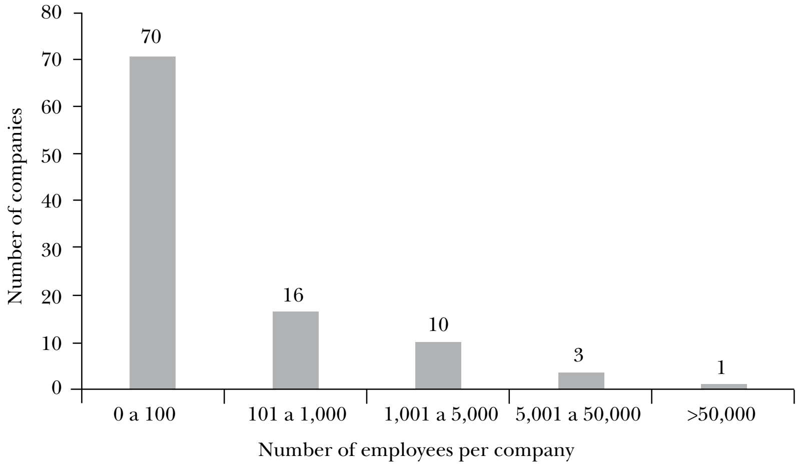
10.2. The spanish sample

Our survey was aimed at executives involved in outsourcing operations for businesses based in Spain. The list of respondents includes members of general management, market strategy and international expansion leaders, human resources managers, and other senior executives. The survey was circulated among more than 4,000 executives at companies from a variety of sectors such as: financial services/banking, technology, energy, travel and leisure, automotive (production), hospitality, environmental, engineering and telecommunications.

Between December 2007 and May 2008 the survey was sent out in five different mailings to participating businesses. In the end, valid responses were received from 100 businesses, 79 of which returned fully completed questionnaires, while 21 sent partial responses. While this sample is not representative of all of the businesses based in Spain, it does give an overview of the various features and trends associated with its offshoring. Graph 10.1 includes data related to the company size.

The companies that responded to the survey were mainly from the following sectors: IT, professional services, manufacturing, finance and insurance, automotive, construction, aerospace and retail (see graph 10.2).

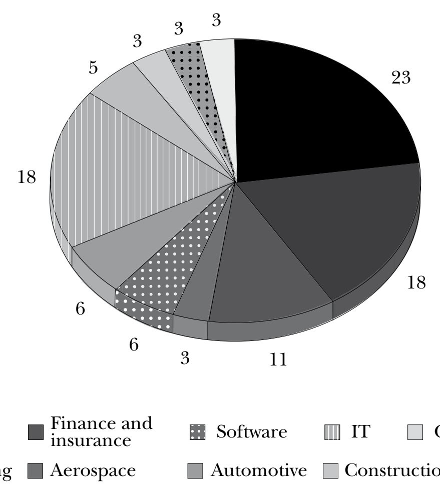
GRAPH 10.1: Number of employees in companies responding to survey



Source: Survey Spain, 2008.

GRAPH 10.2: Distribution of companies by industry in companies responding to survey

(percentage)

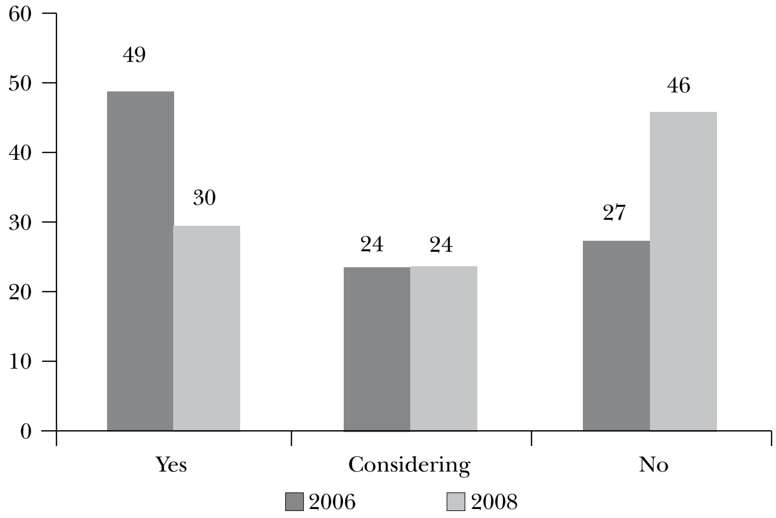


Source: Survey Spain, 2008.

Graph 10.3 shows the sample broken down by offshoring adoption rate and evolution with respect to the previous report:

GRAPH 10.3: Company breakdown according to the level of offshoring adoption in companies responding to survey

(percentage)



S*ource:* Survey Spain, 2008.

The sample of responding companies includes 30 that were engaged in offshoring (with a total of 145 implementations), 24 that were considering doing so (with a total of 83 implementations expected to be carried out) and 46 that were not considering this option. To analyze certain questions, we used the total number of companies for which responses were received, regardless of whether they had fully completed the questionnaire. This allowed for a larger data set.

The results showed an improvement with respect to the offshoring report produced in 2006, which was based on a sample of 55 companies, 27 of which were engaged in offshoring operations, while 13 were considering doing so and 15 others were not.

In the case of professional services companies, only the responses of those already engaged in offshoring were considered. Data related to third-party offshoring advisory projects were disregarded.

10.3. Offshoring in Spain: survey results

With a view to providing more detailed information, this chapter elaborates on the Spanish results, the evolution of those results relative to 2006 and the situation relative to the other ORN study countries.

In 2008, Spanish companies distanced themselves from their U.S. and Belgian counterparts (table 10.1).

TABLE 10.1: Company distribution by country according to the ORN study

Country	Yes	Considering	No	Sample
		(percentage)		
Spain	30	24	46	100
United States	70	12	18	418
Belgium	38	28	34	143

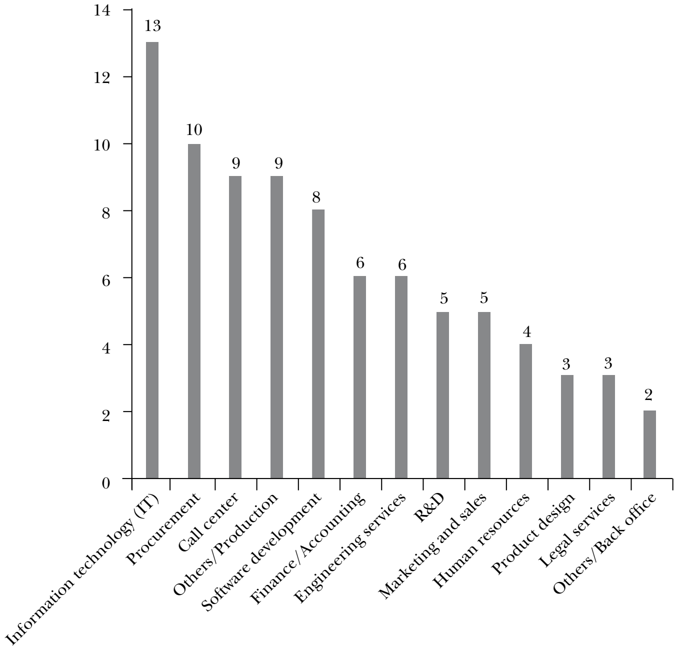
In Spain, the types of functions most commonly offshored (see graph 10.4) are: IT, provisioning, other production processes, call centers, and software development. The results are quite similar to those of the previous edition.

Compared with the last edition of the study, we are still seeing a trend toward outsourcing tasks that involve higher degrees of unskilled labor, which is largely a cost-cutting measure.

Between 2005 and late 2007, the United States saw a considerable increase in offshoring higher value-added tasks, such as product design and software development. However, this growth was not mirrored in Spain (see graph 10.5).

