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Outsourcing and offshoring of business services: Challenges to theory, management and geography of innovation

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Outsourcing and offshoring of business services: challenges to theory, management and geography of innovation

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Abstract

Drawing on an original survey, we discuss the trends and challenges posed by the outsourcing and offshoring of business services. We document and analyse the increasing offshoring of business services (administrative services, call centres, IT services, procurement and product development) from USA and Europe to less developed countries, the functions offshored, size of offshorers, destination, and delivery models and explore the role of ICTs and the development of both large global services suppliers and entrepreneurial ventures in developed and less developed countries. We derive implications regarding outsourcing decisions, globalisation of high value adding activities, such as product development and innovation, raising issues of evolving market structure and the emergence of technical clusters where companies develop expertise to provide, and compete for, activities and skills across a range of sectors.

Keywords

Outsourcing, offshoring, knowledge intensive business services, innovation

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Introduction

Since the 1980s, outsourcing and offshoring of business services have experienced a remarkable growth and extended from basic software coding and call centre work to a range of knowledge-intensive business services and back-office functions such as payroll and accounting, financial and legal research, and even tightly regulated activities, such as drug development. Although there is a large amount of business cover stories and policy reports on the increasing outsourcing and offshoring of business services, there is a scarcity of data and little research on the consequences of the relocation of these activities for innovation, especially at the level of the theory of the firm and international division of labour. This phenomenon raises important challenges for the theory (and boundaries) of the firm, implications for governance, coordination and integration of decentralised knowledge-creating activities and, more specifically, for management practice and theory of innovation.

The main problem regarding research on outsourcing and offshoring of business services is the lack of data (Sturgeon et al., 2006; Kenney et al., 2009), especially fine grained data at the micro level of the projects. Available statistics are mainly about international trade and they tend to be highly aggregate, at industry level or about foreign direct investment by larger companies, richer for developed countries, but very limited for destination countries, therefore allowing only very crude analysis or only on specific sectors, like IT and business services (e.g. Amiti and Wei, 2005) and only static analyses. Few studies are now collecting firm level and project level data (e.g. the ORN project, see Lewin and Peeters, 2006; Manning et al., 2008; Lewin et al., 2009; or the offshoring survey in Denmark, Maskell et al., 2007; Pedersen and Jensen, 2007).

Drawing on the survey data from the Offshoring Research Network (ORN) based at Duke University, we discuss the trends and challenges posed by the outsourcing and offshoring of business services, including knowledge intensive ones (Miles, 2001; Miozzo

and Soete, 2001). Based on a fine grained survey at the level of the individual projects, we document and discuss the increasing offshoring of business services (administrative services, call centres, IT services, product development and procurement) from the USA and Europe to less developed countries. We analyse the functions offshored, size distribution of offshorers, choice of destination, and delivery models – captive operations, outsourcing to local, domestic or international service providers, and joint ventures. We explore the new role of ICTs and the opportunities for both large global services suppliers and small independent entrepreneurial ventures in developed and less developed countries. We derive conclusions regarding the nature of outsourcing decisions, globalisation of high value adding activities, such as product development and innovation, raising issues of evolving market structure and competition and the emergence of technical and knowledge clusters where companies develop expertise to provide, and compete for, activities and skills across a range of sectors. Finally, we raise questions on the extent to which these processes may result in an erosion of the knowledge-based comparative advantage of developed countries. We argue that although firms from advanced countries are increasingly outsourcing and offshoring knowledge-intensive business services to countries like China and India, they retain strategic process knowledge and other fundamental research activities, including technological integration and coordination, in geographical proximity to other core activities, mostly located in dynamic regions in developed economies, indicating a separation between highly value-adding research from incremental innovation and support development activities.

The paper is organised as follows. The first section reviews the contributions on outsourcing and offshoring in the innovation literature. The second section describes the data. The third section examines the emergent issues for innovation studies from offshore outsourcing based on original micro level evidence of offshoring patterns. The fourth section discusses the challenges of these developments for the theory of the firm, for the worldwide

management of science and engineering capabilities, for trade and investment theories and the implications of outsourcing and offshoring of business services for the knowledge-based competitive advantage of developed countries. A conclusion follows.

1. Outsourcing and offshoring and innovation studies

The terms outsourcing and offshoring are sometimes mistakenly used interchangeably. They are, however, distinctive processes which relate respectively to firm and country boundaries and may occur independently or jointly. Outsourcing refers to the decision to buy products or services previously produced internally from another (domestic or offshore) company. It relates to the fundamental question of why firms exist, whether and what a firm should make or buy, and it has been studied using transaction cost economics (Williamson, 1975), core competences (Prahalad and Hamel, 1990), evolutionary and resource based view of the firm (Penrose, 1959; Nelson and Winter, 1982) and dynamic capabilities (Teece et al., 1997). Instead, offshoring refers to a domestic company obtaining services from a foreign based company, be that a subsidiary (captive or international in-sourcing) or an independent service provider (offshore outsourcing).

The process of offshoring, broadly defined as locating activities abroad, e.g., manufacturing as well as other business services, is not new. It goes back to the period of classic multinationalisation (1950s-1970s) when foreign direct investment (FDI) was guided by the characteristics of host economies or ‘locational advantages’ (abundant natural resources, lower labour costs, available skills or market protection) (Hymer, 1976; Vernon, 1966). During this period, labour-intensive stages of manufacturing production such as assembly and processing (Froebel et al., 1980; Helleiner, 1973), first in traditional industries (shoes, textiles, toys, mature and standardised electronics), then in high-tech manufacturing

(electronic components, electronic goods assembly), moved to less developed countries especially in Latin America and Asia.

Outsourcing refers to the decision to buy products or services previously produced internally from another firm, and it is widely held to mean that the provider undertakes client-specific investments so that it is able to supply goods or services that fit the lead firm's specific needs. Similarly to offshoring, outsourcing is also not new and continues the trend for firms to purchase raw materials and standardised intermediate goods and components, but, as a business strategy which entered the business lexicon, is more recent and is linked to a series of organisational changes such as the rise of flexible specialisation (Piore and Sabel, 1984; Womack et al., 1990) in the 1980s, leading firms in capital-intensive sectors such as automobiles and electronics to set up international production networks not only to assemble their finished goods but also to develop a supply base for intermediate products and subassemblies. Outsourcing gained new impetus in the 1990s, often in combination with other organisational changes and restructuring related to downsizing (Pettigrew and Massini, 2003). Outsourcing is not to be interpreted as an inevitable and irreversible secular trend, but one which needs to be unpacked in terms of activities and functions involved for better understanding of its motivations and dynamics (Gertler, 1988).

Contemporary outsourcing/offshoring is a further wave of these developments. This now involves non-manufacturing functions (in many cases involving the transfer of management and/or day-to-day execution of a business function or service to a captive or independent external provider) and affects overwhelmingly white collar educated occupations and jobs, unlike manufacturing, which impacted primarily blue collar workers. While previous trends in offshoring were more geographically constrained in that it was related to regional integration and occurred within continental trade blocks, different set of countries are in contention for these activities and jobs, especially, but not only, India and China. In recent

years, outsourcing and offshoring have expanded to a range of knowledge-intensive business services such as IT applications, finance and accounting, engineering and R&D, human resources and contact or call centres. This, again, is not altogether new, and can be regarded as carrying on from the trend of global product development started by the establishment of corporate labs of large multinationals adapting products from developed economies to the new markets in Asia and Latin America for cost saving reasons (Niosi, 1999). What is new about the current wave of outsourcing and offshoring of business services is that also less internationalised companies and small and medium-sized firms are going offshore and not for accessing, and expanding, their existing activities to new markets, but for cost saving opportunities and accessing relatively less costly talent (Di Gregorio et al, 2009; Lewin et al., 2009). The current wave involves the relocation of existing activities (or functions) from developed countries to less developed countries (not just within the Triad). Moreover, these activities are not designed to serve the local market of the host country, but instead, to serve those activities based in the home country or other global operations (Kenney et al., 2009).

The matrix below (Table 1) shows how economic activities are organised across firms and country boundaries. The top left quadrant corresponds to the ideal-type notion of a domestic firm, with in-house tasks, where no outsourcing or offshoring are undertaken. We use this category with care and for the sake of simplicity to develop the taxonomy in this paper. The top right quadrant relates to domestic outsourcing, that is when companies no longer undertake some tasks in-house and these are carried out by domestic providers. The bottom left quadrant represents the case when a company moves or expands some of their functions or administrative and technical tasks offshore, as fully-owned/captive operations. Finally, in the bottom right quadrant both outsourcing and offshoring take place, that is, a company's tasks are outsourced offshore to a local or international service provider. We

outline below the issues and challenges that have been addressed by the literature on innovation for the processes described in each quadrant.

