Offshoring of Application Services in the Banking Industry – A Transaction Cost Analysis

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OFFSHORING OF APPLICATION SERVICES IN THE BANKING INDUSTRY – A TRANSACTION COST ANALYSIS

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Abstract

Gaining economic benefits from substantially lower labor costs has been reported as a major reason for information systems (IS) offshoring. However, many offshoring projects have failed to achieve expected cost savings, indicating that labor cost savings are offset by additional costs that arise in offshoring projects in certain situations. While previous research on IS offshoring has mostly focused on management issues in offshoring, the focus of this paper is to improve our understanding why the realization of economic benefits varies substantially between offshored software projects. Based on a conceptual framework from transaction cost economics and empirical data from an in-depth case study involving six software development and maintenance projects that were offshored to software vendors in India by a major German financial services organization, two research questions are studied. First, what types of additional costs may arise in offshored software projects? Second, how and why do additional costs vary between projects, considering both task and offshore characteristics? The findings from our analysis indicate that offshoring can lead to increased effort on the client side, both in terms of production costs (requirements specification, knowledge transfer, conceptual development) and transaction costs (vendor coordination, and control). These additional costs are particularly high when the outsourced function is highly asset specific. Moreover, offshore country characteristics such as cultural differences, geographic distance as well as vendor characteristics such as the degree of personnel fluctuation and lack of absorptive capacity can lead to cost add-ons at the client side – in particular when a high degree of human asset specificity is involved in the offshored software projects.

Keywords: Offshoring, software application services, transaction cost economics, absorptive capacity, cross-cultural, human asset specificity, case study

Introduction

Offshore outsourcing of information systems (IS) has seen considerable growth during the past years, especially in the domain of application services. Aside from getting access to skilled and qualified resources, reaping benefits from substantially lower labor costs has been reported as one of the major reasons for offshoring (Apte, et al., 1997; Khan, et al., 2002; Rottman and Lacity, 2004; Schaaf, 2004; Sobol and Apte, 1995). Similarly to domestic outsourcing, however, there are indications that the expected economic benefits are not always achieved. While realized cost savings through offshoring may range around 20-50%, studies also show that in

about 50% of the cases offshoring projects fail to achieve cost savings or actually increase costs (Hatch, 2004; Schaaf, 2004). Obviously, there are situations where a number of additional costs arise in offshore outsourcing that partially or fully offset the benefits achieved from lower labor costs in low wage countries.

Up to now, there is scant research about the types of additional costs that may arise in offshoring as well as about the drivers of these costs. Some studies identified various types of risks or challenges associated with offshore outsourcing (Apte, et al., 1997; Carmel and Agarwal, 2002; Khan, et al., 2002; Kliem, 2004; Ramarapu and Parzinger, 1997). However, in these studies no attempt was made to examine the relationships between offshore-specific challenges, such as cultural differences, geographic distance or regulatory/legal differences, and further economic risks, such as hidden costs. Notably, offshore regions, such as China and India, were found to differ in transaction costs (Qu and Brocklehurst, 2003). This suggests that offshoring can indeed lead to additional costs and that the magnitude of these cost add-ons varies dependent on the characteristics of the offshore country. It becomes apparent, however, that whenever different types of additional costs, such as transaction costs (e.g. initiation, contracting and control costs) were distinguished in previous studies, no attempt was made to explain why those costs may differ between particular offshore projects (Carmel and Nicholson, 2005). When differences in project performance were examined, the focus was on the vendor rather than the client side. For example, it was found that project effort, elapsed time, and software rework are contingent on a number of project characteristics such as the use of standardized processes, project complexity or prior experiences of the vendor personnel (Gopal, et al., 2002).

What is also striking out, when examining the emergent literature on IS offshoring, is the vast majority of research that focuses on how to best manage offshore projects (Carmel and Agarwal, 2001; Gopal, et al., 2003; Heeks, et al., 2001; Kliem, 2004; Krishna, et al., 2004; Nicholson and Sahay, 2001). This stream of research implicitly assumes that any type of service can successfully be offshored if only the right management techniques are applied. This view is in stark contrast to research findings from domestic outsourcing which emphasize that beyond the downstream importance of managing the relationship with the vendor, the decision on what to outsource has important implications for outsourcing success (Dibbern, et al., 2004). For example, it was shown that organizations that selectively outsource IS functions are more successful in realizing expected cost savings than those that radically opt for either complete outsourcing or insourcing (Lacity and Willcocks, 1998).

Considering that offshore outsourcing is actually just a certain form of outsourcing where the vendor is located in a country different from that of the client, research on offshoring should incorporate and build upon findings from the rich stream of research on domestic outsourcing. The most applied theoretical lens to examine the conditions under which the outsourcing of particular IS functions or service makes economic sense is transaction cost economics (TCE) (Dibbern, et al., 2004). Specifically considering economic criteria in alignment with the characteristics of an IS function, TCE provides a suitable basis for analyzing outsourcing from an economic point of view. While, based on TCE, existing research has analyzed in what ways transaction and production costs are influenced by the characteristics of the outsourced IS tasks, research on offshore outsourcing should also consider the influence of offshore-specific characteristics (Dibbern, et al., 2005). It may be argued that in certain situations offshoring may cause such a significant amount of additional production and transaction costs for the client that benefits from lower cost per capita in offshoring are marginalized, thus threatening the originally calculated business case. Therefore, from a theoretical point of view, the question is raised whether traditional TCE needs to be complemented by factors that recognize specific offshore features.

In this paper, we attempt to answer this question by both theoretical considerations and empirical observations. Since previous research on IS outsourcing has shown that IS outsourcing success also depends on the degree of outsourcing, i.e. the nature of the outsourced IS functions (Grover, et al., 1996), we will focus our study on software projects as a distinct type of IS activity. Among the various IT services, software services, i.e. application development, maintenance and support work, are most likely to be outsourced to offshore vendors (Forrester, 2006; Hirschheim, et al., 2004). Having set the focus of our research, we are asking the following two research questions:

1. *What types of additional costs may arise from offshored software projects?*
2. *How and why do these additional costs vary between offshore projects considering the nature of the services offshored as well as the specific offshore characteristics?*

In the next section, we will provide the conceptual foundation for studying these research questions. An a priori framework will be developed that serves as a basis for analyzing offshore application development and maintenance projects of a leading German financial services provider with several years of experience in offshoring. From our theoretical and empirical reflections we are able to derive a refined and enriched theoretical framework that illustrates the composition of the economic benefit in recognition of specific offshore and task characteristics. Moreover, based on our findings, implications for practitioners are outlined and final conclusions are drawn.

Theoretical Foundation

The foundation pillar on which the theoretical framework of this study is built is TCE. It is complemented by offshore specific characteristics that are derived from previous IS offshoring literature as well as knowledge-based reasoning including the notion of absorptive capacity. Figure 1 presents a graphical representation of this framework. It essentially suggests that the client's economic benefit from an offshored software project is influenced by the amount of additional costs not previously anticipated and hence not included in the contract with the offshore vendor. Based on TCE, it is argued that the amount of additional costs critically depends on the task characteristics of the offshored software project, reflected by its degree of human asset specificity. Moreover, offshore characteristics may also lead to increased costs on the client side. The influential role of these offshore characteristics is moderated by the degree of asset specificity. The discussion below elaborates upon each of the key constructs and relationships. After a short introduction to the roots of TCE, we begin the discussion with disaggregating the main dependent variable of our frame "additional client costs" into different types of production and transaction costs that are incurred in different phases of an offshore application software project (research question 1).

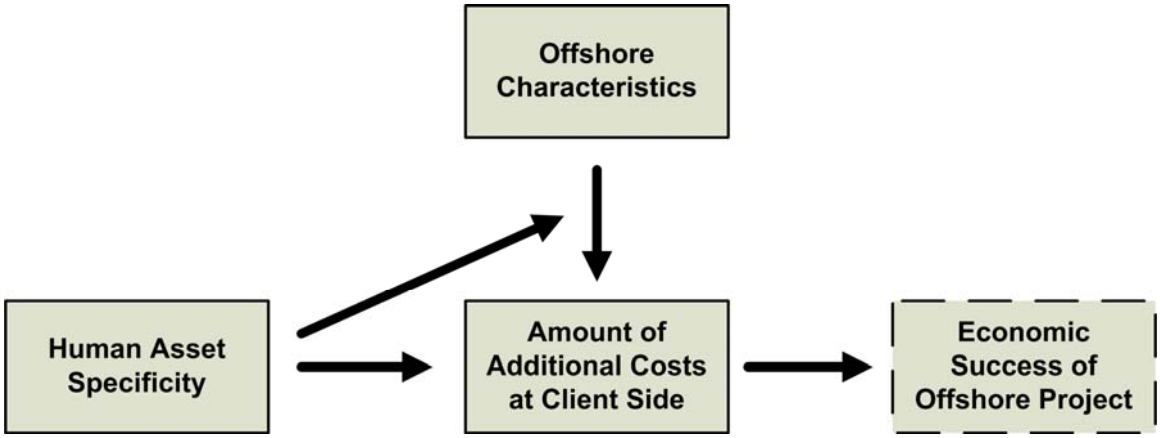

Figure 1. Theoretical Framework

Transaction Cost Economics

The roots of TCE date back to Coase (1937) who argued that firms exist because using the market is costly. This basic argument has been picked up by Williamson (1975; 1985) who called these frictions that arise when exchanging goods or services via markets 'transaction costs'. However, Williamson went beyond Coase in a number of ways. First, he established the main assumptions and conditions under which transaction costs arise. Second, he considered that transaction costs may not only occur when using the market but also within the (hierarchical) boundaries of firms. Accordingly, it is decisive whether transactions costs are lower internally or when using the market. Third, – a fact which is (too) often neglected – Williamson pointed out that beyond transaction costs, production costs may also differ between hierarchical and market governance. These production cost differences partially depend on the same contingency factors that also cause differences in transaction costs (Williamson, 1981).

While numerous studies have tested the empirical validity of TCE in make-or-buy decisions, it is noteworthy that the distinction between transaction and production costs has rarely been made (Rindfleisch and Heide, 1997). One of the few exceptions in IS outsourcing research is the study by Ang and Straub (1998) that explicitly consider both types of costs as determinants of the IS outsourcing decision. In order to provide a solid foundation for our in-depth analysis of the sources of variations in additional costs between offshore software projects, we seek to go one step further by disaggregating those specific production and transaction costs that are typically involved in offshored software development and maintenance projects. These costs are often named as "hidden" costs. They may arise on the client side, but are often neglected or underestimated when it comes to offshoring application services (Rottman and Lacity, 2004).

