

**Systemic, Economic, and Environmental Influences on the Sourcing of
Application Services: A Comparison of Companies in Germany and the
United States**

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Abstract

This paper examines three different rationales that might influence a company's decision of whether to outsource particular information systems (IS) functions within a cross-cultural context. The first of these rationales acknowledges the systemic nature of the IS function i.e. that it is critical for various IS sub-functions and components to work together effectively for the overall IS performance. This perspective is new to IS outsourcing literature. We consider whether and how such systemic effects are factored into a decision to outsource IS sub-functions such as applications development and maintenance. In order to examine the importance of this new perspective, we contrast it with two established ones. The first of these assumes the outsourcing decision is based on a rational cost comparison, including production and transaction costs. The second assumes environmental forces frequently influence outsourcing decisions, as reflected in the opinion of influential stakeholders and the level of discretion in decision-making.

This study also explores whether the relevance of determinants in IS outsourcing is influenced by cross-cultural dimensions. This is empirically examined using data from companies based in the United States and companies based in Germany. While cost factors and the opinion of external stakeholders are significant determinants of IS outsourcing for both countries, the countries differ significantly in how the systemic impact of an IS function and the systemic views of IS professionals are factored into the sourcing decision. In addition, the impact of outsourcing decision-making discretion was found to differ significantly between countries. These differences support our perspective that cultural dimensions, such as differences between the United States and Germany in the individualism-collectivism rating as well as in the legitimized bargaining power of labor interest groups, exert a moderating impact on a company's decision to outsource.

Keywords

Outsourcing determinants, cross-cultural, group comparison, PLS, multigroup structural equation modeling, system theory, transaction cost economics, resource-based theory, institutional theory, power theory, individualism-collectivism

1 Introduction

In the early 1990s, information systems outsourcing was a relatively new phenomenon, dominated by large-scale outsourcing deals in the United States. Today, it is a widely recognized organizational option for managing the IS function of a firm. IS outsourcing is present globally, a fact that is indicated by the increasingly balanced distribution of IS outsourcing expenditure across countries (TPI, 2005). Nonetheless, the evidence suggests that outsourcing should not be considered a panacea for the management of IS services for all organizations. There is still considerable variety among organizations as to the extent to which IS functions are outsourced. Most organizations prefer a selective outsourcing approach, in which only particular IS functions and certain portions of IS functions are handed over to external service providers (Apte et al., 1997, Lacity et al., 1995).

This variation in outsourcing behavior from company to company has prompted researchers to examine the determinants by which companies decide to deploy IS outsourcing. These determinants explain why some organizations prefer to outsource higher percentages of their IS functions to external service providers than other organizations. The different theoretical streams that are used to explain this kind of decision making - including economic, strategic, and institutional theories - are reflected in these determinants (Dibbern et al., 2004). Despite these multiple perspectives, however, very few of the quantitative studies that have been conducted on this issue have considered multiple streams of reasoning within the same study. Accordingly, there is little knowledge about the relative influence of particular perspectives on a company's IS outsourcing decision (Tiwana and Bush, 2007).

Dibbern et al.'s close examination of previously established IS outsourcing determinants (2004) reveals the prevalence of economic theories in explaining the outsourcing decision of a company - the main criterion used to evaluate the appropriateness of outsourcing is cost efficiency. However, in-house and outsourced IS services can differ not only in the efficiency but also in the effectiveness they offer to the company (Clark et al., 1995, DiRomualdo and Gurbaxani, 1998, Hirschheim and Lacity, 2000). A unique aspect of IS effectiveness that has rarely been considered in IS outsourcing

research is the systemic nature of IS. When studying IS effectiveness, it is often difficult to study particular IS resources or IS functions in isolation. It is often the combined effect of various IS components and functions working together – the systemic behavior - that creates value for an organization (Ariav and Ginzberg, 1985). However, it is still far from clear how the decision to outsource a certain portion of an organization's IS function to an external vendor affects the company. Indeed, the question as to whether the overall performance might be threatened by outsourcing has yet to be considered in research, despite the fact that this clearly is an important consideration for any company that needs to decide on selective outsourcing.

Accordingly, the first objective of this study is to establish a theoretical foundation for the consideration of the systemic influences on IS outsourcing decision-making. We then test its validity by comparing it to two established theories of decision-making in the outsourcing context. The first of these theories holds that the outsourcing decision is made on the basis of efficiency, which is established by conducting a cost comparison that includes production and transaction costs. The second theory holds that, outsourcing decisions are often not made in a strictly rational way; that is, decisions are not made by evaluating sourcing options and choosing based on efficiency and effectiveness; rather, institutional influences and politics may play a significant role (Ang and Cummings, 1997, Lacity and Hirschheim, 1993). According to this second perspective, an organization may make its decision in order to conform to environmental pressures, such as the opinion of consultants or peer organizations, or it may not have the discretion to make an outsourcing decision in the face of various constraints, such as resistance from various internal and external interest groups.

The second objective of this study is to examine the impact of cross-cultural differences on the IS outsourcing decision. This second goal is motivated by findings that have emerged from the limited number of cross-national studies that have been conducted on this issue, which found that IS outsourcing determinants varied slightly across countries (Apte et al., 1997, Barthélemy and Geyer, 2001, Tiwana and Bush, 2007). However, there has been almost no attempt to try to explain the

differences. This study is the first to integrate cultural dimensions into its theoretical framework to explain why certain determinants may influence the IS outsourcing decision-making process in different ways across different countries. This contextual approach relies in part on the findings of cross-cultural research that has questioned the universality of management and organizational behavior theories across countries (Cheng et al., 2001, England, 1983, Hofstede, 1983a, 1993, 1994, Triandis, 1982). For example, as Triandis (1982, p. 139) stated:

Culture is the human-made part of the environment (...). Its significance for organizational behavior is that it operates at such a deep level that people are not aware of its influences. It results in unexplained patterns of thought that seem so natural that most theorists of social behavior fail to take them into account. As a result, many aspects of organizational theories produced in one culture may be inadequate in other cultures.

Thus, by integrating cross-cultural dimensions into a mid-range theory on IS outsourcing determinants, a higher level of generality should be achieved (Preston et al., 2006).

Therefore, this paper is organized as follows: the next section conducts an assessment of the major domains of IS outsourcing determinants and clarifies the areas that are yet to be addressed and which this study attempts to investigate. This assessment is then used to develop a theoretical framework that includes both the recognized determinants of IS outsourcing and the hypothesized moderating impacts of cross-cultural dimensions on IS outsourcing. The resulting framework is then tested by using a sample of companies from the United States and Germany and examining their outsourcing patterns in the area of application software services. The study results are then discussed. Finally, the major implications of the study are summarized.

2 Literature Review

2.1 Major Domains of IS Outsourcing Determinants

The study of the determinants of IS outsourcing has already reached a relatively high level of maturity. This is indicated by the approach of previous studies, where multiple theoretical lenses and different empirical and non-empirical research methods have been deployed (Dibbern et al., 2004).

According to the findings of Dibbern et al. (2004), five main types of determinants can be distinguished (see Figure 1).

The first category is *rational decision criteria* (Simon, 1976), where decision makers in organizations apply criteria that are in line with the goals of an organization. It is assumed that these goals and criteria are common to all organization members when evaluating sourcing options and making the final decision. There are two ways in which such criteria are conceptualized in research. They are treated either in a comparative manner, where the in-house and outsourced provision of IS services are compared with each other according to criteria such as production costs (Ang and Straub, 1998, Barthélemy, 2001), or as positive and negative beliefs associated with just one sourcing option - for instance, the perceived level of risk associated with outsourcing (Earl, 1996). While most quantitative studies have focused on cost efficiency as a major decision criteria, qualitative and conceptual studies have emphasized effectiveness criteria, such as reaching strategic objectives (DiRomualdo and Gurbaxani, 1998, McLellan et al., 1995), accessing superior resources (Cross, 1995), or improving service quality (Clark et al., 1995).

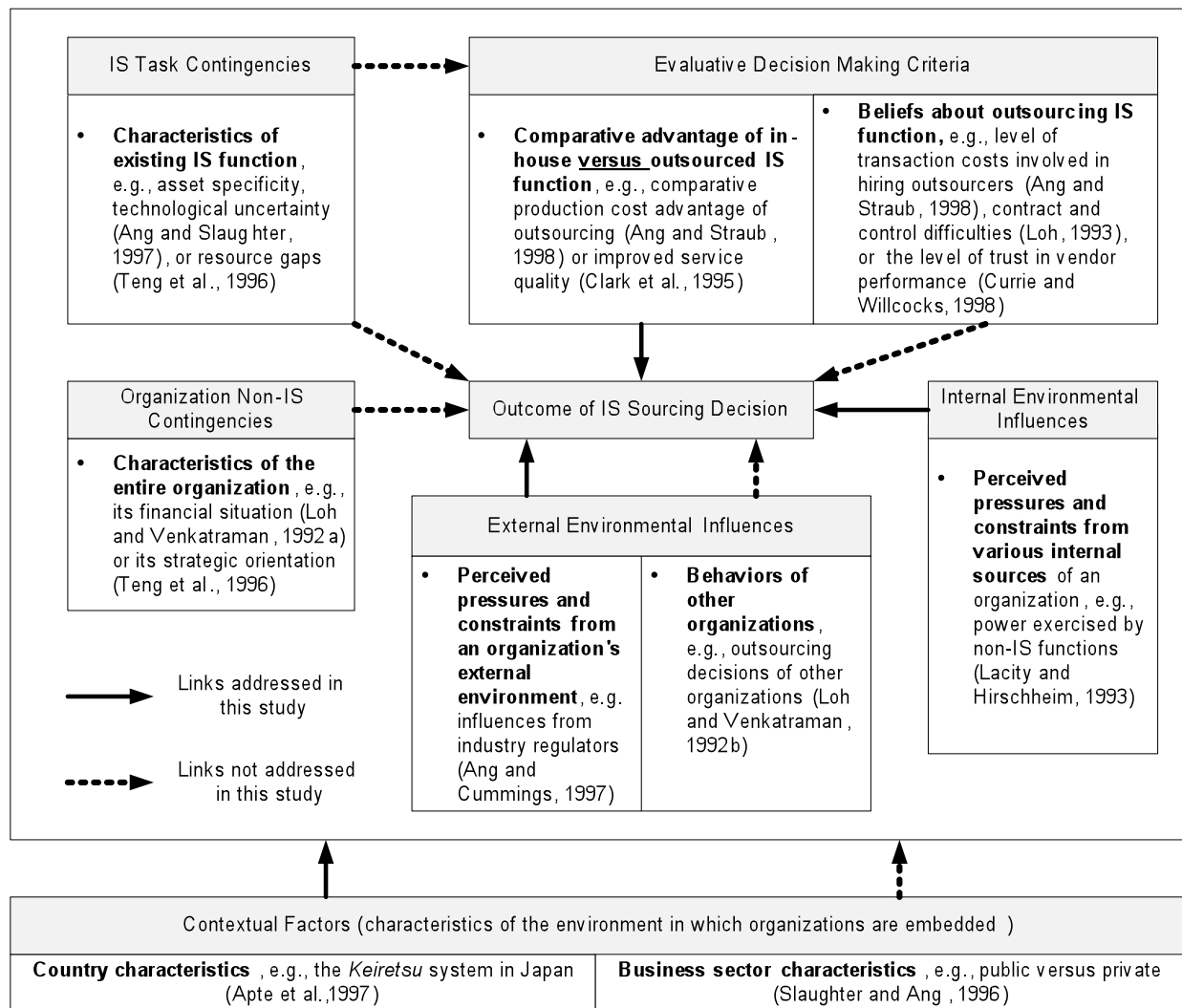


Figure 1. Synopsis of the Determinants of IS Outsourcing

The second category of determinants consists of types of *IS-related contingencies*. The theoretical basis of this approach is that conclusions can be drawn about the appropriateness of IS outsourcing by analyzing the attributes of an organization's current IS functions. For example, based on a combination of resource-based and resource-dependence theories, it has been argued that organizations are more likely to outsource particular IS functions if there is a gap between the actual and desired base of IS resources (Teng et al., 1995). The most prominent example of this contingency approach is transaction cost economics (TCE). This perspective holds that outsourcing a particular IS function is less likely to be due to efficiency disadvantages if it is characterized by contingencies such as a high level of asset specificity or technological uncertainty (Ang and Cummings, 1997, Nam et al., 1996). Notably, the impact of these contingencies also relies on

rational decision criteria discussed in the first category of determinants. For example, the higher the asset specificity of an IS function is, the higher the likelihood that decision makers will perceive transaction cost disadvantages of outsourcing, and the lower the likelihood that companies will outsource this function. Accordingly, as depicted in Figure 1, the impact of contingency factors is mediated by rational decision criteria.