INSERT TABLE 1 HERE

1.1. Domestic outsourcing

For the top right quadrant (2), much of the literature on innovation studies has focused on the outsourcing of R&D, which is not a new phenomenon, but has increased significantly since the early 1980s. At the turn of the twentieth century in-house R&D laboratories were still rare and most firms that needed to undertake research would contract it out to universities or independent research scientists when necessary. Even in sectors with a relatively long scientific tradition, such as the pharmaceutical industry, this was still the most usual method of conducting research up until the First World War. The development of in-house R&D first occurred in the large chemical and electricity firms in USA and Germany (Mowery and Rosenberg, 1989; Mowery and Nelson, 1996). General Electric, DuPont, AT&T and Kodak all set up R&D labs before the First World War, developing by the 1910s the chemical and electrical engineering industries. But it was especially after the Second World War (for the UK and for most other leading European countries) that the large, centralized R&D laboratories became institutionalised as a general feature of managerial capitalism. However, the difference between the external R&D of the late nineteenth and early twentieth centuries and the current outsourcing is that in many cases companies are continuing to develop in-house research and technical capacity, which leads to other hybrid forms of collaboration and R&D-related inter-firm and inter-organisational vertical and horizontal relations, to continue to grow research and technical competences in collaboration with partners such as suppliers, customers, competitors, universities and public and private research labs (Chesbrough, 2003).

The standard arguments for explaining the growing use of external research and technical resources by firms and why firms seek to collaborate or contract out parts of their R&D, design and engineering activities tend to be based on the transaction cost model developed by Williamson (1975). Alternative frameworks are found in the notions of evolutionary and resource-based view of the firm (Penrose, 1959; Nelson and Winter, 1982; Barney, 1991) and dynamic capabilities (Teece et al., 1997). These approaches emphasise that firms have key assets or competencies that have resulted from previous investments and from learning-by-doing. These core competences can be seen as ‘resources’ as well as capabilities and knowledge sets which are accumulated over the long term which firms seek to both develop and deploy to gain competitive advantage. Because of the cumulative nature of technological change and learning processes (Nelson and Winter, 1982, Dosi, 1982 and 1988; Dosi et al., 1990), Coombs (1996) suggests that firms may be over-reaching themselves in their desire to decentralise and outsource their R&D portfolios, ultimately weakening their core technological competences.

The literature on innovation in complex products and systems has addressed the consequences of outsourcing for firm innovation (Davies and Brady, 2000; Gann and Salter, 2000; Hobday, 2000; Prencipe, 2000). Prencipe (1997) rejects the simple notion of core competences that recommends the outsourcing of production and, more importantly, the outsourcing of the development of components and subsystems, arguing that decisions based on economic factors alone may compromise the future technological competences of the firm. Besides, outsourcing requires an intense effort of knowledge and organisational coordination (Brusoni and Prencipe, 2001). This effort of knowledge and organisational coordination in ‘loosely coupled’ network structures is played by ‘systems integrator’ firms, which ‘know more than they do’ and which may outsource detailed design and manufacturing to suppliers

but maintain in-house concept design and the ability to coordinate R&D, design, and manufacturing by suppliers (Brusoni et al., 2001).

Much of the literature on outsourcing focuses on the externalisation of IT, which has shown remarkable growth over two decades and has been the engine of growth for the software and computer services sector. A detailed study of IT outsourcing in the UK and Germany (Miozzo and Grimshaw, 2005; Grimshaw and Miozzo, 2006, 2009) shows that IT outsourcing, as an example of design modularity of business services, can enable economies of scale, production efficiencies and the introduction of new technologies. However, because of the interdependencies of information and production technologies (Scott Morton, 1991), IT outsourcing is frequently accompanied by wider transformations in clients' production technologies. As such, the focus of change is towards improved measurement and monitoring of a range of areas of business performance, in line with the metrics developed in the course of developing and running the IT outsourcing contracts. Indeed, management of IT outsourcing relations means that the client is therefore concerned not only with relations with the external supplier, but also with internal strategies of knowledge and organisational coordination and control. This results in the need for knowledge and organisational coordination in the form of the transfer of staff from the client and the retained IT organisation (Miozzo and Grimshaw, 2005).

The discussion above highlighted a number of features. Outsourcing of R&D and IT is a means for rationalising limited internal resources, and at the same time being able to utilise the latest technologies and knowledge of suppliers and partners. These practices, however, demand important efforts of knowledge and organisational coordination by the outsourcing firm.

1.2. Captive/foreign subsidiary (international in-sourcing)

The bottom left quadrant (3) relates to the transfer of activities from the home base to a foreign location in the form of a fully-owned subsidiary (captive or international in-sourcing). This model is well established in manufacturing (Vernon, 1966; Hymer, 1976; Dunning, 1998) and although it has also grown for R&D-related FDI especially since the 1980s, some scholars posit that it was not all new even then and that, back in the 1930s, the largest European and US firms carried out about seven per cent of their total R&D at locations abroad (Cantwell, 1995) and that this figure has been steadily rising, particularly in technologically-intensive industries since the 1960s (Kuemmerle, 1999b). However, still in the 1990s, international R&D and patenting activities were mainly conducted in the home country (Patel and Pavitt, 1991; Meyer-Krahmer and Reger, 1999), FDI in R&D occurred primarily between a small number of highly industrialised countries (Florida, 1997; Kuemmerle, 1999a), mainly concentrated within the Triad nations (Archibugi and Iammarino, 2002).

Kuemmerle (1999a) identifies distinct waves of FDI in R&D by country of origin. US companies were pioneer investors in R&D facilities abroad and invested first in Europe, then in Japan, and then in the rest of the world (primarily Canada, Australia and a small number of Asian countries). European companies invested first in other European countries, then in the US and then in Japan, but only to a very limited degree in the rest of the world, whereas Japanese FDI started simultaneously in the US, Europe and in the rest of the world in the early 1980s and rose strongly only in the late 1980s and 1990s, to the US and Europe. Overall, the US was the most attractive location for FDI in R&D, attracting 30 per cent of all R&D sites established abroad.

The international business literature argues that FDI occurs when firms seek to exploit firm-specific capabilities in foreign environments (Vernon, 1966; Hymer, 1976; Dunning, 1998; Hakanson, 1990) and suggests that a high level of local R&D is carried out primarily to

adapt products to local markets (Howells, 1990; Hakanson and Nobel, 1993). Traditionally, most FDI into manufacturing and marketing units have fallen in this category. In the case of R&D, these are often called *asset-exploiting* R&D (Dunning and Narula, 1995) or *home-base exploiting* (HBE) R&D (Kuemmerle, 1999b). Home-base exploiting R&D is mainly concerned with adapting home base R&D to local requirements and is likely to be closely connected to and located in proximity of foreign manufacturing and marketing facilities. As firms establish manufacturing facilities abroad and assign increasingly complex products to them, locating R&D sites in close proximity to factories becomes a requisite feature.

A second driver for FDI in R&D has been identified as the need to augment a firm's knowledge base (Howells, 1990; Cantwell, 1991; Florida, 1997; Dunning, 1998). These efforts are often called *asset-augmenting* R&D (Dunning and Narula, 1995) or *home-base augmenting* (HBA) R&D (Kuemmerle, 1999b). Home-base augmenting R&D requires the development of links with host-country R&D organisations and systems to enhance the knowledge base at home and to connect more closely to the foreign R&D environment and access local knowledge (Florida, 1997). Specific nations or regions might be particularly attractive locations for R&D facilities because of potential knowledge spillovers from existing and productive local R&D organisations, such as research universities, publicly funded research institutes and innovative competitors.

In his review of the literature on R&D internationalisation, Gammeltoft (2006) identifies six types of motives: (1) market-driven to customise products for the specific market; (2) production-driven, i.e. R&D close to manufacturing facilities (similar to Kummerle's HBE R&D); (3) technology driven (pull), i.e. to access and monitor knowledge bases in foreign nations (similar to Kummerle's HBA R&D); (4) innovation-driven (push), i.e. to generate new ideas from the foreign environment; (5) cost-driven, namely to access less expensive R&D resources; and (6) policy-driven, i.e. to satisfy foreign governments that demand local

R&D in return for market access (see also Murtha, 1991). This classification summarises the main drivers for internationalisation of R&D, however, the new wave of offshoring of innovative activities and other business services seems to be driven by multiple reasons, such as innovation and technology, as well as cost. It would combine categories 3, 4 and 5 in the Gammeltoft's categorisation. Moreover, a dynamic view should be maintained when studying firms' offshoring strategies, as it is plausible that the motives for offshoring evolve over time, for example companies may start offshoring low-skilled and routinised work for cost reasons, but then expand their offshore activities to include more advanced and complex activities which relate to technology and innovation (Maskell et al., 2007; Lewin et al., 2009). This may also be the case because of the decreasing supply of domestic scientists and engineers and discovery of good pools of relatively cheaper skilled and educated workers in emerging economies (Manning et al., 2008; Lewin et al., 2009).

