

## OFFSHORING OF CORE VERSUS NON-CORE ACTIVITIES

### INTRODUCTION

Triggered by cost savings, access to talented people and new knowledge, offshoring has attracted an increasing number of companies. As competition intensifies and the pace of change accelerates, companies are considering the possibilities of global sourcing of products, knowledge and services. They cannot just rely on the existing configuration of their activities that typically has a strong focus in the home country rather they must consider new ways of offshoring activities (global sourcing). In this sense offshoring has become an imperative for many companies (Lewin and Peeters, 2006; Pyndt and Pedersen, 2006; Dossani and Kenney, 2003).

In order to be able to reconfigure the activities and reap the benefits of offshoring companies are organizing the value chain activities more efficient. In particular, they are fine slice the value chain in smaller but more coherent modules that can be separated from each other in space and time. The value chain can be reconfigured in a number of dimensions e.g. in terms of space and governance of each value chain activity (Asmussen *et al.*, 2007). Therefore, companies must make choices of what to offshore (i.e. which activities should be offshored) and how to govern the offshored activities (i.e. retain the activities within the boundary of the company or contract out the activity to an independent supplier).

When it comes to these choices of how and what activities to offshore it is often argued that companies “keep core activities in-house, and outsource non-core activities.” However, some questions remain unanswered like what is “core activities” and what is “non-core activities”? Is this dichotomous so companies only have core or non-core activities? Or do we rather have some activities that are closer or further away from the core activities? It might be that as companies are fine slicing and offshoring even some of the more advanced activities (e.g. research, design and product development) they will offshore not just peripheral activities but also activities that are closer to the core activities.

In this paper we propose that while companies typically keep the distinctive core activities or what we denote the *core activities of first degree* in-house and close to the headquarter, they are beginning to offshore what we denote *core activities of second degree* i.e. other activities that are essential to the company's competitive advantage, simply because they need to tap into knowledge and talent in other part of the world. Two hypotheses is proposed that the offshoring of core activities of second degree will be in the form of offshoring to its own subsidiary (captive offshoring), while the offshoring of non-core activities more often will involved an independent supplier (outsource offshoring). Furthermore, we argue that this will be even more pronounced in knowledge-intensive industries where interfaces between the different activities are less standardized (two hypotheses).

These four hypotheses are tested on a unique dataset of 263 companies from 15 different European countries that have responded to a 3-page questionnaire on their offshoring behavior. In total the dataset includes 530 offshoring operations spanning five different value chain activities, and with information on the offshoring mode and the importance of these activities for the competitive advantage of the companies.

## **LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT**

### **Captive Offshoring or Outsource Offshoring**

Previous research defines offshoring as the transfer of business processes and activities to foreign locations (Levy, 2005). The distinctions are made between *captive offshoring* (intra-company transfer of activities to fully-owned subsidiaries) and *outsource offshoring* (inter-company transfer of activities to independent companies or companies with minority stakes). We use the term captive offshoring as synonymous to other concepts used in the literature referring to international relocation of activities undertaken by own subsidiaries like *internal offshoring* (OECD, 2005), *offshore in-house sourcing* (OECD, 2007) and *offshore insourcing* (Kotabe, *et al.*, 2007), and the term outsource offshoring referring to relocation of international activities carried out by independent firms which other have denoted *non-captive offshoring* (WTO, 2005) and *external offshoring* (OECD, 2005). Captive offshoring is clearly overlapping with foreign direct investment (FDI) in the sense that captive offshoring involves FDI, but not all FDI involves carrying out captive offshoring (Levy and Dunning,

1993). Captive offshoring involves FDI for those activities that have a global (or regional) mandate and are (or could have been) relocated to other locations, while FDI are including many local and market-oriented activities (like sales subsidiaries and production for the local market) that are not offshoring.

The logic of offshoring is in many ways breaking with the dominant view in International Business studies. The dominant view being that internationalization is mainly following a market-oriented logic (a downstream logic), where competitive advantage is created in the first place at home and then this advantage is exploited abroad through a global network of subsidiaries that mainly apply and adapt the home-based advantage to the local markets. Offshoring is rather following an upstream logic where the focus is on how companies can tap into resources abroad like cheap labor, talented people and new knowledge. According to this logic competitive advantage is created and developed by sourcing the necessary pieces and knowledge in many parts of the world and not just in the local pond at home. Kuemmerle (1997) made the distinction between the home-based exploiting logic and the home-based augmenting logic for subsidiaries. Offshoring is a phenomenon related to the home-based augmenting logic as its starting point is that companies need source some of their valuable inputs and advanced activities on a global scale and not just in the home market.

