



Strategic Response to Institutional Influences on Information Systems Outsourcing

Soon Ang; Larry L. Cummings

Organization Science, Vol. 8, No. 3. (May - Jun., 1997), pp. 235-256.

Stable URL:

<http://links.jstor.org/sici?sici=1047-7039%28199705%2F06%298%3A3%3C235%3ASRTIO%3E2.0.CO%3B2-N>

Organization Science is currently published by INFORMS.

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/about/terms.html>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/journals/informs.html>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

The JSTOR Archive is a trusted digital repository providing for long-term preservation and access to leading academic journals and scholarly literature from around the world. The Archive is supported by libraries, scholarly societies, publishers, and foundations. It is an initiative of JSTOR, a not-for-profit organization with a mission to help the scholarly community take advantage of advances in technology. For more information regarding JSTOR, please contact support@jstor.org.

Strategic Response to Institutional Influences on Information Systems Outsourcing

Soon Ang • Larry L. Cummings

*Information Management Research Center (IMARC), Nanyang Business School,
Nanyang Technological University, Nanyang Avenue 2263, Republic of Singapore
Professor in Strategic Management and Organization, University of Minnesota,
271 19th Avenue South, Minneapolis, Minnesota 55455*

Institutional theory tends to discount the ways by which organizations can be strategically proactive in their adaptation to environmental and institutional influences. The central contribution of this paper to organization theory is an empirical investigation of individual firm strategic responses to institutional influences at a time when hypercompetition has altered the competitive dynamics of the industry. The focus of the paper is on banking industry, which is both hypercompetitive and highly institutionalized, and on the strategic appropriation of information responses of individual banks to institutional influences on outsourcing of information technology capabilities. The paper has important implications for the understanding organization change in terms of institutional strategic adaptation theories.

Arie Y. Lewin

Abstract

This paper underscores the importance of examining strategic response to institutional influences in light of hypercompetition. Focusing on the banking industry, which is hypercompetitive and highly institutionalized, affords a unique opportunity to understand how individual corporations in such an industry respond strategically to institutional pressures.

We examine critical contingencies arising from hypercompetition that moderate institutional influences on information systems outsourcing in commercial banks. Using data from 226 banks and hierarchical moderated regression analyses, we show that the propensity of banks to conform to or resist institutional pressures depends on the nature of institutional pressures, perceived gain in production economies, financial capacity to resist institutional influences, and transaction cost considerations.

(Institutional Influences; Outsourcing; Managerial Discretion; Strategic Managerial Action)

Introduction

According to Oliver (1991), Perrow (1985), DiMaggio (1988), and Scott (1995), institutional theorists often

assume organizations to be passive players. In fact, veneration of institutional norms and rules for organizational behavior is so deeply ingrained that researchers often disregard individual organizations' ability to respond proactively, creatively, and strategically to institutional influences. We investigate one such response, the strategic response of individual banks to institutional influences on information system (IS) outsourcing. We argue that in hypercompetitive environments, institutional theory must accommodate strategic responses of individual organizations.

The Institutional Cage of Banking

Commercial banks in the United States operate in highly institutionalized environments. Historically, stringent banking legislation¹ restricted operations and suppressed competition. First, rules on chartering and branching limited banks' ability to compete with one another geographically. No new bank could set up business without acquiring a national or state charter. State law often prohibited intrastate branching by state-chartered banks, and federal law required na-

tional banks to follow whatever rules individual states established (Baer and Mote 1992, Burns 1988).

Second, restrictions on the services banks could offer limited competition between banks and other financial institutions. Commercial banks monopolized demand deposits. However, they were not allowed to deal in corporate securities, underwrite new corporate issues, or engage in commercial activities. Periodically, federal regulators would visit banks to ensure they conformed to rules and regulations. Thus, incumbents in the banking industry thrived in market niches carved out by bank regulation (OECD 1992).

Hypercompetitive Pressures in Banking

In recent years, regulation that formerly had fended off competition from other financial institutions weakened. Banks became immersed in hypercompetition: rapidly escalating competition based on new and continually shifting product or geographic markets, frequent entry of unexpected competitors, radical redefinition of market boundaries, rapidly changing technologies, and short product life cycles (D'Aveni 1994).

In banking, novel substitutes escalated competition. Securitization enabled businesses to use marketable securities to bypass bank loans as sources of funds. Competition intensified when nonbank corporations were permitted to acquire banks. By spinning off either deposit-taking or commercial loan operations from acquired banks, firms could carry on the remaining activities free of regulatory restraints. By the late 1980s, such nonbank banks had breached the wall that formerly protected banks from outside competition.

At the same time, banks found ways of expanding traditional business domains. With the relaxation of regulation of bank holding companies, banks were legally permitted to compete with nonbanks in mortgage banking, discount brokerage services, financial counseling, and data processing services (Burns 1988).

Hypercompetitive pressures also arose from redefinition of geographic boundaries of the industry. Large money-center banks increasingly explored foreign countries for funds and loans, thereby avoiding restrictive domestic regulation. Those banks in turn introduced smaller banks to global banking by selling them participation in their foreign loans. At the same time, large banks began to securitize on a global scale by shifting from domestic banks or securities markets to foreign banks and international securities markets (White 1993).

Information technology (IT) transformed banking by opening up new cost-saving, risk-reducing, and profit-

enhancing strategies (Office of Technology Assessment 1984, 1987). Continuing technological advances in computers and communications steadily reduced transaction costs of banking. Technological innovations in financial products also transformed financial services. Sophisticated cash management, securitization of mortgage loans, massive trading in government securities, and money market mutual funds for ordinary citizens became possible with IT handling the speed and enormous volume of financial transactions (Steiner and Teixeira 1990) while telecommunications spread information instantaneously, linking formerly separate financial markets into an integrated world market.

In light of increasing hypercompetitive pressures under which banks are operating, we contend that banks may not simply acquiesce to institutional influences. Rather, whether they conform to or resist such influences depends on their responses toward an increasingly deregulated and competitive environment.