Another group of *contingencies* is that of *organization-wide non-IS factors*. These refer to the factors that characterize an organization in its entirety, such as a firm's financial situation or strategic orientation (Loh and Venkatraman, 1992a, Smith et al., 1998, Teng et al., 1995). Previous empirical studies have found mixed support regarding the importance of these non-IS factors.

More consistent results were found for the direct influence of pressures and constraints from the internal and external environment of an organization on the IS outsourcing decision-making process.¹ *External environmental forces* stem from organizations and individuals outside an organization. They may reflect either perceived pressures from external stakeholders (Ang and Cummings, 1997), or actual pressure from external stakeholders (Loh and Venkatraman, 1992) to which organizations seek to conform. Internal environmental forces can come from various internal stakeholder groups, such as business departments or work councils, that may exercise power in order to influence the outsourcing decision (Lacity and Hirschheim, 1993).

Finally, there is some evidence that the context in which an organization is embedded might influence IS outsourcing decision-making. Such a context could be determined by the business sector to which the company belongs or the specific characteristics of the country in which the company is based. For example, there is some evidence of transaction costs playing a more significant role in public organizations because the levels of bureaucracy are potentially higher (Hancox and Hackney, 1999). Some cross-national studies have reported that IS outsourcing decision factors vary between

¹ For clarification of the difference between an internal and external environment, see e.g., Gjerde et al. (2002).

countries. These country differences were explained ex post by citing country specific characteristics, such as the *Keiretsu* system in Japan (Apte et al., 1997, Tiwana and Bush, 2007).

2.2 Gaps in the Literature Motivating this Study

While there are still numerous gaps in the study of IS outsourcing determinants (Dibbern et al., 2004), this study limits its focus to three of them. First, very little research simultaneously examines the impact of different rationales originating from different theoretical perspectives on a company's outsourcing decision. Notable exceptions can be found in the study of Ang and Cummings (1997), who examined whether external institutional pressures on IS outsourcing are moderated by the firm level task-related contingencies that are derived from transaction cost economics. In a similar vein, Teng et al. (1996) examined the moderating impact of an organization's strategic orientation on the influence of resource gaps (IS task contingency) derived from resource-oriented theories. The conflicting influences of multiple task contingencies stemming from different theories, such as transaction cost economics versus the resource-based view, have also been examined (Poppo and Zenger, 1998, Tiwana and Bush, 2007). However, the direct effect of these contingencies on a company's IS outsourcing decision frequently cannot be clearly attributed to one particular rationale - for example, transaction cost economic versus resource-based reasoning (Carter and Hodgson, 2006). Therefore, there is little knowledge about the relative importance of particular types of rationale on the outsourcing decision of a company.

Second, it is worth noting that, in light of the increasing practice of selective outsourcing, most studies focused on particular transactions (e.g., IS sub-functions or projects) as a *unit of analysis* (Dibbern et al., 2004). This selective view is problematic in that there is the danger that the potential interactions between different IS functions might be ignored, hence possibly obscuring the entire IS function. For example, Lacity et al. (1995) observed that, if the development of a software application that requires data from many other applications was outsourced, then the vendor's lack of understanding of the respective interfaces tended to lead to substantial project delays and budget overruns. To date, almost no research has been conducted on these systemic influences within and

across IS functions. Hence, there is very little data on the extent to which systemic influences are recognized in the IS outsourcing decision. Even in studies where the systems' interconnectedness has been conceptually recognized as an important factor, no information that verifies their empirical relevance has been provided (Willcocks and Fitzgerald, 1993). This reinforces recent calls for an explicit analysis of the systemic impacts in boundary choices (Jacobides and Billinger, 2006).

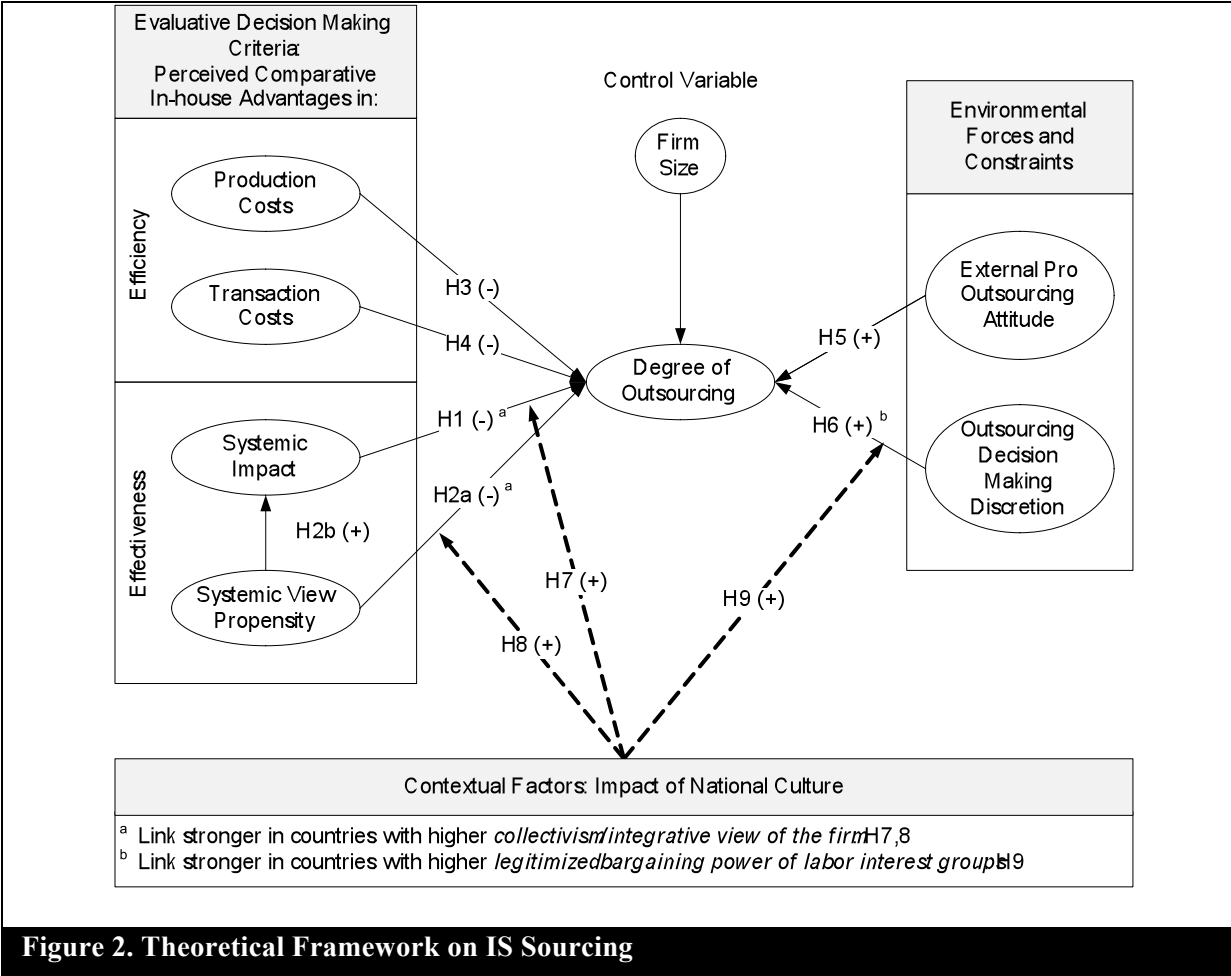
Third, there are very few studies that have explored IS outsourcing determinants or IS outsourcing behavior across countries (Apte et al., 1997, Barthélemy and Geyer, 2001, Barthélemy and Geyer, 2005, Tiwana and Bush, 2007). Studies that do exist have provided some evidence for the existence of significant differences in IS outsourcing determinants between countries. However, little attempt has been made to explain these differences from a cross-cultural research perspective. In particular, no study has attempted to integrate country-specific factors (e.g., cross-cultural dimensions) into the theoretical framework in order to extend the generality of mid-range theories on IS outsourcing determination.

With this background in mind, this study seeks to contribute to the existing research in a number of ways. First, this study introduces systemic influences as a new rationale for a company's IS outsourcing decision, both at the IS function level as well as at the IS workforce level. Second, we test the impact of this new rationale along with well-established rationales such as cost efficiency and the influential role of external and internal forces. This will help clarify the relative importance of IS outsourcing rationales. Third, by testing the impact of our new research model in two countries—the United States and Germany—we are able to explore the impact of national characteristics on a company's IS outsourcing decision.

3 Theoretical Framework

Using the previous literature review as our background, we will develop several hypotheses regarding the impact of three groups of IS determinants on the outsourcing decision of a company. The first group comprises of rational decision criteria, such as those based on efficiency and effectiveness, for choosing among alternative sourcing options. The cost efficiency criteria stem

from production and transaction cost economic theory. The systemic effectiveness criteria are derived from resource-based theory and certain aspects of systems theory. The second group comprises of environmental forces and constraints derived from institutional theory and power theory. The third group reflects country specific characteristics derived from cross-cultural research. A graphical representation of the resulting theoretical framework is presented in Figure 2. Essentially, the model suggests that an IS function is less likely to be outsourced if decision makers regard in-house processes as superior in terms of efficiency (production and transaction costs) and systemic effectiveness. The view of systemic effectiveness is determined by factors such as the ease with which systemic impact can be achieved or how systemic the perspective of IS personnel is. In addition, organizations tend to outsource more of a particular IS function if the attitude of referential others towards outsourcing is positive and if the organization possesses a high level of discretion in making an outsourcing decision.



Furthermore, the framework suggests that the impacts of three of the outsourcing determinants are culturally sensitive and are moderated by cultural characteristics (i.e., dimensions). Finally, in accordance with previous studies on IS sourcing, firm size is added as a control variable (Ang and Straub, 1998, Sobol and Apte, 1995). Table 1 provides a summary of the definitions of the key constructs of the theoretical framework.

Table 1. Definition of Constructs

Construct	Definition
Degree of outsourcing	The extent to which the tasks and activities necessary for the provision of an IS function are carried out by external service providers.
Comparative in-house systemic impact advantage	The extent to which an IS function's synergistic integration with other IS sub-functions and sub-components to leverage overall IS performance is greater in-house than if done by an external service provider.
Comparative in-house advantage in systemic view propensity	The extent to which in-house personnel tend to have more of an integrative view of the organization (i.e., tend to take into account how work in their area fits in and affects all other work in the organization) than the staff of an external vendor.
Comparative in-house production cost advantage	The extent to which fewer resources are required in-house as compared to using an external service provider to perform the actual work for an IS function.
Comparative in-house transaction cost advantage	The extent to which the costs that arise when delegating the tasks of an IS function—such as costs for planning, adapting, and monitoring task completion—to a task owner are lower in-house than they are when using an external service provider.
Pro outsourcing attitude of others	The extent to which individuals or groups whose opinion is important to an organization think that the organization should outsource an IS function rather than keeping it in-house.
Outsourcing decision making discretion	The extent to which an organization has latitude of action when it comes to outsourcing an IS function to an external service provider.

3.1 Effectiveness through Systemic Influences

There has been significant interest in the effectiveness of IS ever since the early 1980s, when the strategic importance of IS began to be recognized (Ives and Learmonth, 1984, McFarlan, 1985). The effectiveness of IS can be described hierarchically. High level organizational impacts, such as

generating a competitive advantage through IS or increasing business process performance, are dependent on base level impacts such as system and information quality (DeLone and McLean, 1992).