Porter (1986) did also highlight this shift in logic when he proposed that companies are moving from a “dispersed value chain configuration” (the mini-replica case where the focus is on optimization on each individual market) to a “concentrated value chain configuration” (where focus rather is on global optimization). The concentrated value chain configuration implies that companies optimize the organization and location of each value chain activity on a global scale meaning that they concentrate each value chain activity in different locations in order to take advantage of the location-specific factors in that particular location e.g. by locating production in China, IT in India, R&D in USA, etc..

Hand in hand with the increasing offshoring goes the effort of splitting up the value chain in finer and finer modules (set of activities) that are internally coherent, and with standardized interfaces with other modules that limit the need for extensive communication and coordination – i.e. the process of fine slicing of the value chain. Many companies have gone through this process of fine slicing the

value chain that basically entail that companies learn its own processes in-depth, standardize some activities, bundle activities in new ways and specify interfaces among the activities. Very often this process is carried out under the heading of Lean or Six Sigma, where the goal is to reorganize, standardize and specify interfaces among different activities.

The offshoring trend originated as early as the 1960s when primarily blue-collar manufacturing activities were relocated to low-cost countries. As the communication infrastructure improved and the global telecommunication costs decreased, the offshoring development was taken to another level (Levy, 2005). The last decade has witnessed an increasing propensity to offshore. Recent findings drawn from an Offshoring Research Network (ORN) that have collected the most complete data on companies offshoring activities (encompassing over 1.600 companies globally) indicates that the level of offshoring have boomed in the last five years (Lewin and Cuoto, 2006).

Yet, as offshoring has boomed, it has also become more manageable. The political and regulatory environments of host countries have eased considerably. At the same time the knowledge pools, flexibility and skill-level of local labor have increased without losing cost competitiveness.

Increasingly, offshoring not only includes manufacturing jobs, but also more advanced and higher value-adding activities (Lewin and Peeters, 2006; UNCTAD, 2004). Ward (2004) acknowledges a shift in the offshoring trend from the standardized processes to increasingly knowledge-intensive processes, which require increasing levels of domain and subject expertise together with higher-end professional talent. In fact, Lewin and Cuoto (2006) report based on the ORN-data that although more standardized activities like IT and Call Center are still the most commonly offshored activities, the activities where offshoring is increasing most are the more advanced activities like R&D, engineering and product design.

### **Offshoring of Core and Non-core Activities**

Current literature increasingly divides the spectrum of relocated or subcontracted activities across the non-core and core distinction (Gilley and Rasheed, 2000; Heikkilae and Cordon, 2002; Levy, 2005). However, this distinction raises the issue of whether the scale is really dichotomous and does this imply that when companies are offshoring advanced activities (like R&D) then they are offshoring

core activities. We doubt that this imply the offshoring of core activities. We know from the auto industry (one of the industries that were early on in offshoring) that it is not uncommon to offshore activities “closer to the core” that was previously conducted in-house. This is for example the case when an entire sub-system of a car, such as the power-train, is offshored to a subsidiary that is given the global mandate to develop this part of the car (Harland *et al.*, 2005).

Accordingly, we argue for a more fine grained distinction of the core activities where they are divided into *core activities of first degree* i.e. the real core activities that is distinctive and crucial for the competitive advantage and *core activities of second degree* i.e. activities that are complementary and important but not as critical for the competitive advantage. Heikeilä and Gordon (2002) make a similar distinction between distinctive competencies (the ones allowing the company to excel), and essential competencies (needed for sustaining its profitable operations). The distinction between different degrees of core activities is in line with the fine slicing of value chain activities, where also some of those activities that previously were perceived as protected core activities are separated out. In that sense the core activities of first degree is typically getting more narrow, while the complementary core activities of second degree is separated out as more independent activities with defined interfaces with other activities.

Initially, the majority of organizations followed the established convention based on the competency view of the firm and offhored mainly their non-core activities. *Non-core activities*, also referred to as peripheral, are those which are not vital for companies’ competitive position (Quinn and Hilmer, 1994) and are less strategically relevant for company’s long-run success (Gilley and Rasheed, 2000). One strong argument for offshoring the non-core activities is that companies were able to allocate more resources, both human and capital, as well as time and effort towards creating and maintaining their *core activities* (Gilley and Rasheed, 2000; Quinn and Hilmer, 1994). In addition, to this argument that builds on the advantages of specialization it has also been put forward that the benefits of offshoring includes increased flexibility and cost savings.