We report a study on bank's response to institutional influences on IS sourcing. First we discuss IS sourcing in the banking industry, and describe institutional norms that affect IS sourcing strategy. We then develop hypotheses on how the relationship between institutional influences and IS sourcing is moderated by strategic contingencies arising from hypercompetitive pressures. After the theoretical development, we describe the study sample, variables, and method, and discuss the estimation process and results. Finally, we summarize the results and corresponding theoretical and managerial implications.

Information System Outsourcing in Banking

As corporations searched for ways to grow and maintain their competitive edge, outsourcing emerged as a dominant organizational strategy for achieving those goals. In outsourcing, firms' orientations toward internal action gives way to greater dependence on external service providers (Kanter 1989, Quinn 1992). Unlike the old model of organization characterized by hierarchical ownership and avoidance of external dependence, new models of organizations are characterized by networks of lateral and vertical interlinkages across firms (Nohria and Eccles 1992). Outsourcing thus epitomizes a more open and networked form of organizing for resources.

One central value-chain activity that companies have outsourced is the information services function (Quinn 1992). A Frost and Sullivan Market Intelligence survey found that more than 50% of all companies with IT budgets in excess of \$5 million were outsourcing or actively considering outsourcing IS. Within the banking

industry, the figure jumped to 85% (*Fortune*, December 12, 1994).

Institutional Pressures and Information Systems Outsourcing

At its core, institutional theory seeks to explain homogeneity of organizational forms and practices. As discussed by DiMaggio (1988), the role of institutional influence is particularly powerful in explaining organizational phenomena in regulated industries where well laid-out rules, structures, external regulation and practices govern organizational forms and operations.

According to DiMaggio and Powell (1983), organizational fields that exert institutional influences on organizations evolve through a process of institutional definition or "structuration." The structuration process consists of four parts: an increase in the extent of interaction among organizations in the field, the emergence of sharply defined interorganizational structures of domination and patterns of coalition, an increase in the information load with which organizations in the field must contend, and the development of a mutual awareness among participants in a set of organizations that they are involved in a common enterprise (DiMaggio 1983, cited by Powell and DiMaggio 1991, p. 65). For example, in a study of the diffusion of IS outsourcing among *Fortune* 500 firms, Loh and Venkatraman (1992) found that the much-publicized Kodak-IBM outsourcing arrangement legitimated the practice of IS outsourcing among *Fortune* 500 firms and stimulated mimicking of outsourcing practices among large organizations. Thus, according to institutional theory, the major impetus toward homogeneity of such organizations is the structuration process of institutional influences arising from external constituents such as key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products (DiMaggio and Powell 1983).

Within the banking industry, influences on IS outsourcing come from both peer banks and federal regulators. Peer banks exert considerable influence on each other because of tight professional networks formalized by memberships in regional and national bank associations. At the regional level, banks affiliate with state associations such as the Michigan Bankers Association, the Minnesota Bankers Association, and the Independent Community Bankers of South Dakota. At a national level, banks belong to the American Bankers Association, and Independent Bankers Association of America. Associations hold regular meetings, conduct IT usage surveys, publish IT guidelines such as the

Bank Administration Institute's Automation Alternative publication (Bank Administration Institute 1980) and American Bankers Association National Operations Surveys (American Bankers Association 1981, 1986, 1990) and share innovative bank practices, including IS sourcing.

Federal regulators exert substantial influence on bank practices and operations. The Federal Reserve Bank and Office of the Comptroller of Currency conduct periodic examinations to ensure that banks conform to myriad rules and regulations. Included in the bank examination is a bi-annual audit of banks' electronic data processing (EDP) or IS practices. Among other concerns, the audit assesses IS sourcing and recommends alternatives if current arrangements do not provide banks with relevant and pertinent information for decision making, or are inadequate to secure financial assets of bank customers (Federal Financial Institutions Examination Council 1992).

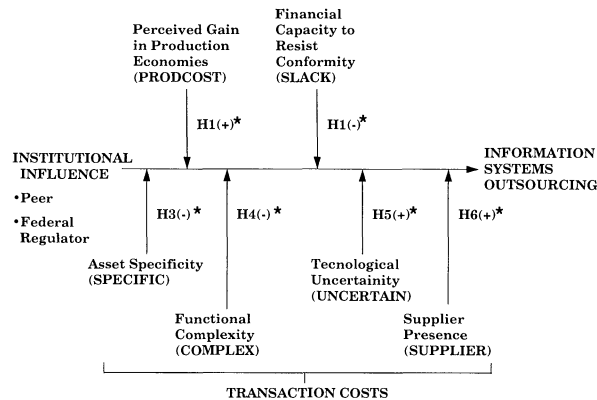
Institutional theory has become an important theoretical framework for investigating diffusion of organizational practices (Galaskiewicz and Wasserman 1989, Tolbert and Zucker 1983). However, firms may not simply conform to institutional pressures. In a critique of institutional research, Oliver (1991) stressed the inadequate attention given to strategic responses. In another essay, Perrow (1985) argued that instead of emphasizing only the "taken-for-granted character of institutional rules, myths and beliefs as shared social reality," institutional theory must accommodate the role of organizational self-interests and active agency.

In line with this argument, we contend that despite the strong influences from peer banks and the federal examiners, banks may enact different strategic responses to institutional pressures for IS sourcing. Specifically, given hypercompetitive pressures to improve performance, we contend that conformity to institutional influence for IS outsourcing will be contingent on economic factors such as perceived economic gain from conformity, financial capacity to resist institutional influence, and transaction costs implied by acquiescence to institutional pressures.

Moderators of Institutional Conformity

Figure 1 is the research model for our study. Institutional influence is shown as affecting a bank's IS sourcing strategy. This relationship is strengthened (positive sign) or weakened (negative sign) by individual banks' perceptions of gain in production economies; financial

Figure 1 Research Model



*H7: Size is hypothesized to affect the interaction of institutional influence and each of the moderators on I / S outsourcing.

capacity to resist institutional influence, and transaction costs associated with a particular sourcing strategy.