Disaggregating Transaction and Production Costs

Basic Definitions and Assumptions. Generally, *production costs* include all expenses for the delivery of an organizational function, i.e. all costs of transforming, assembling, and refining products or services. In the case of the IS functions application development and maintenance, the main driver for production costs are human resource costs (Prosser, 1997). *Transaction costs*, in turn, include all costs that, due to a division of labor, are inherent in the provision of an organizational function (Picot, 1991). IS transaction costs can be defined as all costs in terms of time, effort, and money spent, that arise for "(…) planning, adapting, and monitoring task completion under alternative governance structures" (Williamson, 1981 p. 552f.). Two fundamental behavioral assumptions back up the existence of transaction costs. First, it is assumed that economic actors are *boundedly rational* (based on Simon, 1957). Accordingly, they tend to be satisfied with second best rather than optimal solutions. That is, principals search for cost efficient solutions and strive to settle perfect contracts, but often they have to realize that many contracts can only be settled incompletely (Williamson, 1981, p. 554). The incompleteness of contracts would not matter if the contractual partners were completely trustworthy ("stewardship behavior," Williamson, 1975, p. 26). This, however, is ruled out by a second assumption. It is assumed that some actors *behave opportunistically*, which means that they cunningly take advantage of opportunities at the expense of others – also referred to as "(...) self-interest seeking with guile" (Williamson, 1981, p. 554). It is assumed that it is hard, or indeed impossible, to anticipate another person's attitude towards opportunism, which likely leads to opportunistic behavior (Williamson, 1985, p. 64). Accordingly, transaction costs arise in order to safeguard against opportunistic behavior of an exchange partner.

However, does this mean that in the absence of opportunism, transaction costs are zero? This is a decisive question which has been raised by proponents of the resource-based view of the firm as an alternative – or rather complementary – theory that explains why firms exists (Conner, 1991; Foss, 1993). The fundamental assumption on which the resource-based view resides is that firms generally differ in their resources and capabilities and that some of those assets may be hard to imitate or substitute by other firms (Barney, 1991). Now, assuming that a firm has outsourced such a "non-tradable" function to an external service provider, it may well be that the other party is unable to deliver the function in the same quality as the former in-house team – simply because it lacks those critical resources and capabilities that the client organically possessed. The consequence would be that the client spends high effort on constantly checking the quality of the product delivered by the vendor. This would result in high monitoring costs in spite of an absence of the vendor's opportunistic behavior (Duncan, 1998). Accordingly, transaction cost theory is implicitly based on the assumption that the vendor is generally able to deliver the same performance as the client and that only opportunism may prevent him from doing so.

Both production and transaction costs arise when performing particular activities inherent in the process of developing and maintaining software applications. Those activities and their associated costs, which are particularly relevant for the client organization in outsourcing or offshoring projects, can be separated into two phases: the set-up and the service delivery phase. The respective production costs (PC) and transaction costs (TC) in each of the two phases are illustrated in Figure 2.

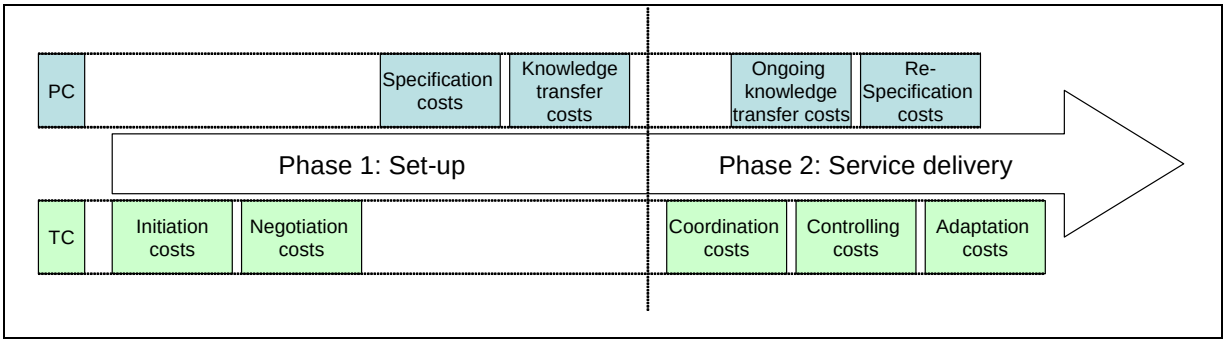

Figure 2. Disaggregated Production and Transaction Costs During Set-up and Service Delivery

Disaggregated Transaction Costs. Five different types of *transaction costs* that are associated with the set-up of an offshoring arrangement and the actual delivery of services can be distinguished (Picot and Maier, 1992). First of all, searching for and choosing a potential service provider implies (1) *initiation costs*, i.e. costs for gathering and evaluating information about potential exchange partners. Second, once a suitable offshore vendor has been selected, a contract between the vendor and the client has to be set up in order to specify each party's commitments and duties. The resources and time required to reach this deal are referred to as (2) *negotiation costs*. Third, the management of the offshoring arrangement entails (3) *coordination costs*, i.e. managerial activities that ensure ongoing service delivery. Fourth, the client organization will experience (4) *controlling costs*, implying that it has to spend resources for ensuring that its offshore vendor performs adequately and in line with the service level agreements. Finally, the adjustment of these conditions during the relationship process implies (5) *adaptation costs*. The last three of these transaction costs (costs for negotiation, control, and adaptation) refer to the post-contractual phase which will be the focus of our subsequent analysis.

Disaggregated Production Costs. Due to the special nature of software development and maintenance as social actions (Hirschheim, et al., 1991; Nygaard, 1986) which require user participation and interactions between different groups of IS professionals (e.g. systems analysts, designers, architects, and programmers), the client has to be actively involved in the software development and maintenance process even if major implementation activities are handed over to the staff of an external vendor (Tiwana, 2004). These remaining activities at the client side constitute *production costs* for the client.

From existing studies on offshore outsourcing of application services, we identified four types of production costs that should be taken into account. During the set-up of an offshoring arrangement, (1) *specification costs* are incurred for the specification of the requirements of the software to be developed and/or maintained (Heeks, et al., 2001; Krishna, et al., 2004; Nicholson and Sahay, 2001). These a priori specifications of requirements often need to be modified or complemented during the actual service delivery phase, leading to (2) *re-specification costs* (Apte, 1990). In addition, a significant amount of time and effort may have to be invested in order to transfer the required knowledge about the application software and the business processes that are to be reflected by the software (Tiwana, 2004), resulting in (3) *knowledge transfer costs* (Beath and Walker, 1998). Since in offshore outsourcing, it is unusual that former in-house employees are taken over by the vendor – this would actually contradict the offshore business model; knowledge transfer has to take place in almost any instance during a transition phase before offshore professionals are able to perform the actual development and maintenance activities as specified by the client. During the service delivery phase, additional knowledge transfer is likely to occur when the vendor realizes that his knowledge is not sufficient for implementing the specifications, when problems arise, or when the client discovers quality gaps. Moreover, the client may be faced with increased effort for knowledge codification in order to document established routines and procedures for managing the offshore vendor (Nicholson and Sahay, 2001). These costs are termed *(4) ongoing knowledge transfer costs*. At this point it should be noted that both specification and knowledge transfer are typical tasks within the software life cycle (Boehm, 1987), i.e. the software production process, and hence cause production rather than transaction costs. In our subsequent analysis, we will analyze all types of production costs, since they all arise in the post-contractual phase.

Impact of Human Asset Specificity

Having identified the main production and transaction costs of a client organization in offshoring projects, the next step is to explain under which conditions these costs are expected to be particularly high. TCE suggests that the question whether it is more cost efficient to deploy a market governance (i.e. outsourcing) or to utilize an internal hierarchy (i.e. insourcing) is dependent upon four contingency factors: asset specificity, site specificity, uncertainty, and frequency (Williamson, 1981).

IS research has applied TCE to examine the determinants of IS outsourcing and has analyzed contingency factors to explain variations in the degree of outsourcing (Ang and Cummings, 1997; Aubert, et al., 1996; Nam, et al., 1996; Poppo and Zenger, 1998). When synthesizing the results of these studies, there is solid support for the impact of asset specificity whenever the construct was operationalized in terms of human asset specificity rather than technological specificity (Dibbern, et al., 2005). In contrast, the impact of uncertainty was found to be very limited. This is consistent with findings from non-IS make-or-buy studies. These studies also emphasize the relevance of human asset specificity and found little support for the consistent impact of the uncertainty uthor></authors></contribu<EndNote><Cite><Author>Rindfleisch</Author><Year>1997</Year><RecNum>1013</RecNum><record><rec-number>1013</rec-number><ref-type name="Journal Article">17</ref-type><contributors><authors><author>Rindfleisch, Aric</author><author>Heide, Jan B.</author></authors></contributors><titles><title>Transaction Cost Analysis: Past, Present, and Future Applications</title><secondary-title>Journal of Marketing</secondary-title></titles><periodical><full-title>Journal

Accordingly, this study focuses on human asset specificity as the main predictor of production and transaction costs. Human assets refer to special characteristics of the actual professionals that are involved in designing and programming software applications. In particular, they refer to different kinds of knowledge sets that are required to perform each IS function. According to Williamson (1981, p. 563), it is the nature of knowledge that matters, when differentiating between highly and less specific human assets. Applied to the IS context, human asset specificity reflects the degree to which the development and maintenance work of a software project requires a significant amount of understanding of and knowledge about unique work procedures and business processes as well as unique software systems of the client organization (Heath and Walker, 1998). If the provision of an IS function requires knowledge that is very client specific, the vendor has to invest a lot of time and resources in order to adopt that unique knowledge. Consequently, the client organization has to invest a lot of time and resources to transfer that knowledge to the vendor personnel both during the set up phase and during the relationship. Moreover, the effort for specifying the functional requirements will likely be high for the client, because the vendor may not be able to understand the needed software functionality as well as its required structure and interfaces with other systems without significant client involvement. While the costs for knowledge transfer and requirements specification constitute additional production costs, transaction costs may also rise significantly when asset specificity is high. If knowledge about idiosyncratic client resources (including business processes and/or software systems) is required, there is often a high level of project uncertainty both regarding the required inputs to the project (e.g. requirements and amount of resources) as well as the output of the process (e.g. the quality of the software) (Nidumola, 1995). Therefore, a lot of control and coordination is necessary to ensure adequate service and product quality (Choudhury and Sabherwal, 2003). Thus, according to TCE, in-house provision of an IS service is more cost-efficient in case of highly specific assets, since outsourcing would imply a transaction cost disadvantage that cannot be compensated for by savings in production costs. Accordingly we propose:

Proposition 1: *The higher the level of human asset specificity in a software project, the higher is the amount of additional costs for the client.*

Impact of Offshore Characteristics

Offshoring, as compared to domestic outsourcing, brings about unique challenges. Those challenges may arise from cultural differences (Krishna, et al., 2004; Rao, 2004), geographic distance (Carmel and Agarwal, 2002; Rao, 2004) as well as languages barriers (Apte, 1990; Zatolyuk and Allgood, 2004) between the client country and the vendor country. Furthermore, specific institutional features of offshore countries, such as infrastructure, security, political conditions and intellectual property regulations as well as the level of IS professionalization within the offshore country have to be taken into account when entering and managing an offshoring arrangement (Hirschheim, et al., 2005; Rottman and Lacity, 2004).