However, these arguments for offshoring the non-core activities are pointing towards outsource offshoring rather than captive offshoring since only outsourcing the task to an independent company will allow the focal company to reap the benefits of specialization and focusing all their

(managerial, financial etc.) resources on developing and maintaining the core activities. Accordingly, we propose the following hypotheses:

*Hypothesis 1: Offshoring of non-core activities will mainly be in the form of outsource offshoring*

Recently, however, a number of studies report an increased redeployment of activities which are strategically important for the company's 'core' (Baden-Fuller *et al.*, 2000; Gilley and Rasheed, 2000; Lei and Hitt, 1995) or core activities of second degree. This is complementary activities that involve research, design, engineering, and product development and the like. The main arguments for relocating these activities are that the companies need to tap into the critical knowledge and the talented people wherever it can be found. They cannot rely on getting all the needed knowledge input from the home base, so they need to scan and mobilize knowledge globally (Doz *et al.*, 2001).

The offshoring of these activities require an ongoing communication and coordination within the company. As such, there might be inherent benefits in retaining these activities within the boundary of the company rather than passing management control and decision rights to a third party. Captive offshoring will also have other benefits as it will be easier to protect the knowledge and exploit it internally. Therefore, we propose:

*Hypothesis 2: Offshoring of core activities of second degree will mainly be in the form of captive offshoring*

The fact that these two hypotheses are not trivial is illustrated by Table 1 that is based on the survey data for the 263 companies included in this study. As expected the share of captive offshoring is larger when offshoring core activities of second degree than for non-core activities (74.7% vs. 63.5%), while it is opposite for outsource offshoring. However, the table also indicates that although this pattern is the dominating pattern in the data there seems also to be other interesting patterns hidden in the data with a generally high level of captive offshoring. One reason for this high level of captive offshoring

in this dataset might be the way population has been selected as having a subsidiary abroad was one of the main criteria for selecting the companies in the population.

**Table 1. Share of activity by offshoring mode**

		OFFSHORING MODE		
		CAPTIVE*	OUTSOURCE**	
ACTIVITY	CORE (SECOND DEGREE)	74.7%	25.3%	100 %
	NON-CORE	63.5%	36.5%	100 %

\* Captive Offshoring  
 \*\* Outsource Offshoring

**Knowledge-intensive companies**

The core activities (of second degree) often involves more knowledge based activities (as listed above) and these activities are typically more tacit in nature with complex and less standardized interfaces with other activities. Where ongoing exchanges of knowledge and quick decisions are required, the efficiency of knowledge exchange and response time of the subsidiary is likely to be shorter than for a third-party provider – especially if those decisions trigger the renegotiation of the outsourcing contract. This is not uncommon as the loosely defined interfaces often will result in a rather vague outsourcing contract. On the contrary when interfaces are defined and standardized it is much easier to write an outsourcing contract, set milestones and do the follow-up on the contract. Therefore, we propose the following two hypotheses:

*Hypothesis 3: Knowledge-intensive companies that offshore core activities of second degree will do this in the form of captive offshoring*

*Hypothesis 4: Companies that are less knowledge intensive and offshore non-core activities will do this as outsource offshoring.*

## DATA AND METHODS

### Research Setting and Data Collection

The population of this study consists of manufacturing companies located in the EU-15 (Austria, Belgium, Denmark, France, Finland, Germany, Greece, Holland, Ireland, Italy, Luxemburg, Portugal, Spain, Sweden and United Kingdom). The main source for identifying the population is the Amadeus database that includes (financial) data on more than 10 billion European companies from 34 different countries. Two selection criteria were used in narrowing down the population as we only selected companies: 1) that were “Global Ultimate Owners” and had subsidiaries abroad; and 2) where the status was active (or unknown) excluding inactive companies (bankruptcy, liquidation or dissolution). With these two selection criteria 3.460 European companies were selected that all were active and exposed to international activities as they all had at least one foreign subsidiary.

A survey on the offshoring behavior was conducted as a (postal) mail survey among these companies. The survey was translated into five different languages: English, French, German, Italian and Spanish, so most companies had a choice of responding in their native language. The survey was designed taking into account Dillman’s Total Design Method (1978) and Miquel et al.’s (1996) recommendations of brevity, simplicity, accuracy and relevance. Four stages of pre-testing, including evaluations by academic colleagues, were made. The final questionnaire had 14 questions derived from the literature and adapted to the specific context.