Perceived Gain in Production Economies

According to Oliver (1991), when an organization anticipates that conformance will enhance economic fitness, acquiescence will be the most probable response to institutional influence. In IS sourcing, we expect banks to adopt IS outsourcing when it affords substantial gains in production economies or operational cost savings. In other words, if external service providers offer advantages in production cost economies over internal IS services, we expect banks to conform more readily to institutional influences for outsourcing.

The emphasis on production costs is exacerbated by hypercompetitive and economic forces facing the banking industry that threaten corporate survival. According to Steiner and Teixeira (1990), a significant 50% of a bank's noninterest expense is for IT operations that support funds movements, such as transaction processing, check processing, cash management, and data networks management. As heavy consumers of IT resources, banks are struggling with spiraling costs of maintaining a progressive IT infrastructure. Recent surveys on IT management have shown "cost containment of IS" to be the dominant concern in financial institutions (American Banker 1988, 1990, 1991, 1992). Outsourcing has been extolled as a means of cutting IT costs (Lacity and Hirschheim 1993). Banks purportedly reap an average of 15–20% operational cost savings from outsourcing, thus substantially reducing financial outlays on IT (Gillis and Biafore 1993). For example, First Fidelity Bankcorp with \$29 billion in assets re-

duced operating expenses by \$150 million in 1991 (American Banker 1991). We therefore expect

H1. *The greater the external production cost advantage, the stronger the relationship between institutional influence and IS outsourcing.*

Financial Capacity to Resist Conformity

Organizations may not conform to institutional influences if they have the financial capacity or working capital to resist external pressures. When external pressures advocate outsourcing, managers may resist by deploying slack resources to amass IT resources internally. That reaction is consistent with Jensen's (1989) observation that managers prefer to deploy slack toward asset capitalization rather than distribute it as dividends to shareholders because increased asset capitalization enhances the social prominence and political power of senior executives (Baumol 1959). Investments in IT represent major asset capitalization. Deemed "crown jewels" in banks (Huber 1993), IT symbolizes firm growth, advancement, and progress. Because investments in IT can promote social prominence, they make managers more likely to resist outsourcing pressures.

In contrast, when slack resources are low, managers are likely to conform to institutional outsourcing pressure (Sutton and D'Aunno 1989). Anxiety is provoked during low slack because financial distress is often attributed to managerial incompetence and organizational ineffectiveness (Meindl et al. 1985, Pfeffer and Salancik 1978, Whetten 1980), and firms react by downsizing to reduce costs and recoup losses (Rubin 1977, Tomasko 1987, Warren 1984).

In 1992, the General Accounting Office found that poorly performing banks outsourced to generate short-term financial slack (GAO 1992). Outsourcing contracts were drawn whereby the service providers purchased IT assets at substantially higher prices than the market value in return for higher servicing fee amortized over an 8- to 10-year period. Outsourcing enabled banks to maintain capital, defer losses on asset disposal, and show an instantaneous increase in financial value on the balance sheet. Accordingly, when slack resources are low, we expect firms to conform to external pressures to outsource.

H2. *The lower the level of slack resources in a bank, the stronger the relationship between institutional influence and IS outsourcing. Conversely, the higher the level of*

slack resources in a bank, the weaker the relationship between institutional influence and IS outsourcing.

Transaction Costs

Transaction costs incurred by conforming to institutional pressures also can affect organizational resistance. From the transaction cost perspective, outsourcing creates a market-contracting, interorganizational relationship between a firm and its external service provider, and requires the firm to incur substantial costs of negotiating, monitoring, and supervising external contractual parties. Transaction costs are exacerbated by the level of specific assets, technological uncertainty, functional complexity, and supplier presence (Joskow 1988, Walker and Weber 1984, Williamson 1985).

Specific Assets. Specific assets are physical and human assets that are specialized and unique to the extent that they generate less value outside the contractual relationship (Joskow 1988, Williamson 1985). IS assets can be divided into IT infrastructure comprising hardware and software and IT skills and specialized know-how. In IS services of banks, specific IT infrastructure will include specialized equipment, operating procedures, and systems tailored for use in a single organization. Specialized IT skills and knowledge consist of expertise acquired only through several years of specialized IT training and knowledge that is useful in only a narrow range of business applications.

According to transaction cost analysis, assuming that parties to an exchange will perform efficiently and forgo opportunistic behavior is imprudent (Anderson and Coughlan 1987). As a result, specific assets cause problems because a firm's continued use of such assets depends on the good-faith behavior or forbearance of the service provider. Firms are exposed to the possibility of "opportunistic expropriation" if the service provider chooses to capitalize on the transaction (Klein et al. 1978). For example, opportunistic expropriation may occur *ex post* when service providers commodify and standardize IS services to the extent that no unique needs of any customers are met, thereby reducing the quality and service to any single client.

The safeguard against opportunistic appropriation is to rely on additional monitoring and enforcing measures to ensure coalignment of interests between the firm and the external service providers. Accordingly, specific IS assets would lead to increased transaction costs and influence the firm toward an internal IS service, as ownership reduces the motivation to expropriate the value of specific investments (Heide and John 1990).

H3. *The greater the specificity of IS assets, the weaker the relationship between institutional influence and IS outsourcing.*

Functional Complexity. Complexity is the degree to which activities are diversified within the IS function. A highly complex organization is characterized by many occupational roles, subunits (divisions and departments), levels of authority, and operating sites. IS activities are many and varied (Price and Mueller 1986). They range from long-term strategic activities such as developing an information systems strategy and IT planning, to tactical decision making on IS human resource management, to operational control over computer capacity, production scheduling, and security. As personal computers and telecommunication networks supplement mainframe operations, the scope of IS services expands to PC and network management.

As banks disperse geographically, they must confront the challenges of spatial complexity (Blau and Schoenherr 1971) in distributed IS services. The wave of bank mergers and acquisitions in the late 1980s left many banks with not only distributed IS data centers, but also the onerous task of integrating disparate information resources residing on incompatible IT infrastructures.