GRAPH 10.4: Type of functions offshored according to the ORN study

(percentage)



S*ource:* Survey Spain using 2006 and 2008 data from the study "Offshoring in Spain".

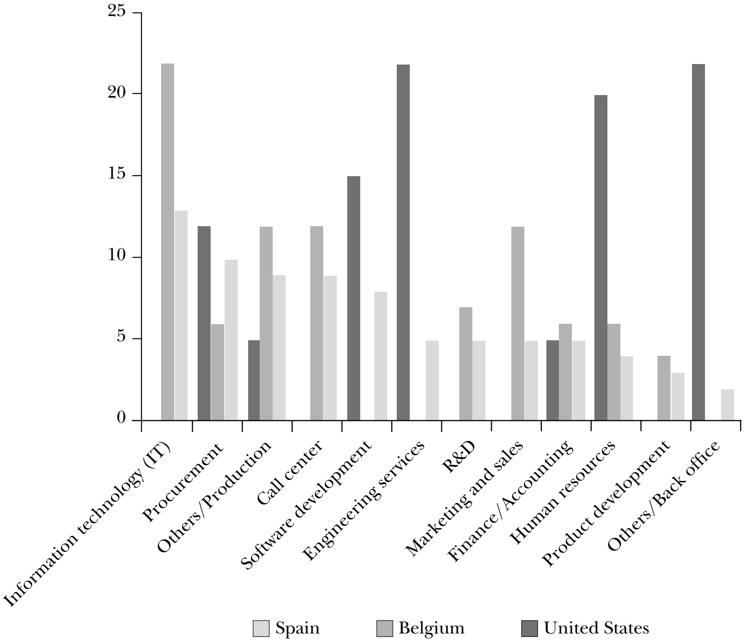
Graph 10.5 also shows that Spain and Belgium are offshoring lower value-added functions. This could be due to the fact that the United States is one of the pioneers of offshoring and is already past the initial stage of relocating its lower-value activities. The focus is currently on knowledge-based activities, a trend similar to that identified in the previous year's study.

With respect to 2002, there has been an evolution in terms of the types of tasks being offshored: albeit slowly, higher value-added tasks increasingly being outsourced, particularly IT-related activities.

Conversely, Spain's offshoring prior to 2002 (see graph 10.6) was limited to administrative and provisioning services. This could be attributed to the fact that the first wave of offshoring involved production activities that required a larger amount of capital and a smaller amount of qualified personnel.

GRAPH 10.5: Type of offshored functions. Spain, United States and Belgium

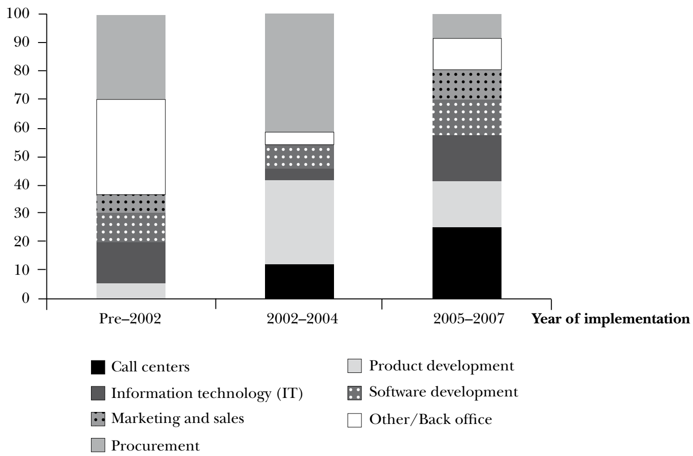
(percentage)



Source: Survey Spain using 2008 data from the study "Offshoring in Spain"; 2007–2008 data for the United States; and 2007 data for Belgium.

GRAPH 10.6: Type of activities offshored by period

(percentage)



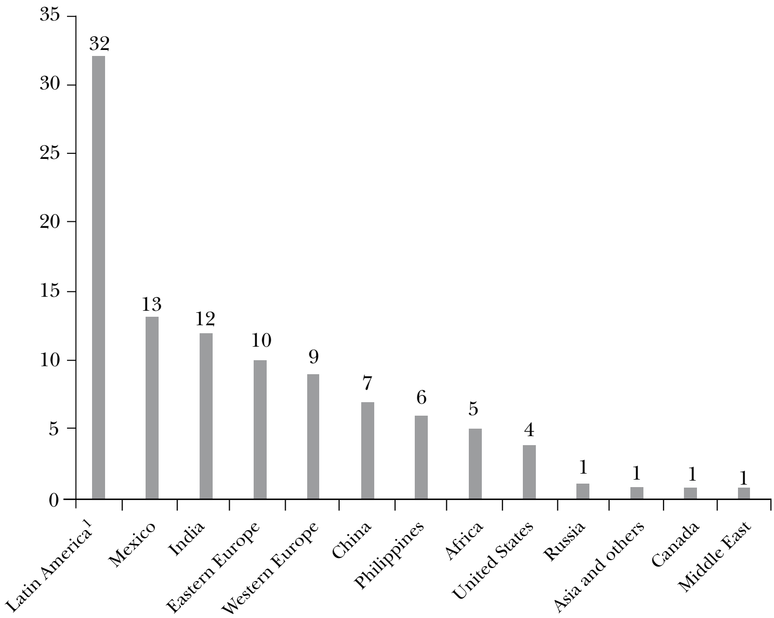
From 2002 to 2004, there was a significant rise in operations related to provisioning, product development and call centers. Administrative services, meanwhile, took a sharp downward turn.

Between 2005 and 2007, we see a notable decline in operations related to provisioning and product development, as well as a greater diversification of the functions implemented. During that same period, there was an increase in the importance of tasks related to IT activities, call centers, marketing and sales.

As for the preferred location for offshoring, the companies based in Spain show a clear leaning toward Latin America (including Mexico). Because of cultural and linguistic similarities, Latin America is one of the most popular regions for outsourcing operations of certain added value. Those factors help ensure that the relocation, infrastructure deployment (if needed) and subsequent communication with the company headquarters will take place with greater clarity and fluency (see graph 10.7).

GRAPH 10.7: Main offshoring destinations for Spanish companies

(percentage)



[1] Latin America does not include Mexico.

Source: Survey Spain using 2006 and 2008 data from the study "Offshoring in Spain".

India is one location that experienced a decline in offshoring from Spanish companies, dropping from 24 percent in 2006 to 12 percent in 2008. This decrease could largely be due to the fact that the survey participants in 2006 were large firms, which tended to have a preference for India, whereas most of those from the 2008 sample were small companies.

Meanwhile, both large and small companies in the United States still preferred destinations such as India and China for offshoring their software and product development operations, although they are starting to look favorably upon other countries, including Mexico and Canada.

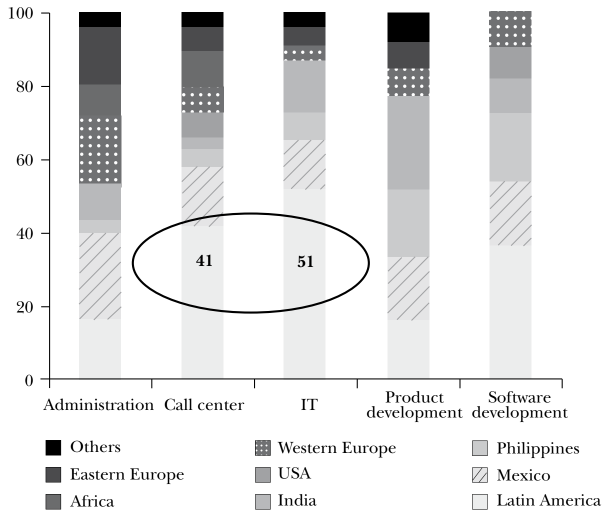
The United States is also starting to pay special attention to Latin America owing to its lower operating costs. Brazil, for instance, is becoming a source for freelance talent and innovation.

