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Editors

Information Systems Outsourcing

Enduring Themes,
Emergent Patterns
and Future Directions

With 43 Figures
and 60 Tables



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Costs, Transaction-Specific Investments and Vendor Dominance of the Marketplace: The Economics of IS Outsourcing¹

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Summary

This paper studies determinants of information systems (IS) outsourcing. It argues that a focus on comparative economic theories and models can improve our ability to explain outsourcing within the larger context of organizational strategy and environment. Specifically, the research constructs of production cost, transaction cost, financial slack, and firm size are examined to understand what influences the outsourcing decision. To empirically test these relationships, a field study gathering information from senior IT managers in 243 U.S. banks was conducted. Financial indices from the archives of the Federal Reserve Bank were a second important source of data. Results of the study showed that IS outsourcing in banks were influenced by production economies, transaction economies, and firm size. The paper has important implications for research and practice. For researchers, the findings suggest that some financial criteria are key factors in outsourcing decisions, but not all. Recapitalizing the IT investment, for example, is a short term strategy that managers may not and, probably, should not be adopting. For practitioners, the findings suggest that sourcing strategies need to weigh both direct and indirect costs when hiring systems

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integrators. Small firms need to consider whether they have sufficient economies of scale to justify internal provisioning.

1 Introduction

The strategic importance of information systems (IS) in banking is widely substantiated (Steiner and Teixeira 1990; OECD 1992; Office of Technology Assessment 1984; Office of Technology Assessment 1987; Apte et al 1990; McFarlan and McKenney 1983). Yet, in spite of this, some banks have outsourced their entire information services function (American Bankers Association 1981; 1986; 1990). On the surface, it seems counterintuitive that banks should potentially erode their competence in the design and delivery of strategic financial services relying heavily on information technology (IT).

Part of the explanation lies in past behaviors and long standing theories about how organizations respond to their environment. According to classical theories of the firm, organizations strive toward autonomy (Gouldner 1959; Burt 1982). They maintain independence by integrating as many business activities as possible within their hierarchical control. By means of backward and forward integration, organizations secure access to markets, safeguard suppliers to raw materials, and prevent competitors from obtaining such access.

While corporations overall have demonstrated many of these tendencies in the post World War II era, a reversal of this trend had begun to emerge by the mid-1980s (Harrison and St. John 1996). Described as "hollowing out of the corporation," organizations began to relinquish internal control and depend more heavily on external service-providers. Outsourcing prompted firms to abandon internal production bases and rely on others for manufacturing, distribution, and other business functions.

The growing practice of outsourcing in modern corporations has led both academics and practitioners to theorize and speculate about the underlying momentum towards outsourcing. The intriguing question is: If organizations are "dependence-avoiders" (Gouldner 1959), why expose oneself to inter-organizational dependencies in outsourcing arrangements? In addition to external dependencies, outsourcing brings on costly and radical changes. It creates upheavals in existing organizational structure and redefines organizational roles. Organizations must hire and terminate employees, sell off fixed assets, and plan for geographical relocation of firm operations.

The evolving literature on information technology (IT) outsourcing offers a variety of explanations for why outsourcing occurs. Many of these arguments have a basis in economic theories and models. One of the most commonly cited reasons, for example, is that managers feel that they can gain cost advantages by

hiring outsiders to perform certain services and produce certain products (Alpar and Sharia 1995; Loh and Venkatraman 1992a). Transaction cost theory offers another economic perspective (Nam, Rajagopalan, Rao, and Chaudhury 1996) that typically frames outsourcing as a decision about drawing firm boundaries (Pisano 1990; Mosakowski 1991) or as vertical integration (Anderson and Schmittlein 1984; Monteverde and Teece 1982; Harrigan 1985). Financial slack and firm size are other factors which can be conceptualized, at least in part, as economic constructs.

This study argues that we can improve our ability to explain outsourcing within the larger context of organizational responses to their strategic environment by focusing on such economic considerations. Our findings suggest which factors play into the outsourcing decision and their relative importance in sourcing choices.

2 Theory Development and Hypotheses

The theoretical model developed in this paper is shown in Figure 1. All relationships except for the connection between degree of outsourcing and firm performance are tested in the current study.

First, in profit-oriented organizations, economics plays an important role in justifying any sourcing strategy. Production and transaction economies are, therefore, appropriate and necessary theoretical lenses for investigating outsourcing.

2.1 Production Economies

Neoclassical economics regards any business organization as a "production function" motivated by profit-maximization (Hirschleifer 1976; Williamson 1981). To maximize profits, organizations provide goods and services to markets where they have cost advantages and rely on the marketplace for goods and services in which they have comparative cost disadvantages. As a theory about how firms choose sourcing options, neoclassical economics predicts that firms justify sourcing options based on production economies. In terms of production economies, acquiring products and services is treated as an economic 'make-or-buy' decision — a decision that compares production costs of internal operations versus the price offered in the marketplace (Walker and Weber 1984; Ford and Farmer 1986). In the context of IS, a firm will choose to outsource or insource based on the comparative costs of internalizing IS versus the price it has to pay vendors for the same IS services. Accordingly, we would expect that:

Hypothesis 1: *The higher the comparative production cost of IT offered by systems integrators, the more likely are firms to outsource IT.*