According to transaction cost analysis, functional complexity precipitates difficult contracting which drives up transaction costs (Mahoney 1992, Masten 1984, Ulrich and Barney 1984). Indeed, a typical outsourcing contract for IS services is highly complex. For example, Brandon and Segelstein (1984) prescribed a checklist of more than 170 essential contracting elements for use in negotiating an outsourcing contract. The elements include technical and monetary details such as price adjustments when volume changes, quality standards, response time for online work, turnaround time for batch work, hardware configuration, site access, staff expenses, costs of termination/cancellation, and dispute resolution mechanisms. Contractual items increase significantly when IS services are geographically dispersed because contractual parties must cope with additional issues such as file and data transfer rights, software access, vendor access procedures, and data and program compatibility. Hence, we expect:

H4. *The greater the functional complexity, the weaker the relationship between institutional influence and IS outsourcing.*

Technological Uncertainty. Organizational decision makers have strong preferences for certainty, stability, and predictability in organizational life (DiMaggio 1988, DiMaggio and Powell 1983, Pfeffer and Salancik 1978, Zucker 1977). When the environmental context is highly uncertain and unpredictable, the organization will exert great effort to reestablish control and ensure stability of future organizational outcomes. One stabilizing strategy is to mimic or imitate legitimate actions and responses of successful organizations (DiMaggio and Powell 1983, Galaskiewicz and Wasserman 1989).

With a high degree of uncertainty in technological change and the corresponding risks of technological obsolescence, banks would be more likely to conform to institutional pressures to outsource. Banks would shift their IS services to external IT service providers to relinquish the financial and administrative burden of rapidly depreciating IT equipment or stagnating skills of IS veterans. As technological uncertainty increases, internal economies of specialization deteriorate in relation to external economies of specialization of service providers, because service providers can spread their innovation risks over a large clientele. Accordingly, we predict that acquiescence is most likely when banks perceive technological uncertainty to be high.

H5. *The greater the technological uncertainty, the stronger the relationship between institutional influence and IS outsourcing.*

Supplier Presence. Supplier presence is the availability of reputable and trustworthy service providers (Walker and Weber 1984). Opportunistic inclinations by any party in a contractual arrangement pose little risk if competitive exchange relations are characterized by a large number of potential suppliers (Pisano 1990). In fact, firms may be constrained in their outsourcing choices if a full array of IS services is not available from another supplier. The presence of suppliers promotes a bank's conformity to institutional pressures to outsource because greater supplier presence reduces small-numbers bargaining problems and dampens opportunism (Williamson 1985).

H6. *The greater the supplier presence, the stronger the relationship between institutional influence and IS outsourcing.*

Impact of Organizational Size

Commercial banks in the U.S. are not homogeneous in their nature of business, bank strategy, use of IT resources, or the customer base they serve (Markus and Soh 1993). Small banks tend to focus on retail opera-

tions, whereas large banks concentrate on wholesale and international bank services. Large banks have greater resources and power to influence their environments and are less dependent on other constituents in the organizational field (DiMaggio and Powell 1983, Oliver 1991, Pfeffer and Salancik 1978, Thompson 1967). Consequently, we expect size to be an important moderator variable in banks' strategic responses to institutional pressures arising from their organizational fields. Specifically, we expect the relationship between institutional influence and IS outsourcing to be weaker for large banks if moderator factors mitigate the attractiveness of conforming to institutional norms.

H7. *Size of firm will affect significantly the interaction of institutional influence and moderations of IS outsourcing.*

Research Method

To test our hypotheses in the banking industry, we drew a sample from banks affiliated with the American Bankers Association.² Stratified sampling based on bank size was used as we expected differential effects of institutional influence and moderating economic factors on IS outsourcing between large and small banks. To minimize standard error in the difference, we stratified by bank size to ensure roughly equal proportions of responses from large and small banks (Ross et al. 1983).

Three hundred eighty-five banks were sampled, 85 with more than \$5 billion in assets,³ and a random selection of 100 banks in each of three other size strata: large (\$1 billion to \$5 billion in assets), medium (\$0.3 billion to \$1 billion in assets), and small (less than \$0.3 billion in assets). The four-way classification of very large, large, medium, and small banks reflects the scheme adopted by the American Bankers Association in their membership database. For the purpose of our study, banks with more than \$1 billion in assets were reclassified as large banks and those with less than \$1 billion as small banks.

A questionnaire was mailed in the second half of 1992 to bank officers with corporate responsibility in IS. Each respondent acted as the informant for his or her bank's sourcing arrangement and practices pertaining to information systems services.⁴

Items in the questionnaire measured concepts in the research model. Other than bank size and sourcing mode, items were measured on 7-point Likert scales. A draft instrument was pretested qualitatively and quantitatively to ensure that the final version was valid for

use in a large sample. The questionnaire was pretested with the chief information officers in 21 banks within the Minneapolis-St. Paul, Minnesota metropolitan area. Banks used in the pilot study were omitted from the main study. The pilot study ensured clarity of the questionnaire and ascertained that theory-based items tapped issues of concern in sourcing decisions.

In the main study, telephone interviews and mail questionnaires were the primary means of collecting data. Each bank in the random sample was contacted by telephone to identify the person who held corporate responsibility for IS. A letter was sent stating the purpose of the study and requesting participation. About a week or 10 days after the letter was sent, the potential respondents were contacted by telephone. From those who verbally agreed to participate, preliminary information was elicited about the bank, including the type of IS sourcing arrangement and the bank's affiliation (if any) with a parent company with respect to IT. Reasons were elicited from those who declined participation. A packet of materials containing a cover letter, survey questionnaire, and a self-addressed, stamped envelope was sent to participants.

Returned questionnaires were examined for completeness of information. Respondents who skipped items on the questionnaires were contacted again by telephone to obtain the missing information. Executive summaries of the preliminary and final analyses of the study were sent to each respondent.

