WHY DO FIRMS LOCATE R&D OUTSOURCING AGREEEMENTS OFFSHORE? THE ROLE OF OWNERSHIP, LOCATION, AND EXTERNALIZATION ADVANTAGES

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WHY DO FIRMS LOCATE R&D OUTSOURCING AGREEEMENTS OFFSHORE? THE ROLE OF OWNERSHIP, LOCATION, AND EXTERNALIZATION ADVANTAGES[1]

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Abstract

We examine the decision to outsource R&D services to an offshore supplier instead of a domestic one. Building on the OLI paradigm, we argue that the decision to outsource offshore an R&D service is dependent on: "ownership" advantages (governance capabilities); "location-specific advantages" offshore; and "externalization advantages" for the activities outsourced. Our hypotheses were confirmed using original survey data from European and U.S. firms in high-tech industries. We found that firms with more governance capabilities are the ones showing a higher propensity to outsource offshore and that the specific location of the agreement is conditioned by the motivation to outsource.

Key words: OLI paradigm; R&D offshore outsourcing; ownership advantages; location-specific advantages; externalization advantages

JEL classification: M10

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INTRODUCTION

Recent research indicates that, in a global economy, firms need to be more flexible, leaner and more focused on their core competencies in order to maintain their competitiveness and be responsive (Hitt et al., 1998; Kedia and Mukherjee, 2009; Kotabe and Mudambi, 2009; Prahalad and Hamel, 1990; Quinn, 2000). As no single firm can possess world-class capabilities across the value chain (Domberger, 1998), firms are increasingly disintegrating and outsourcing their business functions to take advantage of external resources. Firms are changing their sourcing strategies in two ways. First, they are increasing the number of activities of their value chains that are outsourced (Gilley and Rasheed, 2000; Hitt et al., 1998; Jacobides, 2005; Kotabe and Murray, 2004; Quinn and Hilmer, 2004), in such a way that outsourcing practices are being progressively extended to areas that were traditionally vertically integrated, such as those related to the innovation process (Granstrand et al., 1997; Howells et al., 2008; Leiblein et al., 2002; Manning et al., 2008; Narula, 2001; Quinn, 2000; Subramanian and Venkatraman, 2001; UNCTAD, 2005; Veugelers, 1997). And, second, firms are increasingly outsourcing these activities offshore, not only to international providers located in developed but also to developing countries (Bunyaratavej et al., 2007; Doh, 2005; Hirshfield and Schmid, 2005; Kedia and Mukherjee, 2009; Kotabe and Mudambi, 2009; Lewin and Peeters, 2006; Lewin et al., 2009; Mol et al., 2005).

Due to the uneven distribution of production factors and income around the world, the external resources needed by the firm may not be available in the home country, and such cross-country differences in resource endowments may drive the firm to seek for foreign suppliers (Dunning, 1980, 1981). This fact has facilitated the relocation of outsourcing agreements around the world, and, coupled with globalization and improvements in information and communication technologies (ICT), has made the sourcing of human capital possible worldwide. As a consequence, a new stream of research has emerged, largely among International Business scholars keen to gain a better understanding of this international outsourcing phenomenon, including the literature on *offshoring* or global sourcing (Bunyaratavej et al., 2007; Doh, 2005; Graf and Mudambi, 2005; Hätönen, 2009; Kedia and Mukherjee, 2009; Kotabe and Mudambi, 2009; Kotabe and Murray, 2004; Lewin et al., 2009; Manning et al., 2008; Mol et al., 2005; Mudambi, 2008; Lewin and Peeters, 2006). However, as stated by Doh et al. (2009), despite the important contributions of previous literature regarding these practices, past research focused largely on offshoring in the aggregate — the works by Graf and Mudambi (2005), Hätönen (2009), and Howells et al., (2008) being remarkable exceptions— sometimes overlooking the diversity and complexity of

offshore services activities and related location decisions geared toward specific offshoring functions.

This paper analyzes international outsourcing decisions in the specific context of R&D services. This is an interesting context for the study of this phenomenon, for two reasons. First, because of the crucial importance of R&D within every firm's strategy, at least for firms operating in technology-intensive sectors. Second, because the globalization of dynamic markets and the growing complexity and multidisciplinary nature of the innovation process implies a greater need for firms to be open to external partners in order to access complementary resources, achieve lower costs, or reduce time-to-market.

Specifically, we analyze key factors which determine the decision to outsource R&D services to a foreign country (i.e. international outsourcing or offshore outsourcing), explaining why firms outsource either to suppliers located in developed or in developing countries instead of relying on domestic suppliers for these services. To do so, we build a framework based on Dunning's eclectic Ownership-Location-Internalization (OLI) model (1980, 1981) adapted to the specific case of R&D offshore outsourcing. Our starting point is that, once a firm decides to outsource a particular R&D services, onshore (domestic) outsourcing is the default option, and we argue that the decision to move away from the default option will be dependent on: (i) the possession of firm-specific capabilities that favor offshore outsourcing on the side of the outsourcer; (ii) the possession of location-specific advantages on the side of the provider; and (iii) externalization advantages for the activities that are outsourced. We test these hypotheses with original survey data on 99 R&D service outsourcing agreements carried out by technology-intensive firms from the U.S. and the European Union.

THEORETICAL BACKGROUND AND HYPOTHESES

Although outsourcing in general it is not a new practice, outsourcing of high-value and knowledge-based services is[2]. Even though these activities have traditionally been conducted internally within the firm, they are now being progressively outsourced, even to emerging countries (Bunyaratavej et al, 2007; Doh, 2005; Lewin and Peeters, 2006; Lewin et al., 2009; Kedia and Mukherjee, 2009; Kotabe and Murray, 2004; Mol et al., 2005). In this paper we focus on R&D, an area in which the increasing globalization of markets and the growing firms' need to innovate more and at a faster rate, has led technological firms to be open to external partners in order to maintain their competitiveness. While taking into

[2] In this paper we refer as outsourcing to those activities that are performed by unaffiliated external parties.

account the decision of the firm to outsource, we focus our theoretical and empirical analysis on the choice of *where* to outsource, distinguishing between domestic and foreign outsourcing, and between developed and developing countries.

We assume that once a firm decides to outsource a particular R&D service from an external partner, domestic outsourcing is the default option, because it is easier to coordinate with the supplier as information asymmetry and cultural distance between the firm and the provider is lower than when outsourcing from a foreign firm (Mol et al., 2005; Rangan, 2000). In addition, previous research has found that, despite the higher level of internationalization of R&D activities (Cantwell, 1995; Kuemmerle, 1999), firms still conduct the majority of their R&D in their home market (Belderbos, 2003; Berry, 2006; Florida, 1997). However, despite this preference to do business at the national level, due to heterogeneity of resources located around the world, external resources needed by a firm may not be available within its home country, and these cross-country differences in resource endowment may drive the firm to seek such resources offshore searching for location-specific advantages.

In his famous OLI paradigm, John Dunning (1980, 1981) established that productive investments abroad require three requisites: ownership (firm-specific) advantages on the side of the foreign investor, location advantages on the side of the host country, and internalization advantages in the comparative assessment of the wholly owned subsidiary versus other means of transfer of the firm-specific advantages to a foreign country. The phenomenon of offshore outsourcing appears to both reaffirm and to challenge the OLI framework. While location-specific advantages seem to be an important determinant behind offshoring, the relevance of ownership and internalization advantages could be questioned (Doh 2005). Similarly, in a recent paper Kedia and Mukherjee (2009) proposed a theoretical framework to explain the offshoring practice of firms inspired by Dunning's work; the Disintegration-Location-Externalization framework. We agree with this previous literature in that when applying the OLI framework to offshore outsourcing decisions, the importance of location-specific advantages remains unquestionable, while internalization advantages are not so evident. However, we argue that ownership or firm-specific advantages are still required, as not all firms are equally equipped to effectively govern relationships offshore. Therefore, taking these previous works into account, and applying Dunning's OLI logic to the decision of offshore outsourcing we attempt to contribute to this literature by arguing that the firm's decision to internationalize its outsourced R&D functions requires three requisites. First, some ownership or firm-specific capabilities related to contracting abroad. As contracting abroad entails more difficulties than contracting in the home country, firms owning firm-specific capabilities that enable them to be better equipped to deal with these

additional difficulties would opt for offshore outsourcing. Second, offshore outsourcing requires the existence of location-specific advantages that drive the firm to choose foreign suppliers having bundles of resources different than the ones of the domestic suppliers. And third, contrary to Dunning's internalization advantages, offshore outsourcing requires externalization advantages, i.e. the existence of factors that encourage contracting the activity to a foreign supplier instead of to a foreign affiliate (what is called captive offshoring). In the following paragraphs, we analyze each of these three requisites to offshore outsourcing.