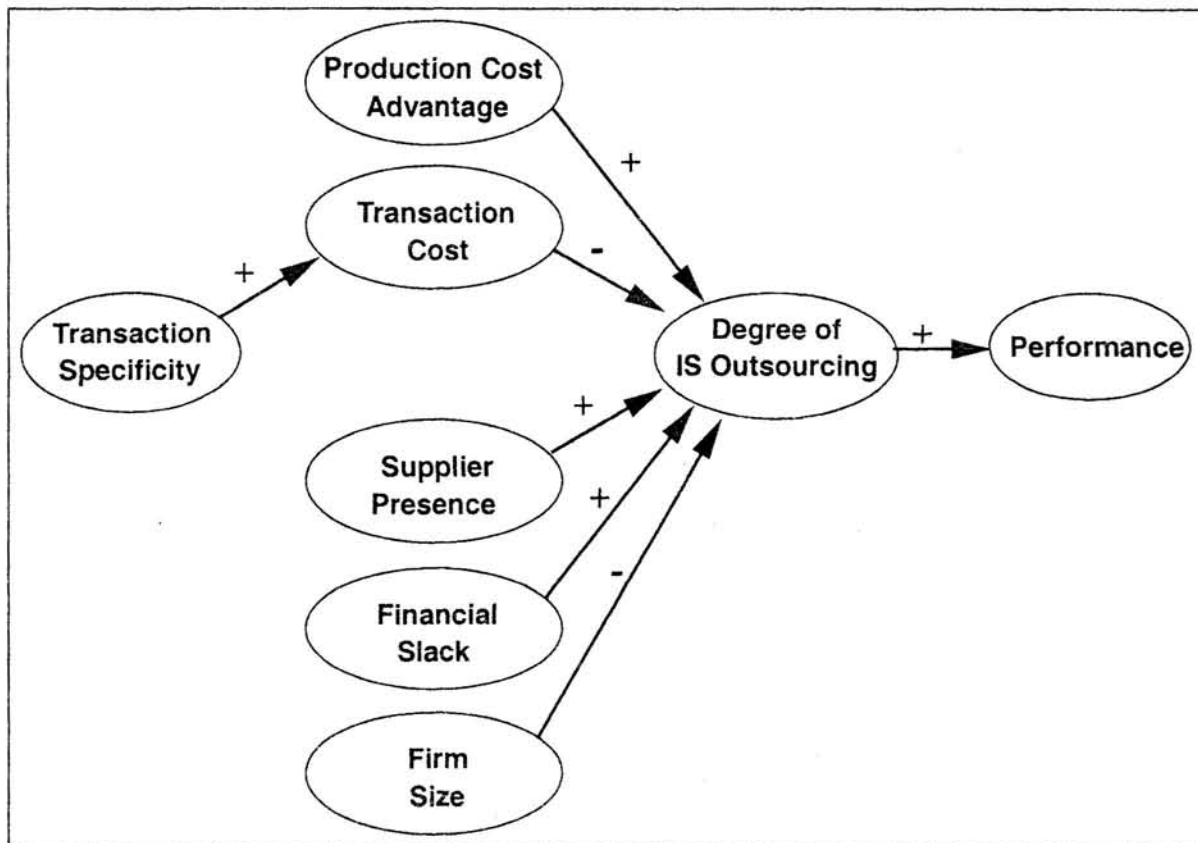


Figure 1: Theoretical Model for Etiology of IT Outsourcing

2.2 Transaction Economies

Transaction cost economics extends the neoclassical economic perspective of the firm by recognizing the significance of transaction costs in any market exchange. Transaction costs refer to the effort, time, and costs incurred in searching, creating, negotiating, monitoring, and enforcing a service contract between buyers and suppliers (Coase 1937; Williamson 1975; Mahoney 1992). Transaction costs can erode comparative advantages in production costs of vendors. When a firm has to incur substantial effort and costs in supervising, coordinating, and monitoring the activities of the vendor, it may decide that external sourcing is too costly. Accordingly, firms may opt for internal sourcing when they perceive transaction diseconomies to override any production cost advantages in market exchanges.

At the core of transaction cost economics is the notion that transaction costs of any economic activity are determined by asset specificity associated with that activity (Williamson 1985). The degree of asset specificity required in an exchange significantly affects the level of transaction costs. Asset specificity

refers to the degree to which investments are unique to the contracting relationship and, hence, possess considerably less value outside the transaction relationship (Joskow 1988). In IS services, transaction specific assets include fixed assets such as specialized and dedicated equipment, operating procedures, and software systems tailored for the use of a specific organization. In addition to specialized computer systems, specific assets also include idiosyncratic professional skills, and specialized know-how embedded in human assets. Professional skills refer to those expertise and know-how acquired only through several years of specialized education and training; while specialized know-how refers to knowledge that is useful in only a narrow range of applications which cannot be easily put to use elsewhere; and customization refers to the degree to which a service is uniquely tailored to one or a few users (Ang and Beath 1993; Erramilli and Rao 1993).

According to transaction cost analysis, it is imprudent to assume that parties to an exchange will forgo opportunistic behavior. As a result, transaction specific investments potentially pose a problem because a firm's sustained use of these assets may depend on the good-faith behavior or forbearance of the IT service-provider. Consequently, firms are exposed to the possibility of relationship termination or "opportunistic expropriation" if the service-provider chooses to capitalize on the transaction (Klein, Crawford, and Alchian 1978).

The safeguard against opportunistic appropriation is to rely on additional monitoring and enforcing measures to ensure co-alignment of interests between the firm and the external service-providers. Thus, transaction specific investments in IS services would lead to increased transaction costs, and may, in time, influence the firm towards an internal supply of services where bureaucratic control and ownership reduce the capacity and motivation to expropriate the value of one's specific investments (Heide and John 1990). In sum, transaction cost economics argues that firms need to retain transaction-specific investments in order to avoid the extremely high transaction costs that result from outsiders creating, maintaining, and safeguarding transaction-specific investments.

Retaining transaction-specific investments is closely related to the line of thinking that firms should outsource only non-core competencies (Prahalad and Hamel 1990; Quinn 1992; Bettis, Bradley, and Hamel 1992; Venkatesan 1992). According to the core-competency perspective, modern organizations cannot afford to internalize and maintain all productive and administrative apparatus necessary to react to external environments that are increasingly dynamic and hypercompetitive. To reduce cost and gain competitive advantage, organizations should source for services and products strategically by internalizing components critical to the product or service which they have distinctive competency and outsourcing peripheral business activities. Service and product assets so "specific" to the firm that they must be maintained through the internal base are, therefore, strategic assets. Information systems that qualify as strategic assets should not be outsourced unless contractual guarantees can be set in place

(Nelson, Richmond, and Seidman 1996). Contracting systems integrators to steward these assets is costly, however. Accordingly, as argued by Lacity and Hirschheim (1993), Alpar and Saharia (1995), and Nam et al. (1996):

Hypothesis 2_a : The lower the perceived transaction costs involved in hiring outsourcers, the more likely are firms to outsource IT.

and

Hypothesis 2_b : Transaction-specific investment is positively related to transaction costs.