From these offshore characteristics, the first three, namely cultural and geographic distance as well as languages barriers, can directly affect the quality and ease of interaction between client and vendor. The most obvious are *language barriers*. If client and vendor speak different languages then communication becomes difficult, which

hampers knowledge transfer between client and vendor and which increases the likelihood of false specification due to misunderstandings (Apte, 1990). Thus, production costs at the client side increase. Similarly, transaction costs are likely to increase. In terms of *geographic distance* it may be argued that communication technologies such as video conferencing and e-mail as well as groupware tools that support virtual collaborative work increasingly substitute the need for physical presence (Clemons, et al., 1993). However, considering the nature of software development and maintenance as social actions, physical meetings are still an issue (Apte, 1990). This is particularly true if a high amount of firm-specific knowledge is involved. This often requires the transfer of tacit knowledge, e.g. if knowledge about unique business processes needs to be adopted by the vendor. Tacit knowledge is best acquired through a process of socialization (Nonaka, 1994) via face-to-face meetings (Nonaka and Konno, 1998). The same applies for specification tasks. Specification requires a process of externalization where tacit knowledge is codified in form of functional requirements which then need to be internalized by the software designers and programmers. Again, these processes frequently require socializing action between client and vendor personnel (Scarbrough, 1998). Geographic distance makes such face-to face meetings more difficult and costly, which may increase client production costs. Moreover, case studies on offshoring indicate that, mostly due to cultural and geographic distance, specifications have to be made in a very detailed way which leads to increasing efforts at the client side (Heeks, et al., 2001; Krishna, et al., 2004; Nicholson and Sahay, 2001). Finally, *cultural* distance can increase information acquisition costs (Kogut and Singh, 1988) and hence increase the cost for all processes where information exchange is required. This is particularly true for knowledge transfer. Considering that knowledge transfer will be particularly intensive when asset specificity is high, cost increases due to cultural differences will increase with a high level of human asset specificity (Erramilli and Rao, 1993).

From the institutional offshore characteristics, the level of *IS professionalization* deserves special attention. Professionalization reflects the extent to which IS has become a profession with worldwide standards in products and procedures. Currently, however, IS professionalization is still quite moderately established. As noted by Hirschheim et al. (2005, p. 1010), the IS profession is "a practitioner-based activity reliant on experience and expertise". On a country level, such experiences and expertise critically depend on IS history. Countries with a young history in IS where the educational system as well as companies have only begun to heavily invest in IS are likely to still lack behind western countries that have a much longer IS tradition. This, in turn, has wider consequences for the level of experiences and expertise of the IS vendors in offshore countries. It is well known that vendors in countries such as India, China, Hungary or Russia have excellent ratings when it comes to proving expertise in applying standardized procedures in service delivery such as those required in the capability maturity model (CMM) (Paulk, et al., 1993). However, there are other factors such as creativity, business process and application domain knowledge, as well as project management experience that are not fully captured by such standard capability measurement tools.

These other capabilities are well captured by the notion of *absorptive capacity*, which reflects the "ability to utilize outside knowledge" (Cohen and Levinthal, 1990, p. 128). This capacity which is also referred to as "creativity capacity" (p. 131) "(…) is largely a function of the level of prior related knowledge" (Cohen and Levinthal, 1990, p. 128). In software development and maintenance projects, prior knowledge means having gained experience in other similar projects. Thus, if the absorptive capacity of a vendor is low, knowledge transfer costs will likely increase for the client. Since the need for knowledge transfer is particularly high in software projects with a high level of asset specificity, the resulting knowledge transfer costs will be even higher for the client, if the absorptive capacity of the vendor is small. Thus, the level of IS professionalization has implications for client additional costs via the degree of absorptive capacity of the offshore vendor.

In summary, we argue that offshore characteristics such as differences in culture, geographic location, languages and IS professionalization between client country and vendor country increase the level of additional client costs involved in offshore software projects. The amount of these additional costs due to these offshore characteristics, however, critically depends on the degree of human asset specificity involved in the offshore project (moderator impact). This is reflected by the following two propositions (see also Figure 1):

Proposition 2a: *Differences in culture, geographic location, languages and IS professionalization between client country and vendor country increase the amount of additional costs for the client.*

Proposition 2b: *The impact of differences in culture, geographic location, languages and IS professionalization between client country and vendor country on the amount of additional costs for the client increases with the degree of human asset specify involved in an offshore software project.*

It should be noted that the direct impact of offshore characteristics on cost add-ons is consistent with previous literature that examined the link between asset specificity and low as opposed to high control modes in foreign investments (Erramilli and Rao, 1993; Gatignon and Anderson, 1988). In these studies it was argued that cultural distance would increase the information acquisition costs and hence affect the propensity for high or low entry modes. Thus, information acquisition costs were implicitly treated as a mediator of the relationship between asset specificity and governance choice. This mediator is directly impacted by foreign country characteristics such as cultural distance which reinforces the direct impact on cost add-ons as proposed in our theoretical framework. Our framework, however, goes beyond these considerations in arguing that the effect of offshore characteristics is contingent upon the degree of asset specificity.

Empirical Exploration

Methodology

Choice of a Research Methodology

The intention of this study is to elaborate and to test the existence of additional hidden costs in offshoring projects which may offset expected economic benefits. Furthermore, the main factors that lead to additional hidden costs shall be scrutinized and explicated. As proposed in Figure 1, we suggest on the basis of TCE that human asset specificity and the characteristics of the underlying transaction environment, e.g. the characteristics of the offshoring project itself, are the main contingent factors that influence the project outcome. Since these proposed constructs are extremely complex and since constructs like *hidden* costs and human asset specificity are hard to observe or measure, we favored an qualitative empirical assessment which allows for a profound investigation of the constructs and their proposed interactions within their natural setting. For broad and complex phenomena where a holistic, in-depth investigation is needed and "why" questions are asked, the literature recommends the adoption of case studies as an appropriate research methodology (Benbasat et al. 1987; Yin 1999).

In our study, this methodology will not primarily be used for the exploration and the generation of new propositions, but rather for testing a priori deduced propositions and for providing explanations for the observed phenomena. Thus, the utilization of the case research methodology follows a widely recognized positivist research approach which intends to provide valuable insights in the proposed interactions (Dube and Paré, 2003). Nevertheless, this approach may also leave room for theory extension in an exploratory manner through identifying additional constructs and their interactions that apparently were missing in the original framework (Eisenhardt 1989)[1].

As outlined, this study is an explanatory single site case study which intends to test and expand an existing theory with additional exploratory elements (See, e.g. Brown 1997). In order to assure its rigor, we utilized the framework from Dubé and Paré (2003) and explicated the attributes applied as indicated in Appendix A. In accordance with the nature of an explanatory study, our research has clear research questions, an a priori specification of constructs, and a particular theory of interest. Furthermore, we decided to apply a multiple case design with a literal replication logic in order to improve the validity of our findings. The unit of analysis are six offshoring projects that have been conducted by an international financial service provider which we will name FINANCE throughout the remainder of this article. The case analysis follows a team-based research approach with different roles of the investigators involved.

[1] Ideally, any theory building attempts from case studies should be unbiased by a priori theoretical perspectives or propositions (Eisenhardt 1989). However, in our study we thought to combine the merits of a theory testing with a theory building approach in the same spirit in which it is proposed as useful to combine positivist with interpretive approaches when studying organizational phenomena (Lee 1991).

Sampling, Data Collection and Analysis

FINANCE is a German based internationally operating financial services provider with several years of experience in offshore outsourcing. In fact, this organization was an early adopter of IT offshoring and has gained considerable experience in both domains – IT outsourcing and IT offshoring. We found this setting promising since most offshoring projects have been analyzed from the perspective of US or UK companies. Offshoring is less widespread in Europe's German speaking countries due to higher language barriers. On the other hand, Germany has the highest export rate in the world which indicates that there is a significant set of capabilities and competencies regarding cross-cultural relationship management.

Together with the two top management representatives of FINANCE that are responsible for its corporate wide offshore strategy, six projects were selected from a database of the company's sourcing management unit that contained information about all outsourcing projects the company had conducted. To increase homogeneity and comparability between the projects only offshore projects with Indian vendors were selected. India was also chosen, since this nation is supposed to be the major and most advanced offshoring nation and the favorite offshore site of FINANCE. Moreover, only ongoing projects were chosen with similar histories. To ensure sufficient heterogeneity among the projects both development and maintenance projects were selected. In line with the study's objectives it was ensured a priori that there was enough variation in the perceived economic success across the projects. This purposeful sampling strategy (Quinn Patton 2002) resulted in three application development and three maintenance projects that involved offshore vendors from India. In order to obtain a comprehensive picture of the offshoring projects, we followed a multiple informants design involving key members of each project. We interviewed several stakeholders of each project: the project manager, one or two team members (from the client team), at least one member from the vendor's team (onsite coordinator, relationship manager or offshore coordinator) and also business responsibles wherever possible. The interviews were based on interview guidelines with semi-structured, open-ended questions, including questions about general project information as well as questions reflecting the constructs of our theoretical framework (specificity, offshore characteristics, additional costs, and economic benefit). The interview guidelines were tailored to the different roles that the interviewees had in the projects. All in all, 27 semi-structured interviews were conducted by the first author and a research scholar. The interviews were open-ended and took between one and three hours. Most interviews were approximately two hours in length. All interviews were face-to-face, except for one interview with an offshore project leader which took place via conference call to India. Table 1 provides an overview of the projects and the corresponding interviewees.