The questionnaires were submitted in June 2008 to the head of international department for the population companies. The packet included a letter, co-signed by the University of Valencia and the director of the research project, the questionnaire itself (3 pages) and a pre-paid envelope with the return address. In this first round, 177 questionnaires were received, of which 21 had to be dismissed. A remainder was submitted in December 2008 and here we received 107 usable questionnaires. All in all we obtained a usable sample of 263 questionnaires, which represents a response rate of 7.6%. This is almost three percent higher than those obtained in other studies that have used a postal survey addressed to global manufacturing companies (Yip and Dempster, 2005).

As show the table 2, the 263 responses are divided among 15 different countries providing a good representation of European manufacturing companies. However, while in most countries the response rate varies between 5% and 8%, in countries like Germany, Austria or Ireland the response rates exceed 10%.

**Table 2: Responses received distribution by origin country**

	Surveys Sent		Surveys Received		Response Rate %
	N° of surveys	%	N° of surveys	%	
Austria	50	1,45	8	3,04	16,00
Belgium	147	4,25	7	2,66	4,76
Denmark	133	3,84	13	4,94	9,77
France	219	6,33	16	6,08	7,31
Finland	91	2,63	4	1,52	4,40
Germany	488	14,10	50	19,01	10,25
Greece	175	5,06	11	4,18	6,29
Holland	125	3,61	6	2,28	4,80
Ireland	35	1,01	4	1,52	11,43
Italy	706	20,40	56	21,29	7,93
Luxemburg	4	0,12	0	0,00	0,00
Portugal	27	0,78	2	0,76	7,41
Spain	629	18,18	49	18,63	7,79
Sweden	202	5,84	17	6,46	8,42
United Kingdom	429	12,40	20	7,60	4,66
<b>EU-15</b>	<b>3.460</b>	<b>100,0</b>	<b>263</b>	<b>100,0</b>	<b>7,6</b>

Source: AMADEUS DATA BASE (2007) and own.

## Measurement and Validation of Constructs

### Variable operationalization

#### *Dependent variable: Offshoring Mode*

The dependent variable, *offshoring mode*, is defined as a dichotomous variable that takes the value=1 in case of “captive offshoring” (relocated activity to own subsidiary) and value=0 when the company is “outsource offshoring” activities (relocated activity to third-party or joint-venture). The questions whether the company have conducted captive offshoring or outsource offshoring were asked for five different value chain activities: R&D and product design, production, purchasing and distribution, sales and administrative activities. All in all 665 offshoring operations were carried out by the 263 companies, of which 198 were outsource offshoring operations and 467 captive offshoring operations

(see Table 3). Production activities are more often outsourced than other activities due to the more standardized nature of these activities, however, surprisingly R&D and product design is also outsourced more often than the other activities.

**Table 3: Distribution of the dependent variable by activity**

	Captive Offshoring		Outsource Offshoring*	
	N	%	N	%
R&D and Product Design	64	13,70	32	16,16
Production	82	17,56	64	32,32
Purchasing and Distribution	75	16,06	39	19,70
Sales Activities**	156	33,40	40	20,20
Administrative Activities***	90	19,27	23	11,62
<b>TOTAL</b>	<b>467</b>	<b>100</b>	<b>198</b>	<b>100</b>

\* Outsource Offshoring includes use of subcontracted companies and joint-ventures.

\*\* Sales activities include Marketing, Sales and After-Sales activities.

\*\*\* Administrative Activities include Human Resources, Finance, I.T. and Management activities.

### Independent variables

*Core activity of second degree:* We asked the companies that had offshored activities about the importance of each activity in relation to the competitive advantage of the company. Using the same five activities of the value chain as with the dependent variable above, the importance of each offshored activity was measured as a dichotomous variable that take the value=1 when the activity is “important or essential to the company’s competitive advantage” and value=0 when the activity is “of secondary importance to the competitive advantage of the company”.

*Knowledge-intensive company:* The share of low skill employees as a percentage of total employees was used as proxy of the knowledge intensity of the company. This variable was measured by asking respondents about the percentage of low skill employees in the manufacturing process and was included as a continuous variable. The variable are reverse coded (multiplied by -1) as companies with high share of low skill employees are seen as less knowledge-intensive, while a small share of low skilled employees indicate that the employees are highly educated and the company are more knowledge intensive.