In the context of product or service procurement, supplier presence or the availability of alternative vendors has also been posited to affect the level of transaction costs (Walker and Weber 1984). Supplier presence is a term that is defined as the availability of reputable and trustworthy external IT service-providers in the market (Walker and Weber 1984). The basic issue is whether the vendor has such a dominant position in the marketplace that the firm suspects that the pricing offered by the vendor is not competitive. In general, opportunistic inclinations by any party in a contractual arrangement pose little risk as long as competitive exchange relations — that is, a large supplier presence — exist (Pisano 1990; Ferris and Graddy 1988). In other words, provided the market offers a sufficient number of potential suppliers to ensure adequate competition for the management of IS services, the likelihood for opportunistic bargaining on the part of the supplier decreases (Walker and Weber 1984). Thus, the transaction costs of external contracting are related to the competition between alternative external IT service-providers who provide comparable services. In fact, firms may be constrained in their outsourcing choices if a full array of IS services are not available from another supplier. Consequently, it is contended that the presence of suppliers promotes outsourcing as an attractive alternative to in-house operations since greater supplier presence reduces *ex-ante* small bargaining problems that threaten outsourcing (Williamson 1975).

Hypothesis 2_c : The higher the supplier presence (i.e., the likelihood that perceived transaction costs with IT service-providers will be low), the more likely are firms to outsource IT.

2.3 Financial Slack

The sourcing conundrum may be explained by a firm's discretionary use of financial slack. Financial slack refers to financial resources an organization possesses in excess of what is required to maintain the organization. Cyert and March (1963) define slack as the difference between total resources and necessary payments while Bourgeois (1981) describes slack as "a cushion of excess resources available in an organization that will either solve many

organization problems or facilitate the pursuit of goals outside the realm of those dictated by optimization principles" (p. 29).

Whenever a firm possesses excess resources, it tends to invest the resources towards increasing the size of the firm. As Jensen (1989) observed, firms tend to invest slack in promoting firm size through asset capitalization rather than in distributing the excess resources back to shareholders. Based on a behavioral view of the firm, the rationale is that, by increasing asset capitalization and, in turn, enlarging the scale and scope of the firm, senior executives in the firm enhance social prominence, public prestige, and political power vis-à-vis other firms in the marketplace (Baumol 1959; Williamson 1963; Cyert and March 1963, Pfeffer 1981; Edwards 1977; Awh and Primeaux 1985).

In the 1970s and early 1980s, slack resources were employed to build the internal IT infrastructure. Especially in information-intensive industries such as banks, IT is considered to be "crown jewels." IT symbolizes *avant garde*, firm growth, advancement, and progress (Sitkin, Sutcliffe, and Barrios-Choplin 1992; Huber 1993). Investments in IT can promote social prominence and public prestige, managers are induced to invest slack resources on internalizing IS services. Inducements towards investments on in-house IS services are further reinforced by well-publicized case studies which demonstrate the competitive advantage and new business opportunities afforded by IT (e.g., Cash, McFarlan, McKenney, and Vitale 1988).

The above reasoning suggests that when organizations possess slack resources, firms may enlarge the scale and scope of their operations by deploying slack resources toward building up internal IT resources in the form of hardware, software, and IS human resources. Conversely, when slack resources are low, firms are likely to resist internalizing in response to the anxiety provoked by loss of financial resources (Sutton and D'Aunno 1989). Anxiety is provoked because the loss of financial resources is often attributed to managerial incompetence and organizational ineffectiveness (Whetton 1980). When financial performance is poor, leaders are more likely to be blamed and replaced (Meindl, Ehrlich, and Dukerich 1985; Pfeffer and Salancik 1978). In response to the anxiety provoked by loss of financial resources, decision makers have been found to reduce costs through downsizing the company by selling off physical assets and laying off workers (Rubin 1977; Warren 1984; Tomasko 1987). In fact, a recent report to the Congressional Committee by the General Accounting Office (GAO 1992) raised concerns that banks were selling IT assets at inflated rates to external service-providers to generate short-term financial slack. The banks then reimbursed the service-providers by paying higher servicing fees for a long-term outsourcing contract of eight to ten years. Specifically, long term facilities management contracts were drawn where the service-providers agreed to purchase bank assets, such as computer equipment, at substantially higher prices than the market value and to provide capital to the bank by purchasing stock from the bank. Arrangements such as these permit banks to maintain capital, defer

losses on the disposition of assets, and at the same time, show an increase in financial value on the balance sheet. Accordingly, when slack resources are low, firms can be expected to downsize internal IS services by selling off IT assets and reducing IS personnel and occupancy expenses.

The concerns of the General Accounting Office are substantiated by assessments of actual outsourcing arrangements among large organizations (Lacity and Hirschheim 1993). For example, in the outsourcing arrangement between First City and EDS, EDS provided First City with much needed financial slack by purchasing First City's information systems assets. In effect, EDS assisted the bank in completing a "badly need recapitalization" (Mason 1990, p. 287; cited in Lacity and Hirschheim 1993). Similarly, executives at General Dynamics viewed their outsourcing arrangement with Computer Services Corporation as a way to partly recover their IT investment (Seger and McFarlan 1993). The vendor may offer a financial package whose net present value is extremely attractive to the prospective customer. Cash infusions for information assets, postponing payments until the end of the contract, and even purchases of the customer's stock render outsourcing desirable (Lacity and Hirschheim 1993). The above analysis thus suggests the following hypothesis:

Hypothesis 3: The lower the financial slack, the more likely are firms to outsource IT

2.4 Firm Size

Like financial slack, with which it has a clear relationship, firm size has a basis in economic theory. Microeconomic theory, in fact, defines firm size in terms of a firm's technical and allocational efficiency (You 1995). The reasoning is fairly straightforward. In achieving internal production cost advantages and economies of scale in their IT activities, larger firms are thus less inclined to outsource than their smaller counterparts. Anderson and Schmittlein (1984) articulate this argument in the following way:

Since large firms achieve economies of scale in finding, holding, and utilizing management skills, a large firm "may be able to get more mileage out of its expenditures on a field sales force and other marketing instruments." Scale economies are likely to play an important role in virtually all integration decisions (p. 388).

While there are good reasons for considering the economic impact of firm size on the outsourcing decision, some IT researchers argue that firm size will not prove to be a decisive factor. McHenry (1992) asserts that "the question of what size company can benefit from the outsourcing alternative quickly loses its significance after the core business questions have been asked." Nevertheless, theory would argue that, in general:

Hypothesis 4: The smaller the firm, the more likely it is to outsource IT.