For Belgian companies, the primary destinations are Eastern Europe, Russia, Western Europe and India.

When looking at the destinations by activity (see graph 10.8), 60 percent of Spain's call centers are being offshored to Latin America (including Mexico). Northern Africa is the second most popular location, which could be because of its shared time zone with Spain.

GRAPH 10.8: Preferred destination by function in Spain

(percentage)



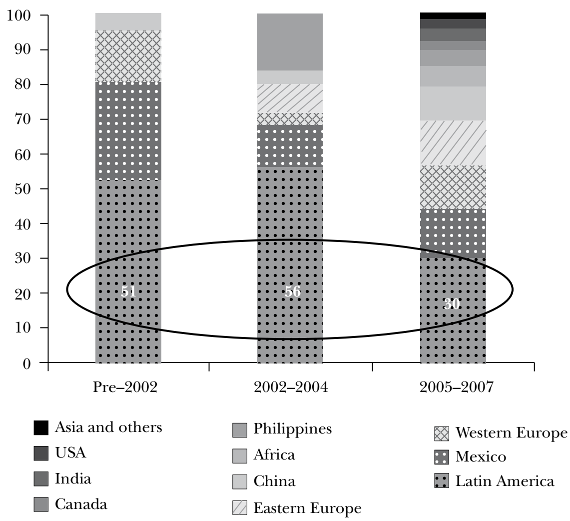
Latin America (including Mexico) is also Spain's primary destination for IT functions, although in this case India is the second most popular choice. Software development is also being outsourced primarily to Latin America (including Mexico), followed by the Philippines.

Spain tends to follow a different pattern with administrative services offshoring, with a preference to keep these services in Western Europe, although Mexico is holding strong. Eastern Europe also emerges as an interesting location for these functions. As for operations related to product development, business leaders opt for India and the Philippines.

But how have preferences changed over the past few years in terms of locations? Prior to 2002 (see graph 10.9), Spanish companies turned to Latin America (including Mexico), Western Europe and China.

GRAPH 10.9: Time evolution of the diversification of offshoring

(percentage)



Source: Survey Spain using 2006 and 2008 data from the study "Offshoring in Spain".

Between 2002 and 2004, there was a continued trend of offshoring to Latin America (excluding Mexico), although other regions such as Eastern Europe and the Philippines also started to surface.

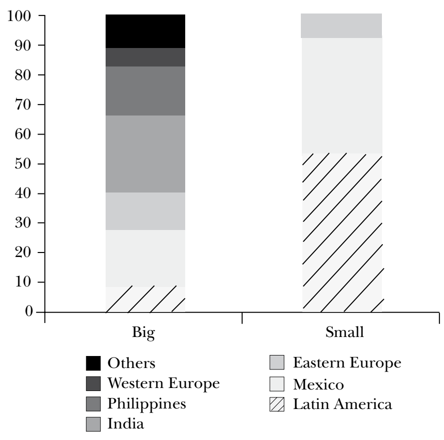
Finally, as of 2005 we see important growth in Western Europe, Eastern Europe and China, as well as the emergence of new destinations such as Africa, Canada, the United States and India. Still, Latin America (excluding Mexico) remains the location of choice for Spanish companies.

The increased predilection for Eastern and Western Europe could be explained by broader trends in offshoring. In the initial stages, business leaders were concerned about cultural issues and difficulty in gaining the acceptance of their internal customers. Those issues later evolved into concerns related to quality of the services provided in the receiving country.

In Spain, preferences regarding outsourcing destinations differ between large and small companies (see graph 10.10). This graph shows how large firms use a wider range of destinations, and predominantly choose India, Mexico, and the Philippines. Small businesses, on the other hand, show a marked tendency toward offshoring in Latin America (including Mexico).

GRAPH 10.10: Offshoring destinations of small and medium Spanish companies

(percentage)

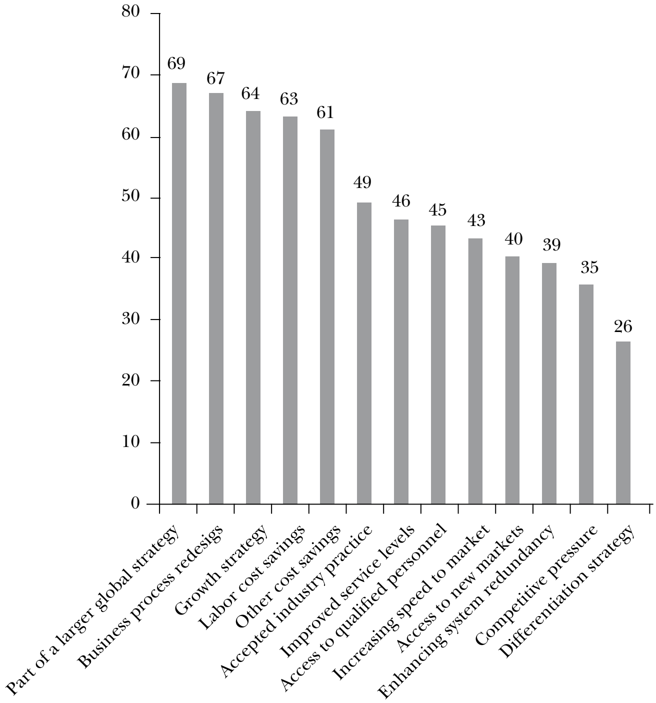


Source: Survey Spain using 2006 and 2008 data from the study “Offshoring in Spain”.

Graph 10.11 shows the rationale behind Spanish entrepreneurs deciding to offshore.

GRAPH 10.11: Reasons for offshoring in Spain

(percentage)



S*ource:* Survey Spain using 2006 and 2008 data from the study "Offshoring in Spain".

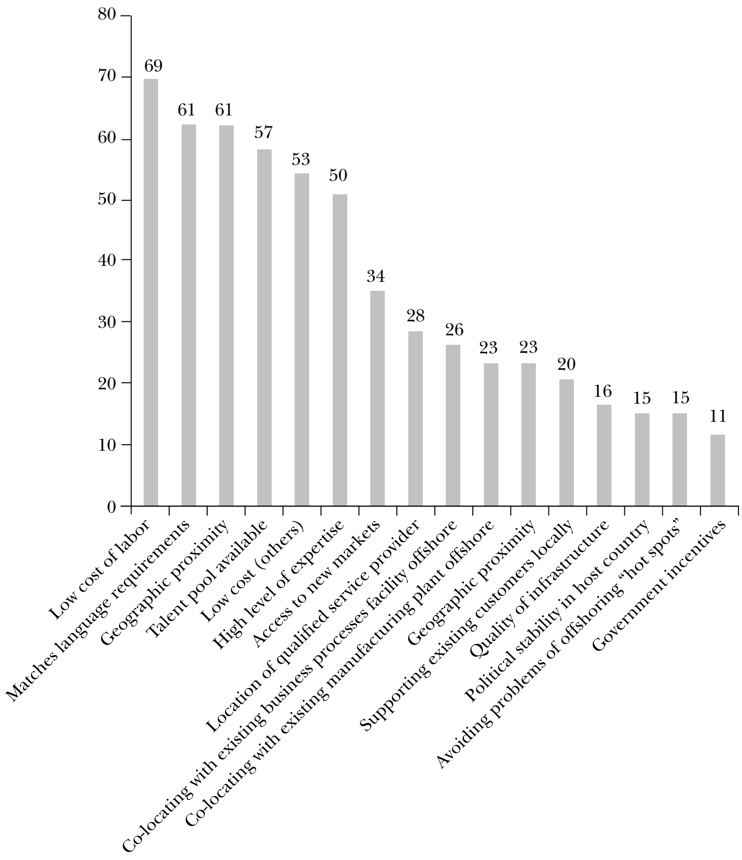
In 2006, the determining factor in a company deciding to offshore was savings in labor costs (84 percent), followed by growth strategy (68 percent). In 2008, those factors changed considerably. The primary reasons involved strategic objectives: "part of an overall strategy", "redesign of business processes" and "growth strategy."