*Interaction among activity and knowledge-intensity:* In order to test hypotheses 3 and 4 an interaction variable was created as the product of the two variables: core activity of second degree and knowledge-intensity of companies.

#### Control variables

In order to control for the level of internationalization and the access to resources we added two control variables capturing these aspects, namely *company size* (number of employees) and *international experience* (number of years operating internationally). *Relative profitability* was added as the offshoring activity might be triggered by red figures in the account (deficit) that force the company to move fast (most likely outsource offshoring) or a surplus that allow the company to act more strategically and slowly build up their own captive offshoring operations (5-point Likert scale with subjective assessment of profitability). In the same vein, we control for the motivation of the offshoring operations by introducing two variables capturing the *saving of labor cost* and *market access* motives (both measured on 5-point Likert scales), respectively. Again if saving labor cost and market access motives are the main motives for offshoring then this will tend to be in the form of outsource offshoring. Finally, we have added two control variables that reflect the character of the activity and the interfaces among these. This is dummy variables for each of the activities itself that control for the different propensity to go captive versus outsource (as we saw in Table 3) for the five value chain activities (4 dummy variables are included). Furthermore, a variable on knowledge transfer (i.e. difficulty of transferring the company knowledge) were added as this will have an impact on the difficulty of setting up outsourcing contracts with a third-party. The more difficult the knowledge is to transfer; the more difficult it will be to specify the tasks in an outsourcing contract (Chandra and Shankar, 2004). The exact operationalization of the included variables is listed in Table 4.

**Table 4. The exact operationalization of the included variables**

<b>Variables</b>	<b>Definition</b>
<i>Dependent Variable</i>	
Offshoring Mode	Dichotomous variable that takes the value "1" when the company uses "captive offshoring" and "0" when the company is "outsource offshoring".
<i>Independent Variables</i>	
Core activity of second degree	Dichotomous variable that takes the value "1" when the activity relocated is important or essential to the company's competitive advantage and "0" when the activity is complementary or of secondary importance.
Knowledge-intensity	Proxy: Percentage of low skill employees multiplied by (-1).
Interaction effect	The product of the two variables: Core activity and Knowledge-intensity
<i>Control Variables</i>	
Company size	Logarithm of the mean of the number of employees of the last 5 years available (2002-2006) of each company.
International experience	Number of years the company has been active in the international market.
Activity	Activity or function relocated abroad (Dummy variable: R&D and Product Design, Production, Purchasing and Distribution, Sales Activities and Administrative Activities).
Knowledge transfer	Degree of difficulty involved in transferring the know-how, being (1) very low and (5) very high.
Relative profitability	Progress of the company in terms of business results compared with your competitors, being (1) much worse than my competitors and (5) much better.
Labor cost motivation	Labour cost motivation to use offshoring strategies, being (1) very low motivation and (5) very high motivation.
Market access motivation	Market access motivation to use offshoring strategies, being (1) very low motivation and (5) very high motivation.

## ANALYSIS AND RESULTS

As a first step, and in order to detect potential problems of multicollinearity among the independent variables in the model, we examined the bivariate Pearson correlations among all the variables included in the model. The correlation matrix presented in Table 5 shows, in general, that the correlations are rather low. In fact, the largest correlation among the independent variables are 0.343 among Company size and International experience, which is far below the usual threshold of 0.5 for detecting potential problems of multicollinearity. In addition, we also calculated the variance inflation factors (VIF) associated with each of the variables in the model shown in Table 6. The VIF-values

were all smaller than 1.3, which again indicate that we have no problem of multicollinearity in these data.

**Table 5: Correlation matrix**

	1	2	3	4	5	6	7	8	9
1. Core activity	1								
2. Knowledge-intensity	-0.037	1							
3. Company size	0.045	-0.092**	1						
4. International experience	0.008	-0.043	0.343**	1					
5. Activity	-0.114**	0.000	0.000	0.000	1				
6. Knowledge transfer	0.014	-0.014	0.059*	0.063**	0.000	1			
7. Relative profitability	0.014	-0.079**	-0.008	0.075**	0.000	-0.003	1		
8. Labor cost motivation	0.006	0.065**	-0.023	0.140**	0.000	0.026	-0.105**	1	
9. Market access motivation	0.005	0.013	-0.005	-0.053*	0.000	0.022	0.039	-0.250**	1

\* p < 0,05; \*\* p < 0,01

Since the dependent variable in our model variable (offshoring mode) is a qualitative and binary (with the values 0 and 1), the hypotheses was tested in a binomial logit regression model. In a binomial logit model, the likelihood that a company chooses the "captive offshoring" versus "outsource offshoring" will be:

$$P_i = P(Y_i = 1 | x_i) = \frac{\exp(x_i \beta)}{1 + \exp(x_i \beta)} = \frac{1}{1 + \exp(-x_i \beta)},$$

where  $x_i$  is a vector that contains the individual characteristics for the company  $i$  on the independent variables ( $x$ ), and  $\beta$  is a vector of parameters. The results of logit regression are shown in Table 6.