Table 1. Overview of Projects and Interviewees

1 = number of interviewees; - = not available for interview; N/A = not applicable, i.e. this role did not exist

Projects / Interviewees	Development			Maintenance		
	FRONTEND	**CORPORATEPAY**	**WEBPORT**	**INTERCHANGE**	**SUBSIDPAY**	**CORPACCESS**
Project manager	2	1	1	1	1	1
Team member	1	1	N/A	1	1	1
Vendor	2	1	1	1	1	2
Business responsible	3	-	2	1	-	1

All interviews were tape-recorded and transcribed. The transcripts from the 27 interviews were aggregated into a case protocol which comprised 198,996 words and 225 pages of text. The projects were encoded and structured using the software NVivo. The coding procedure was done as follows: First, in order to mitigate potential bias, the second author who had not taken part in the interviews read and coded the interview transcripts by identifying text passages that included information about the constructs of the theoretical framework, i.e. information about (a) additional effort that arose on the client side (for knowledge transfer,

specification, coordination, and control), (b) asset specificity (using the distinction between unique business process and technological/software knowledge as a basis), (c) offshore characteristics (geographic distance, cultural differences, language, lack of absorptive capacity) and (d) business case calculations. Additional themes were identified in an exploratory way: fluctuation emerged as a further offshore characteristic, and conceptual development costs were identified as a further type of cost throughout the process of data collection and analysis. Following the coding of the second author, the first author coded the transcripts alike, with the third author severing as a referee when certain text passages were coded differently. A table was produced that included 285 coded text passages which were linked to the identified theoretical constructs and themes. Table 2 shows the structure of our table of quotes and constructs.

Table 2: Structure of Table of Quotes and Constructs

			Additional costs						**Offshore characteristics**					
Project	Quote	**Specificity**	KT	KM	Specification	Control	Coordination	Conceptual	Distance	Language	Absorptive capacity	Culture	Fluctuation	**Business case**
FRONTEND														
Project manager	[...]				1									
…	…													

Some of the citations only provided information about one particular dimension (e.g. asset specificity), while others provided information about two or more constructs as well as the linkages between them. We considered both pieces of information as important when forming a comprehensive picture of each project. Moreover, we considered both when performing a cross case (i.e. project) analysis in order to detect general patterns (Yin, 1999).

Based on the citations, the instances of the theoretical constructs were determined for the constructs human asset specificity and the amount of additional costs (high, medium, low). This will be shown in detail in the sections ‘case findings’ and ‘explaining variations in additional costs’. The instances were determined independently by author one and two, with author three serving as a referee in case of different classification. In order to increase the validity of our coding and data analysis procedure, we used multiple sources of evidence (Yin, 1999), i.e. multiple citations from different stakeholders to determine whether a construct was rated high, medium or low. Moreover, we attempted to increase internal validity by not only performing pattern matching between variables, but also by considering statements that by themselves included causal linkages. Project documentation such as calculated business cases, software requirements, and presentations served as a basis for data triangulation (Yin, 1999). Based on the coded transcripts and the project documentation, case write-ups and case profiles were developed for each case. In the following section, information about the company and overviews for each of the projects will be given. Subsequently, the findings from our analysis are presented.

Company and Project Information

FINANCE started participating in offshore outsourcing in the mid-90s. Staff augmentation, i.e. bringing offshore IS professionals onsite for application development and maintenance was the first step in this respect. In the past few years, the organization also started handing over development and maintenance work to offshore vendors by applying an onsite-offshore-model in which the vendor’s team is offshore but at least one team member is onsite. Some projects had satisfactory results while others did not show the expected benefits. In our case study, the following development and maintenance projects were analyzed.

The first offshore development project, FRONTEND, was one part of a large-scale project encompassing the re-engineering of the client’s current account system. This system was the firm’s largest and most important IT

system. The purpose of the re-engineering was to consolidate two systems into one new system in order to eliminate redundancy, complex maintenance tasks, and the dependency on few key personnel possessing the system know-how. FRONTEND covered the re-implementation of the front end system. The costs incurred in this project exceeded those that were calculated in the business case. The quality of services was lower than expected.

The second offshore development project, CORPORATEPAY, realized the development of a European billing system for high value payments of corporate customers. This system enabled the business unit to bill their corporate customers with flexible conditions, for example multi-tier conditions or rebates. Cost savings as projected in the business case were not achieved, since the project showed a huge delay and additional costs were incurred. The quality of services did not meet the bank's expectations.

WEBPORT, the third offshore development project, encompassed the development of a financial portal by two vendors. A German vendor was responsible for the business requirements analysis and an Indian vendor took over design, coding and testing. The portal to be developed was meant to provide information about capital market products for corporate customers. Contrary to initial expectations of 50% savings, additional effort on the client's side and even from a third party along with an extension of the project's time frame was necessary. The quality of services was lower than expected.

INTERCHANGE, the first maintenance project, encompassed the offshore outsourcing of the maintenance and support of a legacy payment platform for domestic and cross border payments. The software realized conversion services for high value and bulk payments. First, it was decided to only offshore the testing of that application but later on, the whole maintenance and support was handed over to the same vendor. Cost savings were satisfactory for the testing part but not fulfilled for maintenance and support. The project required additional effort on the client's side, but still the business case was met with a 10% deviation. The quality of services was somewhat lower than expected.

SUBSIDPAY, the second maintenance project, covered the offshoring of the maintenance and support of a software package that ensured the bulk payment processing in one of the European subsidiaries. The application processed transactions for local clearing procedures, i.e. credit orders and direct debits. The core product was standard software that was significantly enhanced and customized for the needs and requirements of the firm. Additional costs were incurred since the project got delayed, but cost savings were still achieved. The quality of services was perceived lower as compared to that of the service that had been provided in-house.

In the third maintenance project, CORPACCESS, maintenance of two of the main applications regarding electronic payments processing for corporate customers which was previously outsourced domestically was offshored to an Indian vendor. One system realized the customer access, while the other one enabled the customer administration. Few additional costs were incurred, and the project was rated highly successful in terms of cost savings (about 35%) and quality.

Case Findings

Additional Costs beyond the Business Case

A first look at the case data revealed that additional costs, i.e. additional effort on the client's side that had not been calculated in the business case, were incurred in all of the projects to a certain extent. Regardless of the method that was used to set up the business cases, the case findings suggest that effort and costs for managing the vendors (both production and transaction costs) were underestimated by FINANCE.

- *"We had a budget increase, since FINANCE employees had to support the vendor at times when the vendor should have been working things out on their own." (Business responsible, FRONTEND)*
- *"The result was that the assumption in the business case that the vendor would do 60% of the work turned out to be the other way around, 70% FINANCE and 30% vendor." (Business responsible, FRONTEND)*
- *"We needed three more people from our side." (Project manager, CORPORATEPAY)*

- *"Apparently, we have to invest more time. And time is money." (Business responsible, WEBPORT)*
- *"Our engagement and commitment is very high. And without this special commitment, this professionalism and this technical know-how, it would not have been possible." (Project manager, INTERCHANGE)*
- *"Additional costs were incurred during the set-up phase." (Project manager, SUBSIDPAY)*

Classification of Additional Costs

Analyzing the projects with regard to the additional costs that were incurred (research question 1), we classified those costs according to the production and transaction cost timeline presented in Figure 2. Since the border line between the set-up and delivery phase turned out to be blurred for knowledge transfer and specification, we made no temporal distinction for both constructs in our data analysis. Moreover, we focused on those costs that were incurred after vendor selection and contract negotiation.

Additional production costs for knowledge transfer, ongoing knowledge management, and (re-) specification were incurred throughout all cases, except for CORPACCESS. Some of the client's effort exceeded mere specification, i.e. FINANCE had to make contributions to the actual implementation. After carefully analyzing this phenomenon, we named those identified costs "conceptual development costs". Such conceptual development costs were incurred in the two development cases FRONTEND and CORPORATEPAY. Additional conceptual development costs are those costs that arise from revising or extending the initial systems development or maintenance concept throughout the process of the (offshoring) project.

Additional transaction costs for controlling and coordinating the vendors' performance were incurred in all of the cases. Apparently, FINANCE had to spend increased effort for ensuring that the vendors were able to deliver the services according to the contractual agreements. Examples from the cases for additional production and transaction costs are provided in Table 3.

Table 3. Additional Costs

KNOWLEDGE TRANSFER (KT) / ONGOING KNOWLEDGE MANAGEMENT (KM)	
Case	**Exemplified Quotes**
FRONTEND	"We have to do an enormous amount of knowledge transfer. Somebody from here would already have this knowledge." (Team member)
CORPORATEPAY	"The knowledge transfer was very intense." (Project manager)
INTERCHANGE	"My team members, my German colleagues, are saying, I have to repeat something one hundred times to the team members, why does the knowledge transfer not happen?" (Project manager)
SUBSIDPAY	"We had to explain the same things again and again where we would have expected them to explain things among themselves." (Team member)
(RE)SPECIFICATION	
FRONTEND	"They will still need someone from our side to help them consider what the front end could look like […] or what the problems could be." (Business responsible)
CORPORATEPAY	"The requirements have to be very precise. […] So in the end, we have done most of the work." (Project manager)
WEBPORT	"You have to specify precisely what is required or needs to be done." (Project manager)
INTERCHANGE	"You have to tell them, please use this template. Do it like this." (Project manager)
SUBSIDPAY	"We have to specify and pay attention to much more things." (Team member)
CONCEPTUAL DEVELOPMENT	
FRONTEND	"We have to contribute a lot more in order to balance certain deficits, e.g. conceptual deficits." (Team member)
CORPORATEPAY	"Not only do they need a proof of trust, they also need professional support." (Team member)

VENDOR COORDINATION	
FRONTEND	"Although we are not directly involved in the programming, we have to guide the project very closely, which is very time consuming." (Business responsible)
CORPORATEPAY	"We manage the vendor, we allocate the work, and we take care of quality." (Project manager)
WEBPORT	"I have to do a lot of coordination, otherwise things would not happen at all or in the wrong way." (Project manager)
CONTROL	
FRONTEND	"This is a controlling issue. Even though we don't have to, we do a technical implementation in order to be able to evaluate whether the vendor's solution is right or wrong." (Business responsible)
CORPORATEPAY	"The vendor needs feedback: What went wrong? And why?" (Team member)
WEBPORT	"I am permanently pushing and advising them." (Project manager)
INTERCHANGE	"Documentation, hands on sessions, flying over there, explaining them things, bringing people here, but at the end of the day, the only reasonable approach apart from all those things, you need more control and you need more dedication." (Project manager)

Quantification of Additional Costs

Since additional effort on the client side was observed in all cases but was not tracked rigorously in ex post business case calculations, we estimated the relative amount of those costs based on our interview data. Our initial base line was the information about the extent to which the original business case was not met in each of the projects (see above). In order to validate this base estimate, we counted the number of quotes for each project and cost category, and we averaged those costs by dividing the number of total cost-related quotes by the number of FINANCE employees we had interviewed. Vendor interviews were not considered in this calculation, as the vendors' team members could hardly provide information about additional effort that had to be incurred on the client's side. This calculation is shown in Table 4.