Ownership advantages: Technological Resources and Capabilities, and International Experience

We expect that not all firms are equally prepared to make the most of the potential benefits of offshore outsourcing. Specifically, we argue that the possession of firm-specific advantages such as the firm's degree of accumulation of technological resources and capabilities and international experience will influence both its need and its ability to tap external global resources and thus the probability of outsourcing R&D services to a specific region.

Technological resources and capabilities. When it comes to outsourcing R&D services, firms with strong technological capabilities are likely to have an edge over the competition. Initially, it could be expected that the more technological resources and capabilities a firm has, the less it will need to search for external sources of innovation. However, these capabilities can be leveraged if some specific parts of the R&D process are outsourced to an external firm. In effect, research has found a global tendency for knowledge-intensive firms from both advanced and emerging countries to disperse their value chains in order to control costs and apply leverage to their capabilities (Mudambi, 2008). It bears mentioning that the innovation process, like many other business functions (Gottfredson et al., 2005), is composed of different and technologically separable stages or services ranging from the initial idea to the final product. Due to the complexity of the innovation process, firms cannot achieve the same level of efficiency across all the activities within the process. For this reason, many firms are partially integrated and simultaneously outsource some activities in the R&D process (Afuah, 2001). Some firms even follow a concurrent sourcing strategy, i.e. they simultaneously make and buy the same good or service (Parmigiani, 2007; Rothaermel, 2006). As a result of this, we expect that technology intensive firms will need to search for efficient ways of relocating and organizing their different R&D services worldwide (Mudambi, 2008). This would imply that, when possible and available, these firms will prefer to outsource their R&D services to best-in-world providers in order to maintain its competitive advantage: either because they are more specialized or because they can perform the task

at a lower cost. Thus, due to the heterogeneity of technological resources across countries, we expect firms with sound technological capabilities to be more likely to outsource offshore R&D services as they will need to search either for state-of-the-art or low cost providers. In effect, these are the kind of providers which allow them to leverage their technological resources whilst maintaining a competitive advantage over their rivals.

However, in the context of R&D services, as firms accumulate technological capabilities, they will not only be under more pressure to search for world-class suppliers, but also better equipped than the rest of the firms to establish outsourcing agreements with foreign providers (Mayer and Salomon, 2006). As a result of these capabilities within a technological domain, firms develop governance capabilities so as to better select, negotiate and monitor the behavior of external suppliers (Mayer and Salomon, 2006). So, although firms lacking these capabilities would also benefit from global outsourcing, whatever the motive for doing so, they may not have the capability to manage such agreements. Firms lacking enough technological resources will be ill-equipped to select an appropriate partner, leading them facing adverse selection problems, and besides they will be ill-equipped to monitor their performance. As a consequence, we expect that the technological resources and capabilities possessed by a firm will increase its propensity to establish R&D outsourcing agreements with offshore providers. This leads us to our first hypothesis:

> **Hypothesis1:** The more technological resources and capabilities the firm has, the more likely it will be to outsource R&D services to offshore providers both to developed and to developing countries.

Experience in emerging markets. Previous research has found that offshore outsourcing is a result of firms' ability to search for and evaluate foreign providers (Mol et al., 2005; Rangan, 2000). With respect to this, Rangan's study argues that a lack of knowledge leads to the screening out of foreign sources, whilst a lack of previous interaction increase uncertainty regarding partners' reliability and fear of opportunistic behavior. Firms' international experience has been considered in the literature as one of the most important sources of organizational learning (Belderbos, 2003; Barkema and Vermeulen, 1999; Kogut and Zander, 1993). As, in fact, it has been shown that firms' foreign subsidiaries may act as a mechanism to access local knowledge and source technology (Veugelers, 1997; Frost, 2001). As developed countries have a better institutional environment than developing countries—usually characterized by lower levels of corruption and political instability (Cuervo-Cazurra, 2006)—we expect firms within developed countries to face severe

difficulties so as to be able both to identify a capable supplier in a developing country and to manage effectively an outsourcing agreement in those locations. As a result, in the context of R&D services outsourcing, we expect firms' previous experience doing business in developing countries to be especially crucial in the decision to offshore outsourcing to these countries because of the uncertainty and risk associated with these markets (Cuervo-Cazurra, 2006). This is due to the fact that the policy instability that usually exists in these countries may provide a loophole for the local service provider to behave opportunistically due to the restricted capacity of the foreign firm to enforce their rights (Henisz, 2000). Therefore, we hypothesize that:

> **Hypothesis 2:** Firms with international experience in developing countries will be more likely to outsource R&D services to an offshore provider located in a developing country.

Location-specific advantages: Specialized knowledge vs. Lower labor costs

As we argued before, accordingly to the OLI framework, the main motivation for firms to outsource abroad is the search for location-specific advantages. Similarly to the FDI literature on R&D, which argues that overall firms may decide to internationalize their R&D either to exploit their technological knowledge (efficiency reasons) or to explore or acquire new one (knowledge reasons) (Hagedoorn, 1993; Kuemmerle, 1999) and, following previous research in offshoring (Lewin and Peeters, 2006; Manning et al., 2008; Hätönen, 2009), we will consider the following motivations to outsource offshore: (1) capability-seeking in the form of a supply agreement with a highly specialized world-class supplier; or (2) efficiency**-s**eeking in the form of an outsourcing agreement with a supplier having lower labor costs. There are two aspects to this decision. On the one hand, some inputs and technical knowledge may be available only in limited locations, so firms may decide to outsource some of their activities from these regions in order to access available technological expertise (Calderini and Scellato, 2005; Cantwell and Santangelo, 1999. On the other hand, firms located in advanced economies may find that labor costs are high, compared to the value added to their products (Kotabe, 1998; Trent and Monczka, 2003) and, may thus decide to outsource some of these activities to low-cost countries in order to reduce costs. As a result, we expect that the international or offshore outsourcing decision will be mainly driven by either the objective of reducing labor costs, or that of accessing technological expertise. Therefore, we expect that the preferred location, i.e. domestic as opposed to offshore providers in developed countries or in developing countries, will vary depending on the firm's motivation for outsourcing a particular R&D service.

Capability-seeking. Because R&D services are knowledge-based activities, and knowledge tends to be location-specific, some regions may offer specialized know-how or capabilities within a specific technological domain. Research has found that the dispersion of R&D activities is largely a result of the emergence of increasingly specialized-niche business activities, many of which are strongly tied to a particular geographic space (Calderini and Scellato, 2005; Cantwell and Santangelo, 1999). As a result, in order to tap these resources and access this technological expertise, firms may need to establish outsourcing agreements with providers located within such regions so as to benefit from these specialized providers and take advantage of their experience. In fact, prior research has found that main locational drivers for services offshoring are the abundance and quality of human capital, cultural similarity and telecommunication infrastructure (Bunyaratavej, et al., 2007; Graf and Mudambi, 2005). In effect, recent work has shown that the majority of high-end product development and engineering activities are still being carried out in advanced Western economies (Mudambi, 2008). As a consequence, we expect that because world leaders in knowledge and technology are typically located within developed regions, when a firm wishes to outsource a particular R&D service so as to access specialized know-how or technological capabilities, it will be more likely to outsource offshore to a provider located in a developed country, as such countries are usually more technologically developed, boasting access to better technological infrastructure or centers of excellence. Thus, we argue that:

> **Hypothesis 3:** The more important capability-seeking as a motive for outsourcing, the more likely the R&D service will be outsourced to an offshore provider located in a developed country.

Seeking lower labor costs. As R&D activities are knowledge based and, as a consequence, rather labor intensive, cost remains an important driver behind offshore outsourcing, given that some firms within developed countries may find their labor costs high compared to those of developing countries (Kotabe, 1998). The development of a low-cost market of qualified providers located in emerging countries, not only for standardized non-core activities but also for those which add more value to the firm, such as R&D, has driven some firms to outsource some of these activities to these regions (Liebaerman, 2004; Maskell et al., 2007; Patel and Vega, 1999; Subramaniam and Venkatraman, 2001; UNCTAD, 2005), as this implies the possibility of significant savings on labor costs. As a consequence, we expect that when the reason for outsourcing is the search for a provider able to perform the R&D service more efficiently than the firm due to lower labor cost, firms

will prefer to outsource R&D services to providers located in emerging countries as is the case with other activities, such as manufacturing. Thus, we predict that,

> **Hypothesis 4:** The more important cutting labor costs as a motive for outsourcing, the more likely the R&D service will be outsourced to an offshore provider located in a developing country.