The next most important factor was cost savings. Finally, other determining factors were "accepted practice within the sector", "improved levels of service" and "access to qualified personnel."

With regard to the impetus behind Spanish companies' offshoring location choice (see graph 10.12), the primary factor was "low labor costs", followed by the "similarity of the language", "cultural proximity" and the "talent available in the new location."

GRAPH 10.12: Drivers considered for choosing an offshoring destination

(percentage)



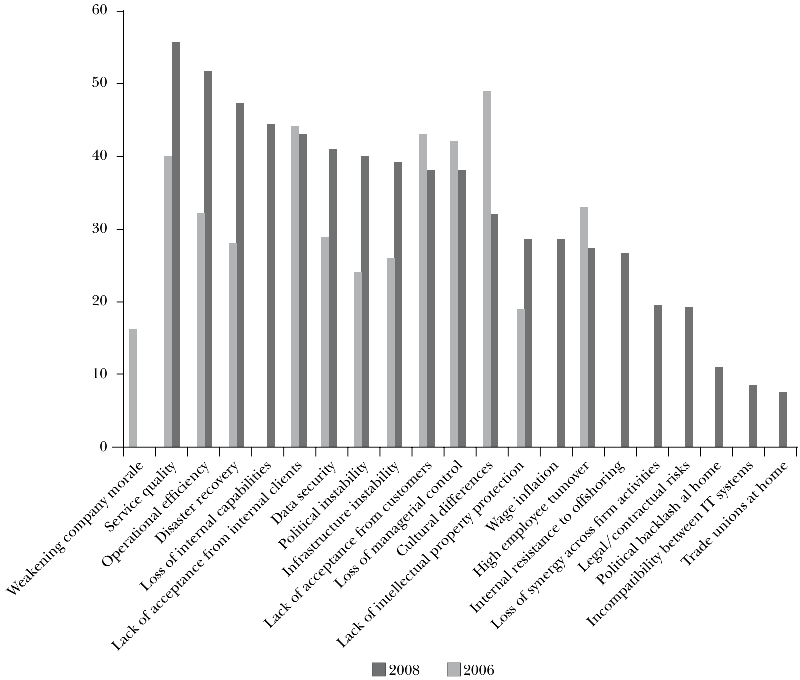
Source: Survey Spain using 2006 and 2008 data from the study "Offshoring in Spain".

In contrast, infrastructure quality, political stability and government incentives were factors largely overlooked by Spanish executives when choosing a location.

Graph 10.13 shows how business leaders evaluated perceived risks in offshoring. At the top of the list are those related to the quality of service in the receiving country and concerns about operational efficiency. Conversely, the risks generating the least concern are those involving political problems in the destination region and legal aspects.

GRAPH 10.13: Risk considered when offshoring

(percentage)



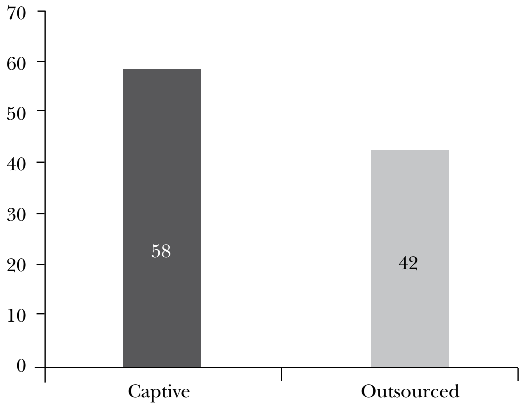
S*ource:* Survey Spain using 2006 and 2008 data from the study "Offshoring in Spain".

The 2006 study showed the primary concern to be cultural differences (50 percent), followed by the lack of acceptance by the company's own personnel or external customers. These factors diminished in 2008, perhaps on account of increased knowledge about local aspects.

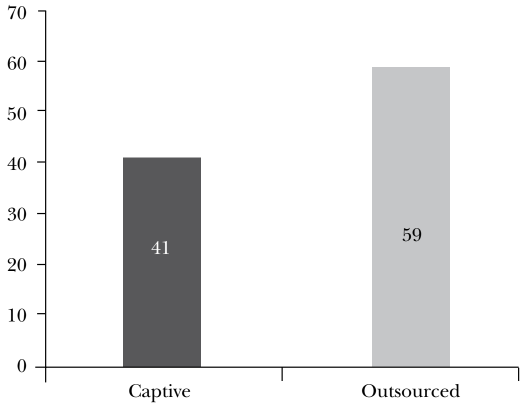
With regard to the adopted service model for offshoring (see graph 10.14), Spanish companies at first opted for installing a captive center in the receiving country. Only later did they start moving toward offshoring through an external provider. This seems to indicate an initial reluctance on the part of Spanish companies to give third parties control over operations that are fundamental for business development.

GRAPH 10.14: Captive or outsourced delivery model?

a. Percentage by number of implementations



b. Percentage by number of companies



Source: Survey Spain using 2006 and 2008 data from the study "Offshoring in Spain".

Legal services and call centers are the functions most commonly handed over to external providers (see table 10.2). IT, engineering services, marketing and sales, and other administrative services are divided evenly between external providers and captive centers.

TABLE 10.2: Activities offshored by number and type of model

Function	Outsourced	Captive	Total
Legal services	5	0	5
Call center	23	10	33
Other production	4	3	7
IT	20	20	40
Marketing and sales	4	4	8
Engineering services	5	5	10
Others back office	1	1	2
Product development	5	8	13
Software development	4	8	12
R&D	5	14	19
Procurement	6	21	27
Finance/Accounting	0	14	14
Human Resources	0	3	3
Total	**82**	**111**	**193**

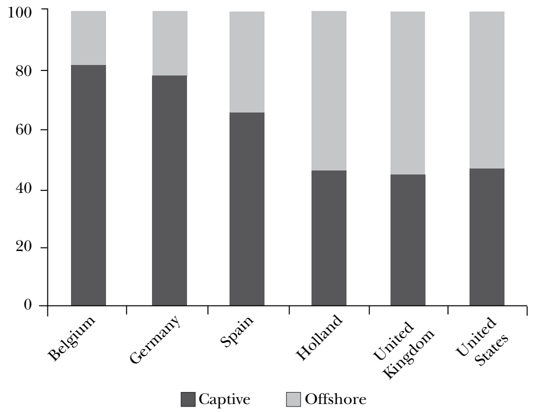
S*ource:* Survey Spain using 2006 and 2008 data from the study “Offshoring in Spain”.

Conversely, knowledge-based operations—i. e., software development, product design, R&D—tend to stay captive. The same is true for operations such as provisioning, finance/accounting and human resources.

When comparing the models of implementation at the international level according to number of implementations (see graph 10.15), Belgium, Germany and Spain appear to prefer to offshore through the creation of a captive center in the chosen country.

GRAPH 10.15: Captive versus externalized model in Belgium, Germany, the Netherlands, Spain, United Kingdom and United States

(percentage)



S*ource:* ORN, 2007–2008.

The savings reported by Spanish companies were slightly below expectations (see table 10.3): 26 percent compared to the initial forecast of 31 percent. This could be due to miscalculations in the initial stages on the cost of the entire process.

Interestingly, the opposite occurred in 2006: the actual savings of 30 percent exceeded the projected figure of 26 percent.