The rapid advances in ICTs have enabled the disintermediation and externalisation of innovation processes through outsourcing and remote relocation of R&D groups and laboratories overseas (Howells, 1990, 1995). Moreover, companies seem to increasingly choose offshore locations independently of geographical distance and locate their IT or business process outsourcing and other functions in less developed countries. Lewin et al. (2009) argue that offshoring strategies are evolving from *home-base-augmenting* to what have been defined as *home-base-replacing* (HBR) innovation capabilities for larger multinationals, the strategies of which have been extensively discussed in the international business literature, whereas small- and medium-sized companies, in general neglected by the mainstream international business literature, seem to be adopting innovation offshoring strategies in order to augment their limited innovation capabilities.

From the discussion above, three features seem to be central to differentiate the past wave of internationalisation of R&D and the current offshoring of business services. First,

this phase involves the participation of small- and medium-sized companies. Second, offshoring now involves the relocation of activities to less developed countries. Third, activities offshored are not aimed at serving local or global market but are part of domestic operations.

1.3 Offshore outsourcing

The bottom right quadrant (4) in the table refers to offshore outsourcing. This process has not received much attention from the innovation literature yet. We suggest that this practice combines the advantages and challenges of both pure outsourcing (the make or buy decision) and fully-owned activities offshore (managing and coordinating activities across national boundaries), and faces new ones, due to the combination of changing both firm and national boundaries, and which are particularly relevant in the case of knowledge-intensive business services (knowledge transfer, outsourcing of non core projects and functions while maintaining enough internal knowledge and absorptive capacity).

Section 2 presents the survey data based on offshoring projects for both US and European companies. Section 3 discusses the evidence of offshoring patterns and surveys the issues for innovation posed by the new phase of outsourcing and offshoring of business services, especially the role of ICTs and the opportunities for small and large firms.

2. Data description

The quantitative data used for the discussion of recent trends on offshoring is drawn from the Offshoring Research Network (ORN) database. The ORN project on offshoring of technical and administrative work was launched in 2004 at Duke University Centre for International Business Education and Research (CIBER), the Fuqua School of Business. At the core of the

ORN project is the contextual commonality of the survey, through the centralised online administration of survey (in the native business language of a country where necessary) each year. The cumulative ORN data base is unique in that it allows scholars to observe empirical phenomena of companies' action as they outsource and offshore any type of task or business process and because it focuses on the specific offshore implementations rather than companies' general experience with offshoring, resulting in fine-grained data. The corporate client survey collects data from US firms (since 2004), European firms (since 2006) and Australian firms (since 2009) and enables researchers to track the evolution of offshoring practices involving seven main areas: functions offshored, choice of offshore location and rationale for this choice, type of service delivery model used (captive, third party and hybrid), strategic drivers of offshoring, perceived risks, performance metrics, and future offshoring plans (future 18-36 months). Functions offshored include contact centres, finance and accounting processes, HR, legal services, procurement, other administrative back office services, and all innovation type work such as R&D, product design and engineering services, and software development. ORN surveys do not cover offshoring of manufacturing activities.

The total sample consists of 1271 offshoring projects by 299 US companies and 1258 offshoring projects by 334 EU companies across different functions, including call and contact centres, finance and accounting processes, HR, legal services, IT and software development, other administrative back office services, and innovation-related work such as R&D, product design and engineering services. These companies are representative of large multinational firms, midsize and smaller firms. In the US sample, the median company has 5000 employees and the average company employment is 27,874 employees. The median and average for the European sample are respectively 400 and 7,793, indicating that they are in general smaller compared to their US counterpart. Nevertheless, it is important to notice significant country differences within Europe, with Belgian, Dutch and UK companies being

smaller than German and Spanish ones, and Scandinavian (which in this study includes companies from Denmark, Finland, Sweden and Norway) being somewhere in the middle. The characteristics of these companies are summarised in Appendix Tables A1, A2 and A3.

3. Empirical results: emergent issues for innovation in the new phase of offshoring

ORN survey data show that US firms offshore more than half (55%) of their projects to service providers, while European firms offshore approximately one third (34%) to service providers and more than half (61%) to captive subsidiaries. This difference holds across all functions offshored, with the exception of product development/innovation related activities which are more offshored as captive operations by US companies, perhaps for knowledge management issues including intellectual property rights issues, but account for a larger portion of joint ventures by European companies, to combine better knowledge assets by both partners. Of the offshored functions, a third or more are IT and software services for both USA and European firms. Other knowledge intensive activities, such as product development, which includes engineering, R&D and product design, and administrative functions such as marketing and sales follow behind (Table 2).

INSERT TABLE 2 HERE

Indeed, offshoring has progressed more rapidly in the USA than in Europe, but, in both regions, it is not limited to IT, and has increasingly involved product development activities. The offshoring of product development started as early as that of IT in the early 1990s and has become the second most frequently offshored business function after IT, followed by administrative functions such as finance and accounting, and human resources. It is notable that call centre offshoring, which attracts most of the media attention, has been lagging behind more knowledge-intensive functions (Figures 1 and 2).

INSERT FIGURES 1 AND 2 HERE

Table 3 shows that India is the preferred host country for all outsourced function for both the USA (56%) and Europe (36%), accounting for around half of all projects outsourced in all functions from the USA, but varying with functions. India accounts for 62% of all IT projects, 58% of marketing and sales and 57% of product development projects offshored by US firms, and presents lower figures from projects outsourced by European firms. For European firms, Eastern Europe is preferred as a location for marketing and sales and procurement to India, probably due to proximity advantages such as relatively short travelling time and not too dissimilar time zones (i.e., near-shoring). China is an important location for product development for both US and European firms (second to India and followed by Eastern Europe for EU companies), which may be explained by the close relation of these functions to offshore manufacturing which is traditionally located more in China than India.

INSERT TABLE 3 HERE

India is by far the most important location (for captive, outsourcing and joint venture) for US firms, but China and also Latin America are important for captive and joint venture offshored projects, with the emergence of the Philippines for joint ventures (see Table 4). For European firms, Eastern Europe and China are stronger competitors to India for offshored projects, but most offshored projects in China are captive in contrast to India, perhaps because of concerns regarding the relatively weaker intellectual property regime in this country. This may also reflect the greater availability of independent vendors in India and perhaps the greater co-location of business services and manufacturing facilities in China compared to India.

INSERT TABLE 4 HERE

Around 80% of offshoring firms are large and mid-sized in the USA, while in Europe a third of the offshoring firms are small and almost half mid-sized (Table 5). It is notable that a sizable minority of offshorers in both the USA and Europe are small.¹ Small firms account for 18% of offshored projects by the US, and 32% by Europe. In terms of location choice for offshoring, US small firms display a stronger tendency to offshore to other Asian countries than do large and mid-sized firms, and European small firms are more likely to offshore to China and Eastern Europe, perhaps to avoid more popular locations with high wage inflation and high employee turnover like hot-spots in India. In terms of the type of functions offshored by firms of different sizes, there are curious differences between US and European firms. First, while in the US firm size is positively associated with a higher share of marketing and sales projects among all projects offshored, for European firms the pattern is reversed; 29% of projects offshored by large US firms are in marketing and sales compared to 18% for small US firms, while the figures for European firms are 12% and 32% respectively. This may reflect more advanced adoption of offshore shared services of administrative functions by larger US companies.

INSERT TABLE 5 AND 6 HERE

US firms from all industrial sectors offshore business services, with manufacturing ranking top, followed by finance and insurance, technical services and software. India has the highest concentration of offshore projects across all industrial sectors. Out of China's offshored projects, 38% is accounted by manufacturing firms, and 34% of the projects located in the Philippines is for technical services (Table 7). Table 8 shows that different functions are offshored across all the industrial sectors in the USA, with a dominance of administrative and marketing and sales, IT and software development and product development activities.²

Manufacturing accounts for the largest share of product development (35%) and procurement (57%) (purchase of raw materials and intermediaries), not surprisingly as this sector is characterised by relatively higher activities in these areas compared to other industrial sectors, and because they are likely to have ongoing manufacturing operations in offshore locations which can be benefit by supporting services. Below we discuss some additional features of outsourcing/offshoring of business services.

INSERT TABLE 7 AND 8 HERE

3.1 ICTs as facilitators of outsourcing/offshoring

The developments in ICTs are playing a very crucial role in the evolution of outsourcing and offshoring of knowledge-intensive business services. This is not only as enabler, in the form of more efficient and cheaper communication. ICTs facilitate outsourcing and offshoring of services as they enable automation of some tasks requiring rules-based logic, e.g. through interactive voice recognition, creating standardised work processes and machine-paced operations through automated call distribution systems and routinisation of work through the use of scripts that reduce operational risks and enable electronic monitoring. These tasks can then be more easily and cheaply transported between producers and consumers located remotely (see Bardhan and Kroll, 2003; Miozzo and Ramirez, 2003; Levy and Murnane, 2004; Batt et al., 2005).