When speaking of IS effectiveness, we often refer to an organization's IS in its entirety, including the entire portfolio of information technology (IT) applications (Hamilton and Chervany, 1981). This holistic treatment of IS recognizes its systemic nature. It is usually the combined effect of various system components or IT applications working together, rather than the performance of specific components or applications in isolation, that create value. For example, a particular software application may be of little use if it is not based on a reliable and secure operating environment, or if it is not dynamically connected to other source or target applications via powerful networks that can establish meaningful identification, gathering, processing, and transfer of information (Davis and Olson, 1985).

This view is consistent with the premise of systems theory, which emphasizes the difference between the whole and its parts (Bertalanffy, 1979, Luhmann, 1994, Rapoport, 1988). Lacity and Willcocks (1995), in referring to the work of Milgrom and Roberts (1995, 1990) on complementary activities in manufacturing, argue that similar phenomena exist in the field of information systems.

An example of complementary transactions in the information systems field is building an information network in conjunction with implementing new application software. As standalone transactions, the network and software add little value. ...it is the combined benefits of building both that add value (p. 240).

In fact, studies have found that IS sub-functions can be viewed as modules that need to be integrated under a common architecture (Schilling, 2002). Each module then needs to be constructed carefully in order to ensure overall system effectiveness. In any examination of the provision of particular IS components or functions, it is therefore essential that their interdependence with surrounding components or functions be considered (Ariav and Ginzberg, 1985). We define this *systemic impact*

of an IS function as the extent to which its synergistic integration with other IS sub-functions and sub-components influences overall IS performance.

When it comes to deciding whether a particular IS function should be outsourced, it is unclear whether such systemic impacts can be effectively accounted for (Jacobides and Billinger, 2006). IS outsourcing often creates additional organizational boundaries, such as geographic distance or increased distance between system users and system providers. This is because external vendor staff may lack an understanding of the client business and its existing information systems landscape. These boundaries may hinder the frictionless interconnection of requirements and code, of systems software, middleware and applications software or of various modules of applications software, which are necessary to achieve high levels of system performance. For example, an external vendor may lack an understanding of the various interfaces that exist between the application software for which he/she is responsible and other source and target applications. He/she may also be unfamiliar with the business processes that are supposed to be supported by the application software (Lacity et al., 1995, p. 90). Accordingly, the software application provided by the vendor may not fit into the overall IS architecture, which in turn may therefore constrain overall IS performance. However, to generalize this may be incorrect.

According to the resource-based view (Wade and Hulland, 2004, Wernerfelt, 1984), IS vendors vary in terms of their resource base, which will influence whether they are capable of coping with systemic effects. Based on past experience in achieving synergies between various IS tasks, a vendor may actually bring to the table particularly strong systemic capabilities (Levina and Ross, 2003, Tanriverdi et al., 2007). In addition, the type of interdependence between the outsourced IS function and other functions could vary case to case (Thompson, 1967), and will require different types of integrative capabilities. Accordingly, it is essential to determine on a case-to-case basis how the systemic nature of an IS function is affected when a process is outsourced to an external vendor rather than kept in-house. This is reflected in the following hypothesis:

H1: The greater the systemic impact advantage of an IS function being performed in-house, the less likely it is that the IS function will be outsourced.

However, accounting for the systemic impact of an IS function also requires that the actual people that perform the IS work consider how their particular job relates to the system as a whole. This *systemic view propensity* is defined as the extent to which IS professionals have an integrative view of their organization; that is, to what extent they take into account how the work that they perform in their particular area fits in and affects all other work throughout the organization.²

Notably, this *systemic view propensity* may extend beyond the boundaries of an organization's IS function. It may include an understanding of the entire system in which a particular IS function is embedded, including other IS functions, business functions, and all users (Alter, 2004). IS professionals that take into account how their particular work affects other work throughout the organization are likely to better consider and align the requirements of IS stakeholders with the organization's overall objective and hence to contribute more effectively to overall system performance.

As studies have shown, if systemic effects are not accounted for, then the alignment of a business's IS functions with the overall organizational objectives may be threatened (Bacon and Fitzgerald, 2001). Thus, as the resource-based view makes clear (Wade and Hulland, 2004), the systemic view propensity of IS professionals should be seen as a valuable resource. This raises the question of how such resources can be best obtained.

There are a number of reasons why the systemic view propensity of in-house versus outsourced IS professionals could differ significantly. First, in-house personnel may have different motivations and

² This definition is based on the concept of systems thinking ability, which has been referred to as the "(...) the ability to see the world as a complex system, in which we understand that you can't just do one thing, and that everything is connected to everything else" (Sterman, 2000, p. 4), or as "(...) being able to see the

commitments than outsourced personnel in considering the system-wide effects of their daily work. Second, a certain level of absorptive capacity is required in each individual if they are to think systematically. That is, in order for an individual to see and consider how they affect other functional areas throughout the organization, a certain level of prior knowledge about and experience with those other areas is needed (Dibbern et al., 2008). For example, in order for an individual to empathize with the user and anticipate their needs, a certain level of shared knowledge between the IT domain and the user domain is required (Ray et al., 2005). Accordingly, it appears crucial for IS outsourcing decision makers to consider whether retaining functions in-house or outsourcing them cultivates higher systemic view propensity:

H2a: The greater the advantage of having in-house personnel perform an IS function in terms of systematic view propensity, the lower is the likelihood that the IS function will be outsourced.

If systemic view propensity is higher when functions are kept in-house, then the systemic impact of an IS function should also be higher in-house::

H2b: The greater the advantage in systemic view propensity of in-house personnel performing an IS function, then the greater the systemic impact advantage of that IS function being performed in-house.

3.2 Efficiency Factors

According to transaction cost economics, the make or buy decision of a business should be guided by economic criteria (Williamson, 1981). Williamson (1981) argues that the governance choice depends on both production and transaction cost differences between the firm and the market.

whole or context of a situation and its interconnections to its environment” (Wolstenholme, 2003, p. 20) – cited by Alter (2004, p. 758).

Production Costs. External vendors are supposed to have an advantage over in-house providers in terms of realizing economies of scale and scope. This is because external vendors provide the same type of service for a larger pool of customers than client organizations could realize in-house (Ang and Straub, 1998). In particular, the vendor's ability to economize on the basis of past experience with multiple customer accounts may explain the lower production costs associated with outsourcing (Levina and Ross, 2003). There is evidence, however, that contrary to Williamson's (1981, 1985) original assertions, the external vendor may generally not offer lower production costs. Indeed, there are cases where clients have consciously decided against outsourcing due to vendors charging substantially higher prices compared to in-house costs (Hirschheim and Lacity, 2000). For example, the vendor may have incurred substantial set-up costs in adopting knowledge unique to the client and recoups by incorporating them into the price premium (Dibbern et al., 2008). Accordingly, the question of whether better production cost efficiency is achieved by keeping an IS function in-house or outsourcing it to an external vendor depends on the particular situation. This prompts the following hypothesis:

H3: The greater the production cost advantage of an IS function being performed in-house as opposed to an external vendor, the less likely that the IS function will be outsourced.

Transaction Costs. Beyond production costs, however, the provision of IS services also incurs transaction costs (Ang and Straub, 1998, Barthélemy, 2001, Lacity and Hirschheim, 1993). Transaction costs refer to the time, effort, and money spent when tasks of an IS function are delegated to one or more agents. For instance, they cover activities such as "...planning, adapting, and monitoring task completion under alternative governance structures" (Williamson, 1981, p. 552f.). These transaction costs can occur both in-house and when outsourcing to an external vendor. Hence, it is the difference between in-house and outsourcing transaction costs that should determine the sourcing choice (Williamson, 1981). This leads to the following hypothesis:

H4: The greater the transaction cost advantage of an IS function being performed in-house as opposed to an external vendor, the less likely that the IS function will be outsourced.

3.3 Environmental Influences and Constraints

So far, it has been assumed that the sourcing decision is made rationally. That is, it has been assumed that, if faced with an IS outsourcing decision, an organization will use certain rational criteria (such as efficiency and effectiveness) in comparing IS outsourcing against keeping functions in-house. However, as studies on strategic decision making have made clear, (Eisenhardt and Zbaracki, 1992), decisions (such as what kind of IS sourcing to adopt) that occur infrequently and with the involvement of top management are often influenced by various non-rational forces and constraints. Specifically, two of the influences reflect the fact that decision makers are often strongly affected by their environment, even if the influence occurs subconsciously.

The first of these influences exemplifies institutional theory, which argues that organizations passively conform to their environment (DiMaggio and Powell, 1983). The other influence exemplifies power and politics theory, which holds that organizations are constructed through various coalitions, each of which have different interests, and that it is the relative power of these various interest groups and their ability to exercise power through politics that determines organizational decision making (Pfeffer, 1981).

Influences from the institutional environment may stem from various sources, such as peer organizations (Ang and Cummings, 1997), consultants (Lacity and Willcocks, 1997), or the public press (Loh and Venkatraman, 1992). Such external opinions may be either actively sought to reduce inherent uncertainties surrounding an IS outsourcing decision or may implicitly influence key decision makers by shaping their general attitude towards outsourcing. This notion is delineated in the following hypothesis:

H5: The more positive the attitude of influential others towards the outsourcing of an organization's IS function, the more likely it is that the IS function will be outsourced.

The preceding arguments are based on the assumption that the outsourcing decision is made by a group of key decision-makers that act on behalf of their organization. While various stakeholders may influence their judgment, it is assumed that they can still act freely in their outsourcing decision.

However, the validity of assuming this managerial choice approach has been called into question by proponents of the power and politics theory (Pfeffer, 1981, Pfeffer and Salancik, 1974). This theoretical perspective acknowledges the fact that the key individuals, such as the CIO, involved in evaluating alternative sourcing options and making the final decision represent just one coalition within an organization. In reality, there may be numerous other coalitions such as other departments, dissatisfied employees, unions, and internal work councils, that may see their interests weakened if IS functions are outsourced. These groups may therefore have incentives to take action against such decisions. In the face of such opposition to the outsourcing of an IS function, an organization's *outsourcing decision-making discretion* - its latitude of action in outsourcing an IS function - becomes severely limited (in line with the concept of managerial discretion, see Hambrick and Finkelstein, 1987). High levels of outsourcing decision-making discretion in a company would then reflect a high level of power to enforce an outsourcing decision (Carpenter and Golden, 1997). Accordingly, greater discretion means fewer impediments to outsourcing and a higher likelihood that an IS function is, indeed, outsourced (Lacity and Hirschheim, 1993). This leads to the following hypothesis:

H6: The greater the discretion of an organization in making the decision to outsource an IS function, the more likely it is that the IS function will be outsourced.

3.4 Impact of Cross-Cultural Dimensions

The preceding network of hypotheses (H1-H6) may be viewed as a mid-range theory that seeks to explain variations in the extent to which organizations outsource IS functions. While we believe it is

reasonably robust in its coverage, it should be clear that the objective is not to establish a definitive model per se. Rather, the aim is to present a plausible model that can clarify whether key rationales used to decide for or against outsourcing an IS function are influenced by national culture (the second goal of our study).

National culture can manifest itself in various forms (Kroeber and Kluckhohn, 1963). On the one hand, it refers to culturally-programmed, deeply-grounded behavioral beliefs, values, and predispositions that are collectively shared by members of a social group, such as a nation (Hofstede, 1980). On the other hand, culture may be embodied in the visible products and expressions created by the members of a social group, such as national regulations and institutional systems (Kroeber and Kluckhohn, 1963).

In order to clarify these issues, we focus on only those dimensions of nationality that clearly relate to an organizational context and that show conceptual overlaps with one or more of the determinants of our theoretical framework. Since we expect the degree of IS outsourcing, and hence the instances of our IS outsourcing determinants (see Figure 2) to vary substantially between organizations, we do not theorize about the direct impact of culture on any of the determinants. Rather, we attempt to identify those IS determinants whose influence is culturally sensitive. From the cultural dimensions that have been clarified in the previous literature, (Lytle et al., 1995), four cultural dimensions were found to be conceptually related to three of our previously-introduced IS outsourcing determinants (see Table 2).