TABLE 10.3: Expected savings versus those obtained

Function	Expected average Percentage of cost savings	Number of implementations
Currently offshoring + Considering Offshoring	31	115
Currently offshoring	31	50
Only considering	32	65

End savings achieved: 26%
(from 42 implementations)

S*ource:* Survey Spain using 2006 and 2008 data from the study “Offshoring in Spain”.

10.4. Conclusions

The data gathered by the ORN along with the comparison of the questionnaires of 2006 and 2008 allow for a number of general conclusions to be drawn about the evolution of offshoring and the trends that we are seeing in this field. Moreover, these conclusions were discussed in a work session with executives from a variety of companies and service providers involved in offshoring operations. The impressions from that session can be summed up in the following points:

Spain is moving swiftly

1. Despite getting off to a late start with offshoring, Spain is now advancing quickly. Large Spanish firms have already systematized the process and integrated it into their overall strategy, encouraging local service providers to also offer offshoring opportunities.
2. Meanwhile, small- and medium-sized businesses have already jumped on the offshoring bandwagon, particularly when it comes to IT-related services, where it is increasingly hard to find good professionals at a reasonable cost.

Customer service and basic IT functions are the most common

Spanish companies tend to outsource lower added value tasks such as IT and call centers more often compared to the United States.

Latin America is the preferred destination

1. Latin America (including Mexico) is the primary receiver of outsourcing for the above-mentioned operations. This is primarily due to the low labor costs (69 percent), language similarity (61 percent), cultural proximity (61 percent) and available appropriately skilled talent (57 percent).
2. Nevertheless, we are seeing notable differences in outsourcing selection among the region's various countries, which is mainly due to the varying states of key offshoring issues, such as the inherent risk of the country.

3. Brazil has become a major global force in offshoring, despite the language factor, which acts as a limitation for certain processes and operations to be offshored.
4. Additionally, there is a progressive relocation from large cities to smaller cities, which have the advantage of more flexible laws in addition to skilled personnel, which is increasingly scarce in metropolises. One example of this can be seen in Argentina, where migration is taking place from Buenos Aires to inland cities such as Córdoba and Rosario, now in the midst of becoming important technological centers.

Size does matter

A very significant trend based on company size is developing with respect to offshoring preferences. Large firms show a marked tendency toward offshoring in India, Mexico and the Philippines, whereas smaller companies prefer Latin America (including Mexico).

Appearance of new regions

1. Current implementation trends reveal that Latin America is losing momentum as a receiver of offshoring operations, to the benefit of emerging regions such as Eastern and Western Europe. The latter region has become receiver of primarily administrative functions, which is likely due to the physical proximity and ease of relocation.
2. Meanwhile, Africa is emerging as an alternative destination for outsourcing call centers, although its limited supply of skilled labor still constitutes a significant operational risk. However, it is worth noting that training opportunities are being made available, similar to internship grants in Eastern countries.
3. In the coming years, China could evolve into a highly attractive outsourcing destination.

Three reasons for offshoring

The determining factors for offshoring can be broken down into three levels. The first level, when strategy is the major concern, is the most important: “following an overall strategy” (69 percent), “business redesign” (67 percent) and “growth strategy” (64 percent). The second level involves “saving on labor costs” (63 percent). The third cites offshoring as an “accepted practice within the sector” (49 percent), claims that it enables companies to offer “improved levels of service” (46 percent) or that it provides “access to qualified personnel” (45 percent).

Costs, language and talent: keys when choosing a location

When choosing between different offshoring destinations, Spanish companies primarily look for those with “low labor costs” (69 percent). Secondly, they value “cultural similarity and proximity” (61 percent) and, to a lesser extent, the “available talent” (57 percent).

New concerns

The offshoring risks perceived by business leaders changed from 2006 to 2008. The results from 2008 indicate that they are less concerned about cultural factors. Conversely, Spanish executives are more interested in the quality of service (56 percent) and operational efficiency of the receiving country (51 percent).

The captive center is the first step toward offshoring

The model most chosen by Spanish companies during the first stage was offshoring through a captive center, which allowed them to retain complete control of the operations. They are now moving toward offshoring through external providers.

External providers for lower-value tasks

Spanish companies tend to assign lower-added-value tasks to external provider offshoring such as legal services and call centers. However, knowledge-based operations, such as product development, software design and R&D, tend to stay captive.

Savings lower than expected

Actual savings were lower than the estimated figure (about 26 percent versus 31 percent).

Image of complexity

Whether in Spain or the United States, offshoring is an increasingly complex undertaking for businesses. In order to shed this image, the sector should focus not only on keeping prices down, but also on operating with total transparency for the end customers and ensuring they receive the required service carried out to their expectations.

Having described the Spanish scenario, we will conclude part two with practical recommendations for both the Spanish and international business communities.

11. The Offshoring of High-Value Services and the Globalization of Capability Sourcing

WE end this book with some thoughts on the offshoring of high-value services, and the globalization of resources for these activities. Offshoring used to be synonymous with the pursuit of a low-cost strategy. In traditional or *first-generation* business process offshoring, firms would send highly standardized or highly repetitive low-skill business processes to workers in countries with significantly lower labor costs. As such, any labor-intensive tasks that could be codified and transmitted over long distances were candidates for the offshorer's axe, in firms faced with increasing cost pressures in their home markets. However, recent surveys repeatedly show that there are significant changes happening in terms of why and how firms offshore services.

As technological advances have made working across geographically dispersed locations increasingly easier, and emerging-economy governments have increased investments in infrastructure and education, pools of skilled workers are being accessed and *brought online* all over the world. Many firms are beginning to discover unexpected pools of untapped talent in countries previously considered uninteresting, and a global scramble for talent appears to be on the verge of taking off. As a result, managers are increasingly citing the desire to access pools of high-quality talent across the globe as one of the prime drivers of their offshoring initiatives.

These developments have very important implications for the future performance of firms that are already engaged in offshoring

Acknowledgments: The authors are grateful to BBVA Foundation for financial support through project grant 162/06. This chapter was prepared as a technical note of the Center for Globalization and Strategy, IESE Business School.

and/or outsourcing, as well as for those that are yet to implement such initiatives.

Early movers have had an advantage up to now in terms of access to high-quality talent (sometimes better than that available at home), at substantially lower costs than in their home countries. However, they are increasingly faced with significant challenges such as coordinating and managing globally dispersed workforces, managerial and employee satisfaction and motivation, and the complexity of making multifaceted decisions regarding the best locations for setting up operations and sourcing capabilities.

Firms that are only now beginning to join this *second generation* of offshoring are also faced with the challenge of deciding how to adapt to changes in pattern of global capability sourcing. Importantly, the question of *where* best to obtain *which* high-quality talent remains a challenge. As the rush for *hotspot* locations begins to cause some labor markets to overheat, second-movers have to carefully decide how to identify possible locations, how and where to invest, and how to create distinctive value. Thus, both early and late movers need to carefully articulate and execute their global strategies.

At the political level, countries on both ends of the spectrum are challenged by current trends in services offshoring. Specifically, while developed countries are faced with the challenge of replacing their dwindling science and engineering workforces, emerging-market governments are faced either with the need to retain their country's competitiveness in the face of new offshoring destinations or to compete with more established and well-known locations.

Consequently, it seems that the emerging trend towards offshoring high-value services will have an important multi-level impact across the parties involved. From the business manager point of view, however, it does not seem too far-fetched to suggest that we might be witnessing the birth of a (relatively) global market for high-value capabilities. If competitive advantage and long-term business success are underpinned by the deployment of specialized resources and capabilities, then the implication is that the ability to tackle the challenges raised by this emergent situation will go a long way in determining which firms will win and which ones will lose in the coming century.

