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A Two Stage Investigation of the Determinants of Information Systems Outsourcing

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Outsourcing has recently emerged as a key method of managing Information Systems especially since the report about Eastman Kodak and IBM's outsourcing partnership in 1989 (Loh and Venkatraman, 1992a, 1992b). The importance of outsourcing is partially illustrated by the fact that there are myriad conflicting arguments both for and against outsourcing (Chaudhury et al, 1989, 1995; Gantz, 1990; Lacity and Hirschheim, 1993; Nam et al, 1995a, 1995b).

Most outsourcing studies have focused on the investigation of the determinants of the decision to outsource by clients. Transaction cost economics (TCE) theory has recently been used in the study of the determinants of outsourcing (Lacity and Hirschheim, 1993; Nam et al, 1995a, 1995b). The theory of transaction cost economics (TCE) was originally formulated to address the "make" versus "buy" choice (Anderson and Coughlan, 1987; Erramilli and Rao, 1993)

In TCE, Williamson (1989, 1987, 1981, 1979) proposed that firms should insource when they expect opportunistic behavior by the vendors. In particular when clients are locked-in with vendors, vendors' opportunistic behavior will significantly impair the clients' interests. This statement implies that attributes of existing relationships such as opportunism affect the firms' subsequent "make-or-buy" decision with the incumbent vendors. However, most prior empirical research on TCE has treated each sourcing decision as an independent event (Masten, 1984; Walker and Walker, 1987, 1984) thereby disregarding the prior relationships that affect the subsequent sourcing decisions. Therefore, any outsourcing study must explicitly incorporate the role of prior ties in its analytical framework (Gulati, 1995).

In the outsourcing context, it has been reported that very often clients continue their relationships with vendors. Also, many firms have to decide whether they should continue the outsourcing relationships with the vendors or not. Factors that affect continuation of the relationships are different from factors that affect the initial outsourcing behavior because client firms have locked-in relationships with vendors. According to Seabright et al (1992), and Levinthal et al (1988), prior relationships need to be investigated in order to study the subsequent relationships between clients and vendors. This study will focus on i) the determinants of the outsourcing decisions and ii) the tendency to persist in the locked-in outsourcing relationship.

We investigate the factors that determine outsourcing decisions in two stages. In the first stage, both insourcing and outsourcing firms are studied to investigate the determinants

of "make-or-buy" decision. In the second stage, only outsourcing firms are considered in order to study the intention to continue with the relationship.

Two dimensions are proposed in order to conceptualize the diverse types of outsourcing between clients and vendors (Nam et al, 1994a, 1994b). The first dimension is the extent of substitution by IS vendors and the second dimension is the strategic impact of IS applications. There are two types of strategic impact of IS applications: differentiation and cost reduction. The first dimension is proposed from the IS vendors' point of view while the second dimension is proposed from the client firms' point of view. Based on these two dimensions, four types of outsourcing relationships are proposed. These four types are support, reliance, alignment, and alliance.

The support cell has a low extent of substitution and low strategic impact. This cell corresponds to the traditional IS vendors service. Vendors are usually restricted to non-core IS activities and the size of contract is small. The reliance cell has a high extent of substitution and low strategic impact. The IBM and Kodak outsourcing example corresponds to this cell. In recent years, the trend of outsourcing has moved from the support cell to the reliance cell. The alignment cell has a low extent of substitution and high strategic impact. Examples in this cell are mostly IS consulting types of services. Even though vendors are not significantly involved with client firms' IS operations, IS vendors significantly influence clients' IS operations. The alliance cell has a high extent of substitution and high strategic impact. Outside vendors not only substitute in-house IS operations but also contribute to clients' competitive advantages through provision of important IS functional activities.

In the first stage, hypotheses are developed based on transaction and non-transaction cost factors with respect to the two proposed outsourcing dimensions. Three transaction cost factors are studied as determinants of the two dimensions: asset specificity, uncertainty, potential number of vendors. Four non-transaction cost factors are also investigated. These four non-TCE factors are IT competency, IS influence, heterogeneity of information systems, and decision analysis effort. Multiple regressions are used to test hypotheses in the first stage.

In the second stage, hypotheses are proposed based on prior relationships between clients and vendors in order to study the determinants of the intention to continue with the outsourcing relationships. Prior relationships are represented by the four types of outsourcing relationships based on two dimensions of outsourcing, vendors performance in terms of client satisfaction, vendors' opportunistic behavior and the length of prior relationships. Logistic regression is employed to test hypotheses in the second stage.

Questionnaires were developed based on interviews with IS manager and pretested. Following a pretest, 800 questionnaires were sent to senior IS managers in the U.S. A follow-up letter was mailed to those who had not responded after about three weeks.

In total 154 usable questionnaires were received representing a response rate of 19.25%. Out of 154, 93 responded as outsourcing firms and 61 responded as insourcing firms.

Results

In the first stage the results indicate that asset specificity, IT competency, and decision analysis effort have positive impact on the differentiation aspect of the strategic impact of IS applications. However, when the focus is on cost reduction, none of the three factor is significant. For the extent of substitution, uncertainty has a negative impact, heterogeneity of IS systems has a positive impact, IT competency has a negative impact, size of firm has a positive impact. Results are summarized in Table 1.