Table 2. Selected Cross-Cultural Dimensions

Category (Lytle et al. 1995)	Cultural Dimension	Study	Related to following IS outsourcing determinant(s)
Relationship between societal members	Individualism versus collectivism	Hofstede (1980)	Systemic impact advantage Advantage in systemic view propensity
	Analytical versus integrative view of the firm	Trompenaars and Hampden-Turner (1994)	Systemic impact advantage Advantage in systemic view propensity
Motivational orientation	Individualistic versus communitarian (Self-orientation vs. collectivity-orientation)	Trompenaars and Hampden-Turner (1994)	Systemic impact advantage Advantage in systemic view propensity
Patterns of institutions and social systems	Legitimized bargaining power of labor interest groups	Argyres and Liebeskind (1999)	Outsourcing decision making discretion

The three IS outsourcing determinants that are expected to be culturally sensitive are systemic impact advantage, advantage in systemic view propensity, and outsourcing decision-making discretion. The two systemic variables were found to be conceptually related to three closely related cultural dimensions. The first is individualism versus collectivism (Hui and Triandis, 1986). According to Hofstede (1980), this dimension reflects the degree to which individuals are integrated into groups. The second is individualism versus communitarianism (Hampden-Turner and Trompenaars, 1993, p. 51). This dimension is based on the “self-orientation versus collectivity-orientation” concept that was first defined by Parson and Shils (1951). It reflects the extent to which managers believe that the quality of life, organizational performance, and faults relate to individuals rather than groups. The third is the analytical versus integrative view dimension (Hampden-Turner and Trompenaars, 1993, Trompenaars and Hampden-Turner, 1994), which reflects the extent to which managers perceive the firm as a collection of individual tasks, functions, people, and machines (analytical view) rather than as a group of related persons working together (integrative view). These three dimensions have a common focus on the contrast between a holistic perspective—where an individual entity is seen as part of a whole—and an individualistic perspective, where individual entities are seen in isolation.

Of these two perspectives, it is the holistic one that appears to be most closely related to the systemic perspective in IS—that is, the extent to which the systemic nature of IS is considered in the IS

outsourcing decision. It may be argued that organizational decision makers are more likely to consider the systemic impact of an IS function as well as the systemic view propensity of IS professionals in their evaluation of alternative sourcing options if their own values and norms are constructed according to a holistic perspective. In contrast, if individualistic thinking dominates, the focus may be on evaluating particular IS functions in isolation and focusing on the more immediate competencies that individuals bring to the table in performing that particular IS function.

In more individualistic nations, the view that optimizing the performance of each IS function individually will result in the best overall IS outcome may dominate. Accordingly, in more individualistic nations, systemic influences should be expected to play a subordinate role in the IS outsourcing decision. This leads to the following hypotheses:

H7: The negative relationship between comparative in-house advantages in systemic impact and the degree of outsourcing is stronger in more collectivist (i.e., less individualistic) nations.

H8: The negative relationship between comparative in-house advantages in systemic view propensity and the degree of outsourcing is stronger in more collectivist (i.e., less individualistic) nations.

The third construct that we postulate to have a culturally sensitive effect is outsourcing decision-making discretion. It is important that we clarify whether decision makers in organizations are more sensitive in some countries as opposed to others to various environmental constraints affecting the IS outsourcing decision. In other words, if an organization were faced with opposition to outsourcing, how strongly would the outsourcing decision be affected, i.e. would that organization indeed outsource less?

In answering this question, it may be worthwhile to examine the sources of possible opposition to outsourcing in different countries. Clearly, there can be many different sources of outsourcing constraints, such as resistance from other departments. One particular constraint that may vary

substantially between countries is the nature and extent of labor market regulations. When outsourcing is implemented in a company, the labor situation of an organization can be greatly affected. This is particularly the case when the current personnel of a company is replaced by or transferred to the outsourcing vendor, or if newly defined work is allocated to the outsourcing vendor rather than to in-house personnel. In any case, labor interests are always affected to some extent by outsourcing. Therefore, this ensures that institutions that protect labor interests, such as worker's councils or unions, are brought into play.

These labor interest groups can exert substantial bargaining power. In particular, codetermination provides employees with the right to participate in organizational decisions that impact their personal disposition or the disposition of the group to which they belong (Chmielewicz, 1990). However, the legitimized power of such groups varies substantially between countries. For example, Argyres and Liebeskind (1999, p. 59) found that countries, such as Germany and France accord greater bargaining power to labor unions and worker's councils than other countries (see also Kieser, 1990, Richardi, 1990).

In countries with strong labor regulations, organizations may be highly sensitized to possible constraints against their outsourcing decision and hence factor them into their decision. In particular, if impediments to outsourcing are seen—that is, outsourcing decision-making discretion is low—then an additional lack of relative bargaining power due to the legitimized rights of labor interest groups may make it even harder to outsource. Hence, organizations are likely to outsource less. In contrast, in nations where the bargaining power of labor interest groups is rather low, organizations have more power to tackle opposition to outsourcing. In this scenario, therefore, the level of outsourcing decision-making discretion is less critical for the outsourcing decision. This is reflected by the following hypothesis:

H9: The positive impact of outsourcing decision-making discretion on the degree of outsourcing an IS function is stronger in countries with higher levels of legitimized bargaining power of labor interest groups.

In summary, there are three relationships (H1, H2a, H6) that are proposed to be culturally sensitive. We expect to find significant differences in the strength of these three relationships between countries that are known to differ in their respective cross-cultural dimensions (H7-9). The other relationships (H2b-5) are expected not to significantly differ between nations.

4 Method

4.1 Data

Choice of Countries. Data for this study was gathered via a mailed questionnaire survey. In order to account for national differences, the questionnaire was administered to organizations in two countries. For the purpose of the study, it was deemed essential that these countries be similar in terms of their industry structure, economic power, and the typical level of IS maturity within corporations (OECD, 2002), but different in the cross-cultural dimensions delineated in the theoretical framework. Two countries that meet these requirements are Germany and the United States. The differences in cultural dimensions between the two countries are shown in Table 3.

Table 3. Instances of Cultural Dimensions in Germany versus United States			
Cultural Dimension	Study	Germany	United States
Individualistic versus communitarian (Self-orientation versus collectivity-orientation)	Trompenaars and Hampden-Turner (1994)	Medium individualism	Relatively high individualism
Individualism versus collectivism	Hofstede (1980, 1983b, 1991)	Medium individualism (rank 15 from 50; index 67)	Highest individualism of all countries (rank 1 from 50; index 91)

Analytical versus integrative view of the firm	Trompenaars and Hampden-Turner (1994)	Toward integrative view	Toward analytical view
Legitimized bargaining power of labor interest groups	Argyres and Liebeskind (1999)	Relatively high ³	Medium

The questionnaire was designed in both English and German. To ensure a fit between the versions, the initial English version was translated into German and then reverse-translated by a native speaker who works as an English lecturer in Germany (Douglas and Craig, 1999). No significant differences could be detected; this increased the confidence in the fit between the English and the German version.

Choice of Respondents. The questionnaires were administered to the highest-ranking IS executives of organizations in the United States and Germany. Chief IS executives were deemed as the most appropriate informants, since they were presumed to be most familiar with an organization's IS sourcing choices and the wider implications of this choice for the entire organization. The selection of this group as key informants is consistent with prior studies on IS outsourcing (cf. Ang and Straub, 1998, Apte et al., 1997, Aubert et al., 1996, Barthélemy and Geyer, 2001, Poppo and Zenger, 1998, Teng et al., 1995). The questionnaire was pre-tested in two rounds of face-to-face meetings with an experienced CIO in Germany. His comments were considered in the development of the questionnaire in order to ensure that all questionnaire items were understandable and could be answered by the intended group of respondents.

Choice of Industries. In order to avoid potential industry influences, only two industries that play a significant role in both countries were considered: finance and machinery (in total, 2130 companies were surveyed; these were broken down as follows: Germany: 406 Finance, 552 Machinery; United States: 676 Finance, 591 Machinery).

Choice of IS functions. In order to account for the practice of selective IS outsourcing, we focused on two particular IS functions: applications development and applications maintenance. Respondents were asked to answer each question on the questionnaire for both the development and the maintenance of software applications (see also Poppo and Zenger, 1998). The choice of two IS functions also allowed us to account for differences between IS functions.

Response Rate. Overall, 180 usable questionnaires were returned from our total sample of 2130 companies (Germany: 77 Finance, 62 Machinery; United States: 17 Finance, 24 Machinery). This gave an overall response rate of 8.4% (3.4% in the United States and 15.1% in Germany).⁴ Since the survey included questions about both the development and the maintenance of software applications, the sample for the country comparison included 278 decisions on the sourcing of software applications in Germany and 82 such cases in the United States. According to recent simulation studies analyzing the relative reliability of the 75 versus 150 scenario (Chin, 2003), our sample size is reliable to a degree either near or above the recommended level of 0.80.

As an additional check, we conducted a new Monte Carlo simulation focusing on the three hypothesized culturally sensitive paths and our results corroborated those of Chin (2003). As Muthen and Muthen (2002) noted “The sample size needed for a study depends on many factors, including the size of the model distribution of the variables, amount of missing data, reliability of the variables, and strength of the relations among the variables.” Following the same approach as Chin (2003), we generated 2,000 sample data sets which mimic the exact sample size differences between Germany and United States as in our study and with the same measurement reliabilities and path

³ In Germany, the transfer of organizational units to legally independent organizations is regulated by law (§ 613 BGB) (Koffka, 1997, p. 124ff.). The works constitution act guarantees the right of employee participation and codetermination in social, economic, and personal matters (Richardi, 1990, p. 1282).

⁴ This relatively low response rate may partly be attributed to the cross-national survey procedure. Based on her literature review, Harzing (2000) concludes: “Cross-national mail surveys aiming at industrial population generate very low response rates. If questionnaires are not either preceded or followed by telephone contact, response rates typically vary between 6% and 16%.” Although the United States survey packages were sent off from the United States and follow-up phone calls were conducted in both countries, differences in the response rates between Germany and the United States could not be prevented. Indeed, the response rates differ significantly. It should be noted, however, that for the United States, similar results were obtained in a more recent IS outsourcing mail survey by Poppo and Zenger (1998). They achieved a response rate of 5% (152 from 3000) in the United States. We were also unable to detect any significant non-response bias using the extrapolation procedure of Armstrong and Overton (1977).

estimates for the two countries. Then, we ran 1,000 multigroup comparisons (to be discussed later) where each two sample data set went through the same 1,000 permutation runs resulting in 2 million computational runs. The results yielded statistical power (i.e., percentage assess significant) of 73.6, 89.3, and 53.1 for Hypotheses 1, 2a, and 6 respectively. These results are consistent with the cross national effect size differences of 0.31, 0.40, and 0.18 and has the appropriate statistical power to match the significance level to be presented in Table 11.

4.2 Measures

Each of the constructs from our model was measured with a block of indicators (questionnaire items). Wherever possible, existing measures from prior empirical studies were adopted. An overview of the constructs and measurement items is provided in Table 4. The items for systemic impact and systemic view propensity were developed based on the construct definitions (see Table 1). Specific facets in the definition (e.g., Chin et al., 2008) were identified to develop the corresponding terms in the items. In order to ensure content and face validity as well as readability, the items were presented to and validated by four noted IS outsourcing researchers prior to pre-testing.

As noted earlier, the items were then pre-tested and the comparative fit of translations from English to German and back provided further assurance. Discriminant, convergent, and nomological validity were subsequently assessed using survey data.

Most of the items were measured on a (positive-to-negative) five-point Likert scale, ranging from “strongly agree” to “strongly disagree,” with “neither agree nor disagree” as a mid-point. To measure the *degree of outsourcing*, respondents were asked to provide an estimated percentage regarding the extent to which their company’s functions were outsourced. To measure the construct *external pro outsourcing attitude*, the semantic differential approach was adopted (Osgood et al., 1957), in which each response is located on an evaluative bipolar (negative-to-positive) dimension using a seven-point scale. All blocks of indicators were formulated in the reflective mode (Chin, 1998a, p. Ix, Chin

and Newsted, 1999, p. 310, Fornell, 1989, p. 161). The respective application service was used as the unit of analysis.

Applications development was defined as the definition, design, and implementation of customized software as well as the analysis, selection, and tailoring of standardized software packages (e.g., SAP R/3). *Applications maintenance* was defined as all corrective, adaptive, and perfective (i.e., optimizing) modifications of application software that do not include any functional enhancements (Bansler and Havn, 1994, Swanson and Beath, 1989).