Also, the new phase of outsourcing and offshoring is facilitated by ICTs because they are functions and activities which are themselves offshored, and because the information systems and other web-based collaborative technologies which are developed in offshore locations (e.g. by SAP, BSM) come to help cope with the managerial challenges of coordinating globally dispersed high value activities. Lehrer (2006) shows how ERP, the widely used Enterprise Resource Planning software or company-wide core IT system for

managing and integrating information and businesses within companies, depends on inter-firm standardisation and codification of business processes which facilitate its effective implementation (to link and integrate the different SAP 'modules' such as Financial Accounting, Sales & Distribution, Asset Management, Human Resources). The popularity of ERP has been associated with the growth of external IT services firms supervising the implementation of these systems, involving parametrisation of thousands of tables over several years and the writing of time-consuming supplementary software codes (Lehrer, 2006). Equally, ERP systems, through the standardisation and codification of business processes, might also encourage the outsourcing and offshoring of the different (back office) functions of the firm.

Also, web-based collaborative technologies, such as Electronic Notebook Systems (e.g. at BMS), have revealed their potential as efficient and powerful tools for tracking on a daily basis the work product of scientists at remote locations. These have been adopted very effectively only by few organisations, but they could soon be implemented on a wide scale not only for R&D but also for project and administrative applications.

3.2 Opportunities for large firms or small entrepreneurial ventures?

Outsourcing and offshoring have created new opportunities for global supplier firms. This trend is more visible in manufacturing, with the emergence of large global contract manufacturers in electronics and in the auto industry (Sturgeon, 2002).

Similarly to earlier trends in the outsourcing and offshoring of manufacturing, we are now witnessing the growth and consolidation of large multinational suppliers in services outsourcing and offshoring. Miozzo and Grimshaw (2010) describe how large IT services suppliers IBM and EDS that grow from outsourcing of business functions, develop their organisational capabilities. These services outsourcing firms have developed a novel form of

skill acquisition – staff transfer from client organisations-, which facilitates their rapid expansion and provides an effective means to acquire client-specific knowledge and develop competences. The challenge for these firms is to develop distinctive capabilities through combining client-(and industry-) specific knowledge brought by staff transferred from multiple client organisations and company-wide processes (such as for project management). An important strategic response of these services outsourcing firms is the implementation of a phased organisational learning model that brings increased productivity and efficiency in the provision of an increasing number of projects (Miozzo and Grimshaw, 2010). Large multinational outsourcers with an international presence have also developed in the area of payroll and accounting, such as ADP, in call centre and customer relationship management, such as Convergys, Sitel and Sykes and large consultancy firms such as Accenture.

A number of multinationals (e.g. General Electric, American Express and Citigroup) have pioneered the relocation of back office operations to countries such as India. As multinationals shift a variety of back office service functions to offshore locations, either by establishing their own offshore affiliates or by outsourcing to foreign contractors and local contractors with foreign operations, we observe changes in the international division of labour. Operating a multinational captive in a different environment requires management talent and organisational coordination (Dossani and Kenney, 2004).

Anecdotal evidence indicates that the Indian operations of some multinationals have enhanced their capabilities to receive global mandates. For example, Cisco has established ‘Cisco Centre East’ in Bangalore India under the leadership of the first Chief Globalisation Officer of the company while their former San Jose US headquarters is now referred to as ‘Cisco Centre West’.

As multinationals dramatically expand their operations in India, the number and size of Indian firms exporting services is expanding rapidly. Only a decade ago, Indian firms were

largely confined to low-level coding and programming and other simple processes (Dossani, 2006). This is evolving as the largest Indian system integrators (SIs) are growing fast and competing increasingly for larger and more sophisticated projects. The three largest Indian SIs have experienced dramatic growth: in 2000, the largest Indian service provider, TCS, had 17,000 employees and Infosys and Wipro had approximately 10,000 each; six years later, in 2006, TCS employed 78,000 employees globally, Infosys had grown to 66,000 and Wipro had 61,000 employees, and these figures have almost doubled in 2009 to 143,000, 105,000 and 96,000 employees respectively. Though the Indian SIs are still smaller than IBM with its global employment of approximately 400,000 (in 2008) or Accenture with 180,000 (in 2009) employees, they are expanding not only in India, but also in advanced countries (Western Europe and US) and other countries in Eastern Europe, and becoming serious competitors to services providers from these countries. These Indian firms, however, are also facing the same challenges as developed countries' offshorers as they move up the value chain, such as high attrition rates and reduction of profit margins due to high wage inflation.

It is said that in manufacturing small and medium-sized firms have disadvantages due to small scale and limited resources for innovation, but advantages coming from lower hierarchical structures and higher flexibility in making decisions. As the data reported in tables 5 and 6 showed, small and medium-sized firms are more active in offshoring than other more aggregate data (e.g., data on internationalisation of R&D, international patents, or FDI studies on multinationals) suggest. In the case of outsourcing and offshoring of business services, flexibility may result as an advantage in deciding to offshore. In the case of outsourcing probably the scale of operations may be too small to reach substantial cost savings; but offshoring may provide opportunities for start-ups to locate some activities and functions in low cost countries from the beginning (Manning et al., 2008). More recently, small entrepreneurial firms have been increasingly offshoring new product development and

other knowledge-intensive activities because these allow them to grow more and faster, increase speed to market, or simply as a last chance for survival (Dossani and Kenney, 2007) especially in knowledge driven industries (Murtha, 2004). Lewin et al. (2009) find that smaller firms have higher probability of offshoring innovation projects, indicating that offshoring enables smaller and more agile companies to augment their innovation capabilities (HBA) in contrast to larger more resourceful companies who are also using offshoring strategies to replace innovation capabilities (HBR). Asia in particular is playing a central role in the growing global innovation networks, as indicated, for example, by the growth in US patents granted to companies in Asia (South Korea, Singapore, China, Taiwan and India) between 1986 and 2003 (Ernst, 2002 and 2006). However, Hirshfeld and Schmid (2005) argue that, although firms in the USA and Europe are increasingly attracted to and are exploring new science and engineering clusters in emerging countries (Manning et al., 2008), advanced economies are likely to remain at the forefront of innovation activities, at least in the foreseeable future. This is because companies are being very careful about offshoring mainly support activities for their high value adding processes, while retaining process knowledge and other fundamental research activities, including technological integration and coordination, in geographical proximity to other core activities, mostly located in dynamic regions in developed economies, indicating a separation between highly value-adding research from incremental innovation and support development activities (Dankbaar, 2007; Malecki 2009). It is clear that the importance of geographical, cognitive, organisational, institutional and social proximity (Boshma, 2005) for generation and integration of breakthrough innovations remains paramount. Indeed, there is much evidence that dynamic and increasingly specialised firms are located in growth-regions underpinned by clusters of firms where research and design capabilities are decentralised at the level of the firm and

diffused amongst the cluster, involving inter-firm and industry-university partnering (Best, 2001).

4. Discussion: the outsourcing/offshoring challenges

This section discusses the challenges of these recent developments for the theory of the firm, for the global management of science and engineering capabilities and for trade/investment theories. We then discuss whether the new wave of business services outsourcing/offshoring is eroding the competitive advantage in innovation of developed countries.

4.1. Challenges to the theory (and boundaries) of the firm

The recent phase of outsourcing and offshoring is part of a more general process of corporate restructuring and vertical disintegration that has received attention in the theory of the firm (and its boundaries). There are different views on the consequences of vertical disintegration for the typical Chandlerian firm. On the one hand, Langlois (2003) argues that vertical disintegration challenges the extension of Chandler's (1977; 1990) managerial revolution into the late 20th century, when vertical disintegration began replacing the multidivisional firm. For Langlois, vertical disintegration ('the vanishing hand') is a further continuation of the Smithian process of division of labour in which Chandler's managerial revolution, with its organisational capabilities to manage scale and scope, was a way-station (Langlois, 2003). Langlois (2003) interprets the changes since the 1980s as a result of changes in coordination technology and extent of markets, which lead to specialisation of function with generalisation of capabilities, and the hiving off not only of unrelated divisions but also vertically-related divisions as well.

On the other hand, and in contrast to Langlois, Pavitt (2003) is more cautious about the interpretation of these trends, and argues that the recent drive for disintegration of product

design and manufacture, made possible by advances in modularity (Baldwin and Clark, 2000; Sturgeon, 2002) and ICTs are, instead, a prolongation of the Chandlerian firm, that is able to exploit economies of scale, speed and scope through 'systems integration'. However, this division of labour is likely to remain incomplete as large specialised firms will need to maintain and develop technological competences beyond what they make themselves (see Brusoni et al., 2001 above), and associated manufacture will remain an important resource. Pavitt (2003) argues that although large firms outsource manufacturing they cannot be regarded as 'services' firms (and we are not moving to a 'post industrial' stage), instead, these firms are focussing on the knowledge-intensive element of industrial activity while buying out more standardised and routinised activities, which can be carried out more efficiently by companies located where the cost of labour is lower.