2.5 Firm Performance

Firms outsource to create value and so there should be a construct representing this value in etiological models of outsourcing. Grover et al. (1996) found significant linkages between IT outsourcing and focus on core competencies, ability to use the vendor's capabilities, and staying abreast of new technology. They did not test firm performance. Teng et al. (1995), Loh and Venkatraman (1992) and Smith et al. (1997) have not found a consistent, significant linkage between these variables. In a study of over 20 major US-based outsourcing decisions, Smith et al. (1997), for instance, found few significant IT outsourcing-performance links.²

The current study does not examine this relationship. Nevertheless, it is the ultimate question for research on IT outsourcing and should be acknowledged as such in our models.

3 Study Method

3.1 Sample and Design

To test the hypotheses described in Section 2, it was necessary to find a population of firms that adopt IS sourcing arrangements which vary by degree of internal control of IT resources. The population must also vary in external production cost advantage, transaction costs, degree of slack resources, and firm size. Finally, to rule out possible effects of decision novelty, the population of firms must have had knowledge and experience with making sourcing and acquisition decisions in information systems.

Banks satisfy these criteria. First, surveys on the use of IT by the American Bankers Association showed that banks, as information-intensive users, acquire IS services from a variety of sources. Banks can opt from services provided in-house, by parent banks; correspondent banks; service bureaus; cooperative joint

² Smith et al [1997 #164] used a large variety of archival financial measures and ratios. Among the COMPUSTAT metrics analyzed were: SG&A / Sales; Operating expense / Sales; Sales / Employee; Asset Turnover; Return on Assets; Return on Equity; Operating Margin; Growth Rate; Dividend yield; Dividend / Sales; Market to book ratio; Cash and Equivalent / Sales; Total Liabilities / Sales; Long term debt / Sales; and Current Liabilities / Sales.

ventures; and facilities management (American Bankers Association 1981; 1986; 1990). As discussed in Ang (1994), these alternative arrangements vary in the degree of internal control banks have of the IS services. Second, because banks vary in size, profitability, IT scale and scope operations, antecedents such as production and transaction economies, financial slack, and perceived institutional influences are expected to vary across banks. Finally, deciding on alternative sources of IS services is not novel among banks. The preponderance of banking literature (cf. ABA Banking Literature Index 1977-1993) describing and prescribing alternative IS sourcing arrangements suggests that wrestling with an appropriate source of IS services is one of the central themes in managing IS resources in the banking industry since the inception of IT into the industry more than two decades ago.

This study adopts a survey research design as the best method for collecting original data from a population too large to observe directly. At the time of this study, there were more than 13,000 commercial banks in the United States. Commercial banks are members of the American Bankers Association, the premier bank association in the nation. The Association released its members list for the purposes of this research. This study adopted a sampling procedure which stratified the population of commercial banks by size because bank size has been shown to affect organizational boundary decisions such as outsourcing (Anderson and Schmittlein 1984; Clark, Chew, and Fujimoto 1987; Pisano 1990).

In the banking industry, banks not only vary in asset capitalization, and, therefore, in their power to purchase or internalize IT resources; more importantly, they also differ in their *nature of business, bank strategy, and the customer base they serve*. Small banks are community banks focusing on retail operations while large banks tend to be regional money centers providing wholesale and international bank services to corporate clients. Thus, bank size not only measures scale differences but also reflects scope differences (Nootebloom 1993).

An analytical sample resulting in a response of at least 200 was sought to ensure sufficient statistical power. To attain a sample of approximately 200 banks, 385 banks³ were drawn from the population. The banks consisted of 85 very large banks⁴ and a random selection of 100 banks in each of the other three size strata: large, medium, and small. This four size strata has been adopted by the American Bankers Association as a way of stratifying their industry.

The sampling approach was to survey random banks from the three strata other than the very large banks, whose population of 85 banks was sufficiently small to permit surveying the entire stratum. Mailing questionnaires to the entire population of the very large banks eliminates the issue of whether the sample

³ The figure 385 was based on an estimate of a roughly fifty percent response rate, a gauge offered by the local bank community during the pilot phase of this study.

⁴ At the time of the survey, the total number of very large banks in the United States was 85.

represents the population (assuming no response bias). Moreover, since sampling of the other three strata was random by design, there should be no systematic bias in the sample finally selected for mailing. That is, the three sub-samples of large, medium, and small banks should fairly represent their populations.

The sampling strategy does not, however, eliminate the possibility of systematic bias in respondents. This is essentially an external validity issue and to test this in the returned sample, community and medium-sized banks were classified as small banks while large and very large banks were classified as large banks.

Based on the sample size of 385 banks, a final number of 243 banks responded, generating an overall response rate of 63.1%. This high response rate was attributable to the focused interest in, and the importance of, IS outsourcing among commercial banks. The high response rate was also due to the elaborate data collection process of eliciting the participation of the respondents and following through with each respondent on an individual and personal basis.

A single respondent from each bank completed the questionnaire. The respondent was either the CIO or a high-level ranking person in charge of IS.⁵ On the average, the respondents had 12.89 (S.D.= 9.09) years of work experience with the bank, and 19.58 (S.D. = 8.11) in the banking industry.

3.2 Test of Non-Response Bias

Given our response rate of over 63%, the external validity of the study is "good," according to Babbie (1973, p. 165). This means that the chance that there is a systematic bias in the respondents is small.

To assess external validity of the sampling, however, we examined the difference between demographics of the respondent group versus the non-respondent group. Specifically, Table 1 provides a breakdown of respondents and non-respondents by bank size. For this analysis, community and medium-sized banks were combined in this study as small banks while large and very large banks were combined as large banks. Based on a χ^2 analysis, no significant difference existed between the distribution of participants and the distribution of the original sample based on bank size ($\chi^2 = 3.62$, $df = 1$, $p > .05$). Thus, in terms of bank size, firms participating in the study do not appear to be a systematically biased sample.

⁵ Of the 243 respondents, only 23 held official titles of the Chief Information Officer (CIO). The more common designation for the person responsible for the IS function in banks was either the Senior Vice President or the Vice President of Information Services. In fact, eighty-eight respondents held titles of Senior Vice President and 76 were Vice Presidents responsible for information systems or bank computer services. The rest of the respondents (56) held titles such as the Cashier, or Bank Operations Officers who were responsible for the overall banking operations including the information services function of the bank.