Table 4. Questionnaire Measures

Construct	Source	Sample Item
Degree of Outsourcing	Based on Teng, et al. (1995) and Dibbern and Heinzl (2009)	For each of the two IS functions, please estimate the average percentage currently allocated to external service providers in terms of 1. the function's total budget (from 0 to 100%) 2. total person working days 3. total number of people that participate in doing the work
Comparative in-house systemic impact advantage	Newly formed based on general systems theory (Bertalanffy, 1979)	If this IS function is not performed in-house but externally, the integration of this IS function into the overall IS function of our organization is weakened 1. the synergetic effects to other IS functions will be threatened 2. the overall performance of our entire IS function will be greatly affected
Comparative in-house advantage in systemic view capability	Newly formed based on concepts of systems thinking (Stermann, 2000, Wolstenholme, 2003)	In doing the actual work required for each of the IS functions, our own employees tend much more than personnel of external service providers to 1. have a systems view of the organization 2. have an organization wide perspective of how work in different areas affect one another 3. consider the task interdependencies in our organization 4. have an integrated view of the organization
Comparative in-house production cost advantage	Based on Ang and Straub (1998)	In doing the actual work required for each of the IS functions 1. our internal staff works more cost efficient than an external service provider 2. we can realize higher economies of scale internally than an external service provider

Comparative in-house transaction cost advantage	Based on Ang and Straub (1998)	Transaction costs are all costs—other than the actual production costs—that arise when delegating tasks of an IS function to a task carrier. When delegating (i.e., transferring) tasks of the particular IS function 1. the costs incurred in negotiating, managing, and coordinating are lower within the firm than in case of contracting with an external service provider 2. less transaction costs are incurred for internal employees than when using an external service provider
Outsourcing decision making discretion	Based on Osgood (1957), Cordano, and Hanzen Frieze (2000)	When it comes to outsourcing this IS function to an external service provider 1. our organization can act unrestrictedly. 2. there are no impediments to our organization.
Pro outsourcing attitude of others	Based on Ajzen and Fishbein (1980)	Persons or groups whose opinion is important to our organization think that outsourcing this particular IS function is 1. bad–good (-3 to +3) 2. negative–positive 3. harmful–beneficial 4. foolish–wise 5. illogical–logical 6. worthless–valuable
Firm size	Based on Ang and Straub (1998)	Please estimate your organization's overall number of employees.

4.3 Group Comparison Procedure

The model testing was done using PLS software (PLS Graph 3.0, Version 1130). PLS was favored over the covariance-based structural equation modeling (SEM) software for several reasons. First, the data points of this study do not follow a multivariate normal distribution⁵. Covariance-based SEM assumes a multivariate normal distribution, but not PLS (Chin, 1998b). Second, in this study, the observations are not truly independent of each other since the same respondent answered each question for both the development and maintenance of software. PLS does not assume independence of cases or that any two cases have equivalent residual distributions (Chin, 1998b, p. 315). Third, the United States' data set was comprised of fewer than 200 respondents, the recommended minimum size for covariance-based SEM. PLS on the other hand, can produce consistent results with sample sizes as low as 17 (Majchrak et al., 2005)..

While these advantages make the suitability of PLS in this study very clear, there is one limitation. To date, most of the multi-group comparisons of PLS models in which differences in path estimations for sampled populations were examined have been relatively “naïve.” Often, researchers simply examine and discuss the differences in the path estimates for two or more data sets. When assessing the significance of the differences, a procedure based on the t-test using the pooled standard errors obtained via a resampling procedure such as bootstrapping from each sample is usually done (e.g. Keil et al., 2000). However, this procedure is valid only under the assumption of normal distribution or similar sample size.

Recently, Chin (2003) proposed an alternative, distribution-free approach in which a random permutation procedure was applied to overcome these limitations. Chin noted that randomization or permutation tests among statisticians are the preferred tests of significance for non-normal data. Random permutation procedures should not be viewed as alternatives to the parametric statistical tests that are currently used. Rather, they should be considered as preferable for data that does not conform to normal distributional assumptions.

The availability of fast computers has made permutation tests increasingly feasible even for large data sets. Since such methods require no particular assumptions concerning statistical distributions, permutation tests are increasingly applied, even in the context of traditional statistical tests (e.g., correlation, t-tests, ANOVAS, etc.). A detailed discussion of permutation tests can be found in Edgington (1987, p. 1) and Good (2000, p. 25). In general, a permutation test based on randomization, is, as Edgington (1987, p. 5) notes, “valid for any kind of sample, regardless of how the sample is selected.” This is an extremely important characteristic of a permutation test based on randomization, because the potential use of nonrandom samples in surveys and experimental studies would invalidate the use of parametric statistical tables (e.g., t or F tables).

⁵ Mardia’s (1970) coefficient of multivariate kurtosis for Germany was 122.61, c.r. = 30.14 and for the U.S was 74.50, c.r. = 9.95; $\frac{1}{N} \sum_{i=1}^N [(x_i - \bar{x}) \hat{S}^{-1} (x_i - \bar{x})] - \frac{p(p+2)(N-1)}{N+1}$.

Essentially, the random sampling assumption underlying these significance tables states that all possible samples of n cases within a specified population have the same probability of being drawn; this is not always tenable.

5 Data Analysis Results

5.1 Descriptive Findings

Table 5 offers insights into the company characteristics of our sample. The data reveals that senior IS executives in the United States have a shorter tenure (10.5 years) than in Germany (15.9 years). Corporate size and the size of the IS function are larger in the United States than they are in Germany.

Table 5. Company Characteristics					
		Germany		United States	
		Mean	Std.	Mean	Std.
CIO company membership (in years)		15.9	11.5	10.5	8.4
Number of employees in	Entire organization	2658	5619	4476	9622
	Entire IS function	88	160	239	796
	Applications development	28	59	137	635
	Applications maintenance	27	55	49	161

The larger size of the IS function in the companies in the United States can partially be attributed to a lower degree of IS outsourcing in applications development and maintenance. Table 6 shows that the German organizations of our sample spent about twice as much money on outsourcing their IS development and maintenance functions.

Table 6. Outsourcing Behavior				
Variable	Germany		United States	
	Mean	Std.	Mean	Std.
Current budget spent on outsourcing (in %)	40.1%	34.2	17.7%	27.3
Expected change in outsourcing expenditure in 1 year (in %)	3.6%	19.3	3.6%	16.4
Percentage of former in-house employees transferred to external vendor in case of outsourcing (in %)	6.8%	18.9	6.9%	22.4
Capital share in external vendor (in %)	10.8%	25.4	10.9%	25.1
No. of contracts in the last 5 years	10.1	19.2	11.1	19.0
No. of decisions against outsourcing in the last 5 years	5.1	8.4	2.1	2.7

Other sourcing peculiarities such as equity arrangements (where a certain amount of capital is exchanged between vendor and client), the average number of employees transferred to external vendor(s) in case of outsourcing, and contracting experiences (no. of contracts signed within last five years) were quite similar between the German and United States sample. Only decisions against outsourcing were made more frequently in Germany; this was not the case in the last five years.

Finally, Table 7 shows the summed averages and standard deviations (Std.) of the constructs of the theoretical model. The United States shows a higher level of perceived in-house advantages in production costs and transaction costs as well as in systemic impact and systemic view capabilities than Germany does. This is reflected in the lower level of outsourcing in the United States.

Table 7. Summed Averages and Standard Deviations for Theoretical Constructs					
Construct	Scale	Germany		United States	
		Mean	Std.	Mean	Std.
Degree of outsourcing	(0-100%)	38.74	34.29	16.61	24.69
Comparative in-house systemic impact advantage	(+2 to -2)	-0.08	1.12	0.56	1.14
Comparative in-house systemic view advantage	(+2 to -2)	0.92	0.88	1.33	0.77
Comparative in-house production cost advantage	(+2 to -2)	0.67	1.09	1.02	1.11
Comparative in-house transaction cost advantage	(+2 to -2)	0.77	1.00	0.98	0.91
External pro outsourcing attitude	(+3 to -3)	0.40	1.24	-0.41	1.42
Outsourcing decision making discretion	(+2 to -2)	-0.11	1.02	-0.22	1.19

On average, in the United States, the level of discretion over the outsourcing decision is lower, and the attitude of others towards outsourcing is more negative than in Germany. This prompts the question as to whether these factors exert a significant influence on the sourcing choice in both countries and whether the linkages we hypothesized to be culturally sensitive are significantly different between Germany and the United States.

5.2 Results of Model Testing

We will now examine the results of the testing for both Germany and the United States beginning with the test of (1) the measurement model, followed by (2) the structural model in both countries, and finally (3) the test of differences in the structural paths between both countries.

Measurement Model. In order to check whether the indicators of each construct do indeed measure what they are supposed to measure, tests for convergent and discriminant validity were performed for both the German and United States samples. Before conducting any multi-group comparisons, it is important to examine whether the measures perform adequately in both data samples.

In terms of convergent validity (Bagozzi and Phillips, 1982, p. 468), both indicator reliability and construct reliability were assessed (Peter, 1981, p. 65). *Indicator reliability* was examined by looking at the construct loadings. All loadings are significant to a level of 0.01 and fall above the recommended 0.7 parameter value. (Significance tests were conducted using the bootstrap routine with 500 resamples (Chin, 1998b)). *Construct reliability and validity* was tested using two indices: (1) the *composite reliability* (CR) and (2) the *average variance extracted* (AVE). All the estimated indices were found to be above the threshold (Bagozzi and Yi, 1988) of 0.6 for CR and 0.5 for AVE (see Table 8).

Table 8. Indicator and Construct Reliability							
Construct	Item	Germany			United States		
		Loading	CR	AVE	Loading	CR	AVE
Degree of Outsourcing	Out1	0.96	0.97	0.93	0.95	0.97	0.91
	Out2	0.96			0.98		
	Out3	0.96			0.94		
Systemic Impact Advantage	Impact1	0.89	0.91	0.78	0.92	0.94	0.85
	Impact2	0.89			0.90		
	Impact3	0.86			0.94		
Systemic View Advantage	EmplOri1	0.77	0.91	0.71	0.77	0.91	0.73
	EmplOri2	0.87			0.84		
	EmplOri3	0.83			0.91		
	EmplOri4	0.89			0.89		
Production Cost Advantage	Pc1	0.81	0.86	0.67	0.86	0.83	0.62
	Pc3	0.82			0.85		
	Pc4	0.82			0.62		
Transaction Cost Advantage	Tc1	0.90	0.85	0.74	0.70	0.83	0.71
	Tc4	0.82			0.97		
External pro outsourcing attitude	Other1	0.92	0.97	0.82	0.93	0.98	0.87
	Other2	0.93			0.92		
	Other3	0.92			0.93		
	Other4	0.89			0.97		
	Other5	0.88			0.96		

	Other6	0.89			0.90		
Outsourcing decision making discretion	CoPro2	0.90	0.93	0.87	0.86	0.93	0.87
	CoPro1	0.97			0.99		