These arguments, however, refer mostly to outsourcing of manufacturing tasks. The two contributions discussed above, and most of the past literature on outsourcing, do not examine explicitly the outsourcing/offshoring of business services. Sako and Tierney (2005) were probably the first to stress the difference between outsourcing of manufacturing and outsourcing of business services. They draw a distinction between traditional vertical disintegration (vertical disintegration of the production of inputs that go into a firm's final products or services) and the unbundling of corporate functions accompanied by further re-centralisation of these services in an outside supplier of services. They argue that while the former is an operational decision made at the factory or divisional level, the latter is associated with the rise of shareholder value, as decisions are made by corporate executives and chief finance officers at the corporate headquarter (as bonuses are linked to cost saving and return on assets, and large outsourcing deals include the sale of a shared service centre, see Adler, 2003). The latter occurs when corporations are undergoing restructuring of corporate functions.

There are different implications from these two different types of vertical disintegration. In traditional vertical dis-integration, suppliers expand through the exploitation of economies of scale across a broad customer base. This expansion is based on developing new capabilities to take on higher value added processes in the supply chain, entering into competition with the client firm's business (which remains powerful due to monopsonistic power vis-a-vis suppliers). In outsourcing involving corporate function unbundling, instead, corporate functions in human resources, IT, finance and accounting, procurement and logistics may be downsized and sold to service providers that have developed specific know how that can be applied to clients in a broad range of industrial sectors. Suppliers expand through the exploitation of economies of scale and scope and cross-sectoral learning without facing direct competition with clients in the same market (which cannot exercise monopsonistic power over them).

The discussion above suggests that the current wave of outsourcing/offshoring of business services can not be regarded as vertical disintegration in a conventional sense, but as the rebundling of an administrative function or process, to be carried out by a third party (Sako and Tierney, 2005). As argued above, it is a decision taken by the company board, affecting the administrative support structure of professional managers, rather than mainly blue collar workers as in the previous wave of (manufacturing) outsourcing. However, although these unbundled functions are no longer within the firm, they are still part of the overall production process and require efforts of coordination and integration of knowledge.

4.2 Challenge of managing science and engineering capabilities worldwide

We are witnessing a change from the central R&D lab which was key to the development of large high tech firms after Second World War, to what has been variously labelled 'distributed mode' (Coombs and Richards, 1993; Christensen, 2002), '5th generation model of innovation'

(Rothwell, 1992) and ‘open innovation’ (Chesborough, 2003). This change includes the downsizing of central labs and the delegation of responsibility for technical innovations to product divisions and subsidiaries and, in many cases, the internationalisation of R&D (Gerybadze and Reger, 1999; Kuemmerle, 1999a). Innovation processes are becoming more open and increasingly distributed across firms, suppliers, customers, research organisations and other institutions, by disintegrating and externalising the innovation process through outsourcing and remotely dispersed R&D groups, recombining knowledge (Kogut and Zander, 1992), and utilising knowledge management practices, knowledge and boundary spanners, and reverse knowledge transfer (Lewin et al., 2009). All together these trends indicate that we are not just revisiting the external R&D labs typical of the pre-war periods, but we are witnessing the development of a new trend of hybrid organisations and complex networks where knowledge flows, transfers and is created through multiple channels. These processes imply that companies need to develop managerial and organisational processes for the knowledge sourcing (Malecki, 2009), using boundary spanners and knowledge brokers (Gertler, 2003) and coordination and integration of decentralised knowledge.

One practice increasingly used in outsourcing offshore is the development of complex service level agreements (Miozzo and Grimshaw 2005). As companies increase the scale and scope of operations and repeatedly outsource to service providers, they can develop learning and contract design capabilities on how much and what kinds of detail to include in a contract, while contracts become repositories for knowledge about how to govern collaborations (Mayer and Argyres, 2004). At the same time, service providers can also develop capabilities to relate to clients as they repeatedly interact over time and on a variety of projects, to improve cost efficiency and project execution (Ethiraj et al., 2004). Client-specific and other infrastructure building investments can also enhance vendors’ capabilities which in turn

contribute to build reputation and mature project management capabilities to compete with larger international service providers.

The increasing transfer of high value adding activities and tasks offshore has resulted in the emergence of technology and knowledge clusters in less developed countries for firms providing services to different industrial sectors (Manning et al., 2008). Local and international service providers tend to be located in concentrated areas, in a similar way to the industrial clusters in developed economies, such as Silicon Valley for IT companies or Southern Denmark for biotechnology companies. However, these new geographic clusters tend to develop around particular *functions* or *upstream services* rather than industries, as knowledge-based clusters that provide services to clients across industries (Manning et al., 2008), and fuel diffusion of knowledge and practices perhaps originated initially as industry-specific to cross different industrial sectors.

The interest in the geography of international business activities and especially in the role of clusters has grown remarkably in the last decade, although the importance of industrial clusters, or districts, was first noted by Marshall (1920) who identified three fundamental elements: clusters of subcontractors, readily available skilled talent, and a knowledge base shared by a local community of firms and people. These elements are also present in 'hot spots' and emerging second- and third-tier cities in India, China and other low-cost countries which are destinations for offshoring of services. Clustering provides synergistic agglomeration effects where traded and untraded dependencies can assist in economic growth and industrial upgrading (Porter, 1990; Storper, 1997). There are many cities in India and other nations that have attracted operations and developed cluster dynamics, such as Bangalore, New Delhi, and Mumbai. Bangalore is the exceptional and well known case, as it is the centre of the Indian IT services industry, and experienced a rapid expansion not only of Indian providers and entrepreneurial start-ups, but also international service providers and

multinationals' R&D and other innovation related activities (Athreye, 2005; Zaheer et al., 2009). In terms of financial services offshoring, Mumbai has become an important destination, though Grote and Taube (2006) concluded that much of the relocated work has been routinised work and not, in general, higher value-added research activities.

The international dimension in the new wave of outsourcing and offshoring of parts of the value chain and business processes to highly specialised external suppliers creates new challenges to develop strategies and policies for managing knowledge interfaces and transferring and reconnecting knowledge across spatial and organisational boundaries (Lewin et al., 2009). Increased emphasis needs to be placed on the management of knowledge, both to identify sources of external knowledge and to link that knowledge with internal knowledge. Firms still need to develop core competences that are unique, complex and difficult to imitate. Christensen (2006) suggests that large firms have expanded the diversification of their technological profiles, placing greater emphasis on the development of 'background competencies' or absorptive capacity (Cohen and Levinthal, 1990) to explore new opportunities emerging from scientific and technological breakthroughs outside the firm. Also, as large firms take the role of coordinators of increasingly distributed innovation chains, they need to develop system integration competences involving experience-based and firm-specific architectural knowledge. An important aspect of this process is that firms need to balance internal and domestic activities with outsourced and offshored tasks and functions, without eroding underlying knowledge (Brusoni et al., 2001) and weakening their core competences (Coombs, 1996).

4.3 Challenges to trade/investment theories

Scholars working on international trade attempt to make progress in the understanding of the outsourcing and offshoring of services using existing theories, especially the eclectic

paradigm (Dunning, 1998), which relies on ownership, location and internalisation (OLI) factors. Markusen (2006) suggests that outsourcing is a 'mode' choice (in transaction cost theory), related to the internalisation make-or-buy decision about the boundaries of the firm, and offshoring is a 'location' choice, claiming that we can understand offshoring of white-collar work at the theory level from the existing portfolio of models. Other scholars are more doubtful about the usefulness of existing theories. Doh (2005) argues that offshoring both reaffirms and challenges the OLI framework, with location being an important variable, but ownership and internalisation advantages becoming less relevant.

The developments in outsourcing/offshoring of business services that we discuss here raise questions about established views on the relation of technology to market structure, including firm entry, product differentiation and standardisation involved in the product and industry cycle models (Vernon, 1966; Klepper, 1997). According to these models (developed to explain the internationalisation of manufacturing), as sectors reach maturity and products become standardised, concerns over production costs begin to replace concerns over product characteristics, and the location of production shifts to less developed countries, which would then export to advanced countries. New sectors would develop in advanced countries, based on their domestic innovation. The developments in the current wave of outsourcing/offshoring raise some questions for these models, since the sectors that are re-located are not mature (as expected in the product/industry cycle model), but instead include a variety of sectors at different stage of industry evolution. More specifically, the activities outsourced are more or less unrelated to the (technological) maturity of the products of the lead firms, but are instead related to the availability of skilled and pliant workers that can be employed in these locations at a relatively lower cost. Also, the decline of industries and destruction of jobs in advanced countries is faster than the creation of new ones. At the early stages of the development of high-tech sectors, some of the more labour-intensive and less skilled jobs are moved to less

developed countries. Soon afterwards, product development and R&D are located offshore due to availability of relatively lower-cost and disciplined engineering skills. Contrary to the slow, sequential internationalisation of manufacturing (Levy, 2005), the low capital intensity and purely electronic form of services delivery means that services offshoring can grow and relocate faster than has been the case with manufacturing (Dossani and Kenney, 2004). Vernon (1966) emphasised the importance of local demand as a catalyst for export and investing abroad, but, in contrast, the new wave of offshoring is to serve home rather than host markets (Kenney et al., 2009). Concern has been raised that since offshoring is unrelated to domestic demand, it may exacerbate the reliance of less developed countries on the capital and resources of industrialised countries, and may make them more vulnerable to the vagaries of multinationals which may choose to shift the production of goods and services from developed to less developed countries and from one less developed country to another (Doh, 2005).