Externalization advantages and disadvantages: The role of Tacit Knowledge and Technological Uncertainty

Contrary to the OLI paradigm, when analyzing offshore outsourcing decisions, instead of internalization advantages, firms need to perceive high "externalization" advantages (Kedia and Mukherjee, 2009). Therefore, the decision to outsource offshore instead of onshore is also related to whether it is easy or difficult to externalize a specific transaction. For this reason, we take two service attributes into account which are especially relevant when deciding either to outsource innovation activities or where to locate them: (i) the extent to which tacit knowledge is required to perform the service; and (ii) the degree of technological uncertainty surrounding the activity.

The extent of tacit knowledge. The degree of tacitness of the knowledge being transferred is considered as a factor hindering research and technology transfer (Howells, 1996). Therefore, we expect the degree of tacit knowledge implicit in the service being outsourced to influence the efficiency of specialized providers worldwide, especially when firms' motivation for outsourcing is the need to access specialized know-how or technological expertise.

Once the firm decides to outsource an activity characterized by a high component of tacit knowledge to an external provider, the odds of finding a specialized provider will be reduced due to the impossibility of an external supplier benefiting from scale or scope economies when performing such idiosyncratic services (Williamson, 1985). Thus, we argue that the propensity of the firm to outsource offshore will be lower in this case. In other words, the efficiency gap between a domestic supplier and the best state-of-the-art supplier overseas will narrow according to the extent to which tacit knowledge is necessary. In addition, offshore outsourcing will entail higher coordination costs than domestic outsourcing. This is the case because tacit knowledge is difficult to articulate, codify and transfer (Kogut and Zander, 1993), and when outsourcing abroad the transfer of this knowledge is more difficult due to different cultures of the nations of the client and the supplier (Madhok, 1997). As a consequence, we expect these difficulties to be even more critical when outsourcing to

offshore providers in developing countries, as the capability of the foreign provider to outperform domestic providers will be reduced due to institutional differences, cultural distance, and communication costs (Teece, 1986). Therefore, we hypothesize that:

> **Hypothesis 5:** The more tacit the R&D service, the less likely the firm will be to outsource it to an offshore provider, either in a developed or in a developing country.

Technological uncertainty. Technological change may have an important effect on the decision to internalize or outsource a particular activity, thus reducing the probability of outsourcing it to a particular location. Internalizing activities under conditions of rapid technological change imposes inflexibility precisely when flexibility is most needed (Poppo and Zenger, 1998). Previous research has shown that greater use of outsourcing may deliver more flexibility, which may help firms to respond quickly to unanticipated threats and market opportunities (Hitt et al., 1998). Due to the fact that investments in technology are commonly quite specialized, rapid technological change may increase the likelihood of technological investments in knowledge and routines being rendered obsolete (Balakrishnan and Wernerfelt, 1986).

As stated by Kogut and Kulatilaka, (1994) in the presence of uncertainty firms can gain flexibility through international outsourcing as it allows for greater adaptability by enabling firms to switch location in the face of changing circumstances. Thus, taking all the above into account together with the main motivations driving firms to outsource R&D services abroad, we expect that, for services characterized by a high level of technological uncertainty, the outsourcing decision will be largely driven by the need to access specialized providers with the resources and capabilities required to perform them at a particular moment in time, and not so much by the need to reduce costs. Thus, we expect the level of technological uncertainty surrounding the R&D service to have a positive effect on the probability of a firm outsourcing it to offshore providers in developed countries, but we do not expect a significant effect on the probability of outsourcing to offshore providers in developing countries. This leads to our final hypothesis:

> **Hypothesis 6:** The more technological uncertainty surrounding the R&D service, the more likely the firm will be to outsource it to an offshore provider located in a developed country.

We summarize the hypotheses in Table 1.

Table 1. Factors driving the probability of outsourcing R&D services to offshore providers in developed countries or in developing countries instead of relying on domestic providers

Factors influencing the R&D outsourcing location	Probability of offshore outsourcing to developed countries	Probability of offshore outsourcing to developing countries
Ownership advantages		
• Technological resources and capabilities (H1)	(+)	(+)
• International experience in emerging countries (H2)	No effect	(+)
Location advantages		
• Capability-seeking (H3)	(+)	No effect
• Lower labor costs (H4)	No effect	(+)
Externalization advantages		
• The extent of tacit knowledge (H5)	(-)	(-)
• Technological uncertainty (H6)	(+)	No effect

DATA AND METHODS

Research Setting and Data

We obtained data on R&D outsourcing agreements through a mail survey conducted on a sample of firms competing in R&D-intensive industries. The targeted population was companies with headquarters in the U.S. and the European Union (EU), with more than 100 employees, and whose 2-digit SIC code was one of the five defined in the OECD classification as technology-intensive industries: (28) chemicals and allied products, (35) transportation equipment, (36) computers and electronics, (37) industrial machinery, and (38) analysis and measurement equipment. We stratified the sample according to industry and firm size to ensure external validity, using both domestic and international versions of the *Dun & Bradstreet Million Dollar Database.* Using these criteria, we obtained a list of 3,529 U.S. firms and 3,375 EU firms. From these lists, we randomly selected stratified samples of 2,000 firms from the U.S. and 2,000 from the EU, taking into account home country, industry and firm size. As mentioned above, efficiently managing R&D plays a crucial role in the competitive strategy of these industries, so we expect these firms to undertake efforts in order to achieve superior performance in their R&D outsourcing agreements worldwide.

In order to better understand the R&D outsourcing phenomenon and to develop a more comprehensive questionnaire, we conducted interviews with the heads of Technology and Innovation of a large US-based multinational company. Furthermore, the questionnaire was pre-tested on seven R&D managers located in different countries. Due to the international nature of the targeted population the questionnaire was translated into five languages: English, French, Italian, Spanish, and German. Given the different sizes of the firms and industries included in our targeted population, the questionnaire was mailed to the firms' CEOs along with a request to pass it on to the head of R&D or technology if necessary. We also made all versions of the questionnaire available on the Internet. The returned questionnaires were filled out by senior managers, namely, CEOs, VPs, heads of R&D or heads of technology or engineering departments.

We followed the principles of the Total Design Method (Dillman, 1978). A total of 105 completed questionnaires were received from the first mailing in July 2006. A second mailing was sent three months later and an additional 33 questionnaires were received. 303 mailings were returned as undeliverable. After a telephone follow-up process, we obtained a final sample of 182 usable responses (81 for the U.S. and 101 for the EU). After excluding the undeliverable addresses, our response rates were 4.5 % for the U.S. and 5.3% for the EU. The returned questionnaires were filled out by senior managers, namely, CEOs, VPs, heads of R&D or heads of technology or engineering departments. It must be noted that cross-national mail surveys aiming at an industrial population generate very low response rates, normally similar to the ones obtained in this study (see for instance, Yip and Dempster, 2005). In addition, in an international context there are virtually no alternatives to mail surveys if more than a couple of countries are included (Harzing, 2000). The 182 responses obtained are representative of the spectrum of firms in terms of industry, country of origin, and firm size (see table A1 in the Appendix for the distribution by firm, country of origin, and industry). Besides this, we compared the responses from the first mailing to those from the second but we found no significant differences at the 95% confidence level between early and late respondents in terms of firm size or the decision to outsource R&D. We thus conclude that a significant non-respondent bias is unlikely.

We asked firms to indicate which R&D service activities they were outsourcing from a comprehensive list of twelve, and where in the world they were doing so. The R&D services included on the list are basic or fundamental research, applied or experimental research, development of new products or new or improved processes, product design, design of technology processes and engineering systems, architectural services, software

development, scientific and technical support consulting services, software implementation services, and testing and analysis services. Given this list, 108 of the 182 firms outsource at least one of the R&D services listed (60% of our sample). Due to the fact that 96 of the 108 firms outsourcing R&D indicated that they were outsourcing more than one type of R&D service, and in order to be able to focus our study on a specific outsourcing relationship for each of the firms in our sample, we asked these firms to identify the type of R&D service that the company was outsourcing regularly, representative of the R&D activities carried out by the company (in terms of resources and volume being contracted) from the range of different R&D services outsourced. By focusing on these agreements we were able to analyze the most representative R&D outsourcing more precisely. Missing data on some of the variables reduced the sample to 99 usable questionnaires[3].

Because our dependent and some independent variables were obtained using the same survey instrument, our results may be affected by common-method bias. In order to deal with this issue, we used the procedural remedies related to questionnaire design suggested by Podsakoff et al., (200), and we performed Harman's single-factor test (Harman, 1967), which suggested no evidence of common-method bias.