The total number in the final sample was 243, yielding a 63.1% response rate. Chi-square analysis was conducted to determine whether there was a difference in the distribution of banks that participated and those that did not. In terms of bank size, banks participating in the study were representative of the original sample ($\chi^2 = 3.62, p > 0.05$).

Variables

Appendix A contains questionnaire items for each construct. *Outsourcing*, the primary dependent variable, refers to the source of IS services a bank adopts. Banks usually choose one of six major sources of IS services: (1) in-house computer operations, (2) an information systems subsidiary at the parent bank,⁵ (3) other banks that provide IS services, (4) service bureaus, (5) facilities management, (6) joint venture, cooperative computer service arrangement (Federal Financial Institutions Examination Council 1992, p. 109). A seventh category, an "other" arrangement category, was created to capture any additional IS source that does not fit appropriately into any of the first six categories.

All but the first two sourcing alternatives (in-house operations and IS subsidiary at parent bank) were classified as IS outsourcing. Use of in-house IS services was considered insourcing. For banks that relied on their parent banks for IS services, decisions about policy, management, and operation of IS resided with the parent bank and not the subsidiary. Consequently, informants at the subsidiary banks often had little knowledge of or control over the administrative choice of IS source. Because informants of subsidiary banks lacked first-hand knowledge of policies on IS sourcing, they either returned incomplete questionnaires or wrote "don't know" across the survey instrument. We therefore discarded responses from banks that relied on their parent banks or bank holding companies for IS services and eliminated them from the subsequent analyses.⁶

Institutional influences are external social pressures toward conformity. Institutional influences on bank operations and practices arise from peer banks (PEER) and federal examiners (FEDERAL).

External production cost advantage (PRODCOST) is the degree to which an external service provider is perceived to have an advantage in production cost economies over internal bureaucratic management of IS services. Production cost was operationalized as hardware costs, software costs, and personnel costs.

Slack resources (SLACK) is the level of working capital, measured as the amount of financial resources available for IS relative to past years' resources and peer banks' resources allocated for IS.

Asset specificity (SPECIFIC) is the degree to which investments in IS yielded unique value to any single firm. The construct was operationalized as (1) the level of investment in specialized equipment, (2) the level of specialized technical skills specific to the needs of a particular bank, and (3) the level of specific business skills and knowledge pertaining to a particular bank.

Technological uncertainty (UNCERTAIN) is the rapid and unexpected change in IT developments. It was operationalized as the degree to which a bank can forecast accurately its technical requirements as well as the degree to which a bank can anticipate IT obsolescence.

Functional complexity (COMPLEX) is the degree of formal structural differentiation within an organization (Price and Mueller 1986). In the context of the IS function, the construct was operationalized as (1) an overall assessment of the degree of complexity in managing IS operations, (2) the number of hardware platforms and systems configurations, and (3) the degree of sophistication of the software portfolio.

Supplier presence (SUPPLIER) is 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 providers to replace the services of a current one.

Size (SIZE) is represented by a dichotomous variable, zero, for small banks and one for large banks. Small banks are those with assets less than \$1 billion and large banks are those with assets of at least \$1 billion.

Construct Validation

For each multiple-item construct, the items were subjected to factor analysis to ensure a single-factor structure. A common rule of thumb is that for unidimensional construct measures, all or most of the items should load more heavily on the first factor than on any other factor (Carmines and Zeller 1979, p. 60; Spector 1992, p. 55). Only one factor emerged from a factor analysis conducted on each multi-item construct, thus confirming the unidimensional nature of the items. Items therefore were summed into a total-score measure for each construct.

Subsequently, inter-item reliability analysis using Cronbach’s alpha was applied to measures based on multi-item scales. Nunnally (1967) suggested reliability in the 0.5 to 0.6 range in the early stages of research and 0.95 as being the desirable standard for research in applied educational settings. In business settings, there are no generally accepted guidelines (Peter 1979), although Van de Ven and Ferry (1980) suggested a range of 0.55 to 0.90 for constructs of narrow to moderately broad conceptual scope. We used that range to assess the reliability of the measures. Alpha coefficients for the constructs are reported in Appendix A.

Slack resources ($\alpha = 0.43$) and specific assets ($\alpha = 0.56$) yielded relatively low reliability. For slack resources, informants were asked to assess slack on the basis of two norm references: peer bank’s slack and past year’s slack. Confirmatory factor analysis showed good fit for a single factor ($\chi^2 < 0.05, p > 0.98$); but poor fit for a two-factor structure ($\chi^2 = 5.78, p < 0.02$), suggesting that despite low inter-item reliability, the items represented one factor.

For specific assets, informants were asked to assess three different types of specific investments: human assets in the form of IS technical skills and specific business skills, and non-human assets in the form of computer equipment. The intercorrelations among the three forms of investments ranged from 0.10 to 0.39,⁷

suggesting a construct that is relatively broad in conceptual scope.

According to Cronbach and Meehl (1955), a scale can have construct validity even when individual items have low intercorrelations as long as those items sample the same conceptual domain. Because items in slack resources and asset specificity covered multiple dimensions of the respective conceptual domains, there is some assurance of construct validity despite modest reliability.

Statistical Analysis

We tested our hypotheses by using hierarchical moderated logistic regression models. That procedure involves forming multiplicative terms as moderator variables, and using a series of logistic regression analyses to determine the relative contribution of the moderator terms to the explanation of variance in the dependent variable. Accordingly, the probability of a firm choosing to outsource its information system services in preference to insourcing can be modeled as a function of the main effects and the interaction terms as

Probability of choosing sourcing mode

$$= 1 / (1 + \exp[-Y])$$

where:

$$Y = b_0 + b_1 X_1 + b_2 X_2 + \dots b_p X_p$$

and X_1, X_2, \dots, X_p are explanatory variables; and coefficients, b_1, b_2, \dots, b_p are the corresponding coefficients with b_0 as the intercept term. The explanatory variables are (1) the main effects of institutional influence (PEER or FEDERAL), the hypothesized variable (PRODCOST, SLACK, SPECIFIC, etc.), and the control variable, bank size (SIZE), (2) two-way interaction effects of institutional influence with the hypothesized variable, institutional influence with size, and the hypothesized variable with size, and (3) a three-way interaction effect of institutional influence, hypothesized variable, and size.