In the first model (Logit 1) we analyze the effect of the control variables on the choice of offshoring mode, finding that the most of the variables included in the model are significant. First of all, the two variables company size and international experience are significant and positive as expected indicating that the more resources and experience in the company the higher the propensity of captive offshoring. The relative profitability is also highly significant and positive signifying that the companies are not forced to do quick offshoring because of financial problems, but rather that it is a strategic and long-term oriented decision that increase the tendency to do captive offshoring. The difficulty of knowledge transfer is also affecting the offshoring mode in the sense that the more difficult it is to transfer the knowledge the higher the propensity of captive offshoring. Surprisingly, neither the activity relocated (4 dummies) nor the labor cost motive, are significantly influencing the

choice of offshoring mode. Only the market access motive turn out to be significant in a way so the stronger the market access motive the more common with captive offshoring.

**Table 6. Logit Regression models (p-values in parenthesis)**

	<b>Logit 1</b>	<b>Logit 2</b>	<b>Logit 3</b>
<b>Company size</b>	0.323*** (p=0.000)	0.321*** (p=0.000)	0.311*** (p=0.000)
<b>International experience</b>	0.011* (p=0.029)	0.012** (p=0.029)	0.012* (p=0.029)
<b>Activity (Dummies)</b>			
Production	-0.423 (p=0.218)	-0.566 (p=0.107)	-0.574 (p=0.104)
Purchasing & Distribution	-0.024 (p=0.949)	-0.061 (p=0.872)	-0.065 (p=0.863)
Sales Activities	0.483 (p=0.162)	0.358 (p=0.310)	0.330 (p=0.350)
Administrative Activities	0.433 (p=0.262)	0.492 (p=0.210)	0.544 (p=0.167)
<b>Knowledge transfer</b>	0.288* (p=0.012)	0.300 ** (p=0.010)	0.298* (p=0.011)
<b>Relative profitability</b>	0.328** (p=0.008)	0.298* (p=0.016)	0.288* (p=0.022)
<b>Labor cost motive</b>	-0.070 (p=0.346)	-0.063 (p=0.404)	-0.055 (p=0.470)
<b>Market access motive</b>	0.266** (p=0.005)	0.291** (p=0.003)	0.304** (p=0.002)
<b>Core activity</b>		0.684** (p=0.002)	1.350*** (p=0.001)
<b>Knowledge-intensity</b>		0.006 † (p=0.098)	-0.002 (p=0.646)
<b>Core activity * Knowledge-intensity</b>			0.014* (p=0.040)
<b>Constant</b>	-3.941*** (p=0.000)	-4.096*** (p=0.000)	-4.468*** (p=0.000)
<b>N(*)</b>	<b>530</b>	<b>530</b>	<b>530</b>
<b>-2 log likelihood</b>	<b>550.6</b>	<b>538.1</b>	<b>533.9</b>
<b>Correct classification (%)</b>	<b>75.8</b>	<b>75.8</b>	<b>74.3</b>

† ≤ 0.10; \* p ≤ 0.05; \*\* p ≤ 0.01; \*\*\* p ≤ 0.001

(\*) Due to missing values only 530 observations have been included.

In the model Logit 2 we include the type of activity (core of second degree or non-core) and the knowledge-intensity as independent variables. Both independent variables are positive and significant, however, with knowledge intensity as only marginally significant ( $p < 0.10$ ). The substantial decrease of the -2 log likelihood value from the Logit 1 to the Logit 2 (12.5 for 2 d.f.) indicates a better fit with the data in the Logit 2-model than in the model with only control variables (Logit 1).