Method of Analysis

In order to estimate a model with multiple discrete outcomes, we use a multinomial probit model. As in multinomial logit models, in multinomial probit, the estimates of coefficients for independent variables measure the effect of the variation of the independent variable on the relative probability of the dependent variable taking a particular value in relation to the probability of it taking another value which is used as reference (domestic suppliers in this case). The main advantage of using the multinomial probit instead of the logit is that this model allows error terms to be correlated across alternatives, thereby permitting it to circumvent the dilemma of the independence of irrelevant alternatives present in the multinomial logit model (Kennedy, 1998).

Measures

Our dependent variable 'LOCATION' equals '1' if the main provider for the R&D service outsourced is located in the firm's home country, '2' if the provider is located offshore but in a developed country, and '3' if the provider is located offshore but in a developing country. As a confirmation that international R&D outsourcing is probably in its early stage (Hirshfeld and Schmid, 2005; Manning et al., 2008) our data show that R&D outsourcing takes place

[3] We tested if this final sample was biased from the original one, but we found no significant differences at the 95% confidence level in terms of firm size, origin, industry or the decision to outsource offshore R&D.

basically at the domestic level. Of the 99 outsourcing agreements in the sample, 62 are domestic, 20 are outsourced to offshore providers located in developed countries, and 17 are located in developing countries. Domestic providers (LOCATION= 1) act as the reference category because, as it was previously justified, we expect it to be the default option (Rangan, 2000).

We included several independent variables. First, as an indicator of the firm's technological resources and capabilities we introduced two different measures. One input variable (*R&D INTENSITY*) as an indicative of the firm's effort on R&D. In order to do so, we asked the interviewee to estimate the firm percentage of R&D investment over sales. Second, as an output measure of the firm's accumulation degree of technological capabilities (*PATENTS)*, we use the number of patents assigned to the firm before the end of 2006, as recorded by the United States Patent and Trademark Office, UPSTO). In order to assess for the firm's international experience in emerging markets *(EXPERIENCE IN DEVELOPING COUNTRIES)* we introduced a dummy variable that takes value 1 if the firm owns subsidiaries either in East Europe, Asia, Africa, Latin America or East Europe, and 0 otherwise. To account for the motivation for outsourcing an R&D service we used two different items within the questionnaire. First, we measured the need to access specialized providers (*CAPABILITY-SEEKING*), asking the interviewee to evaluate the importance of 'Lack of skilled personnel within the company' as a reason for outsourcing the R&D service from 1 (very low) to 5 (very high) on a Likert scale. Second, to measure the need to reduce costs (*LOW LABOR COST-SEEKING)*, we asked in the questionnaire to evaluate the importance of 'Cutting labor costs' as a reason for outsourcing the R&D service on a Likert scale from 1 (very low) to 5 (very high). In relation to the attributes of the R&D service, we proxied the efficiency of specialized providers with the extent to which tacit knowledge is implicit in the service being outsourced (*TACITNESS*). Consequently, we expect that the more tacit the service, the lower the efficiency gap between offshore specialized providers and domestic providers. We used three items adapted from Kogut and Zander's (1993) work, and asked the interviewee to indicate his or her level of agreement with these statements related to the attributes of the R&D service they were outsourcing. Our inter-item reliability was also very high (Cronbach's alpha= 0.823) so we combined these three items to represent our construct. Finally, we created a variable *(UNCERTAINTY)* in order to assess the level of technological uncertainty surrounding the service. We asked the interviewee to indicate his or her level of agreement from 1 to 5 with two statements adopted from Poppo and Zenger (1998) regarding the attributes of the R&D service they were outsourcing (Cronbach's alpha=0.79). See the appendix for a description of the survey items used to develop our variables.

We also included several control variables. First, given that the previous literature also signaled process improvement as one of the main motives for outsourcing (Graf and Mudambi, 2005), we introduced a variable in order to control for this third motive for outsourcing *(PROCESS IMPROVEMENT)*. In order to develop this measure, we asked the interviewee to rank the level of importance of four factors in the decision to outsource the R&D service on a Likert scale from 1 to 5 (Cronbach's alpha= 0.754). Second, in relation to the R&D service being outsourced we controlled for the level of difficulty in measuring worker performance *(MEASUREMENT)* as it may have an effect on the outsourcing location decision. This single-item measure was adapted from Poppo and Zenger (1998) and it is consistent with previous work (Anderson and Schmittlein, 1984). To assess for the firm's overall international experience we created the variable *(MULTINATIONALITY)*, which counts the number of international wholly-owned subsidiaries possessed by the firm. Besides, we also introduced some variables to control for heterogeneity of firms. We created a dummy variable (*FIRM ORIGIN*) coded as one for firms founded in the European Union and zero for the U.S. We introduced the following industry dummies: SIC 28 (Chemicals); SIC 35 (Transportation Equipment); SIC 36 (Electronics); SIC 37 (Machinery); SIC 38 (Measurement Equipment). Due to our low number of observations, in our regression model both SIC 37 (Machinery) and SIC 38 (Measurement Eq.) act as reference categories, given that they were the ones with the lowest number of observations. Table 2 summarizes the variables used in the study and their definitions.

RESULTS

Table 3 shows correlations and descriptive statistics for all independent and control variables used in our model. No high correlations were observed. Table 4 reports the results from our multinomial probit regressions using two different specifications: control variables only (model I), and the full model (model II). Specifically, the table shows the value of the estimated coefficients, their robust standard errors and an indication of their significance level for each model. The models run reach significance levels below 0.001, as shown by the chi-squared values. Thus, the null hypothesis that all estimated coefficients are equal to zero may be rejected in all cases.

Table 2. Variable definitions

Variables	Concept	Data (see Appendix for a description of the survey items)
Dependent variable		
LOCATION	Location of the main provider for the R&D service	Equals "1" if the main provider for the R&D service outsourced is located in the firm's home country, "2" if the provider is located offshore but in a developed country, and "3" if the provider is located offshore but in a developing country.
Independent variables		
R&D INTENSITY	Firm's efforts in R&D	Firm's percentage of R&D investment over sales
PATENTS	Firm's accumulation of technological capabilities	Number of patents assigned to the firm before the end of 2006, as recorded by UPSTO
EXPERIENCE IN DEVELOPING COUNTRIES	Firm's international experience in emerging markets	Dummy variable that takes value 1 if the firm owns subsidiaries either in East Europe, Asia, Africa, Latin America or East Europe, and 0 otherwise
CAPABILITY-SEEKING	Firm's need to access specialized providers as a reason for outsourcing	Importance of "Lack of skilled personnel within the company" as a reason for outsourcing the R&D service from 1 to 5
LOW LABOR COST-SEEKING	Firm's need to reduce costs as a reason for outsourcing	Importance of 'Cutting labor costs' as a reason for outsourcing the R&D service on a Likert scale from 1 to 5
TACITNESS	The extent to which tacit knowledge is implicit in the service being outsourced	We asked the interviewee to indicate his or her level of agreement with three statements related to the attributes of the R&D service they were outsourcing (adapted from Kogut and Zander , 1993)
UNCERTAINTY	The level of technological uncertainty surrounding the service	We asked the interviewee to indicate his or her level of agreement with two statements related to the attributes of the R&D service they were outsourcing (adapted from Poppo and Zenger, 1998)
Control variables		
PROCESS IMPROVEMENT	Importance of process improvement as a reason for outsourcing	We asked the interviewee to rank the level of importance of four factors in the decision to outsource the R&D service on a Likert scale from 1 to 5
MEASUREMENT	The level of difficulty in measuring worker performance	Single-item measure adapted from Poppo and Zenger (1998)
MULTINATIONALITY	Firm's overall international experience	Number of international wholly-owned subsidiaries possessed by the firm
FIRM ORIGIN	Firm's region of origin	Dummy that takes value "1" for firms founded in the European Union and "0" for the U.S
INDUSTRY DUMMIES	2-digit industry dummies	We controlled for SIC 28 (Chemicals), SIC 35 (Transportation Equipment); and SIC 36 (Electronics). SIC 37 (Machinery) and SIC 38 (Measurement Eq.) act as reference categories