In this chapter, we delineate the origins and drivers of this incipient global scramble for talent, as well as identify current major managerial challenges for firms. Managers that are better prepared to face these challenges will more likely be able to lead their firms to superior performance in the face of the *semi-globalization* of capability sourcing.

The next section considers the drivers of the current evolution from low- to high-value-added offshoring of services and then discusses some of the challenges high-value-added offshoring brings with it.

11.1. From sweatshops to R&D labs

Recalling that offshoring refers to the practice of migrating company activities to locations outside of their countries of origin, it is therefore a decision based on geographic boundaries rather than company boundaries (as is the case of outsourcing).

Offshoring *per se* is not a new phenomenon. It dates back to the 1960s and 1970s when Western manufacturing jobs began to be relocated abroad in search of lower production costs. By locating operations in low-labor-cost countries, Western manufacturing firms attempted to rein in escalating costs and to maintain their competitiveness in the face of cheaper, quality imports. Countries like Taiwan and Korea thus benefited from early offshoring investments. Although such countries initially added little value beyond low labor costs, some were able to build on foreign direct investments to raise standards to world-class manufacturing levels.

The late 1980s and early 1990s witnessed the birth of the core competence revolution, along with a continuing need to contain costs in the face of low-priced, high-quality foreign goods. As Western businesses sought to focus on their core competencies, business process outsourcing came into its own. Outsourcing firms sought to deliver cost and efficiency benefits by performing a reduced number of functions in high volume across many clients.

However, as technology and communications infrastructures began to improve in previously underdeveloped nations, some business process *outsourcing* started to give way to business process *offshoring*. At the turn of the century, countries like India benefited from technology and telecommunications investments occasioned by the dot-com bubble and worries over the Y2K (year 2000) bug. It thus became increasingly attractive to send some outsourcing or captive work to such countries (preeminently India in this first phase) where advancements in collaboration technologies were beginning to unlock access to hordes of skilled, English-speaking workers. At this stage though, the focus remained on lower-skill, high-volume operations such as credit card processing, call centers and routine software development.

In recent times, however, several surveys have shown that access to high-quality skills is becoming an increasingly important reason for offshoring. While cost reduction was initially the predominant driver of offshoring, indications are that labor arbitrage is becoming less common as a primary driver of second-generation offshoring as access to talent becomes more important.

Companies are beginning to create competitive advantage by strategically leveraging offshoring. This seems to be happening for a number of reasons. First, those Western firms that had been involved in offshoring the longest began to realize that merely earning more and spending less was not enough to remain competitive. They also needed to offer high-quality products that were internationally competitive, and so the search for highly qualified teams capable of quality product development in offshore locations became a strategic imperative. Simultaneously, as these companies began to realize that local workers were often able to offer some higher-value skills while retaining their cost advantage, local service providers began to move upmarket and to offer more value-added services to their multinational clients. As a result, many offshoring companies began in earnest to include access to high-quality talent as a strategic variable in their offshoring decisions.

Currently, however, two additional reasons seem to be converting this aspect of second-generation offshoring into an urgent strategic necessity for innovative companies. On the one hand, as the supply of qualified scientific talent has grown significantly in developing markets such as India and China, it has been steadily declining in more advanced economies like Germany, the United Kingdom and the United States. For instance, surveys show that the number of U.S. residents graduating with Master's and PhD degrees in engineering has steadily decreased over the past five years, while, at the same time, demand for engineering talent has been growing. In the same period, the annual cap on H1B visas for foreign workers coming into the United States was slashed from 195,000 to 65,000. Also in that same period, however, the supply of science and engineering talent has been growing in countries like India and China.

On the other hand, many developing countries have begun to invest more heavily in infrastructure and in their educational systems. As a result, while the supply and demand for scientific and engineering talent has been moving in opposite directions in many advanced economies, supply has been growing in both quantity and quality in a number of emerging economies. In developing countries, government investments in infrastructure and higher-quality education have further reduced difficulties of doing business while improving access to higher-quality workforces. Thus, as labor markets in popular *hotspot* cities have begun to overheat, new city and/or country players have started to appear, often with specialized workforces and/or attractive fiscal incentives. Consequently, although the appearance of new locations increases the choice and leverage of current offshoring companies, it also makes the benefits of second-generation offshoring more widely available to second-movers who missed out on, or chose to stay out of, the first generation of offshoring.

Thus, as all these factors converge, instead of a value proposition solely centered on low-cost operations, many companies are faced with offshoring locations that can simultaneously offer highly skilled workers, relatively low wages, and attractive fiscal incentives. First-movers therefore, have begun to venture beyond lower-value services and into the establishment of R&D centers, new product development operations and other higher-value knowledge-intensive operations. However, as competition intensifies in many markets, and managers recognize the primacy of knowledge-based assets, more and more companies are beginning to seriously consider possibilities for the global sourcing of high-quality capabilities.

Some commentators have therefore begun to speak about how second-generation offshoring will revolutionize the global sourcing of capabilities. Although the complete globalization of a seamless and competitive market for geographically dispersed talent is unlikely to happen very soon, managers still need to start thinking about how to react to these changes. The pressures of competition and innovation in many markets will make access to talented workers increasingly more important for competitive advantage. While pressures are already intense in many science and engineering-based industries, firms in other industries less impacted (for now) also need to ask themselves what the emergent globalization of capability sourcing portends for them, and what they can/should do about it.

11.2. Coping with the globalization of capability sourcing

According to a recent report by Duke University and consulting firm Booz Allen Hamilton (Couto et al. 2006, 1):

> Offshoring is becoming less about moving jobs elsewhere, and more about sourcing talent everywhere. What began with rules-based, 'follow the book', codified tasks now encompasses procurement, HR, legal services, engineering services, R&D, and product design. And what used to be a tactical labor cost-saving exercise is now a strategic imperative of competing for talent globally.

However, the reality of a *semi-globalized* world where global operations are not yet seamless means that managers have to cope with a number of issues in attempting to build upon these emerging opportunities. The challenges they face can be grouped into two major sets of issues: on the one hand, there is the challenge of articulating a coherent global strategy and, on the other hand, there is a host of internal organizational issues that offshoring brings to the fore.

Getting global strategy right

If strategy is always important, it is even more so when firms are faced with fundamental changes in their business environments.

Managers need to avoid knee-jerk reactions if they do not want to offshore their way to failure. Therefore, when considering offshoring of high-value services, it must be evaluated within the context of a firm's overall global strategy in general and its overall sourcing strategy in particular. Specifically, it is important to think carefully about what to source externally and what to do in-house, as well as where best to locate each activity and where best to source each capability. Approaching these issues in a manner that is inconsistent with a firm's overall strategy is most likely a recipe for rapid failure. In particular, some issues related to offshoring that need to be addressed by a firm's global strategy include the following:

1. *What goes in, what goes out?* Many firms take a piecemeal approach to offshoring and outsourcing, without specifying upfront *the kinds of activities* they wish to perform themselves (domestically or internationally), and the kinds of activities they want to outsource (domestically or internationally). In addition, they often do not critically consider *what specific capabilities* they require from external partners and/or international locations before deciding upon offshoring initiatives.

   One approach suggested by Uday Karmakar (2004) is for companies to base firm and geographic boundary decisions on an evaluation of the complexity of the services they render and the customer needs they satisfy.

   Companies that use *complex* processes to provide highly *customized* services (e. g., personal financial planning, expert medical diagnosis, relationship marketing, etc.) will likely want to keep many of these activities in-house and localized. In this way, they will be able to maintain direct control over service quality and customer information. However, if volume permits, they may consider decoupling and selectively outsourcing some simple stages in their value chains in order to increase efficiency and reduce costs. On the other hand, companies that use relatively *simple* processes to provide *customized* services (e. g., retail sales, web design, technical support, etc.) will want to actively consider outsourcing the non-core stages of their value chains. If volume permits, they may also consider captive offshoring in order to maintain control over customer information and leverage accumulated experience and customer relationships.