Table 4. Additional Costs (Number of Quotes)

	ADDITIONAL PC			ADDITIONAL TC			
	KT/KM	**Specification**	**Conceptual development**	**Vendor coordination**	**Control**	**Total**	**Average***
FRONTEND	17	4	7	2	5	35	5,8
CORPORATEPAY	5	4	1	3	4	17	8,5
WEBPORT	0	4	0	2	3	9	3,0
INTERCHANGE	5	2	0	2	3	12	4,0
SUBSIDPAY	6	5	0	0	0	11	5,5
CORPACCESS	4	2	0	0	2	8	2,7

* Average = Total number of quotes / Number of interviewed FINANCE employees
KT = Knowledge Transfer; KM = Knowledge Management

Based on our assessment of additional costs in terms of frequency and intensity, we derived a quantification of additional costs incurred in each case:

- FRONTEND: high,
- INTERCHANGE: medium – high,
- CORPORATEPAY: high,
- SUBSIDPAY: medium – high,
- WEBPORT: medium – low,
- CORPACCESS: low.

(1) *Frequency:* The average numbers of cost-related quotes suggest that additional costs were mentioned relatively frequently in the development cases FRONTEND and CORPORATEPAY as well as in the maintenance case of SUBSIDPAY, whereas additional costs were mentioned less frequently in the case of WEBPORT, INTERCHANGE and the least in COPRACCESS.

(2) *Intensity / Nature of costs:* The data reveals that additional costs were incurred throughout all cost categories in the cases of FRONTEND and CORPORATEPAY, whereas the additional costs mentioned in the cases of SUBSIDPAY and CORPACCESS were knowledge transfer (management) costs and specification costs, i.e. production costs. In INTERCHANGE, additional costs were incurred in all categories except for conceptual development, while WEBPORT showed some additional specification costs along with additional costs for vendor coordination and control, i.e. transaction costs.

Explaining Variations in Additional Costs

Having identified the major cost facets that are responsible for the initially observed deviations from the calculated business case, the next question to answer is the why these variations in additional costs do exist (research question 2).

Impact of Asset Specificity

In the following, we analyze each of the projects with regard to the degree of human asset specificity. Furthermore, we interpret the relation between the degree of specificity and the level of additional costs (Proposition 1). Table 3 provides an overview of the average degree of asset specificity for each project. In line with Dibbern et al. (2005), asset specificity was rated high when the development or maintenance work required knowledge about unique software applications and/or business processes of the client. In contrast, if the application service provision primarily required technological knowledge (e.g., programming capabilities) that can be acquired without close interaction with client personnel, the asset specificity was rated rather low. Moreover, in terms of software maintenance, asset specificity was rated high when the client applications that were taken over by the vendor were highly complex and if it was difficult to understand the underlying logic of the programming code.

Table 5. Asset Specificity

Case	Rating	Quote
FRONTEND	High	"Throughout the project, a great amount of business knowledge is needed. " (Project manager) "It is a highly complex system. You will not be able to understand it immediately." (Team member)
CORPORATEPAY	High	"There are thousands of companies that offer billing systems; however, those systems do not quite satisfy our needs. […] Standard products offer some of the functionalities we need, but still we would have to make a lot of adaptations so that we will be better off to develop the system ourselves." (Project manager) "We were looking for people who possess know-how about the billing system and the programming and who were able to get a quick hold of the underlying data model." (Project manager)
WEBPORT	Medium - low	"This is a portal. This is a pure technical project, actually. It is more technology than functionality." (Vendor) "As I said, you should have a basic knowledge about the data that is displayed. Beyond that, you are not expected to understand how the rates are calculated." (Vendor)
INTERCHANGE	Medium - high	"The complexity we have is very high to test. […] I would say, 60% of the knowledge was on the paper and the rest of it was in the people's heads." (Project manager) "The system is very complex. We have technical people, and we have people who contribute their knowledge for the business analysis part." (Team member)
SUBSIDPAY	Medium - high	"[Business know-how] is of great importance. You need to have the right understanding of the application and the business, and you need a certain understanding for our customers." (Project manager) "The product itself was tailored by FINANCE people themselves. […] It is complex in the sense that it is on a legacy system and has interfaces with multiple systems." (Vendor)
CORPACCESS	Medium	"It will not be enough to know Java programming. You should also have some knowledge about payment systems and our specific standard for this system." (Team member) "What you need is general domain knowledge. You should know about the kinds of payments, statement and the concept of this system." (Project manager)

From all projects, the re-engineering project FRONTEND turned out to be the one with the highest level of human asset specificity. On the one hand, it required an excellent understanding of the two prior systems that were custom-built over a period of almost 30 years. Only few key persons possessed knowledge about the system and understood the structure. The system reflected business rules that even the business unit itself was not aware of anymore. The documentation was enormous, but still had gaps. The system was a unique application which reflected idiosyncratic organizational processes that needed to be understood by the vendor. Moreover, transformational business knowledge was needed since the new system should entail additional functionalities that went beyond the original twin-system. CORPORTEPAY is on second position with regard to human asset specificity. It primarily required client-specific business knowledge and a very good understanding of the banking market. Moreover, knowledge about FINANCE's idiosyncratic IT landscape was needed. INTERCHANGE was positioned on third place, rated medium-high in terms of human asset specificity. The project started with handing over the testing followed by maintenance and support of a proprietary complex system reflecting processes that are unique to the bank. Although testing methodologies are generic and apply to all types of software, a certain amount of knowledge and understanding about the system's structure and processes is required. For the maintenance task, detailed knowledge about firm specific processes and

application flow was needed. Number four is SUBSIDPAY, also rated medium-high. The project involved the maintenance of a U.S. standard software which was extremely customized to a European subsidiary's needs. Thus, firm-specific processes were reflected in the application and hence needed to be understood by the vendor. However, the actual maintenance task only included minimal software upgrades and changes. Therefore, the degree of human asset specificity is rated as medium. CORPACCESS ranks on fifth place, because only little unique client knowledge was needed in this project. Most of the process flows could be documented. The maintenance work load consisted of technical standard tasks, such as upgrades of the operation system version, the database version or the programming language version. For these tasks, general domain knowledge was required and some unique knowledge about the specific standards that were used in the bank. Accordingly, the degree of human asset specificity of the outsourced tasks is rated medium-low. Finally, WEBPORT was rated the lowest in terms of asset specificity. For this development project, hardly any organization-specific know-how was needed. The requirements analysis phase required the external vendor to bring in knowledge about web portals in the business market and provide innovative ideas. However, as the German vendor together with the business unit successfully took over this creative part, the Indian supplier needed to bring in design, coding and testing know-how for the application development. The software did not map any firm-specific process flows. Accordingly, among all outsourced projects to India, this one represents the lowest degree of human asset specificity.

Having positioned each project on the asset specificity continuum, the next step is to examine Proposition 1, i.e. whether projects with a higher level of human asset specificity actually showed higher levels of additional costs. For this purpose we created a simple contingency table crossing the two variables (" specificity" and "amount of additional costs") (Hubermann and Miles 1994). This mapping is illustrated in Figure 2. As can be inferred from Figure 2, this logic largely applies to all of the projects, supporting Proposition 1.

Interestingly, when we examined the relationship between asset specificity and additional transaction costs, we initially could not find any conclusive evidence that coordination and control costs where particularly high due to safeguarding against vendor opportunistic behavior. The vendor staff was perceived as highly motivated and willing to work hard throughout the projects. Only in one of the testing and maintenance projects the project manager complained about high coordination costs for finding motivated and skilled people at the vendor side. The project manager put tremendous efforts into getting highly motivated and skilled team members.

> *"It was a pain in the neck and I was selecting almost every team member, kept looking on the CVs, their experience, the way they react, the way they respond, whether they are serious or not, whether they are professional, whether they are too young people not committed to this project […]. So I supervised the project very strictly." (Project Manager, INTERCHANGE)*

The opportunistic behavior became apparent in a more subtle way. What appeared to be problematic in all of the projects was the high level of fluctuation among the vendor's team members during the project. This is taken up in the next section that deals with offshore characteristics.

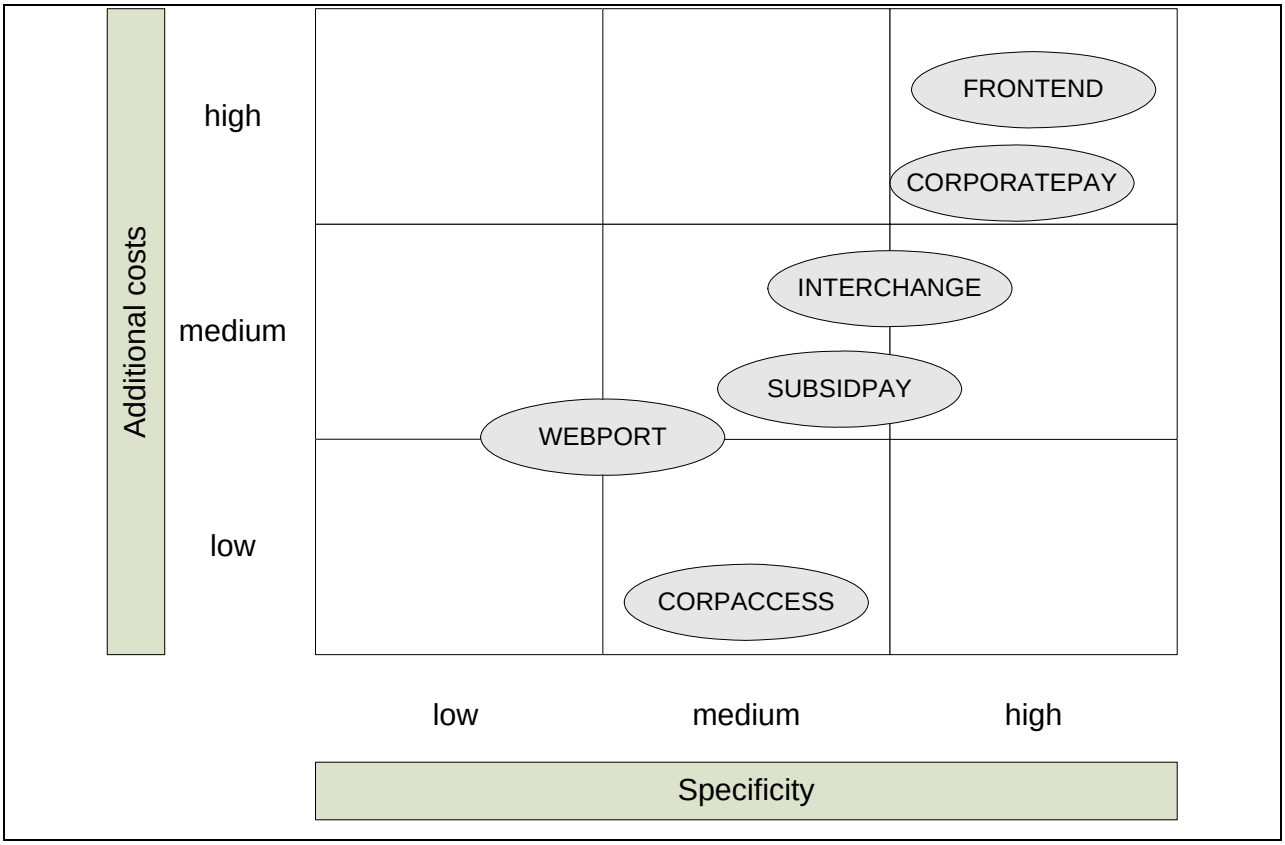

Figure 3. Relationship between Specificity and Additional Costs Impact of Offshore Characteristics