Table 3. Descriptive statistics and correlation matrix

	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. TACITNESS	2.99	1.01															
2. R&D INTENSITY	5.82	5.65	0.05														
3. PATENTS	84.97	296.46	-0.05	-0.09													
4. EXPERIENCE IN DEVELOPING COUNTRIES	0.18	0.39	0.07	-0.07	0.34*												
5. LOW LABOR COST-SEEKING	2.23	1.52	-0.00	0.02	-0.02	-0.02											
6. CAPABILITY-SEEKING	3.02	1.40	0.02	-0.28*	0.05	0.10	-0.15										
7. PROCESS IMPROVEMENT	3.23	1.05	0.25*	0.15	-0.18	-0.01	-0.01	0.07									
8. MEASUREMENT	2.62	1.18	0.23*	-0.05	-0.11	-0.15	-0.01	0.20*	0.31*								
9. UNCERTAINTY	2.44	1.16	0.03	0.11	-0.11	-0.13	-0.02	0.01	0.29*	0.41*							
10. MULTINATIONALITY	8.96	24.59	0.18	0.09	0.13	0.22	-0.15	-0.08	0.03	-0.09	0.11						
11. FIRM ORIGIN	0.50	0.50	0.03	0.11	-0.2*	-0.15	0.11	-0.05	-0.10	0.03	0.23*	-0.06					
12. SIC28	0.25	0.43	0.03	-0.11	0.11	0.11	-0.16	0.00	-0.13	0.03	-0.04	0.21*	0.18				
13. SIC35	0.27	0.44	-0.20*	-0.10	0.00	0.02	0.25*	0.08	-0.26*	-0.08	-0.05	-0.13	-0.09	-0.35*			
14. SIC36	0.22	0.41	0.18	-0.05	-0.01	-0.08	-0.10	0.12	0.39*	0.23*	0.06	-0.15	-0.14	-0.30*	-0.33*		
15. SIC37	0.10	0.30	-0.07	0.05	-0.07	-0.00	-0.01	-0.00	0.01	-0.02	-0.02	-0.04	0.02	-0.19*	-0.20*	-0.18	
16. SIC38	0.14	0.35	0.04	0.28*	-0.06	-0.06	0.00	-0.2*	0.00	-0.20*	0.05	0.12	0.04	-0.24*	-0.25*	-0.22*	-0.14

Note: (*) significant at the 5% level

Table 4. Multinomial probit regressions results predicting the probability of offshore outsourcing R&D to either a provider from a developed country or from a developing country (Baseline category: outsource R&D to a domestic provider)

	Model I		Model II	
Independent variables	**Developed countries**	**Developing countries**	**Developed countries**	**Developing countries**
R&D INTENSITY			0.142	-0.033
			(2.89)***	(0.47)
PATENTS			0.002	0.002
			(3.10)***	(3.23)***
CAPABILITY-SEEKING			0.418	-0.176
			(2.34)**	(0.54)
LOW LABOR COST-SEEKING			0.187	2.291
			(2.34)	(5.33)***
EXPERIENCE IN DEVELOPING COUNTRIES			0.165	3.03
			(0.23)	(1.95)*
TACITNESS			-0.527	-1.49
			(2.00)**	(2.36)**
UNCERTAINTY			0.625	-0.092
			(2.44)**	(0.20)
PROCESS IMPROVEMENT	0.027	-0.071	-0.155	-0.174
	(0.12)	(0.32)	(0.57)	(0.40)
MEASUREMENT	-0.313	-0.126	-0.58	0.363
	(1.56)	(0.63)	(2.27)**	(0.99)
MULTINATIONALITY	-0.004	-0.014	-0,010	-0,026
	(0.46)	(1.59)	(1,19)	(0,82)
FIRM ORIGIN	-0.749	-0.826	-1.304	-2.033
	(1.75)	(1.83)	(2.20)**	(1.74)*
SIC28 (CHEMICALS & PHARMACEUTICALS)	0.798	0.798	1.788	-2.473
	(1.35)	(1.35)	(2.79)***	(1.63)
SIC35 (TRANSPORTATION EQUIPMENT)	-0.292	0.133	-0.533	-4.384
	(0.47)	(0.24)	(0.70)	(2.83)***
SIC36 (ELECTRONICS)	0.150	-1.247	0.733	-3.669
	(0.23)	(1.58)	(1.04)	(2.80)***
Constant	-0.008	0.197	-1.543	-0.865
	(0.01)	(0.21)	(1.19)	(0.49)
Log pseudolikelihood	-77.176		-42.593	
Wald chi2	23.67*		183.03***	

Robust z statistics in parentheses

* significant at p<0.05; ** significant at p<0.01 ; *** significant at p<0.001

As can be seen in Table 4, the overall results support our hypotheses. According to out first hypothesis, PATENTS is positive and statistically significant, so the progressive accumulation of technological resources and capabilities increases the probability of offshore outsourcing as compared to the probability of outsourcing to a domestic provider. However, it should be noted that when we analyze the variable R&D INTENSITY aimed at measuring the technological resources a firm may have due to its R&D efforts, although we observe the expected positive sign, it is only statistically significant for those firms offshore outsourcing their R&D services to providers in developed countries. Thus, this result may suggest that, everything else being constant, firms which are more R&D intensive may feel less pressure to search for low-cost providers. The availability of financial resources to fund the R&D activities seems to lead these firms to look for state-of-the-art providers, instead of low-cost ones.

As regards the tests of Hypotheses 2 through 6, all variables involved present the expected sign and are statistically significant. In relation to Hypothesis 2, it may be observed that the variable EXPERIENCE IN DEVELOPING COUNTRIES shows a positive and significant effect when explaining the likelihood of offshore outsourcing the R&D service to providers in developing countries, as compared to the likelihood of outsourcing to domestic providers. Regarding Hypothesis 3, the variable CAPABILITY-SEEKING has a positive and significant effect on the probability of firms outsourcing R&D services to offshore providers located in developed countries as opposed to outsourcing to domestic providers. While the LOW LABOR COST-SEEKING variable is positive and highly significant when explaining the probability of outsourcing R&D services to developing countries, as compared to the probability of outsourcing them within the firm's home country. Thus, this result supports Hypothesis 4. Furthermore, the variable TACITNESS displays a negative and statistically significant coefficient for both developed and developing locations compared to the probability of outsourcing them to domestic providers. Finally, according to Hypothesis 6, the more technological uncertainty the more likely the firm will be to outsource R&D services to offshore providers located in developed countries, as is shown by the positive and significant coefficient of the UNCERTAINTY variable. With respect to this, it is important to note that, as we expected, UNCERTAINTY is non-significant in terms of explaining the probability of outsourcing to developing countries as opposed to outsourcing to domestic providers. We further explain these results in the discussion section.

With respect to the control variables, some results deserve special emphasis. First, the variable MEASUREMENT has a significant negative effect on the likelihood of outsourcing R&D services to offshore providers located in developed countries, but not to providers in

developing countries. This result suggests that, because outsourcing to developed countries has been found to be mainly driven by the need to take advantage of more developed capabilities, higher difficulty in measuring provider performance may aggravate the information asymmetry faced by firms when contracting foreign suppliers. Second, our results suggest that U.S. firms are more likely to outsource offshore R&D services as compared to those from the European Union, according to the negative and significant effect of the variable FIRM ORIGIN when explaining the probability both to offshore to developed countries and to developing countries as opposed to outsourcing to domestic providers. Thus, it is interesting that as it happens in the FDI literature on R&D that found that U.S. firms have been pioneers in the internationalization of their R&D activities compared to European or Japanese firms (Kuemmerle, 1999), U.S firms seem to be pioneers also in their decisions to outsource offshore stages within their R&D processes. Finally, the control variable measuring the overall firm's international experience (MULTINATIONALITY) is not statistically significant. So, as expected, it is the firm's experience in doing business in developing regions the one increasing the likelihood of offshore outsourcing to these locations, whilst previous international experience in developed countries appears not to be determinant when explaining the likelihood of that firm offshore outsourcing R&D services.

DISCUSSION AND CONCLUSION

The goal of this paper was to improve our understanding of the location determinants of R&D offshore outsourcing agreements. In particular, we analyzed the factors driving firms to outsource offshore R&D services either to providers located in developed countries or in developing countries, instead of relying on domestic suppliers to perform them. This phenomenon challenges the conventional wisdom of international R&D management and imposes a redefinition of the firms' R&D global strategy. Traditionally, the literature assumed that technology-intensive firms should not outsource R&D in order to protect their proprietary knowledge, as these activities are expected to be closely related to their competitive advantage. However, the practice of outsourcing some stages of the R&D process to specialized providers not only to developed countries but also to developing ones has been gaining momentum over the last years, even in the case of firms operating in technology-intensive sectors. By sourcing R&D globally, technological firms have found a way to benefit from the comparative advantages offered by both developed and developing countries in terms of specialized technological knowledge or lower labor cost. Knowing how to establish and manage this global R&D outsourcing network is a key function of today's managers of technological firms. However, due to the fact that international R&D outsourcing is still at an

early stage, there remains a lack of empirical studies able to shed light on the determinant factors driving firms to outsource to a particular offshore location.