For firms that use *complex* processes to deliver *standardized* services (e. g., credit analysis, software development, tax preparation, etc.) captive offshoring will often provide the benefits of leveraging in-house capabilities and experience while delivering lower costs and higher volumes. Nevertheless, as skill levels in offshore locations rise, these kinds of services may increasingly be provided through offshore outsourcing.

Finally, *standardized* services that are delivered through *simple* processes have historically been the first to be delivered through offshore outsourcing, and it is unlikely they will be delivered in any other way in the near future.

In summary, regardless of the analytical framework utilized, companies that want to take advantage of globally dispersed talent should not make decisions on offshoring independently of their global sourcing strategy. Nevertheless, it should be pointed out that the decision of what tasks to keep in-house, to outsource, or to offshore is not independent of the capabilities the various candidate vendors and locations have to offer. Thus, this decision is interlinked with an analysis of the best locations for carrying out various activities or for sourcing various capabilities. We will now look at this issue.

2. *Which capabilities from which locations?* Historically, the vast majority of offshore service jobs have gone to a handful of cities in India, Eastern Europe and Russia; notably, Hyderabad, Bangalore, Delhi and Mumbai; Budapest and Prague; and Moscow, respectively. Among these locations, many surveys show that Indian *Tier 1* cities occupy a unique position in terms of providing very highly qualified talent, along with (until recently at least) some of the lowest labor costs in the world.

   In recent times, however, some popular hotspot cities have become somewhat less attractive as the number of firms piling into them have pushed up labor costs and caused a strain on local infrastructure. Consequently, forward-looking firms are now beginning to cast their nets more widely, at the same time that many new contending cities are appearing on the scene. Many of these *new* locations are trying to build on unique strengths and advantages. For example, Dubai, United Arab Emirates, stresses its multinational, skilled and stable workforce, robust infrastructure, zero taxes and five-star amenities; Cape Town, South Africa, emphasizes its qualified workers, its unusually high number of actuaries, good business services, and well-developed telecommunications and IT infrastructure; Morocco is home to customer care and back-office operations for a number of major French and Spanish companies requiring fluent speakers of their home languages; Vietnam offers graduates that are well schooled in mathematics, speak French, English, German, or Russian, and don't demand high wages; and so on. In fact, a 2003 study by the McKinsey Global Institute (MGI) found that there were 6.4 million young professionals across 28 low-wage countries who were suitable[47] for employment by multinational companies (Farrell 2006).

Given the increasing breadth of options, the authors of the MGI report suggest that managers should follow a structured approach to location choice. They should first start by drawing up a list of candidate locations, define weighted decision criteria and then rank the candidate locations along the identified criteria. Important decision criteria to consider include the following:

- *Cost*: Especially labor, infrastructure, real estate and taxation.
- *Availability of skills*: The immediate labor pool as well as the local vendor community providing IT services and other business functions.
- *Market potential*: Local markets as well as adjacent markets in nearby regions or countries.

[47] Suitable professionals were defined as "university graduates with up to seven years of experience who have the skills and attributes (language skills, technical knowledge, ability to interact successfully in a corporate environment) that multinationals want."

- *Quality of infrastructure*: Especially telecommunication and IT, real estate, transportation and power supply.
- *Risk profile*: Security, regulatory, macroeconomic and intellectual property risks.
- *Environment*: Including the degree of government support, the business environment, the living environment and the location's accessibility.

These criteria have to be explicitly weighted in order to take into account the relative importance of each factor given different company strategies and risk profiles. Once the locations have been ranked, a decision can then be taken, always bearing in mind location dynamics and possible future changes in each of the criteria.

Getting global organization right

A second set of issues facing offshoring companies are organizational and managerial in nature. Although broader questions like the global sourcing strategy and location selection are important, surveys show that the most common problems bedeviling offshoring initiatives are internal organizational ones. As such, there are at least three major sets of issues that managers have to plan for in attempting to benefit from the globalization of capability sourcing.

1. *Organizational and operational challenges.* Many managers underestimate the amount of work that needs to be done to transform an offshoring *decision* into an efficient business *operation.* In addition to the detailed analysis that precedes the offshoring decision, its implementation also requires a long list of detailed tasks that need to be carried out. Consequently, inadequate planning can cause offshoring implementations to run into problems.

   Furthermore, many firms (especially smaller ones) do not have clearly defined processes, standard operating procedures or control parameters that are robust enough to guide and enable offshoring. Therefore, when these companies try to move a function or task offshore, they lack the organizational tools and skill set to manage the transition and to establish appropriate metrics for measuring and controlling this work once it is being performed remotely —often by a third party.

In addition, internal processes often need significant modification in order to be adapted to global operations. For example, employees may have to document procedures and establish performance benchmarks before processes can be sent offshore; and it often takes between 12 and 24 months before offshore performance stabilizes and the volume of work ramps up, which slows payoffs.

In summary, therefore, before embarking on an offshoring initiative, firms need to critically analyze their current business processes to see whether they are structured and defined well enough to be adapted to global operations. If this internal analysis is neglected, the returns to global sourcing initiatives may be seriously hampered by organizational difficulties.

2. *Recruiting, developing and retaining global talent.* Companies with greater offshoring experience are beginning to discover that *initial* access to talent is not sufficient to stay competitive. In particular, employee turnover rates are becoming a major challenge for many companies running offshore operations. As initial *subsistence* concerns subside, many workers in low-wage countries start to pay more attention to career development and personal fulfillment. Demanding jobs that are not perceived to substantially enhance long-term career prospects (e. g., call center operatives) are among the hardest hit by high employee turnover in countries like India. In response, companies are beginning to experiment with developing global career programs and incentive systems that integrate offshore talent into their global workforces.

One important driver of the increasing difficulty of retaining high-quality talent around hotspot locations is the growing competition for talent, as more companies arrive in increasingly crowded hotspots. Consequently, although many risk-averse companies follow the pack by investing in hotspot locations such as Bangalore or Shanghai, other companies try to avoid these hotspots and to invest in second-tier locations that can provide access to pools of qualified people at lower costs. However, because of lower standards of education and work experience, the actual qualification of many of these workers is more difficult to evaluate and often is considered to be below the requirements of Western companies.

In response, some companies have entered into strategic alliances with local universities or technical institutes to qualify talent for their particular needs and to secure access to these talent pools in the long run. In turn, some universities in offshore locations have recruited multiple Western partners and sponsors to provide customized programs. All these players contribute to, and partly compete for, further development, segmentation and accessibility of global talent pools.

3. *Coordination and collaboration capabilities.* Finally, as more companies begin to turn to offshoring for the global sourcing of high-value innovative capabilities, they are being faced with the very significant challenge of managing global collaboration and knowledge-sharing processes across multiple locations, languages, cultures and disciplinary backgrounds. In order to reap maximum benefits from global capability sourcing, firms therefore need to integrate dispersed, diverse talent pools, in order to focus their capabilities on organizational innovation objectives. This is no easy task, and companies are still experimenting with various solutions to this problem.

   Some approaches include: modifying organizational structure to permit collaboration and knowledge-sharing; using web-based collaboration tools; increasing direct coordination; setting up innovation competitions between global R&D locations; and utilizing modular organizing structures that facilitate work in dispersed teams. Some firms have implemented so-called global innovation networks designed to facilitate knowledge-sharing and collaboration across geographic boundaries. These networks connect R&D labs and local teams in different countries, and serve as social infrastructures for diffusing knowledge from local hubs of innovation. Other initiatives attempt to enhance R&D productivity by collecting ideas from suppliers, collaborating scientists, lead customers and global partners.