Table 1: Breakdown of Respondents and Non-Respondents by Bank Size

	Large	Small	Total
Response	108	135	243 63.1%
Non-response	77	65	142 36.9%
Total	185	200	385 100%

3.3 Procedure

A draft instrument was qualitatively and quantitatively pretested to ensure that the instrument was valid for use in a large sample. The instrument was pretested with the chief information officer at each of the twenty-one banks within the Minneapolis-St. Paul, Minnesota (USA) metropolitan area.⁶ The pilot study ensured clarity and readability of the instrument and ascertained that the theory-based items in the instrument tapped issues of concern with regards to sourcing decisions (Straub 1989). Questionnaire length was also assessed to reduce potential response-rate problems. Phone interviews and mail questionnaires were primary means for collecting data. Based on the list of names, addresses, and telephone number of banks provided by the American Bankers Association, each bank in the stratified sample was contacted by phone to identify the person who held corporate responsibility for IS in the bank. His or her name, position title, mailing address, and telephone number were noted. The informant of large banks usually held the title of the Chief Information Officer (CIO), or Senior Vice President responsible for bank operations. In smaller banks, the informant was typically the President or Cashier. With the name of potential informant, a letter describing the purpose of study and requesting participation was sent to each potential informant. After a week or ten days after the letter was sent, the potential informant was contacted by phone. A packet of materials containing a cover letter, survey instrument and a self-addressed, stamped envelope was sent to participants. Slightly more than 66% of completed questionnaires were returned within three weeks upon sending out the instrument. In the case where the survey was not returned, follow-up phone calls, written reminders and duplicate survey instruments were sent to "errant" participants. In total, at least three efforts were made to ensure participants who had previously committed to the project finally completed and returned the survey instrument. Returned

⁶ Banks in the pilot study were omitted from the main study.

questionnaires were examined for completeness of information. Respondents who omitted items in the questionnaires were contacted again by phone to obtain missing information. Once completed questionnaires were received, archival financial information on the banks were retrieved from the Federal Reserve Bank databases. Executive summaries of the preliminary and final analyses of the study were subsequently sent to each respondent.

3.4 The Survey Design

A major source of data was a paper and pencil survey instrument administered to bank officers who have corporate responsibility for IS in their respective commercial banks. Each bank officer acted as the informant for his or her bank's sourcing arrangement and practices in information systems services.

Table 2: Characteristics of Measures

Construct	Scales/Measures	# of Items	Type of Variable	Reliability*
IT Outsourcing	Degree of Internal Resource Control	8	Survey scale	.92
Production Cost	Cost Advantage	5	Survey scale	.93
Transaction Cost	Perceived Transaction Costs	3	Survey scale	.75
	Asset Specificity	2	Survey scale	.57
	Supplier Presence	3	Survey scale	.84
Financial Slack	Available Slack	1	Archival data	—
	Potential Slack	1	Archival data	—
	Perceived Slack	2	Survey scale	.72
Size	Firm Size	1	Archival data	—
	Log of Firm Size	1	Derived	—

* Reliabilities were assessed with Cronbach's α

Items in the survey instrument measured the degree of IS outsourcing, external production cost advantage, transaction cost variables, and slack. Table 2 presents the relevant characteristics of these measures. The operational definitions and actual items appear in the Appendix. For transaction costs and financial slack, multiple, distinctly different measures of the constructs provided a variant viewpoint on the same sets of relationships (Cook and Campbell 1979).

To validate the instrument, a principal components factor analysis was performed to assess the dimensionality of each scale. All scales were found to be unidimensional. Multiple-item constructs were subjected to Cronbach's α reliability testing to assess internal consistency. Most of the scales were reliable, as Table 2 shows. Relatively low reliability, however, was found for asset specificity (Cronbach's $\alpha = .57$). As discussed in Van de Ven and Ferry (1980), a construct with relatively broad sampling scope covering a number of conceptually distinct facets tends to result in low reliability. In the case of asset specificity, informant were asked to assess two different types of specific assets: human assets in the form of specific IS skills and fixed assets such as investments in computer equipment. The correlation between the two forms of specific assets was .39, suggesting that the construct assets specificity in the context of IS services is relatively broad to cover two distinct facets of assets. Nevertheless, this statistic is not dramatically below Nunnally's .60 rule of thumb (1967) for exploratory research and the construct was retained for that reason.

3.5 Archival Data

A second important source of data for this study was financial indices extracted from two from two Federal Reserve Bank financial databases: *Bank Holding Company Performance Reports* and *Uniform Bank Performance Reports*. These databases contain financial statistics for individual commercial banks in the United States and comparative financial indices for banks in the same peer or size categories. These financial indices were obtained to measure independently the level of financial slack resources available in banks. Key financial indices used to measure slack in the banking industry were: retained earnings, interest paid, and asset capitalization. In the financial services industry, total assets, usually taken as a measure of firm size, was used.

As advocated by Bourgeois (1981) and Bourgeois and Singh (1983)⁷, financial slack was measured by the derived financial indicators: (1) available slack and (2) potential slack. Available slack refers to resources that are not yet assimilated into the technical design of the system (Bourgeois and Singh 1983, p. 43).

⁷ Bourgeois and Singh (1983) had identified a third dimension of financial slack — recoverable slack. Recoverable slack refers to resources that have been absorbed into the system design as excess costs (e.g., excess overhead costs), but may be recovered during adverse times. Recovered slack was not considered in this study because practically, it is difficult to differentiate excess overhead costs from necessary overhead costs. As argued by Blaxill and Hout (1991), once absorbed into the system, overhead costs are extremely difficult to recover. Furthermore, recoverable slack, operationalized by Bourgeois and Singh (1983) as the ratio of the amount of overhead expenses to sales, seems to indicate the *use* of slack rather than a measure of recoverable slack.

Operationally, available slack was derived by taking the difference between the average three-year level of retained earnings and the three-year average level of retained earnings of peer banks.

Potential slack refers to the capacity of the organization to generate extra resources from the environment (Bourgeois and Singh 1983, p. 43). Operationally, potential slack was derived by taking the difference between the average of the past three-year yield of a bank compared to the past three-year yield of banks in the same peer group, where yield refers to interest revenue earned on interest-earning investments.

One additional measure of slack — perceived slack — supplemented the archival measures.

4 Analysis and Results

Linear regression was used to analyze the effects of these various economic variables on the decision to outsource IT. The dependent variable was a seven-point scale (anchored with “Exclusively internal...Exclusively external”) of eight items. Whereas there is a case to be made that this scale can be considered to be interval data, this argument is not necessary. The dependent variable is at least ordinal in data type and, according to Conover and Inman (1981), regression running ordinal data as the DV is robust to the violation of interval data type.