To address this gap, and following Doh et al.'s suggestion (2009) to move beyond aggregate analyses, we developed a theoretical framework based on Dunning's (1980, 1981) OLI paradigm in which we argued that the decision to outsource offshore a specific R&D service depends on the ownership of firm-specific capabilities that favor offshore outsourcing by the outsourcer, on the existence of location-specific advantages in the country of the outsourced firms, and on the existence of externalization advantages for the activities that are outsourced. The integration of these factors allowed us to develop a more fine-grained analysis of the R&D offshore outsourcing phenomenon, as previous research on IB has stated the difficulty in exploring the distinctive features of these business practices. Therefore, on the one hand, by taking a similar approach to the OLI paradigm, our study extents the works by Doh (2005) and Kedia and Mukherjee (2009) to the particular case of R&D offshore outsourcing. On the other, it complements Graf and Mudambi's (2005) and Hätonen's (2009) work by recognizing the primary influence of factors such as what is being outsourced and why, and what kind of experience the firm has, on the decision of where to locate R&D services outsourcing agreements. Our main theoretical contribution is to highlight the fact that even to outsource offshore some firm-specific capabilities are required. The explicit consideration of these capabilities would thus help to explain inter-firm differences in the propensity to outsource offshore.

Our theoretical and empirical analysis highlights important implications for R&D management as our results suggest that firms are using R&D outsourcing as a competitive tool by combining (i) value-oriented outsourcing agreements for their more sophisticated R&D services located in more familiar and stable institutional environments, and (ii) cost-oriented outsourcing agreements for those R&D services being less critical within the innovation process, much of them directed towards providers in emerging markets. Our results suggest that firms having greater technological resources and capabilities are the ones that appear to be benefiting the most from this R&D offshore outsourcing market. Compared to firms lacking technological capabilities, those firms having strong technological resources and capabilities can approach more effectively either state-of-the-art providers in offshore developed countries or low-cost providers in developing countries. The accumulation of technological capabilities may allow these firms to develop governance capabilities, so they will be better equipped to identify world-class providers and to monitor their behavior (Mayer and Salomon, 2003). Thus, one important implication of our study is that technology managers have to be aware of the importance for the firm of developing strong technological capabilities in order to

effectively manage this global sourcing network. Our results complement Berry's (2006) finding that it is the leading technological firms that are investing in foreign R&D because a firm's prior possession of relevant knowledge and skills is crucial for a knowledge-seeking strategy to work on a global basis. In effect, another implication of our study is related to the type of provider chosen for performing R&D services. Firms with operational experience in developing countries are more likely to outsource R&D in such locations. Consequently, this indicates the important role that foreign subsidiaries in developing countries may play as a way to reduce uncertainty and the risk inherent to these regions, and thus allow the firm to better select available providers and manage these agreements. Accordingly, it seems that because firms have different abilities to absorb and transfer foreign knowledge, this will influence which firms will be able to use foreign R&D as part of a strategy to augment their technological capabilities (Berry, 2006).

Previous studies on offshoring have shown rather conclusively that the primary motives for outsourcing activities abroad are related to cutting costs, accessing resources or capabilities unavailable within the firm, and, to a lesser extent, process improvement (Lewin and Peeters, 2006; Kakabadse and Kakabadse, 2002; Manning et al., 2008). Thus, in relation to these motives, although there are recent studies arguing that firms are increasingly relocating innovation activities to developing countries motivated by the high-qualified workforce within these regions (Lewin et al., 2009; Manning et al., 2008), our study contributes to this literature by finding that —in the specific case of R&D offshore outsourcing—once fragmented the innovation process into different R&D services, it can be observed that only a small percentage of the most representative services within the R&D process are being outsourced by technology firms to developing countries and mainly motivated by lower costs. Thus, although R&D outsourcing is becoming a more widespread practice within technology firms —as was previously stated in Mol's (2005) work—the main location determinant of outsourcing to developing economies is labor cost. As a consequence, we do not find evidence that firms are outsourcing R&D services to developing economies searching for knowledge or because of their superior skills. Instead, when they have these motivations to outsource, firms seem to prefer providers in developed economies. Despite this, we should note that because R&D offshore outsourcing is a rather novel business practice, this may not be the case for other services. So, one limitation of this study is that our findings may be context-specific. However, this is rather inevitable when trying to disentangle this phenomenon and move beyond the aggregate analysis within this topic. Therefore, from a dynamic perspective, it can be expected that as firms gain experience through outsourcing in developing countries and, as a result of these practices providers within these regions develop greater technological skills, firms may evolve from seeking lower costs to

knowledge-seeking objectives when deciding to outsource to developing locations (Maskell et al., 2007). This propensity to outsourcing high-value R&D research services would increase as firms from emerging markets accelerate the catching up process in which they are reducing the competitive gap against established MNEs (Guillen & Garcia-Canal, 2009).

In agreement with previous research arguing that the degree of tacitness of the knowledge transferred hinders research and technology transfer (Howells, 1996; Howells et al. 2008), our study highlights the difficulty of effectively transferring tacit knowledge offshore. In effect, the degree of tacitness of the R&D service considered is expected to be especially determinant when deciding where to outsource it, as it has been widely recognized in the literature that the tacit component of technological knowledge requires costly face-to-face interaction to be effectively transferred (Teece, 1977). Consistent with this literature, we found that for those R&D services with a higher level of tacitness firms prefer to outsource them to domestic providers, as compared to offshore providers. This negative impact of the degree of tacitness of the service on the probability to outsource offshore is thus indicative of the increased difficulties associated with transferring this knowledge as the institutional and cultural distance between the firm's home country and that of the provider increases (Madhok, 1997; Teece, 1986). Consequently, the more tacit the service, the more specific to the firm, so the firm will have more difficulties in taking the most of the specialization advantages offered by a provider—in terms of economies of scale, scope, and learning effects—which will be greater the larger the difference between the institutional environments of the parties. These increased difficulties of benefiting from a specialized provider would thus reduce the externalization advantages perceived by the firm. Being able to exploit these specialization advantages is expected to be critical because, as it was previously established by Howell and colleagues' (2008) research on R&D outsourcing practices in the pharmaceutical industry, the activities attracting more outsourcing were those associated with specialist competences.

Finally, we found that the more technological uncertainty surrounding the R&D service, the more likely the firm was to outsource it to an offshore provider in a developed country as opposed to relying on a domestic provider to perform it. As a consequence, offshore outsourcing adds flexibility to the firm as it offers the possibility of switching production locations between countries offering providers with different technological resources and capabilities as the need arises. This higher probability of offshore outsourcing (to developed countries) as compared to domestic outsourcing can be also explained considering the role of trust when outsourcing this type of R&D services. Confidence and trust about the partner has been found to be a major constraint on the sourcing process (Howell's et al., 2008).

However, for services subject to frequent technological changes the development of a trustful and long-lasting relationship with the provider is not expected to be a major requirement, as the outsourcing agreement is not intended to last for a long period of time. In effect, taking into consideration the most representative R&D outsourcing agreements for the firms in our sample, when we analyze the average duration of the outsourcing relationships with the main provider for the R&D service, the obtained results support this argument (see the ANOVA analysis in table 5). Interestingly we find that in average the outsourcing relationships with providers in the firm's home country last substantially more than those with offshore providers. Whilst offshore R&D outsourcing agreements with providers in developing countries are, on average, the shortest relationships. This finding again suggests that international R&D outsourcing is probably in its early stage (Disher and Lewin, 2007; Hirshfeld and Schmid, 2005; Manning et al., 2008). However—similarly to the previously explained expected evolution from cost to value with respect to the motives driving firms to outsource to developing countries— from a dynamic perspective it can be also expected that the duration of the outsourcing relationships with providers in developing countries to evolve towards more long-lasting and trustful relationships as the firm gain experience doing business within these regions.

Table 5. Average duration of the outsourcing relationship with the main provider for the R&D service by location of the provider.

Location of the main provider for the R&D service	Average duration of the outsourcing agreement (in years)
Home country	13.67
Offshore developed country	9.05
Offshore developing country	7.53

F: 2.613 (2 d. f.) Sig. 0.079

This paper is not devoid of limitations. A more fine-grained study could be developed were we able to know the volume being outsourced as a percentage of the total budget designated to the R&D service, and of the firm's total R&D outsourcing budget. Even though our respondent firms are representative of the population by country of origin, industry, and firm size, we obtained a low response rate so our results should be analyzed with caution. Besides, this study could be further developed by analyzing the type of outsourcing relationship—i.e. long-term versus short-term agreement—chosen by the firm depending on

the R&D outsourcing location. In effect, further research overcoming these limitations and taking a longitudinal approach could facilitate a better understanding of the R&D offshore outsourcing phenomenon.