Finally, in the third and fully specified model (Logit 3) we are testing our hypotheses. Here we introduce the interaction effect between the core activity of second degree and knowledge-intensity. The offshoring of core activities of second degree is highly significant ( $p < 0.001$ ) and positive as hypothesized. This is a strong indication that when offshoring activities that is closer to the core activities this is mainly done as captive offshoring. As such this result is providing support to both hypotheses 1 and 2. The interaction term that is added in order to test hypotheses 3 and 4 is also positive and significant which is indicating that the relation between captive offshoring and offshoring of core activities are even stronger in companies that are more knowledge-intensive, as also hypothesized. Again, from the Logit 2-model to the Logit 3-model is seen a decrease in the -2 log likelihood value (of 4.2 for 1 d.f.) indicating that the Logit 3-model provide a slightly better fit with data.

## **DISCUSSION AND CONCLUSION**

The last decades has witnessed a dramatic increase in the level of offshoring, both in the form of captive offshoring and outsource offshoring. This wave of offshoring and relocation of value chain activities is fueled by changes in the political and regulatory environments of host countries that have eased considerably, more efficient and less expensive information and communication technology, and new techniques for organizing the value chain activities that include fine slicing and standardization of interfaces among activities. In addition, the intensified global competition has the effect that many companies cannot afford to put all their eggs in one basket

meaning that they cannot just rely on that they can get access to all the most advanced innovations and knowledge and talented people in one location (in the home country). They are increasingly forced to create a global network enabling them to tap into knowledge in other parts of the world, which implies offshoring of more knowledge based activities.

Interestingly, this wave of offshoring includes not only manufacturing and IT and other more standardized activities that is driven by cost savings and mainly involves lower skilled labor, but as highlighted in many studies (e.g. Baden-Fuller *et al.*, 2000; Lewin and Cuoto, 2006) it also includes more advanced activities like research, design, engineering and product development. This study based on 263 European companies confirm that although more traditional activities capture the major part of offshoring, the more advanced and knowledge-based activities still take a significant part. As shown in Table 3, alone the offshoring of R&D and product design activities take up approx. 15% of all offshoring. It has been suggested in the literature that offshoring is shifting from the execution of standardized to work on knowledge processes – the offshoring of activities that require domain expertise, subject expertise, and higher-end professional talent. This might be going too far as most offshoring is still (at least partly) driven by cost savings, however, this trend of offshoring of more advanced activities raises a number of interesting research questions. This is, in particularly, the case because much of the theoretical development in this area have lacked behind.

The conventional theoretical wisdom based on the transaction cost theory and the competence based view and is that companies should keep their core activities very close to the heart i.e. the headquarter. The arguments is that the company should do everything possible in order to protect the core activities and offshoring or outsourcing the core activities might imply a risk for others stealing or imitating, since it will be more difficult to control the core activities if offshored or outsourced.

The big issue is to what extent does the theoretical focus on protection of the core activities aligns with the empirical findings of increasing offshoring of advanced activities that are closer to the core activities. In this paper we have argued that one has to develop a finer grained concept of core versus non-core activities, which is very much in line with the increased fine slicing of the value chain activities. Classifying activities as either core or non-core may lead to serious oversimplification of the complexity of the activities as the activities obviously are differently related to the core. As a first step

in this more fine grained understanding of the activities we propose to distinguish between three types of activities: 1) the *core activities of first degree* that are the really distinctive and crucial activities; 2) the *core activities of second degree* that essential and highly complementary; and 3) the *non-core activities* that are more peripheral but still relevant for the success of the company.

We develop four hypotheses based on the idea that some core activities, those we denote core activities of second degree, can, in fact, be offshored, however, to its own subsidiary (captive mode), and that this will be even more pronounced for knowledge-intensive companies. The hypotheses are tested in a logit regression model with data for 530 cases of offshoring (spanning five different activities) and our hypotheses are basically confirmed. All in all, we see the results as a confirmation of the fact that some activities closer to the core (core activities of second degree) are, in fact, offshored, and can successfully be offshored as a captive mode. Although most companies rather prefer to be very protective and keep the core activities close to the headquarter we see the results as an indication that companies increasingly are forced to open up for more knowledge-based offshoring in order to be able to source knowledge and talent in other parts of the world.

The results strongly indicates that the captive mode are used in the case of offshoring of advanced activities, knowledge-intensive companies, difficulty in transfer of company knowledge, over normal profitability, and access to other company resources and international experience. The outsourcing mode seem to be more related to smaller companies that offshore non-core activities mainly in order to reap cost savings. Surprisingly, the nature of the activity (R&D, production, purchasing, sales and administrative activities) does not seem to have any bearing on the choice of offshoring mode signifying that the conclusions above cut across the different activities.