In order to deal with the problem of multicollinearity between the several measures of individual constructs (see Table 2), a series of regressions were run, each time substituting in alternative measures of a construct into the variables of a baseline regression. Using this approach, multicollinearity between independent variables was minimized, with all tolerance levels being acceptable by the standard rule of thumb threshold of 1.0. Table 3 presents a snapshot of the overall results of hypothesis testing and Figure 2 shows a graphical representation of the study findings.

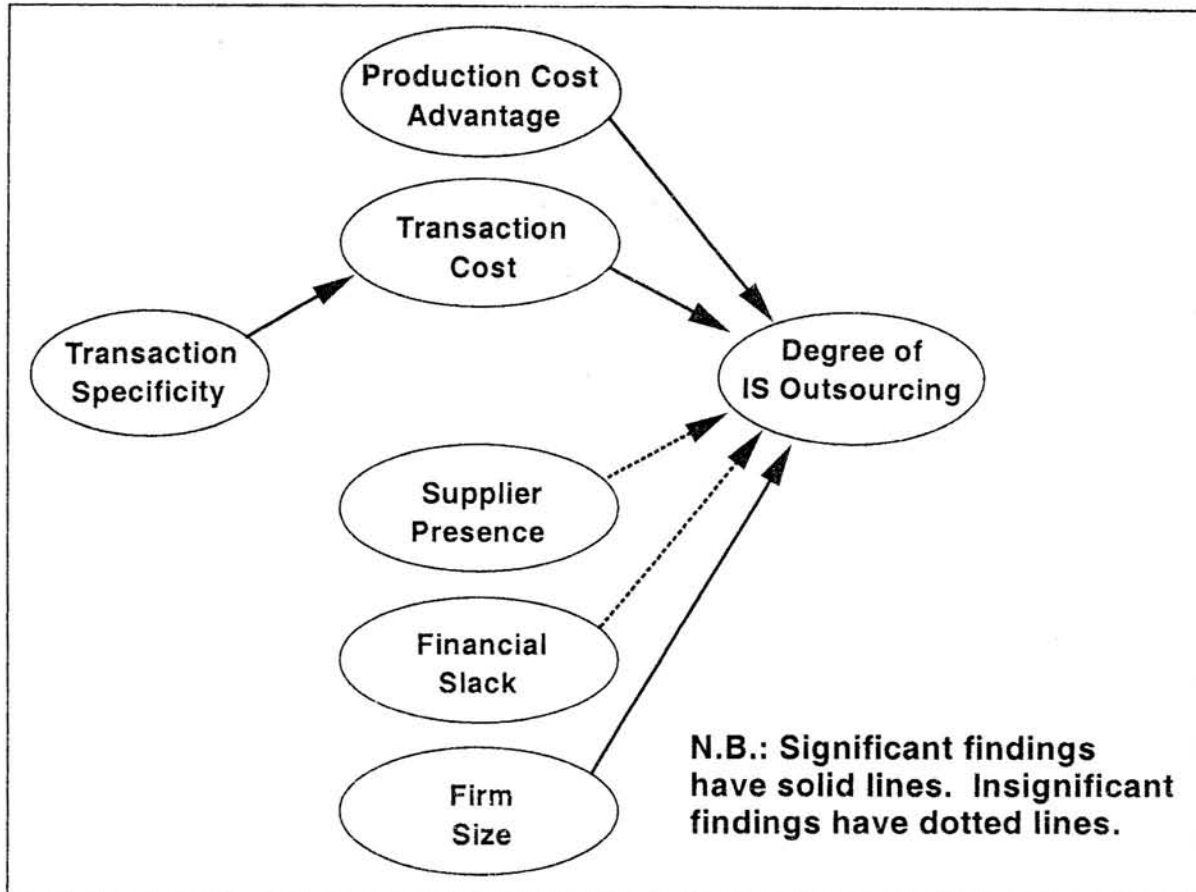


Figure 2: Quantitative Findings of Study

Overall, the baseline regression demonstrated a significant F ($F = 30.15$; $p\text{-value} = .000$) and the regression explained 35% of the variance in the dataset. Subsequent regressions, all similarly significant, varied little from this pattern of explained variance. As shown in Table 4, the regression β linking advantage in external production costs to information systems outsourcing in the baseline regression run was significant and in the posited direction. This finding supports Hypothesis 1. Banks tended to outsource IT when they perceived external services-providers could offer comparative advantages in IS production costs.

Table 3: Overall Results of Hypothesis Testing

#	Hypothesis	Supported?
1	<i>The higher the comparative production cost of IT offered by systems integrators, the more likely are firms to outsource IT.</i>	Yes
2 _a	<i>The lower the perceived transaction costs involved in hiring outsourcers, the more likely are firms to outsource IT.</i>	Yes

2_b	<i>Transaction-specific investment is positively related to transaction costs.</i>	Yes (but low R ²)
2_c	<i>The higher the supplier presence (i.e., the likelihood that perceived transaction costs with IT service-providers will be low), the more likely are firms to outsource IT.</i>	No
3	<i>The lower the financial slack, the more likely are firms to outsource IT.</i>	No
4	<i>The smaller the firm, the more likely it is to outsource IT.</i>	Yes

For transaction economies, the regression β linking perceived transaction costs with IS outsourcing was statistically significant and negative. This result supports hypothesis 2_a. Banks were less likely to outsource IS activities when they perceived transaction costs associated with outsourcing the function to be high. In a separate regression run, hypothesis 2_b was also supported ($\beta = .1378$; p-value = .0388) which suggests that asset specificity is related to transaction costs, as argued in transaction cost economics. Although significant, this relationship explained only 2% of the variance in the dataset.

The other tested dimension of transaction cost theory, supplier presence, was not supported in the data analysis, as the findings presented in Table 5 show. The presence of alternative service vendors apparently did not significantly increase the extent to which the sampled banks outsourced.