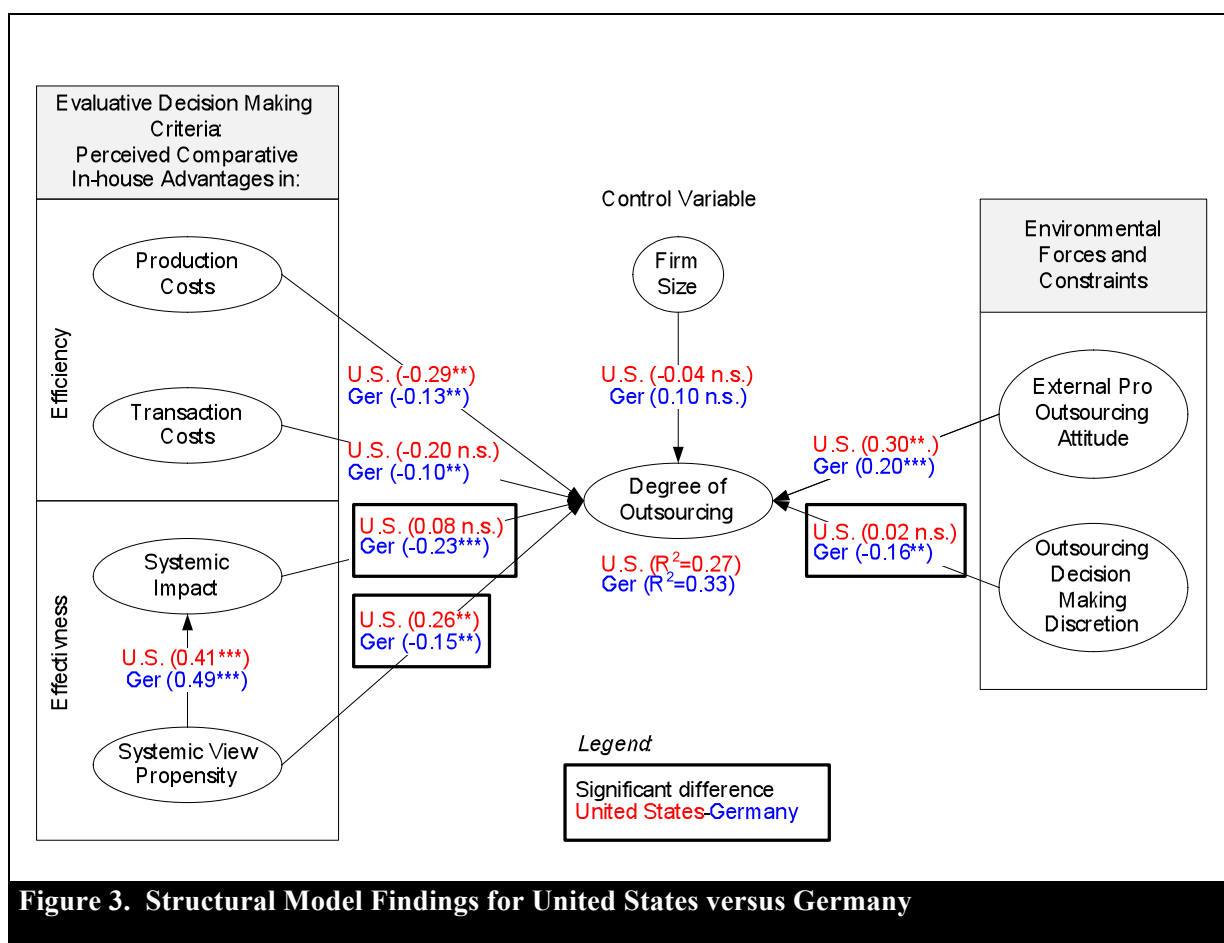
Examining the cross-loadings provides further check on the discriminant validity of the construct items. They are obtained by correlating the component scores of each latent variable with both their respective block of indicators and all other items that are included in the model (Chin, 1998b, p. 321). The cross loadings for Germany and the United States are presented in Tables 9 and 10 (see Appendix). The loadings on their respective constructs are shadowed. Tracing the data from one side of the rows to another reveals that each item loads higher on its respective construct than on any other construct. Tracing the data from the top of a column to the bottom also shows that a particular construct loads highest with its own items. Taken together, this data implies discriminant validity for both samples.

Finally, in order to allow for common method variance due to the self-reported responses by CIOs, Harman's one-factor test was conducted for both the United States and the German data set (Podsakoff and Organ, 1986). For this purpose, a confirmatory factor analysis was used (using AMOS 17.0), where the seven latent variables of the model were loaded on one factor. The results showed poor model fit; this suggests that common method variance is not responsible for the observed relationship among the variables.

Structural Model. Having gained confidence that the measures are appropriate for the German and United States sample, the next stage involved testing both the explanatory power of the entire model on IS sourcing and the predictive power of the independent variables in both countries. The *squared multiple correlations* (R^2) of the main dependent variable, which represents overall predictiveness of IS outsourcing, was used to assess the explanatory power. It can be concluded from Figure 3 that 33% of the variation in the degree of outsourcing ($R^2 = 0.33$) can be explained by the independent variables in Germany, while 27% can be explained in the United States sample ($R^2 = 0.27$).

The hypotheses were tested by examining the magnitude of the standardized parameter estimates between constructs together with the corresponding t-values that indicated the level of significance (t-values were obtained through the bootstrap routine, (Chin, 1998b, p. 320)). An overview of the results can be obtained from Table 11. Figure 3 is a graphical representation of the findings for the United States and Germany.

The findings provide significant evidential backing for the efficiency and effectiveness hypotheses in Germany. All of the path coefficients show the expected negative sign and are significant to a level of 0.05 (**) or 0.01 (***). Notably, the perceived comparative in-house advantage in the *systemic impact criteria* was found to have the strongest impact (H3: -0.23, t = 3.67). The impacts of the two constructs reflecting environmental forces and constraints were found to be less consistent.



While solid support was found for the influence of *external pro outsourcing attitude* on the degree of outsourcing (H5: 0.20, t = 3.93), the link between *outsourcing decision making discretion* and the

degree of outsourcing was found to be negative for Germany; this is in contrast with the predictions of the model. Moreover, *firm size* was found to have no impact on the degree of outsourcing in a company.

In the United States data, more deviations from the hypotheses were found than in the German data. The comparative in-house advantages of in-house professionals were found to be positively related to the degree of outsourcing in *systemic view propensity*. This is in contrast to the predictions made in the model. Also, in contrast to Germany, no evidence can be found in the data from the United States for the significant impact of comparative *transaction cost advantages*, *systemic impact advantages*, or *outsourcing decision-making discretion* on the degree of outsourcing in a company. Firm size was also found to have no impact on the degree of outsourcing.

Significance of Group Differences. The data regarding whether there are significant differences between Germany and the United States and whether those differences confirm the proposed cultural differences (Hypotheses 7-9) can be found in the right hand side column of Table 11. It shows the level of probability (P) with which the Null-hypothesis (the difference in the parameter estimates for both countries equals zero) is *true*. This probability (scaled from 0 to 100) should be limited to a critical distance of 1% ($P \leq 1$), 5% ($P \leq 5$), or 10% ($P \leq 10$) (Mohr, 1991).

As hypothesized, only the three culturally sensitive paths (H7-9) were found to show statistically significant differences between Germany and the United States. Of the eight structural paths that were assumed to be equivalent for both countries, five were found to be different but not to a significant degree. The probability of exactly matching the eight hypotheses is one in 256 (i.e., 0.39%). The results for the path coefficient from *systemic impact advantage* to degree of outsourcing (H1) in the structural model for Germany were found to be significantly stronger ($P = 2.5$, $p \leq 0.05$) than the corresponding path in the structural model for the United States. This supports H7 to a 0.05 level of significance. The data also partially supports H8, which proposes that there is a negative relationship between *systemic view advantage* and degree of outsourcing and that this negative

relationship will be stronger in Germany than in the United States. However, the results show that it is not the strength, but the *direction* of that link that differs significantly between Germany and the United States ($P = 0.3$, $p \leq 0.01$). The link is found to be negative in Germany (as predicted) but positive in the United States. Finally, the link between *decision-making discretion* and degree of outsourcing was found to be significantly stronger ($P = 7.9$, $p \leq 0.1$) in Germany than in the United States. While this tends to support H9, it should be noted that in Germany, the directional link is the opposite of that proposed in H9.

Table 11: PLS Results for Structural Model and Group Comparison

				Germany (n = 278)	United States (n = 82)	Country Difference
Hypothesis				Path <i>t-value</i>	Path <i>t-value</i>	Δ Path <i>P-value</i>
In-house systemic impact advantage	H1 (-) →	Degree of outsourcing		-0.23 *** 3.67	0.08 0.54	-0.31 ** 2.5 H7
In-house systemic view advantage	H2a (-) →	Degree of outsourcing		-0.15 ** 1.98	0.26 ** 2.11	-0.40 *** 0.3 H8
In-house systemic view advantage	H2b (+) →	In-house systemic impact advantage		0.49 *** 11.38	0.41 *** 3.86	0.08 17.1
In-house production cost advantage	H3 (-) →	Degree of outsourcing		-0.13 ** 1.86	-0.29 ** 2.05	0.17 13.0
In-house transaction cost advantage	H4 (-) →	Degree of outsourcing		-0.10 * 1.66	-0.20 1.23	0.10 25.2
External pro outsourcing attitude	H5 (+) →	Degree of outsourcing		0.20 *** 3.93	0.30 ** 2.31	-0.10 20.9
Outsourcing decision making discretion	H6 (+) →	Degree of outsourcing		-0.16 ** 2.22	0.02 0.21	-0.18 * 7.9 H9
Firm size	→	Degree of outsourcing		-0.04 1.08	0.10 0.65	-0.14 12.0

5.3 Results from Control for Industry and IS functional differences

The same analysis of country differences between Germany and the United States was performed separately for each function (development and maintenance) (see Table 12). The results are similar to those of the aggregated data sets, particularly regarding the two systemic variables. Analogous to the aggregated data sets, the strongest differences can be seen in the data pertaining to H2a between the

countries; these differences are statistically significant for both functions. The path of H1 differs at the 0.05 level in maintenance and at around the 0.1 level in development.

The impact of decision-making discretion (H6) was found to differ significantly only in applications development. It is noteworthy that the “external pro-outsourcing attitude” has a significantly stronger influence in the United States with regard to the outsourcing of applications development. Finally, production cost savings was found to be more important for applications maintenance in the United States than in Germany. Overall, it is striking how consistent the findings are between the two countries with regard to the different impacts of systemic influences.

Table 12: Group Comparison for each Function

Hypotheses	Maintenance				Development			
	GER	United States	Country Diff.	p-value	GER	United States	Country Diff.	p-value
	Path	Path	Δ Path		Path	Path	Δ Path	
H1 (-)	-0.24***	0.15	-0.39	4.57** (H7)	-0.23 ***	0.03	-0.26	11.62* (H7)
H2a(-)	-0.24***	0.28*	-0.52	0.25*** (H8)	-0.15 **	0.33 **	-0.47	5.26* (H8)
H2b (+)	0.44***	0.36**	0.07	26.27	0.49 ***	0.46 ***	0.03	17.99
H3 (-)	-0.07	-0.36*	0.28	10.23*	-0.13 **	-0.24	0.12	38.53
H4 (-)	-0.11	-0.24	0.13	27.97	-0.10 *	-0.18	0.09	44.44
H5 (+)	0.14*	0.11	0.03	43.81	0.20 ***	0.56 ***	-0.36	2.30**
H6 (+)	-0.17*	-0.05	-0.12	30.43	-0.16 ***	0.09	-0.25	10.37* (H9)
Firm size	-0.07*	0.12	-0.19	15.19	-0.04	0.02	-0.05	46.74

We also compared the two IS functions (development and maintenance) for the combined data set of the United States and German firms. Additionally, we tested for possible industry differences (Finance versus Machinery). When comparing the IS functions ($n = 180$ for each), only one path turned out to differ slightly between the functions ($p \leq 0.1$) - the path between the external outsourcing attitude and the degree of outsourcing (H5). This was 0.28 for development and 0.16 for maintenance.

When comparing industries, the evidence suggested that systemic influences were found in the expected direction (negative) for both samples, but only to a significant extent for the Finance industry. These differences between industries were weakly significant ($p \leq 0.1$). Also, decision-

making discretion was found to have a negative impact on outsourcing in the finance industry, but was insignificant for the machinery industry (the difference was significant to a degree of 0.05).

Overall, these controls show that the differences between paths are considerably stronger between countries than between IS functions or industries. This further strengthens our ex ante mid-range theory that due to possible contextual factors, national characteristics may be significant in our model on IS outsourcing determination.

6 Discussion

In the following section, the results of the model testing will be discussed and interpreted in the light of our research objectives. As mentioned previously, the objectives are concerned with the relative importance of IS outsourcing determinants, the role of systemic influences as new determinants to the IS outsourcing literature, and cross-cultural differences. Since the differences between countries turned out to be very strong for some relationships, we separate the discussion of results into two parts - the country-level differences and common findings across countries. The discussion concludes with the study's limitations.

6.1 Differences between Countries

Notably, all three determinants that were hypothesized to be culturally sensitive did indeed show significant differences in the structural paths between Germany and the United States (H7-9).