In search for patterns among the cases, four offshore-specific characteristics emerged that played a crucial role in the offshoring projects: distance, fluctuation, lack of absorptive capacity, and cultural differences between the bank's and the offshore vendor's employees. Language differences were found to play a minor role in all of the projects. Due to the strong international orientation of FINANCE, English was well accepted as a business language and there were little problems in understanding each other in the projects. Only in the maintenance projects the translation of some German documentations caused extra efforts. Hence, language issues were not further considered in our analysis. Fluctuation appeared as an important issue in almost all projects and was considered in addition to the offshore characteristics which we had anticipated in our theoretical analysis as discussed in the beginning of this paper. In this section, we will illustrate the offshore characteristics we observed in the cases. We will explain how those offshore characteristics are related to the observed additional costs during the set-up and delivery phase (Proposition 2a) and we will analyze the impact of the offshore characteristics in the light of each project's specificity (Proposition 2b).

Distance. Distance and the resulting time difference caused increased efforts and time investment on the internal team's part for *coordination, monitoring and knowledge transfer*. Several interviewees mentioned that in particular complex issues could be better explained face-to-face and it took several rounds of conference calls and email exchange in order to solve them. This has been confirmed both by vendors and clients.

> *"Sometimes they [business team] say: it is difficult, had the team been here, we could have resolved this in one day and now we have to make two or three rounds of telecons [telephone conferences] or video cons to explain and review. Yes, it is true. That is the pitfall of offshore outsourcing." (Vendor, WEBPORT)*

> *"We do have communication tools, web conferences and things like that, in place, however, with complex issues, face-to-face is a lot more efficient. You are able to reach much smoother and simpler solutions. This is what we have realized." (Business Manager, WEBPORT)*

> *"Instead of sending a slide and explaining difficult things during a telephone conference, it would be a lot easier and faster to explain things on a piece of paper. That is why it is not a bad idea to*

have one or two people supporting the team onsite in order to clarify things that are difficult to resolve on the phone." (Team member, FRONTEND)

As a consequence, offshore personnel was often required to work onsite, which increased production costs even more:

"Having them [offshore team members] onsite is associated with an enormous amount of costs. This eroded the original business case." (Project Manager, CORPRATEPAY).

This supports our proposed direct impact of geographic distance on cost increases at the client side (Proposition 2a) as well as the moderating impact of asset specificity (Proposition 2b), since it was also mentioned that distance becomes particularly problematic when complex and difficult issues uses needed to be communicated.

Fluctuation. A high turnover rate was one aspect that all maintenance project managers and team members invariably complained about, and that also occurred in the development project CORPORATEPAY.

"Fluctuation is very high. " (Project manager, SUBSIDPAY)

"We had trouble because of fluctuation of the people, people disappeared […]." (Project manager, INTERCHANGE)

"We have almost every year a rotation of the current onsite coordinator, because they want to return to India." (Project manager, CORPACCESS)

"We struggled with the usual things such as extremely high employee turnover." (Project manager, CORPORATEPAY)

Employee turnover at the Indian vendor increased the *costs for knowledge management* because in-house team members had to re-explain and specify things for new offshore team entrants.

"We get involved in issues where the know-how should be with the vendor." (Project manager, SUBSIDPAY)

The *administrative efforts* for integrating a vendor team in a big organization should not be underestimated either. Due to the high fluctuation with India, these costs are higher as compared to domestic outsourcing.

"Every time a new onsite coordinator enters the team, this is related with an incredible amount of administrative work: making sure he has passwords and access to a variety of systems." (Team member, CORPACCESS)

"I have for example taken part in the development of an internet trade platform some years ago with a domestic vendor. Not anything worked out there at once either. But it was a much smoother process." (Business responsible, WEBPORT)

Since fluctuation may be considered as a vendor-specific offshore characteristic, the case evidence supports Propositions 2a by showing how fluctuation may lead to additional costs at the client side. We also found evidence for two different kinds of fluctuation that may affect offshore outsourcing projects. On the one hand, offshore team members may leave one project in order to work on another project of the same vendor; on the other hand, they may leave the offshore vendor for good in order to work for a different company or offshore provider. Both forms may be considered as variants of opportunistic behavior, and any safeguards against such behavior cause transaction costs.

Lack of Absorptive Capacity. Another aspect which persistently appeared in the case study was a perceived inexperience of the vendors' team members and their lack of creativity. In many cases, the Indian professionals lacked domain-specific know-how, i.e. knowledge about the client's market environment and the business.

"Precise requirements are realized. But if you ask them to present a solution developed by themselves, you will encounter limits. If creativity is required, there will be problems. They [Indian vendors] are not yet at that stage." (Project manager, WEBPORT)

"I get the desired quality for clearly defined processes. This will be difficult or not achievable for work where I expect creativity from the [Indian supplier] firm." (Project manager, SUBSIDPAY)

"We possess this creativity. […] The vendor possesses this creativity only to a limited degree." (Project manager, CORPORATEPAY)

"They do it precisely as you have described. And if creativity is required, then it does not work." (Team member, CORPACCESS)

Inexperience of Indian team members led to higher *knowledge transfer costs*. Although the Indian vendor of FRONTEND had already worked with FINANCE in other projects, the German project manager realized the lack of domain-specific know-how and experience and additionally hired two German consultants, that previously had worked with FINANCE, for understanding and translating the know-how of key resources. These two consultants' support was perceived as very important and helpful by the FRONTEND project manager. The initial idea that the vendor would be able to understand the existing applications landscape by using its own reengineering tools was misleading. Additional knowledge transfer was required to understand the highly specific application logic.

"Because of these difficulties, we have to invest in team building, which was underestimated. We also thought that the Indian professionals would be able to analyze the program with their tools by their own, and to acquire the business know-how with the help of these tools, but that is also not the case. They highly depend on our help." (Project Manager, FRONTEND)

The Indian vendors' lack of absorptive capacity also increased the *specification effort*. Because of the Indian professionals' lack of creativity and inexperience of young team members, the requirements specifications have to be very accurate when offshoring.

"It was a learning process for us: A lot of things that we consider as obvious have to be communicated to the vendor. Sometimes we can't even imagine all the things that have to be specified until we see that it has been done in a wrong way." (Team member, SUBSIDPAY)

One issue that we did not consider in our pre-conceptualized phase model is that the client could actually be forced to take over work that was originally covered by the contract and hence the responsibility of the vendor. In the projects CORPORATEPAY and FRONTEND, the vendor was not able to deliver without some internal team members taking over tasks that were planned to be in the vendor's responsibility. In both projects, the effort of the internal team members for working on those tasks, i.e. *conceptual development costs*, was far beyond of what had been expected. For FRONTEND, internal team members had to fly to India to help execute the testing. In CORPORATEPAY as well, internal programmers were sent to India to have a look into the source codes and technically support the team. These additional engagements of the client were necessary because of the vendor's inexperience and lack of required skill sets, i.e. absorptive capacity. Moreover, it is striking, that the conceptual development costs occurred in those two projects with the highest human asset specificity.

"In my opinion, you have to work closely together and observe very closely what work is being done. And this is why the 40:60 [onsite : offshore] model is really hard to achieve. Because in my opinion we have to contribute a lot more in order to balance certain deficits, e.g. conceptual deficits." (Team member, FRONTEND)

This implies that there is a point when the effort for knowledge transfer is so high that the client is better off performing the task by himself. The case study revealed that not only the profile of the vendor is important but also the offshore team members' skills and their attitude. Interviewees in all projects observed that there is a high skill set discrepancy between the team members. The majority of team entrants were young and inexperienced. FINANCE felt the need to actively get more experienced members into the team. However, taking care of the team's composition creates extra-effort and *coordination costs*.

"The only thing that works is the firm [vendor] ensuring that the right people are in the team. I do not want to read vendor employees' CVs. That does not correspond to the notion of outsourcing." (Project manager, SUBSIDPAY)

Also inexperience and lack of insight into the firm-specific processes had to be compensated by the internal team.

"They [the vendor team] have become really good in resolving 'standard issues', i.e. issues that occur repeatedly. For exceptional issues they still need our help." (Team member, SUBSIDPAY)

Control of a project's progress is another important issue. CORPORATEPAY showed that outsourcing the analysis phase and not controlling the results of the design phase may lead to severe problems. The vendor did not possess the required degree of business understanding, creativity, and experience to fully recognize the business requirements and needs.

"We said we will hand over everything [the whole development cycle] to the vendor. He gets our business requirements in a box and will deliver us a 'gift box' containing our software product and that's it. That was a fallacy." (Project manager, CORPORATEPAY)

Overall, the case evidence shows that the offshore vendor's lack of absorptive capacity may lead to additional costs for knowledge transfer, specification, conceptual development, coordination, and control, thus supporting Proposition 2a. It is striking how the lack of absorptive capacity was associated with all types of production and transaction costs that we had previously considered in our phase model. The case findings also suggest that the impact of a lack of absorptive capacity becomes especially apparent in the highly human asset specific cases, thus supporting Proposition 2b.

Cultural Differences. Throughout the cases, the team members perceived obvious differences in the German and the Indian working culture. The Indian professionals strongly adhered to hierarchies and tended to implement prescribed specifications without reflection.

"When you talk to two [Indian] persons, it is obvious who sits in the driver's seat." (Team member, FRONTEND)

"They implement what you tell them. But merely what you tell them, partly they do not look one step ahead." (Team member, CORPACCESS)

"When they presented us some alternatives, we said: 'what do you think?'. And you could tell, they did not expect that question and seemed to be surprised and unprepared for an answer." (Team member, FRONTEND)

The Indian team needed enhanced support and high social collaboration during *knowledge transfer* because of their different learning approach and their high conformism. Feedback mechanisms were established in order to recognize misunderstandings at an early stage.