To assess the explanatory power of the three-way interaction term, we applied a hierarchical moderated regression strategy using an improvement likelihood ratio chi-square (Hauck and Donner 1977, Hosmer and Lemeshow 1989). Analogous to the hierarchical *F*-test in multiple regression (Aiken and West 1991, Ch. 6), the improvement chi-square statistic computes the change in the $-2 \log$ likelihood ($-2LL$) between suc-

cessive steps of building a model. Accordingly, we formulated and tested nested models of variables with and without the focal interaction term using the improvement chi-square as the statistic to assess the relative contribution of that interaction term.

When large numbers of interaction terms are included in a model, serious multicollinearity is likely. We rescaled the original variables using procedures recommended by Aiken and West (1991). All continuous variables were “centered” by subtracting the corresponding variable mean from each value. Such rescaling does not affect the substantive interpretation of the coefficients (Aiken and West 1991).

Effects of each hypothesized variable on the relationship of institutional influence (PEER or FEDERAL) to OUTSOURCING were analyzed separately rather than including all of them in the same logistic regression model. That strategy seemed appropriate given that the greater the number of independent and moderator variables included in a model, the lower to power of the test.⁸

The following series of hierarchical logistic equations illustrates how hierarchical moderated logistic regression assesses the effect of a moderator, external production cost advantage (PRODCOST), on the relationship between PEER influence and OUTSOURCING. First, the three-way interaction term (PEER*PRODCOST*SIZE) determined whether there was a difference in the PEER*PRODCOST interaction between large and small banks. The logistic regression model included all main effects, 2-way and 3-way interaction effects of peer influence (PEER), the moderator variable (PRODCOST), and the control variable (SIZE).

$$\begin{aligned} &\text{Log(OUTSOURCING)} \\ &= \underline{a} + \underline{b}_1\text{PEER} + \underline{b}_2\text{PRODCOST} + \underline{b}_3\text{SIZE} \\ &\quad + \underline{b}_4(\text{PEER*PRODCOST}) + \underline{b}_5(\text{PEER*SIZE}) \\ &\quad + \underline{b}_6(\text{PRODCOST*SIZE}) \\ &\quad + \underline{b}_7(\text{PEER*PRODCOST*SIZE}) \end{aligned}$$

To determine the significance of the (PEER*PRODCOST*SIZE) interaction term, we computed $-2 \log$ likelihood ($-2LL$) improvement from a model

containing all of the lower-order terms,

$$\begin{aligned} &\text{Log(OUTSOURCING)} \\ &= \underline{a} + \underline{b}_1\text{PEER} + \underline{b}_2\text{PRODCOST} + \underline{b}_3\text{SIZE} \\ &\quad + \underline{b}_4(\text{PEER*PRODCOST}) + \underline{b}_5(\text{PEER*SIZE}) \\ &\quad + \underline{b}_6(\text{PRODCOST*SIZE}), \end{aligned}$$

computed the $-2LL$ from a model containing these lower-order terms plus the three-way interaction term,

$$\begin{aligned} &\text{Log(OUTSOURCING)} \\ &= \underline{a} + \underline{b}_1\text{PEER} + \underline{b}_2\text{PRODCOST} + \underline{b}_3\text{SIZE} \\ &\quad + \underline{b}_4(\text{PEER*PRODCOST}) + \underline{b}_5(\text{PEER*SIZE}) \\ &\quad + \underline{b}_6(\text{PRODCOST*SIZE}) \\ &\quad + \underline{b}_7(\text{PEER*PRODCOST*SIZE}), \end{aligned}$$

and tested the incremental $-2LL$ improvement with a hierarchical chi-square test. If an improvement in chi-square value was statistically significant, a three-way interaction effect was present.

A significant three-way interaction term would mean that the effect of the hypothesized moderator variable (in this case, PRODCOST) on the relationship of peer influence to outsourcing is significantly different between large and small banks. Subsequently, coefficients of the two-way interaction of (Peer*Prodcost) for large and small banks would be examined to determine whether the significant impact of the hypothesized variable resides in large or small banks.

If the hierarchical chi-square test revealed that the three-way interaction term of PEER*PRODCOST*SIZE was not significant, it would mean that the effect of the hypothesized variable (PRODCOST) on the relationship of PEER to outsourcing is independent of size. The coefficient of the two-way interaction term (PEER*PRODCOST) would then be examined for all banks.

Results

Table 1 reports the means, standard deviations, and intercorrelations among the major constructs in the study. The intercorrelations show a significant positive bivariate association between peer influence and IS outsourcing ($r = 0.51, p < 0.01$) and a significant posi-

tive bivariate association between IS outsourcing and federal regulator influence ($r = 0.22, p < 0.01$), thereby establishing associations between institutional influences and IS outsourcing. We report the moderated relationships between peer influence and IS outsourcing first, then those between the federal regulators and IS outsourcing.⁹

Moderated Effects on Peer Influence

External Production Cost Advantage (PRODCOST). Hierarchical moderated regression showed the three-way interaction effect of PEER*PRODCOST*SIZE to be significant at the $p < 0.10$ level (Table 2). This

finding suggests that the effect of external production cost advantage on the relationship of peer influence to outsourcing is different between large and small banks. Subsequent independent analysis of the beta coefficients of the two-way interaction of PEER*PRODCOST for large and small banks showed that PRODCOST significantly strengthened conformity to peer influence for IS outsourcing in large banks and not in small banks. Hence, H1 is supported.