Nevertheless, the creation and sharing of knowledge across global innovation networks remain a major challenge, and will possibly remain the trickiest impediment to reaping maximum benefit from the global sourcing of innovative capabilities.

11.3. Conclusion: from the globalization of capability sourcing to the globalization of innovation

In summary, we are beginning to see very significant changes in the way companies approach offshoring. With growing pools of high-quality, low-wage talent in multiple locations, firms are increasingly looking beyond labor arbitrage to the reinforcement or growth of their strategic capabilities. However, in order to navigate this new environment beneficially, managers will need to think carefully about their global strategies, while navigating the organizational challenges deriving from the coordination of geographically dispersed knowledge workers.

As unique resources and capabilities become more critical for business success, and competition becomes more knowledge based, the ability to source and retain superior talent will become more critical for long-term business success. Firms best able to navigate the next generation of global sourcing and the globalization of innovation will be best placed for long-term success.

12. Concluding Thoughts

ALTHOUGH the world is globalizing, distance still matters. However, with offshoring it matters far less than it used to. Now firms can move a whole unit of production or a particular service department as far as communication technologies allow. A call-center unit relocated to the Moon? Why not? The future will tell. Yet the truth is that, back on Earth, offshoring may disrupt employees' lives (and that of their families). But there are also benefits to be reaped.

With the communications revolution, which was due, in part, to the growth and development of the Internet, there is currently an increasing number of jobs *at risk* of being relocated. And this is not only true about production-related (i. e., blue-collar) jobs —the trend towards services-based offshoring (i. e., white collar jobs) is changing as well.

As we have seen, offshoring is a natural development of economic progress, and is as beneficial for a country as commercial trade. Currently, we predict higher growth rates for services offshoring than production-related offshoring, even though production will remain bigger in the total numbers. The offshoring of services is an entirely new phenomenon for various reasons:

1. This new offshoring entails highly skilled service workers who are usually not engaged in highly repetitive tasks, as in the manufacturing sector.
2. Offshoring of services is not as visible as the conventional offshoring of production. There is no sudden shuttering of factories, but rather, the relocation process is more gradual.
3. With services, there is an additional appeal from a managerial perspective to compete for worldwide talent, beyond the short-term cost-benefit analysis.
4. New and enhanced communication technologies allow a much faster pace of offshoring of services around the world.

5. Thanks to the fast development and dynamic nature of services offshoring, companies are in a better position to develop their own capabilities and to address their strategies from a global point of view.

On the other hand, at an individual level, offshoring comes as a loss for the domestic workers whose jobs are relocated. In the case of services offshoring, this has set off alarms for highly skilled workers, since now everybody in the world is equally *at risk* of having their jobs relocated to a destination thousands of miles away. These individuals are the potential *visible victims* of offshoring. But we should keep in mind that, in trying to cope with this visible effect, governments might hinder a natural economic process, which would generate further *not-so-visible victims,* both at the entrepreneur and worker levels. And, it is usually the case that these people are disperse and cannot exercise the same political power that the *visible victims* might.

But there is also a positive side to the story, especially with regard to services offshoring. As illustrated in this book, the direct employment effects are less extreme here, as we expect highly skilled workers to adapt more easily to the requirements of new job opportunities. Moreover, positive productivity effects can result from both traditional offshoring and, to a greater extent, the new services offshoring.

As a consequence, for services offshoring the effects on employment are less disruptive. In fact, the offshoring of services may encourage activities to be upgraded domestically (e. g., call centers may upgrade to business processes and then to product development), thus enhancing domestic productivity and opening the door to many *offshorable* jobs in the future.

Cost advantages are surely among the most important drivers for this business practice (the one and only driver, an economist would say, or "comparative advantages in full force"). But with the advent of the Internet and telecommuting become a feasible option, firms are positioned to take full advantage of the pool of cheap and available well-trained workers. Indeed, the communications revolution permits firms to select the best of the best from a vast worldwide pool of well-trained workers. Likewise, workers around the world can benefit, including in those regions in which their more *traditional* activities are being moved abroad.

However, as we have demonstrated, the amount of offshoring in the services industry is relatively small compared with that of manufacturing activities, despite a much higher growth rate. We should expect to see a change over the years, as the world becomes more interconnected and the challenge posed by distance becomes a vestige of the past.

Empirically, while the socioeconomic impact of offshoring is still unclear, in practice, services offshoring is very important for companies and their value chains. It is becoming a key factor for global strategies, and not just a mere isolated managerial quandary. Moreover, socioeconomic considerations are especially important in dealing with aggregation, adaptation, and arbitration issues (Ghemawat's triple-A framework; see Ghemawat 2007).

More than ever, improvements in efficiency are becoming a necessity in today's business activities, since overhead costs are significantly increasing. Overhead expenses refer to ongoing expenses that are necessary to the continued functioning of the business but that cannot be immediately associated with the company's products or services. Offshoring of services might be a possible solution.

So, what have we learned about offshoring? What word of advice, if any, can Academia offer? Clearly, there are several economic agents, such as governments, firms and workers, that should be consulted as well.

First of all, we could ask a radical question:[48] What would be the effect of a political decision imposing an outright ban on offshoring to protect national employment? At first this might seem like a well-meaning policy that merely seeks to protect the visible victims of offshoring and, therefore, a socially desirable objective with no negative impact on the people. However, if we delve beyond the surface of this argument, we will see that this is not necessarily the case. Something else belies this scenario, something strongly embedded in basic economic principles, and that is that

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[48] Extreme hypothetical situations are usually very helpful in delivering a clear answer to an elusive and complex issue.

the world as a whole cannot lose from trade. And by extension, the world as a whole cannot lose from offshoring (which is, in a sense, a specific kind of trade).

Indeed, if governments leave offshoring on its own, other countries experiencing an increase in employment will eventually *return the favor* as a natural result of growth by increasing their demand for goods and services, many of which will be produced abroad, and some of which will even be produced in the country from which its activities had been relocated. That is, to produce these new goods and services and thus meet the increased international demand, more labor will be certainly needed. Therefore, directly prohibiting offshoring would eventually prevent *invisible* local workers from getting jobs created by the potential increase in the international demand for local goods and services. Furthermore, offshoring is more than a one-way street, since inshoring (the inflow of jobs from relocating international firms) is yet another reality of the business world.

Second, firms must soon begin to address the reality of offshoring and start thinking of it as an intricate part of a global strategy. Otherwise, they are liable to lose terrain on other more willing firms, both locally and internationally. True, many have already bought into the new offshoring hype without the proper know-how, with unsuccessful and regrettable results. But the message here should be clear: keep your eyes on services offshoring as you accumulate enough knowledge to make the leap.

In addition, staying flexible and efficient in managing the workforce is imperative for business practices worldwide, where offshoring could be seen as another brick in the human resources wall. Those firms that, through their human resources division, invest much of their time and resources in finding the right strategy to train and shape their staff, are in a much better position when the time arrives to finally go offshore. Career-long learning, career planning, staff development and skill renewal are just a few of the possible strategies that can help firms and their workers adapt to the new offshoring reality.

Finally, one piece of advice should be given to those workers who might suffer the offshoring stigma and are not skillful enough to be assigned to another job within the same firm, or are not lucky enough to find another job outside. Having geographic mobility is as much an advantage today as it was, for instance, during the time of the American colonies. The Britons who settled in the virgin soil of Northeast America never imagined the economic success laid out ahead of them.

All in all, offshoring in general and the offshoring of services are activities naturally associated with the fast development of economic activities. As such, there is much to be gained by both savvy executives and flexible workers and, subsequently, the society as a whole. One should not forget about those who, through no fault of their own, find themselves at risk for having their job relocated. However, we must be wary of well-intentioned government intervention that could curtail the positive effects of offshoring. We must attempt to keep the offshoring debate among political forces and social actors active and alive.

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