Table 4: Results of Baseline Regression Run

Variable	Beta	T	p-value
Production costs	.5087	8.855	.0000
Perceived Transaction Costs	-.1229	-2.112	.0359
Financial Slack (Available)	-.0767	-1.403	.1621
Firm Size	-.1118	-1.986	.0482

Results likewise did not support Hypothesis 3. The regression coefficient linking available financial slack with IS outsourcing was not statistically significant although it was in the predicted (negative) direction. Across all sizes of banks,

banks did not outsource IS services to a larger extent when available slack is low than when available slack is low. Likewise, as shown in Table 5, potential slack did not significantly impact the sourcing decision. This variable, moreover, had a β sign that was positive, which runs counter to the hypothesis. Perceived slack was in the correct direction, but, with a p-value of .15, did not reach significance (see Table 5).

Table 5: Results of Regressions with Alternative Measures

Variable	Beta	T	p-value
Alternative Suppliers	.033919	.590	.5556
Financial Slack (Potential)	.015089	.276	.7830
Financial Slack (Perceived)	-.078946	-1.421	.1568
Log of Firm Size	-.22152	-3.682	.0003

Finally, firm size did show a significant, negative relationship with outsourcing tendencies, as hypothesized. The p-value for firm size was .048 (see Table 4). To ensure that these results were not an artifact of heteroscedascity in the dataset (i.e., a disproportionate effect from the skewed distribution), a separate regression was run with the log transform of firm size. This β was even larger and its p-value of .003 (see Table 5) indicates a strong relationship with the choice to outsource. Thus, the evidence in this sample suggests that smaller firms are more likely than are large banks to hire a systems integrator or even another bank to provide IT services.

5 Discussion

Overall, the results offer evidence that economic factors play an important role in the decision-making processes of bank managers. Production and transaction economies both affected IS outsourcing choices and firm size also had a clear bearing on such decisions. Financial slack proved not to be a factor, no matter how it was measured.

While measurement validity is always an issue in research projects, steps taken in the present study try to ensure that these results are not merely artifacts. Multiple

measures of different constructs were used and these were tested separately in the regressions to avoid the problem of multicollinearity.

5.1 Production and Transaction Economics Findings

Based on the data analysis in section 4, perceived comparative advantages in production costs of vendors led to greater degree of IS outsourcing. This result is consistent with Walker and Weber (1984; 1987) where findings in the U.S. automobile industry strongly supported the effect of production advantage of the supplier on sourcing decisions. Production costs were particularly salient, reflecting perhaps, that the major corporate rationale for outsourcing is operational cost savings. With an average 15% to 20% savings in operational cost from outsourcing, banks have been able to substantially reduce technology outlays on IT expenditure (*American Banker*, May 18, 1992, p. 2A; *American Banker*, February 18, 1993, p. 3). For example, First Fidelity Bancorp, which has \$ 29 billion in assets, reduced operating expenses by as much as \$ 150 million in 1991, with the bulk of the saving derived from lower labor, real estate, and equipment costs related to IT. Although Lacity and Hirschheim (1993) argue that reports in popular press tends to inflate potential savings, this study, nevertheless, showed that perceived comparative cost advantages offered by vendors was the major factor in banks outsourcing IS services. In that banking is an industry with a long history of outsourcing, the strength of this finding is worth noting.

Bank managers, though, were apparently not overconfident in the returns they would receive from IS outsourcing. Their decision was tempered by the degree of transaction costs associated with outsourcing. They were aware, for example, that firms must pay a price to negotiate a good contract and to monitor the ongoing actions of their systems integrators. Consistent with prior research on transaction cost analysis (Nam et al. 1996; Beier 1989; Schary and Coakley 1991), when asset specificity is high, organizations opted for internal procurement. Software applications at the innovation frontier utilize new technologies in imaging systems, multimedia, electronic funds transfer, and decision support systems to provide banks effective marketing devices and sophisticated market databases (Brown 1989; Arend 1992; O'Henry 1991). Such systems are developed to champion idiosyncratic competitive strategies of the bank, and are, hence, highly firm-specific.

Results showed that presence of alternative suppliers did not promote outsourcing across all banks. This may reflect the different degrees of maturity of the external services markets faced by banks of varying sizes. However, contrary to our predictions, they are consistent with the findings of Nam et al. (1996). To the extent that alternative service-providers are present to ensure lively competition, theory argues that outsourcing poses less risk to user organizations as adequate

competition will lower the likelihood for opportunistic bargaining on the part of the service provider.

5.2 Financial Slack Findings

Based on results in section 4, the sourcing decision is not readily explained by a firm's sensitivity to fluctuations in financial slack. In spite of the fact that three different forms of measure were utilized, none were significant at the .05 or even .10 level. With a sample size of 223, moreover, statistical power was high (Cohen 1977), which means that it is unlikely that these results are simply a statistical artifact.

As discussed in Lacity and Hirschheim (1993) and in the report written by the General Accounting Office (GAO), IT vendors often offer financial packages whose net present value provide organizations with immediate cash infusions and postpone payments until the end of the contract. Based on such accounts, it has been thought that this type of sourcing arrangement enables banks to maintain capital, defer losses on disposing assets, and show an increase in financial value on the balance sheet. However, these arrangements also mean that bank books are artificially inflated and hence do not reflect the true financial position of the institutions. The evidence in this study indicates that banks, at least, are not regarding outsourcing purely as a monetary solution for alleviating anxiety generated from declining retained earnings. If this changes, however, outsourcing arrangements could come to be based not on sound IS management decisions, but on the attractiveness of short term monetary infusions afforded by such arrangements.

5.3 Firm Size Findings

The strong relationship between bank size and outsourcing was not surprising. Smaller organizations have more difficulty generating the economies of scale in their IT operations that would allow them to justify internal operations. No doubt there are other elements to firm size that would also explain why this relationship appears so consistently as a factor in the IS literature (Brynjolfsson 1994; Grover, Cheon, and Teng 1994). Firm size, for example, clearly has roots in social characteristics related to IT sourcing (Ang and Cummings 1996).

6 Study Limitations

Despite the accordance of the findings here with other empirical evidence that connects IT outsourcing decisions to transaction cost analysis, the *completeness*

of transaction cost explanations has been questioned (Robins 1987; Eisenhardt and Brown 1992). In fact, the fundamental critique of transaction cost analysis is that it focuses solely on efficient organizational boundaries and ignores other factors. Consequently, transaction cost analysis isolates or atomizes organizational economic actions when such actions should be construed more appropriately as socially embedded in ongoing networks of relationships with *internal* and *external* institutional constituents (Ang and Cummings, 1996 ; DiMaggio and Powell 1983; Hesterly, Liebeskind, and Zenger 1990; Granovetter 1985, 1992a, 1992b; Zucker 1987; Robins 1987). With an undersocialized conception of economic actions, transaction cost analysis then overemphasizes short-run efficiency concerns and ignores other non-efficiency organizational goals such as legitimation, approval, and power. Besides approaching the study of IS outsourcing through other substantive dimensions, researchers should also explore the use of alternative methods.