4.4 Is outsourcing/offshoring of business services eroding the competitive advantage in innovation of developed countries?

The developments in the outsourcing/offshoring of business services discussed in this paper also raise the question as to whether this process is an important step in the globalisation of production and innovation that can lead to the erosion of the existing knowledge-based competitive advantage of developed countries. On the one hand, our evidence confirms that global fragmentation and dispersion of economic activities of business services is not confined to low-end activities. The evidence shows that outsourcing and offshoring of business services is not restricted to call centres, but involves a substantial share of IT services and R&D activities. Case studies of selected Chinese and Indian firms show that they are moving up the value chain towards higher value-added segments in services as a result of

outsourcing and offshoring (Chen, 2004; Niosi and Tschang, 2009). This has resulted in increased patenting and other indicators of innovative activity by companies headquartered in these countries suggesting some globalisation of innovation and localised learning processes in these regions.

On the other hand, however, it is an open question whether it is possible for regions to leverage knowledge assets to derive significant and sustainable benefits from clusters formed by FDI projects in outsourcing and offshoring of services. It has been shown that external economies presumed to be derived from clustering are the exception rather than the rule in clusters dominated by manufacturing multinationals (Felker, 2004; Phelps, 2008). The experience of East Asian countries is instructive of the magnitude of the policy effort required to harness manufacturing FDI successfully to take advantage of external economies in clusters. As suggested by Felker (2004) and Phelps (2008), different phases of the expansion of multinationals in Asia offered distinct, and diminishing, possibilities for local industry cluster development in first and second tier producers in the global division of labour in production.

There has been little work so far on the effects on local firm cluster formation from services outsourcing/offshoring. As shown above, upgrading of (products and processes) has translated into increased incomes. However, questions remain regarding two issues: first, how profits are divided up among multinationals and local service suppliers, and, second, how this has led to general improvements in conditions for workers (Gertler, 1992). Moreover, since service clusters are technology or function based (rather than industry based), it raises the question as to whether there is enough industrial diversity in these locations to take advantage of the external economies from outsourcing and offshoring projects. The evidence of the growth of indigenous SIs, for example, may be no more than a reflection of the 'reconfiguration' of core and periphery regions, of the extension of the 'logic' of advanced

global capitalism to a number of producers in India and China (Starosta, 2010). Outsourcing and offshoring of business services is in some ways simpler than manufacturing outsourcing in terms of resources, space and equipment requirements due to digitalisation and intangible nature of most of these activities. This suggests that changes in the division of labour and innovation may occur much more quickly. However, despite the emergence of India and China as important hubs of activity, outsourcing and offshoring has not meant a wholesale transfer of (especially knowledge intensive) economic activity out of developed countries and into less developed countries. Although China and India show upgrading in the provision of a number of services, they face a ‘moving target’ as firms in developed countries retain higher skill content knowledge-intensive and creative services activity, and seek to move up the skill ladder to produce more specialised and new types of services (as evidenced by surplus of exports of services with higher skill content by developed countries), while ostensibly shedding the services in the production of which they are less efficient. Thus, an important set of activities, especially the most creative and knowledge-intensive ones, and their technological integration and coordination, remain rooted in advanced economies (Bunyaratavej, et al., 2007), even as they have become tightly interlinked with activities located elsewhere (as has previously been the case with agriculture and manufacturing).

Although there is evidence of income growth in selected Chinese and Indian locations, outsourcing and offshoring of services may largely lead to wealth creation for shareholders, but not necessarily for countries or employees, as it brings a growth in the corporate capacity to manage dispersed networks (with important activities of coordination still remaining in advanced countries), with the implication that the core of these clusters will become less ‘sticky’ and increasingly devoid of workers (decoupling value creation or appropriation and geographic location) (Levy, 2005). We noted above that offshoring decisions are largely financially-driven board decisions implying short-term shareholder value motives rather than

long-term value-enhancing motives. Foreign investment in services can be more ‘footloose’ because of lower capital intensity and sunk costs, as well as weaker linkages with domestic suppliers. The work of Miozzo and Grimshaw (2008) on IT outsourcing in Argentina and Brazil, reveals that IT services firms move between countries not only their own operations but also the execution of contracts with client firms. These practices relocate client firms’ outsourcing from subsidiaries of IT firms within the same national economy to subsidiaries located outside it, in turn facilitating consolidation and regionalisation of business segments of (multinational) client firms and thereby potentially reducing the economic contribution of client firms to the host economy. This suggests that some less developed host countries could increasingly face the risk of not fully developing their own competitive advantage, since this depends increasingly upon multinationals’ location and integration decisions, resulting from confidential global corporate strategies of upgrading, downgrading and hierarchical ranking among subsidiary production units (Chesnais 1992). These decisions seem to be easier to execute in services which require relatively less investments in infrastructure and other tangible assets compared to the (re)location of manufacturing activities.

5. Conclusions

In this paper we have examined emergent issues from outsourcing and offshoring of business services based on original evidence. Table 9 summarises the characteristics of the new wave of business services outsourcing/offshoring including the nature of decisions, suppliers, role of ICTs, investment, clusters and location and contrast them with the previous wave of outsourcing/offshoring of manufacturing. The new wave of outsourcing/offshoring is related to firm restructuring decisions, and involves not only large multinationals, but also small and medium-sized firms in all industries. Suppliers of business services develop in a different sector from the outsourcer/offshorer and develop know how in specific functions that can be

applied to clients in a broad range of sectors, and, differently from the previous wave of offshoring of manufacturing, they do not face competition from their clients. In many cases, this is leading to the development of global suppliers and the evolution of local providers into large offshoring service providers. ICTs not only have an enabling role, but have become an organisational function that can be outsourced/offshored and a coordination tool for outsourcing/offshoring of business services. The recent wave of offshoring is to serve home markets or the global operations of the firm and demands coordination of globally and inter-firm dispersed activities and knowledge. The clusters that develop in offshoring locations are technology/knowledge/function-based, rather than industry-based, and lead to the emergence of hybrid organisations and complex networks. Offshoring of business services involves rapid re-location of existing domestic activities to India and China starting in the 1990s and expanding to other Asian countries, Eastern Europe and Latin and Central America in the 2000s, through hybrid forms of organisation and complex networks, though India remains today the preferred choice, due to a number of reasons, such as abundance of IT and other technical workers, deregulation of the IT and other industries, relatively more developed IPR system and high level of spoken English. Although China and India show upgrading in the provision of a number of higher skilled services, China especially for product development activities, they face a ‘moving target’ competing with firms in developed countries which are moving up the skills ladder to produce more specialised and new types of services. An important set of activities, including the most creative and knowledge-intensive activities and technological integration and coordination of lead firms, still remain rooted in dynamic regions in advanced economies.

INSERT TABLE 9 HERE

Moreover, the transfer of functions such as product design and engineering services to less developed countries requires development of such skills and critical mass of talent pools to benefit from positive spillovers. Some selected less developed economies have begun to implement national policies and tax incentives designed to 'reverse' the brain drain, and evolve their infrastructures and institutions, partly based on, partly deviating from, developed countries' models, in order to continue to attract and benefit from an increasing number of foreign operations, resulting in virtuous cycles which will make the destinations even more attractive.

At the same time, however, it appears that research and innovation policies in a number of home countries of offshoring companies have not kept up with the latest global development and seem to be struggling to counteract the relocation of high-end innovation activities. The inter-relation between developed and less developed countries is becoming tighter and the interdependencies of education, business, and innovation systems ever closer. Policy-makers in both developed and less developed economies need to become more aware of these interdependencies, not least in order to anticipate better the effects and consequences of their policy decisions. Moreover, managers in developed countries need to become more involved in the discussions and formulation of national policies affecting technology policies and other policy discussions and interventions at the international levels which may affect the outcome of their offshoring strategies and plans (Nelson, 1995).

It is clear that the evolution of offshoring cannot be understood as an isolated event, but should be seen as a co-evolutionary process (e.g., Manning et al., 2008) where phenomena result from the interplay and interaction of multilevel agents and endogenous and exogenous factors, demand and supply or push and pull factors which interplay and affect one another to result in emerging dynamics. Therefore, understanding the emerging outsourcing/offshoring of knowledge intensive and innovation-related business service requires multi-level analysis

from macroeconomic and institutional factors to structural changes in local and global business systems and environments, industries, firms, managers, their environments (institutions and practices) which co-evolve with the phenomenon.