Systemic Influences. When looking at the two systemic factors, it is first worth noting that their impact turned out to be quite strong in comparison to all other determinants. For the German companies, systemic impact has the strongest impact among all determinants. For the United States firms, systemic view propensity is almost as important as production costs and external influences in the outsourcing decision.

Second, the differences between countries were found to be particularly strong for systemic influences. We found that the perceived in-house advantage in the *systemic impact* of an IS function

was found to impede the extent to which this function outsourced in Germany, whereas the relationship was found to be negligibly small (0.08) and non significant in the United States. This country difference is consistent with the perspective that in countries that are characterized by a very high level of individualism and a more analytical view of the firm, organizations are less inclined to consider system-wide effects in their evaluation of alternative sourcing options for particular IS sub-functions. In contrast, in Germany, which is more collectivist in nature and where companies tend to hold an integrative view of the organization, the implications of outsourcing a particular IS function on overall system performance are explicitly recognized. Thus, the moderating impact of individualism-collectivism shows up in the findings as hypothesized (H7).

The results also suggest, however, that we should not assume that systemic influences are ignored in highly individualistic countries. In the United States, these systemic influences are recognized at the level of the IS workforce, albeit in a completely different way than in Germany. In Germany, it was confirmed that application services are outsourced to a lower extent if in-house personnel is regarded as having a better systemic view propensity. In contrast, the exact opposite trend is found in the United States; application services are outsourced to a higher level in particular if in-house personnel are seen as superior in their systemic view propensity.

Thus, in contrast to the prediction (H8), a higher level of individualism was not found to lower the extent to which the systemic view propensity of IS professionals is factored into the IS outsourcing decision. Instead, individualism seems to modify the way in which systemic view propensity is considered. Our hypothesis on the impact of systemic view propensity was based on the assumption that such ability and behavior is generally valued highly for all IS professionals in collectivist countries, whereas it would be generally valued lower in more individualistic cultures.

This assumption, however, may not hold true for strongly individualistic cultures. In strongly individualistic societies, such as the United States, systemic thinking may not be seen as a required trait for all IS professionals, but for some. Consistent with the more analytical view of the firm, the

responsibility for taking care of systemic effects of an IS function may be in the hands of a specialized task force that makes up a minority of that function. At this point, it is interesting to note that in the United States sample, systemic view propensity was generally seen to correlate strongly with favoring in-house workforces—even in cases where the majority of an IS function was outsourced to an external vendor. This interesting finding can be inferred from the data presented in Table 13, where the responses of CIOs on systemic view propensity are averaged and then compared. This comparison was conducted between firms that kept the respective application service primarily in-house and those that primarily outsourced the respective function (for a similar analysis see Ang and Straub, 1998, p. 545). As shown in Table 13, in contrast to Germany, in the United States the average level of perceived in-house advantage in systemic view propensity is quite similar between those firms that substantially outsource (1.27) and those with minority outsourcing portions (1.34).

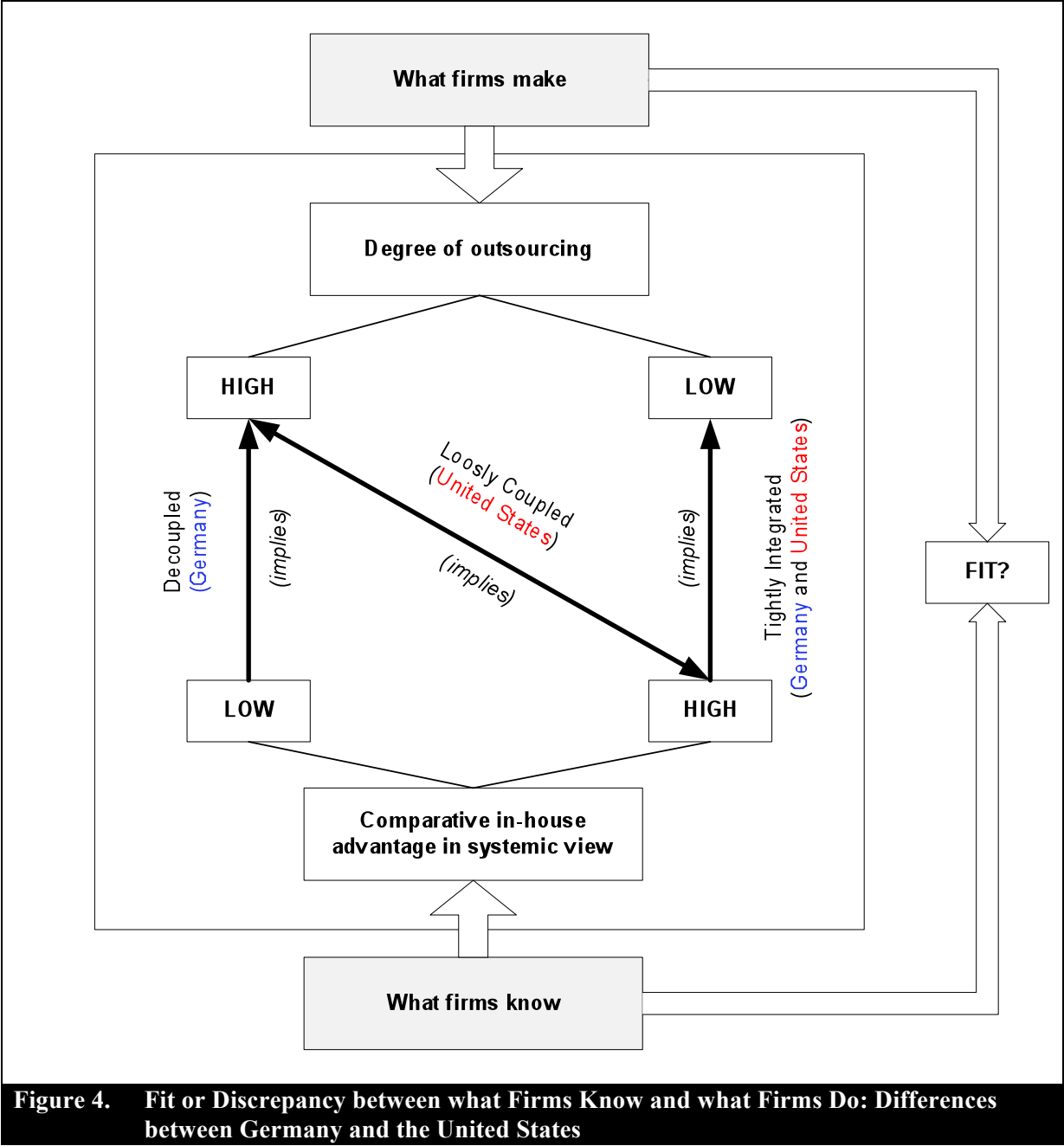
Table 13: In-house Advantage in Systemic View Propensity Across the Decision to Outsource (where -2 = Strongly Disagree; 2 = Strongly Agree; 0 = Neutral)					
	Country	Primarily in-house (<50%)	Primarily outsourced (≥50%)	Difference	Total N
In-house advantage in systemic view propensity	United States	1.34 (M=67)	1.27 (N=14)	0.07	81
	Germany	1.10 (N=167)	0.65 (N=111)	0.45	278
	Country Difference	0.24	0.62		

From a theoretical point of view, the finding that some United States firms show high levels of IS outsourcing in spite of the fact that in-house personnel is seen advantageous in their systemic view propensity appears perplexing at the first view. The finding contradicts the knowledge-based view argument that firms keep the know-how and capabilities of what they do in-house, while outsourcing the required resources of what they do not do (Brusoni et al., 2001). Thus, if a firm outsources the majority of its software development work to an external vendor, then the personnel of the external vendor is expected to hold superior knowledge about all the activities required to perform the outsourced function. This would entail the systemic capabilities required to ensure integrative fit of the outsourced function with the client's organization.

More recently, however, the opposing view has been taken. It has been argued that firms may actually keep or build up broad systemic knowledge in-house in order to coordinate the work being outsourced (Brusoni et al., 2001). Such organizational arrangements are described as *loosely coupled* (Orton and Weick, 1990), which means that the client organization and the work being outsourced represent distinctive (i.e., modular) entities that still need to be integrated. This integration of the outsourced function requires a profound understanding of the interfaces and interdependencies between the function being outsourced and the rest of the organization. This understanding is reflected in the concept of systemic view propensity. In fact, in-house systemic view propensity may be seen as a precondition for outsourcing the majority of an IS function in order to ensure “...integration among organizational subunits to actively manage the relevant technological and organizational interfaces” (Brusoni et al., 2001, p. 609-10). Thus, the majority of an IS function may be outsourced to a separate organizational entity, but to ensure systemic integration with the rest of the organization superior systemic view competency is retained in-house. This reflects a reciprocal relationship between the in-house advantages in systemic view propensity and the degree of outsourcing (see Figure 4). Thus, higher levels of outsourcing would imply keeping a strong systemic view propensity in-house.

In contrast, most German companies appear to employ the traditional path of organizational coupling, where a close correspondence exists between what a firm knows and what it does (Brusoni et al., 2001). That is, if an organization regards the systemic view propensity of their IS professionals (“what the firm knows”) as an in-house advantage, then this integrative capability is obviously required for what the firm does in-house, i.e. developing or maintaining application software. This reflects *tight coupling* where close interaction is required for performing a function consisting of entities that are not very distinct and that share many interfaces. Tight coupling is then best achieved through vertical integration, i.e. by keeping most of that function in-house (“what the firm does”). In contrast, if German firms see no in-house advantage in systemic view propensity among the IS professionals, this would be reflected by higher levels of IS outsourcing – on the one hand, because

the vendor may have superior systemic view capabilities; on the other hand, because little interaction may be required between the function outsourced and the rest of the client's systems/organization. This is consistent with the *decoupling* perspective. Thus, the sourcing option chosen by German firms reflects either a decoupling or tight coupling perspective, whereas in the United States we also see cases of loose coupling, as is illustrated in Figure 4.



While this seems to be a plausible explanation of the study findings, it should be kept in mind that this study did not control for the level of modularity of an IS function being outsourced, which is one of the prerequisites for differentiating alternative coupling arrangements. And yet, our findings suggest that cultural values and norms, such as individualism versus collectivism, contribute to explain whether organizations prefer to delegate the task of systemic integration to a small group of responsible persons (individualist view) as opposed to the collective body of all workforces that together perform an IS function (collectivist view).

Decision-making discretion. Another relationship that was found to be culturally sensitive is the link between outsourcing *decision-making discretion* and degree of outsourcing. It was proposed that a higher level of outsourcing decision making discretion would be positively related to the degree of outsourcing, and that this link should be stronger in Germany than in the United States. Interestingly, this link was indeed weak in the United States (slightly positive, but non-significant). However, our results showed the link to be significantly negative in Germany. In other words, German organizations tend to implement higher levels of outsourcing despite the fact that overall, their IS executives do not believe that their organization has latitude of action when it comes to outsourcing an IS function. This surprising result is again nicely illustrated if the German and the United States samples are separated into those that primarily keep the respective IS function in-house and those that primarily outsource. As can be inferred from Table 15, in the United States, organizations tend to outsource more if they have decision-making discretion (0.11), and outsource less if they believe decision making discretion is missing (-0.28). In contrast, in Germany, both organizations that primarily outsource and those that primarily keep application services in-house tend to disagree that they have decision making discretion. Those that primarily outsource particularly disagree (-0.15) .

Table 15: Decision Making Discretion Across the Decision to Outsource (where -2 = Strongly Disagree; 2 = Strongly Agree; 0 = Neutral)					
	Country	Primarily in-house (<50%)	Primarily outsourced (>=50%)	Difference	Total N
Outsourcing decision making discretion	United States	-0.28 (M=67)	0.11 (N=14)	0.39	81
	Germany	-0.08 (N=167)	-0.15 (N=111)	0.07	278
	Country	0.20	0.26		

	Difference				
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This implies that in countries like Germany, where labor interest groups exert a particularly high influence on IS outsourcing decisions, the perception of decision making discretion is particularly low in case of IS outsourcing, possibly because the need to consider multiple stakeholder perspectives during the decision making process is particularly strong among those organizations that actually implemented substantial outsourcing and hence are likely to have experienced significant obstacles during the process. Thus, the data suggests the possibility of a reciprocal relationship existing between the degree of outsourcing and the level of decision-making discretion. This link should be explored thoroughly in future research.