However appropriate to the research questions being explored in this study, the banking sample clearly limits the generalizability of results. As outsourcing becomes pervasive across industries and develops longer decision-making histories in these firms, future researchers will want to gather samples that extend the external validity to all industries.

7 Conclusion

Supply and demand forces place in perspective the interesting conflict of a reluctant organization striving to maintain its independence from others while knowing that it must assent to interorganizational ties to procure the resources it needs (Lacity and Hirschheim 1995). Outsourcing poses challenges for both user organizations and service providers: challenges in estimating the "true" costs and savings of outsourcing; managing power dependencies in the exchange; and in balancing the opportunities offered by open boundaries and free-flowing information against need to protect the organization's unique capabilities.

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Appendix

Definition and Operationalization of Constructs in the Survey

Information Systems Outsourcing. For this study, outsourcing is measured by the degree of external reliance on external service-providers for IS function. Informants from each bank indicated the degree to which decisions on major IS management activities were controlled internally, jointly between bank personnel and external service-providers, or externally by service providers. This is consistent with Loh and Venkatraman (1993), Quinn and Hilmer (1994) where outsourcing was conceptualized as the locus of governance in decision rights or control. Following the conceptualization of Cash et al. (1993) on the IS function, the major IS management activities were: IS strategy, IT planning, capacity management; production scheduling; IS human resource management; security management; network management; and PC management.

External Production Cost Advantage refers to the degree to which an external service provider is perceived to have advantage in production cost economies over an internal bureaucratic management with respect to IS services. Production cost was operationalized through three components: hardware costs, software costs, and cost of information systems personnel.

Asset specificity measures the degree to which investments in the management and operations of IS yield value only in a idiosyncratic IT environment. The construct was operationalized by: (1) the level of investment in specialized equipment; (2) the level of specialized human skills specific to the needs of a particular bank.

Supplier Presence refers to the availability of reputable and trustworthy external IT service-providers in the market. It was operationalized by the perceived presence of adequate service providers and the ability to find comparable service-providers to replace the services of an existing service-provider.

Financial Slack refers to financial resources an organization possesses in excess of what is required to maintain the organization. It was operationalized by: (1) an archival measures of available slack; (2) an archival measure of potential slack; and (3) a perceived measure of the excess budgetary and funding resources available for IT investment.

Firm Size refers to the capability of a firm to create and maintain scale economies. It was operationalized by total firm assets, which is the standard way of measuring bank size and the log transform of this figure.

Summary of Measures

Construct	Questionnaire items are on a 7 point scale with 1 -- exclusively internal; 4 -- jointly; and 7 -- exclusively external
Information Systems Outsourcing	<p>For each of the IS activities listed below, please circle the number corresponding to the DEGREE to which decisions concerning IS management and operational control are made internally by your bank personnel, jointly (cooperatively) by your bank personnel and those of an external service provider, or externally by those of an external-service provider. External service providers include information systems consultants, bank holding companies, correspondent banks, service bureaus, facilities managers, and joint venture cooperatives.</p> <ol style="list-style-type: none"> 1. Information Systems Strategy: Building an information technology (IT) architecture, assigning priorities to new projects, identifying and initiating new systems design and operations, etc. 2. Information Technology Planning: Ongoing audit for potential obsolescence and opportunities; determining the cost effectiveness and adequacy for growth of existing installed technologies. 3. Capacity Management: Measuring and managing capacity utilization of hardware and software resources. 4. Production Scheduling: Production planning and control to ensure high-quality, zero-defect operation, job scheduling, monitoring of day-to-day operating costs. 5. Human Resources Management: Managing information technology (IT) human resources including recruiting, training, establishing appropriate performance evaluation procedures; etc. 6. Security Management: Systems security and disaster recovery. 7. Network Management: Management of data and voice telecommunications networks 8. Personal Computer (PC) Management: Management of end-user computing including PC acquisition, PC help desk support.

Construct	Questionnaire items are on a 7 point Likert scale with 1 -- strongly disagree; 2 -- moderately disagree; 3 -- slightly disagree; 4 -- neutral; 5 -- slightly agree; 6 -- moderately agree; and 7 -- strongly agree (unless stated otherwise)
External Production Cost Advantage	<p>"We have the scale and volume to justify internal data processing management and operations;"</p> <p>"An external data processing service-provider would be able to reduce our <i>hardware costs</i>;"</p> <p>"An external data processing service-provider would be able to reduce our <i>software costs</i>;"</p> <p>"An external data processing service-provider would be able to reduce our <i>information systems personnel costs</i>;" and</p> <p>"It is cheaper to manage our own data processing facilities and services than to rely on external data processing service-providers."¹</p>
Transaction cost	<p>"There would be significant problems associated with negotiating a contract or agreement (e.g., agreeing on conditions, prices, etc.) with an external service-provider for our data processing services."</p> <p>"External data processing service-providers would have to be closely and constantly monitored to ensure that they adhere to our contractual terms and conditions."</p> <p>"It would be very difficult to modify our contracts or agreements with external data processing service-providers once a contract is signed."</p>
Asset Specificity	<p>"Compared to our peer banks, our IS facilities and services require technical skills that are relatively unique;"</p> <p>"To process our data, external service-providers would have to make substantial investments in equipment and software tailored to our needs."</p>
Supplier Presence	<p>"There are a sufficient number of reputable external service-providers who potentially could provide IS facilities and services to our banks;"</p> <p>"There are a sufficient number of trustworthy external service-providers who potentially could provide IS facilities and services to our banks;"</p> <p>"If we decide to terminate in-house IS operations, there are other external service-providers who could provide us with the same level of IS facilities and services."</p>
Financial Slack	<p>"Compared with our peer banks, our bank has more money that could be invested in data processing services and operations."</p> <p>"We are facing tighter data processing budget limitations than we did three years ago."</p>

1 Questionnaire items for external production cost advantage were worded slightly differently depending on whether the bank adopted in-house IS services or outsourced for IS services. For banks that outsourced, the phrase "would be" was changed to "is" in each of the items in order to reflect the situation facing the respondent or the respondents' context.