"[…] we recognized, in the direct contact there will be no such feedback as 'I do not understand'. We have to organize the feedback. That means we have to establish measures in order to oblige those who have absorbed information to re-explain it." (Project manager, FRONTEND)

Differences in the Indian working culture also increased the *specification effort*. Because of Indian professionals' high conformism, the requirements specifications had to be very accurate.

"After having completed one phase, we had a bad awakening. The functional specifications [which the vendor was responsible for] were inspected and a lot of gaps were identified. This is related to the Indian culture. […] What they get as an input, they do not question at all. Of course it is also the lack of knowing the business. You can only ask questions if you know the context. […] It is the mentality of the Indian professionals to always say yes and to scrutinize." (Team member, CORPORATEPAY)

We also observed that in terms of *coordination and monitoring*, the internal team had to compensate aspects such as the Indian professionals' tendency to not ask questions and clarify issues.

"Instead of working for three weeks and coming up with a 200-pages document, we require them to come back earlier for reviews." (Overall project manager, FRONTEND)

"We told them to come up earlier with partial results. We have had the experience that they worked for a long period of time on a document and then we saw that they had moved into a completely different direction." (Team member, SUBSIDPAY)

"Basically what they need is feedback: this is the right way, or no, that is the wrong way." (IT unit team member, CORPORATEPAY)

The case findings show how cultural differences between German and Indian IS professionals may lead to additional costs for knowledge transfer, specification, coordination, and control, thus supporting Proposition 2a. Thus, overall our prepositions are widely supported and we will now delve deeper into the implications of our findings.

Discussion

This study was motivated by the need to improve our understanding why the extent to which expected economic benefits from offshore software projects are realized varies substantially between projects. While previous literature has focused mainly on relationship management issues that should be addressed in order to ensure successful offshoring arrangements, the findings from our study suggest that beyond the importance of effectively managing the relationship with offshore vendors, specific offshore characteristics and the nature of the work that is offshored have wider implications on the achievement of economic benefits. As shown by our results, general offshore characteristics as well as unique offshore vendor characteristics can lead to additional effort at the client side and thus decrease the benefits from lower labor costs. These additional client costs and the effect of the offshore characteristics on additional costs were found to be particularly high in projects that are characterized by a high degree of human asset specificity. Before elaborating on the theoretical and practical implications of these findings, the limitations of our study will be presented in order to provide a well-defined context for interpretation.

Study Limitations

There are several limitations to take into account. First and foremost, it should be recognized that the study findings are based on a single site case study. The findings may be biased to a certain extent by the overall corporate strategy and culture of the bank. We found a strong identification of the in-house project members with the bank and a strong commitment to their work in the bank's best interest. This may have increased the perception of cultural differences at the client side at the beginning of the projects. On the other hand, we could not identify any bias through possible connections between the projects. The projects were completely disconnected, the decisions were made independently, and there was no evidence that the management of the project was influenced by other projects. Second, it should be kept in mind that we only studied offshoring from Germany to Indian vendors. Thus, the offshore characteristics and their impact should be treated with caution when studying other client locations or offshore countries. Third, the subjective rating of the variables by the authors may still be an issue, even though procedures for increasing internal and external validly were followed. Moreover, the fact that the researches that were involved in selecting and analyzing the data were German or educated in Germany (as in case of the research scholar) poses the risk of cultural bias. A final limitation is a potential bias in the answers of the interview partners. At the client side, we found this concern to be vitiated by the extremely open and even self-critical behavior of the interview partners. This was slightly different at the vendor side, where the interview partners were more reserved, avoiding statements that could shed a negative light on their company.

Theoretical Implications

Keeping these limitations in mind our study offers a number of important theoretical contributions. The refined and substantiated theoretical framework that resulted from our data analysis and interpretation is depicted in Figure 4.

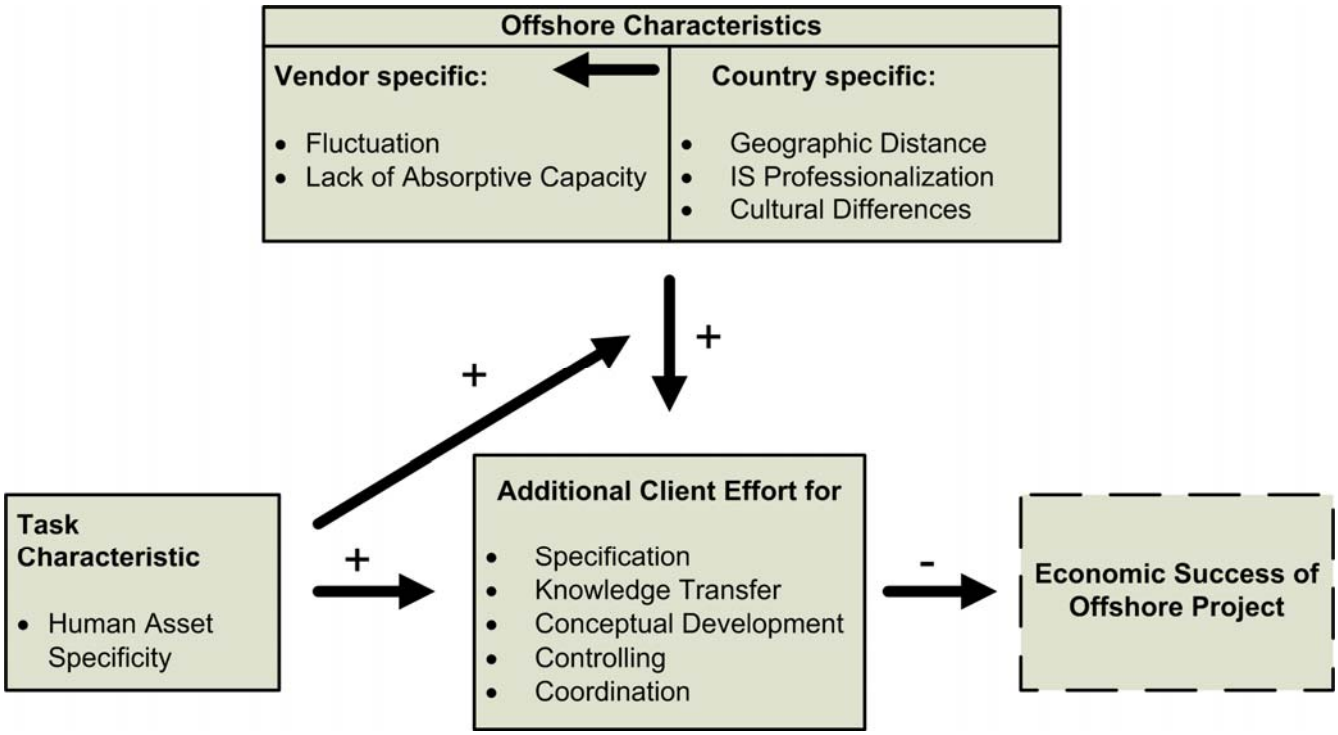

Figure 4. Theoretical Framework for Future Research

Theory Refinement: 'What is Offshored' Affects Specific Production and Transaction Costs

First of all, our results reinforce the logic that the economic success of an outsourcing arrangement critically depends on "what is outsourced" (Lacity and Willcocks, 1995). In line with TCE, the projects with a high level of asset specificity showed higher additional costs than those where less unique application and business domain knowledge was required. Our study makes a further contribution by opening the production and transaction cost "black box", disaggregating the two types into more specific costs, including both production costs for knowledge transfer, requirements specification and conceptual development as well as transaction costs for controlling and coordinating the offshored project. Based on this distinction, another remarkable contribution of our study is that we are able to show empirically that a higher level of human asset specificity leads to both increased production and transaction costs for the client (Dibbern, et al., 2005).

Theory Extension: Offshore Characteristics May Cause Additional Client Effort

The second contribution of this study lies in its differentiated analysis of the impact of certain offshore characteristics on the economic benefits of offshore application software projects. Two groups of offshore characteristics can be distinguished. The first group, labeled *country-specific offshore characteristics*, includes cultural differences, geographic distance, as well as differences in the level of IS professionalization. The cultural differences between Indian and German project members can be traced back to differences in power distance between the two nations. Power distance refers to the extent to which less powerful members of organizations and institutions (like the family) accept and expect that power is distributed unequally. Cross-cultural research has shown that power distance is stronger in India than in Germany (Hofstede, 1980). In our projects, the high level of power distance in India was reflected by a high level of conformism (tendency to say yes) as well as obedience to and dependence on rules and obligations among Indian IS professionals. This particularly increased the clients' effort for specification, knowledge transfer and vendor control. Besides its high level of power distance, the Indian culture is characterized by a relatively high level of collectivism (Hofstede, 1980). This stipulates the formation of in-group behavior (Hui and Triandis, 1986). Chen et al. (2002, 289) have argued that "(...) collectivists typically draw the distinction between those they are personally related to (in-groups) and those they are not (out-groups)". This means, that significant effort has to be invested in forming a common knowledge space ("ba") (Nonaka and Konno, 1998) before the Indian IS professionals – that

together may form an in-group – communicate and exchange tacit knowledge with Germany client personnel. The German team may indeed behave as an in-group as well – either because of the corporate culture or because of the national German culture which also leans towards collectivism (Hofstede, 1980). Thus similarity in the cultural dimension "collectivism" between two cultural groups may not automatically lead to the absence of cultural clashes, rather a process of convergence is required to form a collective of two distinct collectivist (in-)groups. Beside the economic affect of national distance, geographic distance also affects the efficiency of offshore arrangements. Geographic distance was found to increase specifically the transaction costs and knowledge transfer costs.