From a *methodological perspective*, the differences that we found between the two countries, i.e. where the structural paths of each country shifted from one direction to the other or to an insignificant level, are typical of interaction effects. By definition, traditional hypothesized effects are assumed to change according to the moderator variable. Indeed, whether the paths for both countries are in the same direction, opposite, or non-significant is mainly contingent on the strength of the impact of the moderator. This is defined as a disordinal interaction (Jaccard et al., 1990, pp. 75-78). Given a specific starting point for one country, the stronger the cultural differences between the two countries being examined, then the greater the likelihood that the path for the second country moves towards either a non-significant path or opposite sign, as was the case in our study (Baron and Kenny, 1986).

6.2 Commonalities across Countries

Production and Transaction Costs. In both the German and the United States sample, differences in *production costs* between in-house provision and outsourcing were found to have a significant impact on the sourcing of application services. This substantiates the findings from previous empirical studies (Ang and Straub, 1998, Apte et al., 1997, Clark et al., 1995, Lacity and Willcocks, 1998, McLellan et al., 1995). Notably, the descriptive results have shown that on average, production

costs tend to be regarded as lower in-house, which is in contrast to Williamson's (1981) assertion that economies of scale and scope could generally be better achieved through the market.

This study also supports evidence from previous empirical studies that production costs are more influential on the sourcing choice than transaction costs (see Ang and Straub, 1998). One reason for the different level of importance of the two types of costs could be that it is much harder for organizations to estimate transaction costs. They often appear as hidden or extra costs in the later stages of the actual service delivery, such as costs of increased control and coordination effort (Barthélemy, 2001, Dibbern et al., 2008).

External Outsourcing Attitude. It is intriguing to note that the attitude of influential external stakeholders towards outsourcing plays at least an equally important role as production costs in the United States and a more important role than costs in Germany. This could be explained by the fact that IS outsourcing is often associated with a high level of uncertainty on matters such as the true cost of outsourcing. Organizations often have to rely upon external stakeholders such as consultants or peer organizations. The negative side of these external impacts, however, should not be overlooked. There is the danger that organizations unknowingly and unreflectively conform to external opinions and pressures (Ang and Cummings, 1997) when making an outsourcing decision.

6.3 Study Limitations

Despite the significant findings that emerged from this study, any future research and practice drawing on the results of this study should note its possible limitations. Due to the cross-sectional nature of this study, the ability to draw causal inferences is limited. Moreover, experiences that managers may have had under the current governance of their company may have caused their initial perceptions from when the sourcing decision was made, to change. Despite this, managers may not be able to adjust governance structures as quickly as their managerial perceptions change. Accordingly, there are possible drawbacks to linking the degree of outsourcing in a company with the perceptions of managers regarding IS outsourcing. There are indications of such a possible drawback in at least two relationships of this study. First, the perception of decision-making

discretion may be influenced by the actual experiences of an outsourcing decision (see the inverse link found in the German data, as detailed above). Second, there is a possible reciprocal relationship between the degree of IS outsourcing and in-house systemic view propensity (see the discussion above on loose coupling). Such time-dependent and reciprocal effects call for follow-up studies that examine the IS outsourcing decision process over time.

Furthermore, while the response rate in the United States was significantly lower than in Germany, hence resulting in different sample sizes, highly significant relationships could still be detected in both samples. Thus the threat of limited statistical power was reduced. Additionally, in spite of the fact that the average degree of outsourcing among the United States firms was lower than among German firms, the theoretical relationships found in this study should be regarded as valid – in particular as to the distribution of the degree of outsourcing among United States companies, which was explicitly accounted for in the discussion of the findings (see Tables 14 and 15). Finally, our Monte Carlo simulation mirroring our exact sample size and measurement details were found to corroborate an earlier study (i.e., Chin, 2003) that statistical power is acceptable.

Another limitation that should be acknowledged is that the differences in cultural profiles were determined inductively from archival data. Accordingly, the confirmation and disconfirmation of the proposed cultural differences in the structural paths of the IS sourcing model should be treated with some caution (Janssens et al., 1995).

Finally, while the team of authors is made up by representatives of the two cultures being examined, as is usually recommended when conducting cross-cultural research (Pauleen et al., 2006), this may also imply that the development of the framework may have been affected by the respective cultural perceptions and values of the authors.

7 Implications

Several theoretical implications can be derived from our study. First, this study has substantiated the view that the IS outsourcing decision of a company should be viewed from a multi-theoretical

perspective (Ang and Cummings, 1997, Cheon et al., 1995, Poppo and Zenger, 1998). There is no single stream of reasoning that can fully explain why organizations choose to outsource. Rather, our findings confirm that an organization's chosen sourcing arrangement is a result of the combination of rational choice reasoning (such as efficiency and effectiveness criteria) and social and environmental influences.

Despite this, there is potential for theoretical improvement of our model. In this study, the alternative rationales were treated as though they work independent of each other. In reality, they have to be aggregated in a certain way to result in a final outcome that is either for or against outsourcing. This interaction between rationales should be explored in more detail. A theory of multiple IS outsourcing rationales should also account for the reinforcing, conflicting, and dominating rationales for the IS outsourcing decision; this is consistent with the theory of multiple contingencies (Sambamurthy and Zmud, 1999).

The results of this study may be viewed as one step in this direction. It has provided a more complete picture of the possible rationales that influence the IS outsourcing decision of a company. This was achieved by introducing a new perspective of systemic influences into the decision making process, an area that had previously been mostly ignored in theorizing about IS outsourcing determination. Furthermore, this study has also shed light on the contextual factors that go some way to explain the circumstances under which certain rationales are factored into the IS outsourcing decision in different organizations. To this end, cross-cultural dimensions were introduced as possible moderating factors.

Both of these new perspectives should prove to be fertile grounds for future research. The relatively strong impact of systemic influences on the IS outsourcing decision found in this study points to the necessity for a much deeper understanding of certain aspects - the role of interdependencies among IS components and IS functions and interdependencies between IS and non IS functions for understanding and guiding IS outsourcing decision making. Previous research has focused strongly

on studying the sourcing of individual IS professionals, IS functions, or IS projects as units of analysis. However, each of these organizational entities is responsible for creating particular IS effects that should be integrated into a coherent whole, possibly under one common architecture.

As regarding existing interfaces between particular IS artifacts (i.e., products), there should exist corresponding interfaces between the resources that provide them (Schilling, 2002). In-house and outsourced provision may therefore be seen as not only two alternative organizational arrangements for performing particular IS functions or creating particular IS artifacts, but also as alternative arrangements that can be utilized to manage the interdependencies between IS artifacts and IS functions.

An understanding of what kind of knowledge architecture is required for a particular IS product architecture seems to be necessary for a full understanding of this issue. That is, further clarification should be sought as to whether roles and responsibilities (knowledge carriers) should have a narrow distribution (centralized) or wide distribution (decentralized) across organizational units, and whether they should be located inside or outside the boundaries of a firm. The introduction of systemic influences on the IS outsourcing decision, as outlined in this study, opens up a variety of research opportunities to study the interplay between product architectures, knowledge architectures, and internal versus external governance architectures.

Since IS outsourcing is such a globally influential area, the influence of national peculiarities also requires more attention. This study has highlighted the impact of national context on the IS sourcing decision made by a company. As shown by Kumar et al. (1990), differences in the values and norms of nations may translate into different IS design values. Differences in IS design values in turn may lead to differences in IS artifacts and associated IS architectures. While this study has incorporated cultural dimensions indirectly into its theoretical frame, future research may do so explicitly by actually measuring the cultural values of IS professionals of different nations, comparing IS artifacts

between nations, and examining how such differences influence IS outsourcing decision making and management.

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Appendix

Table 9: PLS Cross-loadings for German Sample

	PC	TC	firm size	Out	Sys_Imp	Discretion	Sys_View	Ext_Infl
Pc1	0.85	0.57	0.05	0.34	0.40	0.16	0.44	0.25
Pc3	0.88	0.44	0.10	0.38	0.49	0.12	0.42	0.33
Tc1	0.53	0.90	0.12	0.36	0.33	0.14	0.33	0.30
Tc4	0.45	0.82	0.03	0.27	0.40	0.06	0.39	0.29
No_All	0.09	0.07	1.00	0.01	0.03	0.01	0.13	0.00
Out1	0.40	0.36	0.03	0.96	0.41	0.05	0.35	0.36
Out2	0.41	0.37	0.01	0.96	0.43	0.04	0.38	0.32
Out3	0.38	0.36	0.02	0.96	0.41	0.04	0.37	0.38
Impact1	0.51	0.41	0.03	0.38	0.89	0.24	0.46	0.21
Impact2	0.46	0.36	0.03	0.41	0.89	0.14	0.44	0.28
Impact3	0.40	0.34	0.02	0.35	0.86	0.16	0.41	0.22
CoPro1	0.16	0.11	0.03	0.05	0.18	0.97	0.17	0.05
CoPro2	0.14	0.12	0.07	0.03	0.21	0.90	0.17	0.05
EmplOri1	0.34	0.36	0.08	0.23	0.40	0.15	0.77	0.18
EmplOri2	0.47	0.39	0.17	0.38	0.41	0.08	0.87	0.31
EmplOri3	0.41	0.31	0.03	0.33	0.39	0.22	0.83	0.17
EmplOri4	0.44	0.34	0.14	0.33	0.46	0.15	0.89	0.19
Other1	0.37	0.37	0.03	0.34	0.28	0.07	0.25	0.92
Other2	0.35	0.35	0.03	0.33	0.27	0.07	0.27	0.93
Other3	0.33	0.31	0.01	0.34	0.27	0.03	0.22	0.92
Other4	0.26	0.28	0.03	0.33	0.22	0.09	0.22	0.89
Other5	0.23	0.25	0.03	0.31	0.22	0.06	0.18	0.88
Other6	0.27	0.32	0.04	0.34	0.21	0.02	0.22	0.89

Table 10: PLS Cross-loadings for United States Sample

	PC	TC	firm size	Out	Sys_Imp	Discretion	Sys_View	Ext_Infl
Pc1	0.92	0.39	0.02	0.36	0.53	0.01	0.17	0.30
Pc3	0.89	0.47	0.02	0.31	0.59	0.02	0.36	0.33
Tc1	0.31	0.70	0.02	0.11	0.31	0.15	0.34	0.25
Tc4	0.46	0.97	0.02	0.30	0.36	0.07	0.35	0.20
No_All	0.02	0.02	1.00	0.16	0.10	0.04	0.06	0.17
Out1	0.28	0.19	0.25	0.95	0.08	0.00	0.06	0.29
Out2	0.36	0.33	0.11	0.98	0.19	0.02	0.01	0.32
Out3	0.41	0.27	0.11	0.94	0.25	0.04	0.01	0.37
Impact1	0.62	0.40	0.16	0.22	0.92	0.17	0.37	0.34
Impact2	0.50	0.31	0.00	0.16	0.90	0.11	0.30	0.44
Impact3	0.56	0.35	0.09	0.14	0.94	0.07	0.44	0.40
CoPro1	0.01	0.10	0.04	0.02	0.13	1.00	0.10	0.01
CoPro2	0.11	0.10	0.03	0.00	0.09	0.86	0.04	0.03
EmplOri1	0.19	0.28	0.12	0.09	0.34	0.19	0.77	0.28
EmplOri2	0.34	0.44	0.05	0.03	0.31	0.01	0.84	0.28
EmplOri3	0.25	0.38	0.12	0.11	0.40	0.04	0.91	0.35
EmplOri4	0.19	0.23	0.08	0.08	0.35	0.12	0.89	0.28
Other1	0.32	0.25	0.17	0.28	0.39	0.05	0.28	0.93
Other2	0.35	0.21	0.23	0.28	0.37	0.07	0.24	0.92

Other3	0.31	0.12	0.14	0.24	0.42	0.05	0.31	0.93
Other4	0.36	0.27	0.15	0.36	0.42	0.05	0.34	0.97
Other5	0.34	0.26	0.17	0.34	0.39	0.02	0.41	0.96
Other6	0.26	0.21	0.08	0.37	0.37	0.10	0.36	0.90

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