Given the current business environment, further analyses of R&D outsourcing promises to contribute to management practice. Our study provides evidence on the existence of a global market for R&D services outsourcing that covers practically all the stages within the firm's innovation process, whilst also demonstrating that that it is widely used by firms operating in technology-intensive sectors. This implies that R&D managers must search for the best way to effectively organize their firm's innovation activities worldwide in order to benefit from the comparative advantages offered by both developed and developing countries in terms of specialized technological knowledge or lower labor costs. Since those activities constitute the firm's core competences and are continuously evolving (Prahalad and Hamel, 1990), technology firms should be aware of the development of a global market of qualified providers for R&D services. Effective R&D managers should continuously rethink the technology strategy followed by the firm, i.e. which activities within the R&D process should be kept in-house and which ones should be outsourced and where. They should be able to analyze and identify which stages within the R&D process are critical for the firm—and, as a consequence, should be performed internally—and which stages are not longer core for the firm and thus should be outsourced to a specialized provider either domestically or offshore. In particular, taking an OLI approach, this study suggests that managers should continually reassess: (i) the ownership advantages, or firm-specific capabilities, possessed by the firm in order to effectively govern outsourcing agreements; (ii) the location-specific advantages offered by a particular country; (iii) together with the perceived advantages of externalizing a particular activity. In conclusion, what appears clear is that firms are using R&D outsourcing as a competitive tool, so knowing how to effectively combine a global network of value- and cost-oriented outsourcing agreements with providers dispersed worldwide presents several managerial challenges which deserve further attention from scholars in the field.

REFERENCES

Afuah, A. 2001. Dynamic boundaries of the firm: are firms better off being vertically integrated in the face of a technological change? *Academy of Management Journal*, 4(4): 1211-1228.

Balakrishnan, S. & Wernerfelt, B. 1986. Technical Change, Competition and Vertical Integration. *Strategic Management Journal*, 7(4): 347-359.

Barkema H.G., Shenkar O., Vermeulen F., & Bell J.H.J. 1997. Working abroad, working with others: How firms learn to operate international joint ventures. *Academy of Management Journal*, 40(2): 426-442.

Belderbos R. 2003. Entry mode, organizational learning, and R&D in foreign affiliates: Evidence from Japanese firms. *Strategic Management Journal* 24(3): 235–259.

Berry, H. 2006. Leaders, laggards and the pursuit of foreign knowledge. *Strategic Management Journal*, 27:151-168.

Bunyaratavej, K., Hahn E. D, & Doh, J. P. 2007. International offshoring of services: A parity study. *Journal of International Management*, 13 (1): 7-21.

Calderini, M. & Scellato, G. 2005. Academic research, technological specialization and the innovation performance in European regions: an empirical analysis in the wireless sector. *Industrial & Corporate Change*, 142: 279-305

Cantwell, J. 1995. The globalisation of technology: What remains of the product cycle model. *Cambridge Journal of Economics*, 191:155-174.

Cantwell, J., & Santangelo, G.D. 1999. The frontier of international technology networks: sourcing abroad the most highly tacit capabilities. *Information Economics and Policy*, 11(1): 101-123.

Cuervo-Cazurra, A. 2006. Who cares about corruption? *Journal of International Business Studies*, 37: 807–822.

Dillman, D.A. 1978. Mail and telephone surveys: The total design method. New York, NY: John Wiley & Sons.

Doh, J. 2005. Offshore outsourcing: Implications for international business and strategic management theory and practice. *Journal of Management Studies*, 42: 695-705.

Doh J. , Bunyaratavej, K. & Hahn, E. 2009. Separable but not equal: The location determinants of discrete services offshoring activities. *Journal of International Business Studies*, 40 (6): 926-943.

Domberger, S. 1998. The contracting organization: A strategic guide to outsourcing. Oxford University Press, Oxford

Dunning, J.H. 1980. Towards an eclectic theory of international production: Some empirical tests. Journal of International Business Studies, 11 (1): 9-31.

Dunning, J.H. 1981. International Production and the Multinational Enterprise. London: Allen and Unwin.

Florida R. 1997. The globalization of R&D: results of a survey of foreign affiliated R&D laboratories in the USA. Research Policy, 26: 85–103.

Frost T. 2001. The geographic sources of foreign subsidiaries' innovations. *Strategic Management Journal,* 22 (2): 101–123.

Gilley, K. & Rasheed, A. 2000. Making more by doing less: An analysis of outsourcing and its effect on firm performance. *Journal of Management*, 26: 763-790.

Gottfredson , M., Puryear, P., & Phillips S. 2005. Strategic sourcing: From periphery to the core. *Harvard Business Review*, Feb. 05: 132-139.

Graf, M. & Mudambi S. M. 2005. The Outsourcing of IT-Enabled Business Processes: A Conceptual Model of the Location Decision. *Journal of International Management*, 11 (2): 253-268

Granstrand, O., Patel, P. & Pavitt, K. 1997. Multi-Technology Corporations: Why they have "Distributed" rather than "Distinctive Core" Competencies". *California Management Review*, 39 (4): 8-25.

Guillen, M.F. & Garcia-Canal, E. 2009. The American Model of the Multinational Firm and the "New" Multinationals From Emerging Economies. Academy of Management Perspectives, 23 (2): 23-35.

Harzing, A. 2000. Cross-national industrial mail surveys: Why do response rates differ between countries? *Industrial Marketing Management*, 29 (3): 243-254.

Hagedoorn, J. 1993. Understanding the rationale of strategic technology partnering: interorganizational modes of cooperation and sectoral differences. *Strategic Management Journal*, 14: 371-385.

Harman, H. 1967. Modern factor analysis. Chicago, IL: University of Chicago Press.

Hätönen, J. 2009. Making the locational choice: A case approach to the development of a theory of offshore outsourcing and internationalization. *Journal of International Management*, 15 (1): 61-76.

Henisz, W. J. 2000. The institutional environment for multinational investment. *Journal of Law, Economics and Organization*, 16 (2): 334-64.

Hirshfeld, S. & Schmid, G. 2005. Globalization of R&D. *Technology Review* 184/2005, Tekes.

Hitt, M. A. Keats, B. W. & DeMarie, S. M. 1998. Navigating in the new competitive landscape: Building strategic flexibility and competitive advantage in the 21st century. *Academy of Management Executive*, 12 (4): 22-42

Howells, J. 1996. Tacit knowledge, innovation and technology transfer. *Technology Analysis and Strategic Management*, 8: 91-106.

Howells, J., Gagliardi, D. & Malik, K. 2008. The growth and management of R&D outsourcing: evidence from UK pharmaceuticals. *R&D Management*, 38 (2): 205-219.

Jacobides, M.G. 2005. Industry change through vertical disintegration: How and why markets emerged in mortgage banking". *Academy of Management Journal*, 26: 395-413

Kedia, B.L. & Mukherjee, D. 2009. Understanding offshoring: A research framework based on disintegration, location and externalization advantages. *Journal of World Business*, 44: 250–261

Kennedy, P. 1998. *A Guide to Econometrics*. Cambridge, MA: The MIT Press.

Kogut, B. & Kulatilaka, N. 1994. Operating Flexibility, Global Manufacturing, and the Option Value of a Multinational Network. *Management Science*, 40 (1): 123-139.

Kogut B. & Zander, U. 1993. Knowledge of The Firm And The Evolutionary Theory Of The Multinational Corporation. *Journal of International Business Studies*, 4th Qt.: 625-645.

Kotabe, M. 1998. Efficiency vs effectiveness orientation of global sourcing strategy: A comparison of US and Japanese multinational companies. *Academy of Management Executive*, 12: 107-119

Kotabe & Mudambi, R. 2009. Global sourcing and value creation: Opportunities and Challenges. *Journal of International Management*, doi:10.1016/j.intman.2009.03.001

Kotabe, M. & Murray, J. 2004. Global sourcing strategy and sustainable competitive advantage. Industrial Marketing Management, 33: 7-14

Kuemmerle W. 1999. The drivers of foreign direct investment into research and development: an empirical investigation. *Journal of International Business Studies* 301: 1–24.

Leiblein, M, Reuer, J. & Dalsace, F 2002. Do make or buy decisions matter? The influence of organizational governance on technological performance. Strategic Management Journal, 23: 817–833.

Lewin, A., Massini, S., and Peeters, C. 2009. Why are companies offshoring innovation? The emerging global race for talent. Journal of International Business Studies, 40 (6): 901-925.

Lewin, A., & Peeters C. 2006. The Top-Line Allure of Offshoring. Harvard Business Review, 84: 22-24.