## REFERENCES

- Amadeus Data Base (2007). Analyse Major Databases from European Sources. Bureau Van Dijk Electronic Publishing.
- Asmussen, C.G., Pedersen, T. and Petersen, B. (2007). 'How Do We Capture "Global Specialization" When Measuring Firms' Degree of Globalization?'. *Management International Review*, **47**, 791-814.
- Baden-Fuller, C., Targett, D. and Hunt, B. (2000). 'Outsourcing to outmanoeuvre: Outsourcing re-defines competitive strategy and structure'. *European Management Journal*, **18**, 298-295.
- Chandra, R. and Shankar, V. (2004). 'Business Process Outsourcing: a Costs Perspective'. *European Business Forum*, **19**, 50-53.
- Dillman, D.A. (1978). *Mail and telephone surveys: The total design method*. New York, NY: John Wiley & Sons.
- Dossani, R. and Kenney, M. (2003). ' "Lift and Shift": Moving the Back Office to India'. *Information Technologies and International Development*, **1**, 21-37.
- Doz, Y., Santos, J. and Williamson, P.J. (2001). *From Global to Metanational: How Companies Win in the Knowledge Economy*. Harvard Business School Press.
- Gilley, K.M. and Rasheed, A. (2000). 'Making more by doing less: An analysis of outsourcing and its effects on firm performance'. *Journal of Management*, **26**, 763-790.
- Harland, C., Knight, L., Lamming, R. and Walker, H. (2005). 'Outsourcing: assessing the risks and benefits for organizations, sectors and nations'. *International Journal of Operations & Production Management*, **25** (9): 831-850.
- Heikkilae, J. and Cordon, C. (2002). 'Outsourcing: a core or non-core strategic management decision?'. *Strategic Change*, **11**, 183-193.
- Kotabe, M., Mol, M.J. and Murray, J.Y. (2007). 'Outsourcing, performance and the role of e-commerce: A dynamic perspective'. *Industrial Marketing Management*.
- Kuemmerle, W. (1997). 'Building Effective R&D Capabilities Abroad'. *Harvard Business Review*, March-April 1997.

- Lei, D. and Hitt, M.A. (1995). 'Strategic restructuring and outsourcing: The effect of mergers and acquisitions and LBOs on building firms skills and capabilities'. *Journal of Management*, **21**, 835-860.
- Levy, D.L. (2005). 'Offshoring in the new global political economy'. *Journal of Management Studies*, **42**, 685-693.
- Levy, D. and Dunning, J.D. (1993). 'International Production and Sourcing: Trends and Issues'. *Science, Technology and Industry Review*, **13**, 13-59.
- Lewin, A.Y. and Cuoto, V. (2006). *Next Generation Offshoring: The Globalization of Innovation*. Duke-Booz-Allen-Hamilton Offshoring Research Network Survey Report.
- Lewin, A.Y. and Peeters, C. (2006). 'Offshoring Work: Business Hype or the Onset of Fundamental Transformation?'. *Long Range Planning*, **39**, 221-239.
- Miquel, S., Bigné, S., Lévy, J.-P., Cuenca, A.C. and Miquel, M.J. (1996). *Investigación de mercados*. Ed. McGraw Hill, Madrid.
- OECD (2007). *Offshoring and Employment: Trends and Impacts*. OECD.
- OECD (2005). 'Globalisation of the ICT sectors and international sourcing of ICT-enabled services'. OECD Information Technology Outlook 2004, Chapter 2.
- Porter, M. (1986). *Competition in Global Industries*. Harvard Business School Press. Boston, Massachussets.
- Pyndt, J. and Pedersen, T. (2006). *Managing global offshoring strategies – A case approach*. Copenhagen: Copenhagen Business School Press.
- Quinn, J.B. and Hilmer, F.G. (1994). 'Strategic Outsourcing'. *Sloan Management Review*, **35**, 43-55.
- UNCTAD (2004). *The Shift Towards Services*. UNCTAD World Investment Report 2004, United Nations, New York and Geneva.
- Ward, S. (2004). 'Outsourcing research: What's your position?'. *Business Information Review*, **21**, 227-239.
- WTO (2005). Standards, 'offshoring' and air transport focus of 2005 WTR. World Trade Report 2005.
- Yip, G. and Dempster, A. (2005). 'Using the Internet to enhance global strategy'. *European management Journal*, **23**, 1-13.