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Figure 1: Offshored projects by different business functions, USA

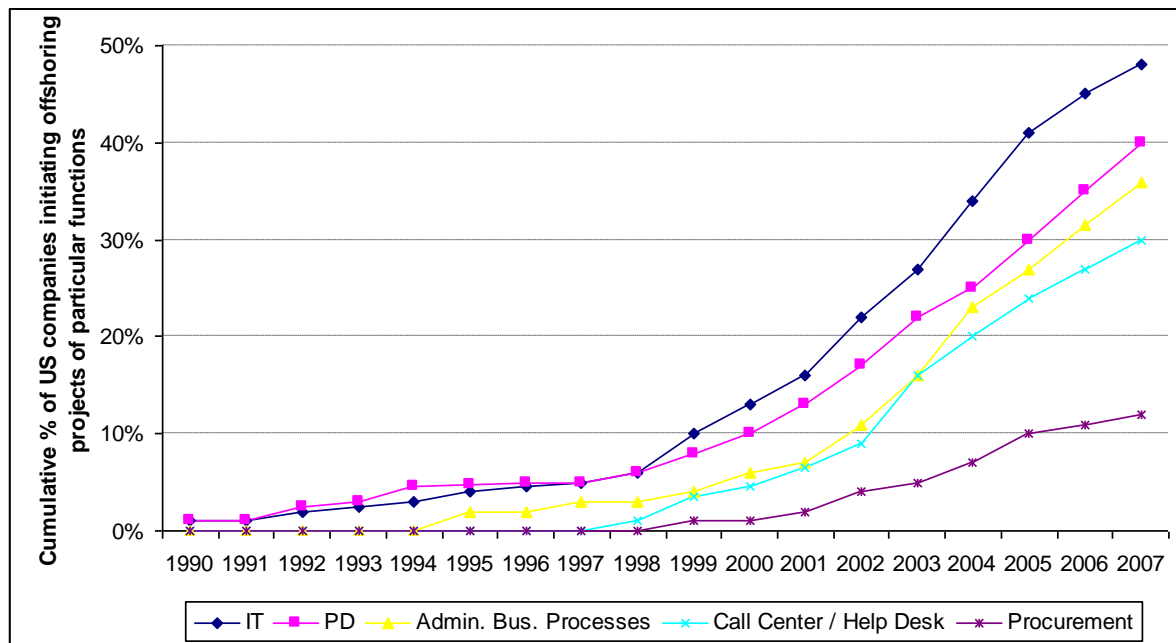


Figure 2: Offshored projects by different business functions, Europe

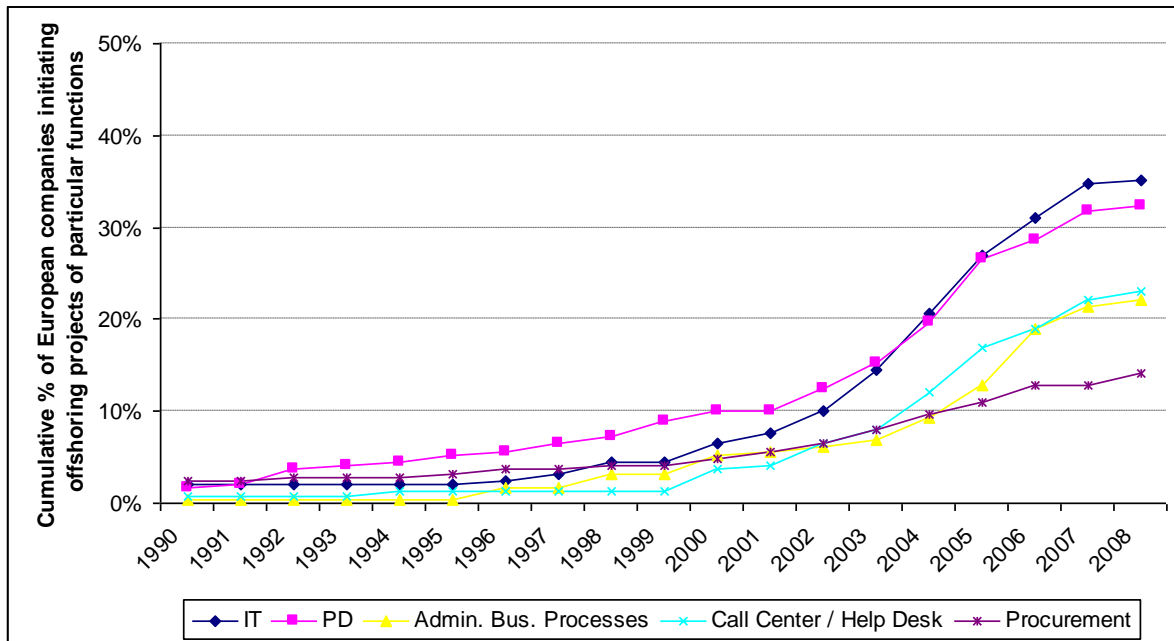


Table 1: Offshoring/outsourcing matrix

		Outsourcing	
		NO	YES
Offshoring	NO	1) Internal domestic provision	2) Domestic outsourcing
	YES	3) Captive/foreign subsidiary (international in-sourcing)	4) Offshore outsourcing

Table 2: Functions offshored and delivery models

USA	Captive	Outsourced	Joint Venture	Total (N)	EUROPE	Captive	Outsourced	Joint Venture	Total (N)
Admin & M&S	23%	22%	27%	23%	Admin M&S	29%	23%	29%	27%
CC	11%	17%	13%	14%	CC	13%	17%	0%	13%
IT&Soft	28%	38%	20%	33%	IT&Soft	27%	33%	19%	28%
PD	31%	19%	27%	24%	PD	19%	18%	48%	21%
Procur't	7%	4%	13%	6%	Procur't	12%	8%	3%	10%
Total	100%	100%	100%	100%		100%	100%	100%	100%
(N)	(316)	(408)	(15)	(739)	Total (N)	(320)	(177)	(31)	(528)
Admin & M&S	44%	53%	2%	100% (167)	Admin M&S	65%	29%	6%	100% (143)
CC	33%	65%	2%	100% (105)	CC	58%	42%	0%	100% (71)
IT&Soft	36%	63%	1%	100% (246)	IT&Soft	57%	39%	4%	100% (150)
PD	54%	43%	2%	100% (180)	PD	57%	29%	14%	100% (109)
Procur't	51%	44%	5%	100% (41)	Procur't	71%	27%	2%	100% (55)
Total	43%	55%	2%	100% (739)	Total	61%	34%	6%	100% (528)

Table 3: Locations and functions offshored

USA	India	China	Latin Am	Philippines	East Eur	Oth Asia	Total (N)	EUROPE	India	China	Latin Am	Philippines	East Eur	Oth Asia	Total (N)
Admin M&S	24%	13%	24%	32%	25%	22%	23%	Admin M&S	19%	12%	15%	24%	31%	20%	21%
CC	10%	7%	30%	35%	9%	16%	14%	CC	9%	7%	23%	10%	12%	17%	12%
IT&Soft	35%	24%	26%	20%	40%	29%	31%	IT&Soft	44%	22%	25%	34%	27%	27%	33%
PD	26%	45%	14%	9%	24%	27%	26%	PD	22%	38%	11%	28%	17%	23%	22%
Procur't	4%	12%	6%	5%	3%	6%	5%	Procur't	6%	21%	25%	3%	14%	13%	13%
Total	100%	100%	100%	100%	100%	100%	100%	Total (N)	100%	100%	100%	100%	100%	100%	100%
(N)	(518)	(119)	(90)	(82)	(68)	(51)	(928)		(225)	(73)	(79)	(29)	(147)	(70)	(623)
Admin M&S	58%	7%	10%	12%	8%	5%	100% (217)	Admin M&S	33%	7%	9%	5%	35%	11%	100% (130)
CC	41%	6%	20%	22%	5%	6%	100% (132)	CC	28%	7%	24%	4%	22%	16%	100% (76)
IT&Soft	62%	10%	8%	6%	9%	5%	100% (290)	IT&Soft	48%	8%	10%	5%	20%	9%	100% (203)
PD	57%	23%	5%	3%	7%	6%	100% (240)	PD	36%	21%	7%	6%	19%	12%	100% (135)
Procur't	43%	29%	10%	8%	4%	6%	100% (49)	Procur't	18%	19%	25%	1%	25%	11%	100% (79)
Total	56%	13%	10%	9%	7%	5%	100% (928)	Total	36%	12%	13%	5%	24%	11%	100% (623)

Table 4: Offshore locations and delivery models

USA	India	China	Lat Amer	Philippines	East Eur	Oth Asia	Total (N)	EUROPE	India	China	Lat Amer	Philippines	East Eur	Oth Asia	Total (N)
Captive	40%	60%	41%	37%	50%	60%	44%	Captive	41%	59%	56%	93%	68%	62%	56%
Outsourcing	59%	37%	56%	60%	50%	40%	54%	Outsourcing	53%	27%	42%	7%	26%	26%	37%
Joint Venture	1%	2%	3%	3%	0%	0%	2%	Joint Venture	7%	14%	2%	0%	7%	12%	7%
Total	100%	100%	100%	100%	100%	100%	100%	Total	100%	100%	100%	100%	100%	100%	100%
(N)	(345)	(81)	(68)	(65)	(50)	(30)	(639)	(N)	(123)	(44)	(55)	(15)	(90)	(42)	(369)
Captive	49%	17%	10%	9%	9%	6%	100% (282)	Captive	24%	13%	15%	7%	29%	13%	100% (208)
Outsourcing	58%	9%	11%	11%	7%	3%	100% (346)	Outsourcing	48%	9%	17%	1%	17%	8%	100% (135)
Joint Venture	45%	18%	18%	18%	0%	0%	100% (11)	Joint Venture	31%	23%	4%	0%	23%	19%	100% (26)
Total	54%	13%	11%	10%	8%	5%	100% (639)	Total	33%	12%	15%	4%	24%	11%	100% (369)