For the second stage, three dummy variables are employed in order to compare the intention to continue with the relationship in the four cells. The results indicate that outsourcing relationships in the reliance and alignment cells are more likely to persist compared with relationships in the support cell. However, outsourcing relationships in the alliance cell are not likely to persist compared to relationships in other cells. Clients' satisfaction has a positive impact and vendors' opportunistic behavior has a negative impact on the persistence of the relationships. The duration of prior relationships do not affect the persistence of relationships between vendors and clients. Results are summarized in Table 2.

Discussion

In the first stage, the results (see Table 1) indicate that only one TCE factor, uncertainty, is significant while other two factors, asset specificity, and potential number of vendors, are not significant. These results are not consistent with the theory of TCE. The most possible reason deals with the nature of TCE. Gulati(1995) argued that there are two types of governance structures: equity and nonequity ownership. Nonequity ownership does not involve the sharing or exchange of equity, nor does it entail the creation of a new organizational entity. In contrast, equity based ownership requires a capital commitment from both parties or one party, and the transaction cost factors are signified by the capital commitment. Thereby, application of TCE to outsourcing may not be as satisfactory as application to other equity-type governance modes unless it requires equity ownership. If outsourcing practices are more equity-based, more consistent results would be obtained.

In the first stage, IT competency and heterogeneity of information systems are more significant factors than uncertainty and size of firms. IT competency and heterogeneity of information systems are systems-related factors, while uncertainty is an environment-related factor and size of firms is an organization-related factor. It is inferred that even though environmental and organizational factors affect the decision of outsourcing, major determinants of outsourcing are systems-related.

There are several important findings in the second stage with respect to four cells. The first finding is concerned with the two types of strategic impact, cost reduction and differentiation. Regardless of whether outsourcing vendors are involved in cost reduction functions or differentiation functions, same factors affect the persistence of relationships.

The second finding is relevant to the current trend of outsourcing. The trend of outsourcing relationships is a movement from the support cell to the reliance cell or alignment cell.

The third finding is with regard to the future trend of outsourcing. One of the most interesting issues in outsourcing is whether outsourcing for strategic functions is a good practice or not. This question is equivalent to asking whether the alliance cell is a good and viable option for client firms to be in. The study indicates that outsourcing relationships tend to persist when either the strategic impact of outsourced IS activities or the extent of substitution by vendors is high. It implies that outsourcing vendors are successful in reliance and alignment cells regardless of whether IS applications are for cost reduction or differentiation. However, when both

Table 1. Hypotheses Testing in the First Stage

Determinants	Dependent Variables		
	ST_IMP_Diff	ST_IMP_Cost	Ext_Sub
Asset Specificity	+(***)	.	.
Uncertainty	N/A	N/A	-(**)
Potential Vendors	N/A	N/A	.
IT Competency	+(***)	.	-(***)
IS Influence	N/A	N/A	.
Heterogeneity	N/A	N/A	+(***)
Experience	N/A	N/A	.
Size	N/A	N/A	+(**)
Decision Effort	+(*)	.	N/A
R Square	0.2667	0.0308	0.1091
F Value	18.185	3.026	2.221
Prob>F	0.001	0.0314	0.0291

Level of Significance: *** for p=0.01, ** for p=0.05, and * for p=0.1
Size = LOG (Sales)

the strategic impact and the extent of substitution by vendors are high, there is no evidence of a tendency to persist in the relationship. It implies that current practice of outsourcing for the alliance cell is not stable enough for existing relationships to persist. Hence, the factors that affect the persistence of relationships in the alliance cell should be further investigated.

The fourth finding provides interesting implications for IS vendors. In this study, vendors' performance was represented by two factors: opportunistic behavior and satisfaction with vendors. Satisfaction with vendors was operationalized in terms of vendors' technical competency. A further investigation of the chi-square values for each variable from individual logistic regression indicates that both factors are almost equally

important in determining the persistence of existing relationships. This implies that IS vendors should be sound in terms of technical competency and relationships.

The fifth finding is concerned with duration. The result indicates that duration of prior relationships has no effect on the persistence of outsourcing relationships. According to TCE, duration is one of important factors that affect the types of contract as well as future relationships between vendors and clients. However, it is found that long-term prior relationships do not guarantee the persistence of outsourcing relationships at all.

This study contributes in three ways: First, transaction cost economic theory is enhanced with the non-TCE factors and is used to investigate two

Table 2. Hypotheses Testing in the Second Stage

- Out of 93 outsourcing firms, 15 firms who do not have a specific plan were dropped from the analysis. Therefore, 78 firms were used for analysis.
- 78 firms were categorized into four cells by median values of each dimension.
- Since the dimension of strategic impact is operationalized in two ways, the samples are categorized in two ways. The first column shows the result for strategic differentiation and the second column is for cost reduction.

Determinants	ST_IMP_Diff	ST_IMP_Cost
DUMMY (Alignment)	+(**)	+(**)
DUMMY (Reliance)	+(**)	+(*)
DUMMY (Alliance)	.	.
Satisfaction	+(**)	+(**)
Opportunism	-(**)	-(*)
Duration	.	.
Chi-Square	24.258	23.331

Level of Significance: *** for p=0.01, ** for p=0.05, and * for p=0.1

dimensions. Second, diverse outsourcing relationships are conceptualized by two dimensions and four types of outsourcing relationships. Third, it investigates the tendency to continue with existing relationships.

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