Slack Resources (SLACK). From Table 3, we observe that the three-way interaction effect of PEER*SLACK*SIZE is not significant ($p > 0.30$),

Table 1 Means, Standard Deviations, and Matrix of Intercorrelations

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10
1. Outsourcing (0 = in, 1 = out)	0.62	0.49	1.00									
2. Peer	4.10	1.67	0.51**	1.00								
3. Federal	3.99	0.70	0.22**	0.21**	1.00							
4. Production Cost	3.77	1.72	0.67**	0.40**	0.18*	1.00						
5. Slack	3.56	1.17	-0.13	-0.16*	-0.09	-0.18*	1.00					
6. Uncertain	3.14	1.12	0.32**	0.16	0.12	0.31**	-0.06	1.00				
7. Specific	4.01	1.09	0.03	0.06	-0.03	0.08	0.12	0.11	1.00			
8. Supplier	4.64	1.54	0.23**	0.31**	0.07	0.25**	-0.10	0.09	0.55**	1.00		
9. Complex	3.27	1.40	-0.12	-0.13	0.00	-0.01	0.19*	-0.08	0.28**	-0.13	1.00	
10. Banksizes (0 = large, 1 = small)	0.55	0.50	0.20*	-0.13	-0.02	0.09	0.15	0.22**	-0.04	-0.01	-0.17*	1.00

*Significant at the 0.01 level, one-tailed test.
 **Significant at the 0.001 level, one-tailed test.

Table 2 Moderated Hierarchical Regression on Three-Way Interaction of PEER*PRODCOST*SIZE

	df	-2LL	p-Value
Model without three-way interaction term	6	159.30	0.00
Model with three-way interaction term	7	162.13	0.00
Improvement in likelihood-ratio chi-square with three-way interaction term	1	2.83	0.09

Follow-up Two-Way Interaction Analysis of PEER*PRODCOST

Effect	Beta	Large Banks			Small Banks			
		S.E.	Wald	p-value	Beta	S.E.	Wald	p-value
PEER	1.18	0.44	7.07	0.00	0.33	0.10	10.29	0.00
PRODCOST	0.44	0.11	15.35	0.00	0.18	0.03	22.42	0.00
PEER* PRODCOST	0.08	0.04	3.74	0.05	0.01	0.01	0.51	0.46

which suggests that the effect of slack resources on the relationship of peer influence to outsourcing is independent of bank size. Analysis of the coefficients of the two-way interaction of PEER*PRODCOST for all banks regardless of size shows that the *p*-value for the interaction term is 0.11 (close to the $\bar{p} = 0.10$ significance level). This finding implies that, regardless of bank size, conformity to peer influence for IS outsourcing was weakened (indicated by the negative sign of the beta coefficient) with increasing perceived slack resources. Hence, H2 is supported.

Table 3 Moderated Hierarchical Regression on Three-Way Interaction of PEER*SLACK*SIZE

	df	-2LL	<i>p</i> -value
Model without three-way interaction term	6	98.11	0.00
Model with three-way interaction term	7	99.01	0.00
Improvement in likelihood-ratio chi-square with three-way interaction term	1	0.90	0.34

Follow-up Two-Way Interaction Analysis

Effect	Beta	S.E.	Wald	<i>p</i> -value
PEER	0.44	0.07	39.89	0.00
SLACK	-0.07	0.05	1.85	0.17
PEER*SLACK	-0.04	0.02	2.52	0.11

Asset Specificity. The three-way interaction effect of PEER*SPECIFIC*SIZE is significant at $p < 0.01$ level (Table 4). This finding suggests that the effect of specific assets on the relationship of peer influence to outsourcing is significantly different between large and small banks. Independent analysis of the coefficients of the two-way interaction of PEER*SPECIFIC for large and small banks shows that SPECIFIC significantly weakened conformity to influence for peer outsourcing in large banks and not in small banks, thus supporting H3.

Functional Complexity. As with asset specificity, the three-way interaction effect of PEER*COMPLEX*SIZE is significant at $p < 0.01$ level (Table 5). Therefore, the moderating effect of functional complexity on the relationship of peer influence to outsourcing is significantly different between large and small banks. Two-way interaction of PEER*SPECIFIC for large and small banks shows that COMPLEX significantly strengthened (as indicated by the positive sign of the beta coefficient) conformity to peer influence for outsourcing in large but not in small banks. H4, which posits increasing functional complexity to weaken conformity to peer influence, is not supported.

Technological Uncertainty. Table 6 shows that the three-way interaction effect of PEER*UNCERTAIN*SIZE is not significant ($p > 0.40$). The effect of technological uncertainty on the relationship of peer influence to outsourcing is independent of bank size. The two-way interaction of PEER*UNCERTAIN for all banks technological uncertainty had no moderating

Table 4 Moderated Hierarchical Regression on Three-Way Interaction of PEER*SPECIFIC*SIZE

	df	-2LL	<i>p</i> -value
Model without three-way interaction term	6	92.60	0.00
Model with three-way interaction term	7	102.38	0.00
Improvement in likelihood-ratio chi-square with three-way interaction term	1	9.78	0.00

Follow-up Two-Way Interaction Analysis of PEER*SPECIFIC

Effect	Beta	Large Banks			Small Banks			
		S.E.	Wald	<i>p</i> -value	Beta	S.E.	Wald	<i>p</i> -value
PEER	1.00	0.26	14.69	0.00	0.43	0.09	23.85	0.00
SPECIFIC	-0.44	0.20	5.13	0.02	0.02	0.10	0.33	0.86
PEER*SPECIFIC	-0.28	0.09	9.63	0.00	0.01	0.04	0.18	0.89

Table 5 Moderated Hierarchical Regression on Three-Way Interaction of PEER*COMPLEX*SIZE

	df	-2LL	p-value
Model without three-way interaction term	6	96.24	0.00
Model with three-way interaction term	7	113.34	0.00
Improvement in likelihood-ratio chi-square with three-way interaction term	1	17.10	0.00

Follow-up Two-Way Interaction Analysis of PEER*SPECIFIC								
Effect	Beta	Large Banks			Small Banks			
		S.E.	Wald	p-value	Beta	S.E.	Wald	p-value
PEER	1.65	0.50	10.88	0.00	0.44	0.09	24.13	0.00
COMPLEX	0.61	0.19	10.74	0.00	0.03	0.05	0.37	0.54
PEER*COMPLEX	0.28	0.10	8.12	0.00	0.00	0.02	0.07	0.79