Table 5: Offshore locations and company size

USA	India	China	Lat Amer	Philippines	East Eur	Oth Asia	Total (N)	EUROPE	India	China	Lat Amer	Philippines	East Eur	Oth Asia	Total (N)
Small	16%	22%	19%	15%	16%	38%	18%	Small	22%	45%	43%	5%	40%	29%	32%
Midsized	42%	44%	21%	36%	35%	33%	38%	Midsized	55%	36%	32%	68%	43%	53%	48%
Large	42%	34%	60%	49%	49%	29%	43%	Large	23%	19%	25%	26%	17%	19%	20%
Total	100%	100%	100%	100%	100%	100%	100%	Total	100%	100%	100%	100%	100%	100%	100%
(N)	(443)	(103)	(78)	(74)	(63)	(48)	(809)	(N)	(170)	(74)	(44)	(19)	(132)	(70)	(509)
Small	48%	15%	10%	7%	7%	12%	100% (149)	Small	23%	20%	12%	1%	33%	12%	100% (163)
Midsized	59%	15%	5%	9%	7%	5%	100% (310)	Midsized	39%	11%	6%	5%	24%	15%	100% (242)
Large	53%	10%	13%	10%	9%	4%	100% (35)	Large	38%	13%	11%	5%	21%	13%	100% (104)
Total	55%	13%	10%	9%	8%	6%	100% (809)	Total	33%	15%	9%	4%	26%	14%	100% (509)

Table 6: Company size and functions offshored

USA	Admin M&S	CC	IT&Soft	PD	Procur't	Total (N)	EUROPE	Admin M&S	CC	IT&Soft	PD	Procur't	Total (N)
Small	14%	14%	16%	26%	19%	18%	Small	47%	25%	32%	36%	20%	35%
Midsized	31%	33%	45%	40%	19%	37%	Midsized	42%	44%	43%	47%	54%	45%
Large	55%	53%	39%	34%	62%	45%	Large	11%	31%	25%	17%	26%	21%
Total (N)	100% (228)	100% (147)	100% (293)	100% (250)	100% (47)	100% (965)	Total (N)	100% (176)	100% (119)	100% (198)	100% (180)	100% (69)	100% (742)
Small	18%	11%	27%	38%	5%	100% (174)	Small	32%	12%	25%	25%	5%	100% (256)
Midsized	20%	14%	36%	28%	3%	100% (359)	Midsized	22%	16%	26%	25%	11%	100% (332)
Large	29%	18%	27%	20%	7%	100% (432)	Large	12%	24%	32%	20%	12%	100% (154)
Total	24%	15%	30%	26%	5%	100% (965)	Total	24%	16%	27%	24%	9%	100% (742)

Table 7: Offshore locations and industrial sectors, USA

USA	India	China	Lat America	Philippines	East Europe	Other Asia	Total (N)
Finance and Insurance	23%	5%	28%	19%	7%	4%	19%
Manufacturing	30%	38%	23%	33%	47%	37%	32%
Media	4%	1%	1%	1%	4%	2%	3%
Professional Services	6%	7%	3%	0%	0%	9%	5%
Retail	6%	4%	1%	3%	0%	4%	4%
Software	17%	22%	13%	7%	25%	9%	16%
Technical Services	14%	20%	20%	34%	15%	30%	18%
Transportation	2%	2%	11%	3%	2%	4%	3%
Total (N)	100% (98)	100% (55)	100% (425)	100% (75)	100% (46)	100% (73)	100% (772)
Finance and Insurance	68%	3%	15%	10%	3%	1%	100% (143)
Manufacturing	51%	15%	7%	10%	10%	7%	100% (248)
Media	71%	5%	5%	5%	10%	5%	100% (21)
Professional Services	65%	19%	5%	0%	0%	11%	100% (37)
Retail	74%	12%	3%	6%	0%	6%	100% (34)
Software	56%	17%	8%	4%	11%	3%	100% (126)
Technical Services	42%	14%	11%	18%	6%	10%	100% (141)
Transportation	32%	9%	36%	9%	5%	9%	100% (22)
Total	55%	13%	10%	9%	7%	6%	100% (772)

Table 8: Functions offshored and industrial sectors, USA

USA	Admin M&S	CC	IT&Soft	PD	Procur't	Total (N)
Finance and Insurance	27%	24%	29%	8%	5%	21%
Manufacturing	30%	28%	31%	35%	57%	33%
Media	4%	2%	3%	1%	0%	3%
Professional Services	7%	1%	3%	6%	5%	4%
Retail	4%	6%	3%	4%	7%	4%
Software	10%	12%	19%	20%	2%	15%
Technical Services	16%	20%	11%	19%	25%	16%
Transportation	2%	7%	1%	6%	0%	3%
Total	100%	100%	100%	100%	100%	100%
(N)	(208)	(145)	(274)	(247)	(44)	(918)
Finance and Insurance	29%	18%	41%	10%	1%	100% (192)
Manufacturing	21%	14%	29%	29%	8%	100% (301)
Media	38%	13%	38%	13%	0%	100% (24)
Professional Services	36%	3%	18%	38%	5%	100% (39)
Retail	20%	23%	23%	28%	8%	100% (40)
Software	15%	12%	37%	35%	1%	100% (141)
Technical Services	22%	19%	19%	32%	7%	100% (149)
Transportation	13%	31%	9%	47%	0%	100% (32)
Total	23%	16%	30%	27%	5%	100% (918)

Table 9: Features of previous and present wave of outsourcing/offshoring

	Previous wave of (mainly) manufacturing outsourcing/offshoring	Present wave of business services outsourcing/offshoring
Outsourcing decision	Operational decision, made at the factory or divisional level Typically made by large multinationals	Board decision, related to firm restructuring Made by large multinationals <u>and</u> small and medium-sized firms
Nature of suppliers	Supplier operates in the same sector as client Monopsonistic power of clients Emergence of new intermediaries, fuzzy boundaries	Know-how that can be applied to clients in a broad range of sectors Suppliers do not face competition from clients Development of large global suppliers (IBM, EDS, Accenture) and evolution of small local providers into large offshoring service providers (TCS, Wipro)
Role of ICTs	Enabling role	Enabling role Organisational function that can be outsourced/offshored Coordination tool
Nature of investment	To exploit domestic capabilities and serve local markets Co-location of manufacturing and marketing	To serve home market or global operations of the firm Coordination of globally and inter-firm dispersed activities and knowledge
Clusters	Industry based Competition in the supply chain	Technology/knowledge/function based Hybrid organisations and complex networks
Location	Triad and sequential internationalisation to Asia and Latin America since the 1950s	Rapid re-location of existing of activities to India and China in the 1990s and in rest of Asia and Eastern Europe in the 2000s Important set of activities (technological integration and coordination) remain rooted in advanced economies

Appendix Table A1: Samples Description

	US	EU	Belgium	Germany	Netherlands	Scandinavia	Spain	UK
Companies offshoring	299	334	72	45	102	32	48	35
Implementations Offshore	1271	1258	219	192	453	71	205	118
Average Employment	27874	7793	636	53517	1945	3829	5209	16926
Median Employment	5000	400	120	13750	200	825	1800	283

Appendix Table A2: Size Distribution – Companies

Employees	US	EU	Belgium	Germany	NL	Scand	Spain	UK	Total
<500	29%	53%	72%	12%	70%	19%	43%	60%	41%
501-20000	36%	34%	26%	43%	30%	76%	39%	10%	35%
20000+	35%	13%	2%	45%	0%	5%	17%	30%	24%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
N	245	245	65	42	74	21	23	20	490

Appendix Table A3: Size Distribution – Projects

Employees	US	EU	Belgium	Germany	NL	Scand	Spain	UK	Total
<500	21%	39%	67%	10%	48%	14%	20%	40%	30%
501-20000	34%	42%	33%	34%	52%	74%	61%	12%	38%
20000+	45%	18%	0%	57%	0%	11%	20%	49%	32%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
N	995	863	207	185	286	35	82	68	1858

¹ Due to the very large size of US companies (see Tables A1, A2 and A3 in the Appendix) we define small companies as those with less than 500 employees, mid-size companies as those with 500 to 20,000 employees and large companies as those with more than 20,000 employees. Both companies and projects distribute fairly evenly in these classes (Appendix Tables A2 and A3).

² Information on industrial sectors is not available for Europe.