Madhok A. 1997. Cost, value and foreign market entry mode: the transaction and the firm. Strategic Management Journal, 181: 39-61.

Manning, S., Massini, S. & Lewin, C. 2008. A dynamic perspective on next-generation offshoring: the global sourcing of science and engineering talent. Academy of Management Perspectives, August, 35-54

Maskell, P., Pedersen, T., Petersen, B., & Dick-Nielsen, J. 2007. Learning paths to offshore outsourcing: From cost reduction to knowledge seeking. Industry & Innovation, 143: 239-257.

Mayer K.J & Salomon R.M. 2006. Capabilities, contractual hazards, and governance: Integrating resource-based and transaction cost perspectives. Academy of Management Journal, 49: 942-959.

Mol, M. 2005. Does being R&D intensive still discourage outsourcing? Evidence from Dutch firms. Research Policy, 34, 571-582.

Mol, M., van Tulder R.J.M., & Beije, P.R. 2005. Antecedents and performance consequences of international outsourcing. International Business Review, 14 pp. 599-617

Mudambi, R. 2008. Location, control and innovation in knowledge-intensive industries. Journal of Economic Geography, 8 (5): 699–725.

Narula, R. 2001. Choosing between internal and non-internal R&D activities: Some technological and economic factors. Technology Analysis & Strategic Management, 13 (3): 365-387.

Narula, R., & Hagedoorn, J. 1999: Innovating through strategic alliances: moving towards international partnerships and contractual agreements. Technovation, 19: 283-294.

Nicholls-Nixon C., & Woo C. 2003. Technology sourcing and output of established firms in a regime of encompassing technological change. Strategic Management Journal, 24 (7): 651-666.

Parmigiani, A.E. 2007. Why do firms both make and buy? An investigation of concurrent sourcing. Strategic Management Journal, 28: 285-311.

Patel P. & Vega M. 1999. Patterns of internationalization of corporate technology: location versus home country advantages. Research Policy, 28, 145-155

Poppo, L., & Zenger, T. 1998. Testing alternative theories of the firm: transaction cost, knowledge-based, and measurement explanations for make-or-buy decisions in information services. Strategic Management Journal, 19 (9): 853-877.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y., & Podsakoff, N.P. 2003. Common method biases in behavioral research: A critical review of the literature and recommended remedies. Journal of Applied Psychology, 88: 879-903.

Prahalad, CK & Hamel, G. 1990. The Core Competence of the Corporation. Harvard Business Review 68: 79-91.

Quinn, J.B. 2000. Outsourcing innovation: the new engine of growth. Sloan Management Review, 41 (4): 13-28.

Quinn, J.B. & Hilmer, F.G. 1994. Strategic outsourcing. Sloan Management Review, 35: 43-55.

Rangan, S. 2000. Search and deliberation in international exchange: Microfoundations to some macro patterns. Journal of International Business Studies, 31: 205 – 222.

Rothaermel, F.T., Hitt, M.A., & Jobe, L.A. 2006. Balancing vertical integration and strategic outsourcing: effects on product portfolio, product success, and firm performance. Strategic Management Journal, 27 (11): 1033-1056.

Teece, D. 1986. Profiting from technological innovation: implications for integration, collaboration, licensing and public policy. Research Policy, 15, 285-305.

Trent R.J. & Monczka, R.M. 2003. International purchasing and global sourcing—what are the differences. Journal of Supply Chain Management 39 (4): 1–16.

UNCTAD 2005. World Investment Report 2005: Transnational Corporations and the Internalization of R&D.

Veugelers, R. 1997. Internal R&D expenditures and external technology sourcing. Research Policy, 26: 303-315.

Williamson, O.E. 1985. The economic institutions of capitalism. New York, NY: The Free Press.

APPENDIX.

Description of survey items used in the study.

R&D INTENSITY

- Could you please estimate your company's R&D investment over sales? …….. %

CAPABILITY-SEEKING

- In your opinion, rank the level of importance that the following factor had in the decision to OUTSOURCE the R&D service mentioned:

REASONS for OUTSOURCING	LOW HIGH
Lack of skilled personnel within the company.	(1) (2) (3) (4) (5)

LOW LABOR COST-SEEKING

- In your opinion, rank the level of importance that the following factor had in the decision to OUTSOURCE the R&D service mentioned:

REASONS for OUTSOURCING	LOW HIGH
Cut labor costs.	(1) (2) (3) (4) (5)

TACITNESS (Cronbach's alpha= 0.823)

- In your opinion, could you indicate to what degree the following ATTRIBUTES are characteristic of this R&D service being outsourced by your company?:

ATTRIBUTES of the R&D service outsourced	LOW HIGH
It is difficult to third parties to understand the company know-how related to this service.	(1) (2) (3) (4) (5)
It is difficult to third parties to copy or imitate the abilities or technological knowledge required to perform the service.	(1) (2) (3) (4) (5)
Effective transfer of the company know-how to perform this service requires a high and frequent level of interaction with the personnel of the company.	(1) (2) (3) (4) (5)

UNCERTAINTY (Cronbach's alpha=0.79)

- In your opinion, could you indicate to what degree the following ATTRIBUTES are characteristic of this R&D service being outsourced by your company?:

ATTRIBUTES of the R&D service outsourced	LOW HIGH
The skills required to perform the service are frequently changing.	(1) (2) (3) (4) (5)
The optimal configuration of hardware and software required to perform this service is frequently changing.	(1) (2) (3) (4) (5)

PROCESS IMPROVEMENT (Cronbach's alpha= 0.754)

- In your opinion, rank the level of importance that the following factors had in the decision to OUTSOURCE the R&D service mentioned:

ATTRIBUTES of the R&D service outsourced	LOW HIGH
Reduce the time it takes from product development to sales ("time-to-market").	(1) (2) (3) (4) (5)
Cut costs through consolidating certain activities at specialized centres.	(1) (2) (3) (4) (5)
Increase operational flexibility.	(1) (2) (3) (4) (5)
Reorientate company efforts and resources to its core activities.	(1) (2) (3) (4) (5)

MEASUREMENT

- In your opinion, could you indicate to what degree the following ATTRIBUTES are characteristic of this R&D service being outsourced by your company? :

ATTRIBUTES of the R&D service outsourced	LOW HIGH
It is difficult to measure the collective performance of those individuals who perform this service	(1) (2) (3) (4) (5)

Table A1. Distribution of survey responses by country of origin and industry.

		Population of firms		***Mailed surveys***		***Received surveys***	
		Nº	***%***	***N***	***%***	***Nº***	***%***
ORIGIN	US	3529	*51.12%*	2000	*50%*	81	*45%*
	European Union	3375	*48.88%*	2000	*50%*	101	*55%*
	Austria	95	*1.38%*	56	*1.40%*	2	*1.98%*
	Belgium	43	*0.62%*	25	*0.63%*	2	*1.98%*
	Czech Republic	33	*0.48%*	20	*0.50%*	1	*0.99%*
	Denmark	38	*0.55%*	23	*0.58%*	0	*0%*
	Finland	54	*0.78%*	32	*0.80%*	0	*0%*
	France	373	*5.40%*	221	*5.53%*	9	*8.91%*
	Germany	1041	*15.08%*	617	*15.43%*	24	*23.76%*
	Greece	4	*0.06%*	2	*0.05%*	2	*1.98%*
	Ireland	29	*0.42%*	17	*0.43%*	0	*0%*
	Italy	854	*12.37%*	507	*12.68%*	32	*31.68%*
	Luxembourg	2	*0.03%*	1	*0.03%*	0	*0%*
	Poland	63	*0.91%*	37	*0.93%*	3	*2.97%*
	Portugal	22	*0.32%*	13	*0.33%*	1	*0.99%*
	Spain	157	*2.27%*	93	*2.33%*	9	*8.91%*
	Sweden	71	*1.03%*	42	*1.05%*	3	*2.97%*
	The Netherlands	35	*0.51%*	21	*0.53%*	1	*0.99%*
	UK	421	*6.10%*	249	*6.23%*	12	*11.88%*
	East Europe	40	*0.58%*	24	*0.60%*	0	*0%*
INDUSTRY	SIC 28 (Chemicals)	1312	*19.00%*	760	*19.00%*	45	*24.73%*
	SIC 35 (Transportation Eq.)	2337	*33.85%*	1357	*33.93%*	58	*31.87%*
	SIC 36 (Electronics)	1635	*23.68%*	947	*23.68%*	40	*21.98%*
	SIC 37 (Machinery)	840	*12.17%*	487	*12.18%*	16	*8.79%*
	SIC 38 (Measurement Eq.)	780	*11.30%*	449	*11.23%*	23	*12.64%*

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