In addition to these national characteristics that were found to increase costs in all projects, two *vendor-related offshore features* were identified, namely the level of absorptive capacity and the degree of fluctuation of vendor staff. Both dimensions are partially impacted by national characteristics. For example, the average level of absorptive capacity of a offshore country's IS vendors will likely be lower compared to other regions (or the client home country) if the vendor country has a relatively young IS tradition and hence a relatively low level of IS professionalization. Our study results showed that from all offshore characteristics, the level of absorptive capacity of the vendor had the widest impact on additional costs. A low level of absorptive capacity leads to increased knowledge transfer effort at the client side and a higher need for detailed specifications. In two of the cases, the client even resigned and took over part of the conceptual development work of the vendor because the costs of specification and knowledge transfer had been getting too high. In addition, controlling effort to ensure appropriate software quality increases due the vendor's lack of creativity in designing innovative high quality software solutions. These findings go beyond the resource-based reasoning that vendor capabilities are critical for outsourcing success (Goles, 2003). In particular, these findings suggest that in addition to existing capabilities such as technical and project management capabilities, the potential to absorb new knowledge is important. This is consistent with findings from previous studies which suggest that in many outsourced projects knowledge overlaps between client and vendor are required, calling for a knowledge transfer process between both parties (Tiwana, 2004). Thus the strong impact of the vendor's absorptive capacity reinforces the complementary role of resource-based and knowledge-based reasoning in explaining the economic success of sourcing arrangements. What also appeared to be a severe problem was the degree of staff fluctuation at the vendor side. Once the knowledge transfer which usually occurred onsite was completed, the vendor staff was often either transferred to other clients or left the vendor company for good. This then forced the client to repeat the knowledge transfer with the replacement staff which lead to increased effort. To avoid fluctuation, the client had to more closely observe the vendor's recruiting and personnel management, which lead to increased controlling effort. This final finding is consistent with TCE logic that transaction costs arise to safeguard against opportunistic behavior. When personnel leaves for good, this may be viewed as a form of opportunistic behavior that negatively affects both the vendor and the clients production costs. When the vendor transfers personnel from one client account to another, this may be viewed as another, more severe form of opportunistic vendor behavior.

Theory Integration: The Interplay of TCE and Offshore Characteristics

The third important contribution lies in theory integration by establishing a moderating link between the TCE construct asset specificity and the impact of both general offshore attributes and vendor related characteristics. When asset specificity was high, i.e. when a lot of unique process and/or software knowledge is required to perform the development and maintenance work, then the negative consequences of a lack of absorptive capacity, high fluctuation, geographic distance and cultural differences were particularly strong. In projects with low asset specificity, such as the development project WEBPORT, little knowledge about unique business processes of the bank was required. Accordingly, a lack of absorptive capacity had no dramatic impact on additional costs. The vendor could mostly draw on standard knowledge about how to build a web interface following the specifications of the client. However, in the development project CORPORATEPAY, where a lot of profound understanding of the idiosyncratic billing processes of the bank was required, the lack of prior experience of the mostly young vendor staff caused a great amount of extra effort at the client side. This effort even increases if the vendor personnel is very hesitant to ask questions and to actively participate in the knowledge exchange process (impact of cultural differences).

Implications for Management

Although cost savings were the primary reason for offshore outsourcing in the cases, our findings show that "hidden" costs were neither completely considered in the decision phase nor tracked rigorously in all projects.

> *"There are 'subjective' factors that were not considered in the business case: proximity, cultural difference, communication." (Project manager, INTERCHANGE)*

As the findings from our study indicate, a detailed analysis of costs is necessary in order to fully assess the economic benefit of offshore outsourcing. From our findings, a number of implications for management can be derived.

(1) *Recognize that characteristics that are unique to offshoring may be associated with additional production and transaction costs.* Cultural differences, geographic distance, fluctuation, and the vendor's lack of absorptive capacity may necessitate additional effort on the client side. Additional production costs include costs for requirements specification, knowledge transfer, and conceptual development, while transaction costs are incurred for coordination and controlling.

(2) *Consider both production and transaction costs in your business case.* A proper business case should not only include labor costs but also additional production costs and transaction costs as mentioned above that arise in offshore outsourcing. It is important to understand to what extent a positive effect of labor cost savings is diminished or even outweighed by additional production and transaction costs. Managers should systematically consider additional costs based on our classification.

(3) *When making a decision about offshoring an IS function, carefully analyze the specificity of related tasks and assets.* Developing a standard web portal with new features requires less firm-specific and partially less tacit know-how about internal processes than developing an application that is highly customized to the needs of the client and that is deeply embedded in its IT landscape. There is a fundamental difference between the two tasks although they are both application development. Generally speaking, if the provision of an IS function includes highly specific tasks and/or requires very specific assets, offshoring this IS function will lead to an increase in production and transaction costs, i.e. additional specifications, knowledge transfer, and coordination will be necessary. Thus, for an assessment of the economic benefit associated with offshoring, it is important to understand that specificity is a driver for production and transaction costs.

(4) *Track both production and transaction costs in the course of an offshoring project.* Once an offshoring arrangement is implemented, production and transaction costs should be tracked and compared to the initial calculations of the business case. Productivity metrics and monitoring mechanisms should be introduced in the organization. By doing so, "hidden" or additional costs may be detected.

(5) *Safeguard against additional unexpected production and transaction costs.* Although safeguarding is not trivial, client organizations may consider well known options like fixed price contracts, penalties for mal- or non-deliveries, guarantees regarding the allocation of key professionals with distinct track records, incorporation of sufficient personal meetings between client and vendor professionals as well as the integration of mediating consultants that possess highly specific domain and business process knowledge as well as intercultural skills.

If these options are more proactively considered, the client organization may protect itself against another source of opportunistic behavior from the vendor side which may be regarded as a winners curse situation: A too optimistic offer from the vendor in order to win the bid while taking advantage of the subsequent lock-in effect of the client organization (Kern, Willcocks, van Heck, 2002).

Future Research

Following on from the previous discussion of the study limitations and its findings a number of implications for future research are emerging. First, our single site research design calls for replication studies that use multiple sites in different industries to enrich the insight into the phenomena investigated. Second, it would be necessary to study our frame from the perspective of other cultures both on the client and the vendor side. For example, it would be interesting to examine whether cultural differences are smaller in near shore arrangements (e.g. between Germany and Russia) and whether this would lead to comparatively smaller additional costs at the client side. Third, the formation of cross-national research teams, where researchers from both the client and the vendor country are included, may be a fruitful way to avoid national biases by the researchers and provide better access to informants of foreign countries. Fourth, although very demanding, a longitudinal perspective could yield further insight into the phenomena observed. For example, an evolutionary study that examines the offshoring costs over time associated with dynamics in the independent variables could reveal how transaction frequency and organizational learning influence the economic outcome of such projects. A number of interesting

questions could be associated with such a design. Are offshore characteristics a moving target? Do vendors catch up in absorptive capacity? Do cultural differences disappear or will they be more effectively managed over time? Fifth, whilst looking on absorptive capacity, another promising research approach would be to look closer on the client side. Which capabilities are necessary at the client organization and can the client positively influence the absorptive capacity of the vendor (Goles, 2001; Tiwana, 2004)? Which of those capabilities, for example, have been missing at FINANCE? How can the knowledge transfer from the client organization to the vendor organization be managed more effectively? In this context, emerging tools for distributed software development or collaborative software development with substantial requirements engineering and knowledge management capabilities could facilitate the client vendor relationship, reducing hidden additional costs in offshoring settings.

Conclusion

Although many companies claim to realize significant cost advantages through offshore outsourcing of IS services, this paper suggests that there is a need for a more profound and differentiated analysis of the economic benefit associated with offshore outsourcing. While labor cost savings are a constituent factor in offshore outsourcing leading to production cost savings, the findings of this paper indicate that additional types of costs may arise when software projects are offshored which may offset initial labor cost benefits. This paper has shown how TCE may be applied to the offshore outsourcing scenario in order to be able to understand variations in economic benefits between offshored software projects. Based on our findings, we have proposed how TCE may be refined by disaggregating different types of production and transaction costs, and how TCE may be extended to include offshore country and vendor characteristics that have an effect on production and transaction costs in IS offshoring projects. Despite its limitations that we addressed at the beginning of the discussion, this paper is unique in a sense that it builds upon and extends a theory that has traditionally been applied to analyze domestic IS outsourcing, namely TCE. On this basis, the major contingencies for unexpected additional costs in offshoring projects have been elaborated. Future research should be encouraged to pursue this approach in order to enrich the theory in IS sourcing as well as to capitalize the benefits of global labor division settings.

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Appendix A

Attributes Used to Assess the FINANCE Projects (based on Dube and Paré, 2003)

Research Design	
Nature of own study	Positivist, explanatory study that tests a new phenomenon based on a well accepted theory with exploratory elements through observation and theory enhancement (see also Lee 1991)
Clear research questions	Yes - What = hidden additional costs in IS offshoring arrangements - Why = Examination of the role of human asset specificity and offshoring characteristics in explaining *why* the economic success of offshore projects varies.
A priori specification of constructs	Yes, due to explanatory character
Clean theoretical slate	No, propositions were formulated a prior due to explanatory nature
Theory of interest	Transaction cost economics
Rival theories included	None (but one complementing theory, e.g. the resource based view)
Multiple case design	Yes, one organization, six projects; every project represents a case
Replication logic	Literal replication logic: two different IS functions, six different application domains and six different technologies lead to similar results
Unit of analysis	Six offshoring projects which are well stated and well documented; the unit of analysis is consistent with the boundaries of the theories tested Germany vs. India has been chosen due to the perceived larger cultural distance as compared to US vs. India A global German bank, which is listed on NYSE has been chosen since it is an early mover in IT offshoring and since we wanted to incorporate a setting with a potential language barrier; for both countries English is NOT the mother language
Pilot case	Not conducted, since it is recommended for studies with highly exploratory nature
Team-based research	Yes
Different roles of investigators	First author and research scholar undertook data collection Second author and first author coded and interpreted the data independently Third author reconciled coding and interpretation differences
Context description	
Detailed site description	Yes
Case period	Yes, the case material was collected during a period of three months with several onsite visits and follow-up phone calls
Longitudinal design	No; not required since the underlying logic of TCE model is variance not a process theory (for details see Markus and Robey 1988)
Time spent onsite by the researchers	Yes
Nature of data collection	Retrospective

Elucidation of data collection process	
Multiple data collection methods	**Yes; data was solicited from different stakeholders via interviews; official project documentations from the client organization were fully available and added into the analysis**
Qualitative and quantitative data	Only qualitative.
Data Triangulation	Yes, for different stakeholders and sources
Case Study Protocol	Yes
Case Study Database	Yes, using the software package NVIVO
Data Collection Methods Applied	
Interviews	Yes
Documentation	Yes
Observation	No
Questionnaires	Yes, in the form of interview guides
Artifacts	No, only examination of the software systems that were offshored
Time Series	No
Sampling Strategy	Combination of convenient sample and quota sample (three projects of IS development and three projects of IS maintenance)
Elucidation of data analysis process	
Field notes	Yes
Coding	Yes
Data displays	Yes
Flexible and opportunistic process	Yes
Logical chain of evidence	Yes
Empirical testing	Yes
Explanation building	Yes
Time series analysis	No
Searching for cross-case patterns	Yes
Use of natural controls	No
Quotes (evidence)	Yes
Project reviews	Yes
Comparison with extant literature	Yes, especially with supporting literature