Table 6 Moderated Hierarchical Regression on Three-Way Interaction of PEER*UNCERTAIN*SIZE

	df	-2LL	p-value
Model without three-way interaction term	6	101.17	0.00
Model with three-way interaction term	7	101.84	0.00
Improvement in likelihood-ratio chi-square with three-way interaction term	1	0.67	0.41

Follow-up Two-Way Interaction Analysis				
Effect	Beta	S.E.	Wald	p-value
PEER	0.45	0.07	37.81	0.00
UNCERTAIN	0.24	0.06	16.22	0.00
PEER*UNCERTAIN	0.02	0.02	1.07	0.30

effect on the conformity to peer influence for IS outsourcing ($p > 0.30$). H5 is not supported.

Supplier Presence. The three-way interaction effect of PEER*SUPPLIER*SIZE is significant at the $p < 0.10$ level (Table 7) suggesting that the effect of supplier presence on the relationship of peer influence to outsourcing is significantly different between large and small banks. The two-way interaction of PEER*SUPPLIER for large and small banks shows that SUPPLIER significantly strengthened peer conformity to outsourcing in large but not in small banks, thus supporting H6.

Bank Size

Finally, we examined the omnibus hypothesis of size (H7) as it affects the relationship between peer influence and IS outsourcing. With the exception of slack resources, moderator variables did not affect small banks as much as large banks in their conformity to peer influence. Decreasing slack resources induced both large and small banks toward conforming to peer influence on outsourcing. External production cost advantage and supplier presence significantly strengthened, while assets specificity and functional complexity weakened, large banks' conformity to peer influence on outsourcing.

Moderated Effects on External Regulator Influence

External Production Cost Advantage (PRODCOST). Table 8 shows that the three-way interaction effect of FEDERAL*PRODCOST*SIZE is not significant ($p > 0.90$) which implies that the effect of external production cost advantage on the relationship between federal regulator influence and outsourcing is independent of bank size. The two-way interaction of FEDERAL*PRODCOST shows that PRODCOST had no moderating effect on conformity to federal regulator influence for IS outsourcing ($p > 0.30$). H1 is not supported for institutional influence originating from federal examiners.

Slack Resources. The three-way interaction effect of FEDERAL*SLACK*SIZE also is not significant ($p > 0.10$, Table 9), which implies that the effect of slack resources on the relationship between federal

Table 7 Moderated Hierarchical Regression on Three-Way Interaction of PEER*SUPPLIER*SIZE

	df	-2LL	p-value
Model without three-way interaction term	6	92.07	0.00
Model with three-way interaction term	7	95.00	0.00
Improvement in likelihood-ratio chi-square with three-way interaction term	1	2.93	0.08

Follow-up Two-Way Interaction Analysis of PEER*SUPPLIER

Effect	Beta	Large Banks			Small Banks			
		S.E.	Wald	p-value	Beta	S.E.	Wald	p-value
PEER	0.71	0.17	17.60	0.00	0.41	0.09	21.54	0.00
SUPPLIER	0.04	0.08	0.40	0.53	0.03	0.05	0.42	0.51
PEER* SUPPLIER	0.06	0.03	4.12	0.04	0.00	0.02	0.00	0.97

Table 8 Moderated Hierarchical Regression on Three-Way Interaction of FEDERAL*PRODCOST*SIZE

	df	-2LL	p-value
Model without three-way interaction term	6	133.45	0.00
Model with three-way interaction term	7	133.45	0.00
Improvement in likelihood-ratio chi-square with three-way interaction term	1	0.00	0.99

Follow-up Two-Way Interaction Analysis

Effect	Beta	S.E.	Wald	p-value
FEDERAL	0.29	0.13	5.45	0.02
PRODCOST	0.25	0.03	57.34	0.00
FEDERAL*PRODCOST	0.02	0.02	0.93	0.33

Table 9 Moderated Hierarchical Regression on Three-Way Interaction of FEDERAL*SLACK*SIZE

	df	-2LL	p-value
Model without three-way interaction term	6	26.29	0.00
Model with three-way interaction term	7	27.98	0.00
Improvement in likelihood-ratio chi-square interaction term with three-way	1	1.69	0.19

Follow-up Two-Way Interaction Analysis

Effect	Beta	S.E.	Wald	p-value
FEDERAL	0.27	0.09	8.82	0.00
SLACK	-0.08	0.04	3.43	0.06
FEDERAL*SLACK	0.01	0.02	0.19	0.67

regulator influence and outsourcing does not depend on bank size. The two-way interaction of FEDERAL*PRODCOST is not significant ($p > 0.60$). H2 is not supported. SLACK has no moderating effect on the conformity to federal influence.

Asset Specificity. Table 10 shows that the three-way interaction effect of FEDERAL*SPECIFICITY*SIZE is not significant ($p > 0.20$). This finding implies that the effect of asset specificity on the relationship between federal regulator influence and outsourcing is independent of bank size. There is no significant two-way interaction between FEDERAL and SPECIFIC ($p > 0.40$), and H3 is not supported. Regardless of bank size, SPECIFIC has no moderating effect on bank's conformity to federal influence.

Functional Complexity. The three-way interaction effect of FEDERAL*COMPLEX*SIZE is not significant ($p > 0.40$, Table 11) which implies that the effect of functional complexity on the relationship between federal regulator influence on outsourcing is independent of bank size. Two-way interaction of FEDERAL*COMPLEX for all banks also is not significant ($p > 0.20$). H4 is not supported. Functional complexity had no moderating effect on conformity to federal influence.

Technological Uncertainty (UNCERTAIN). The three-way interaction effect of FEDERAL*UNCERTAIN*SIZE is significant at the $p < 0.05$ level (Table 12).

Table 10 Moderated Hierarchical Regression on Three-Way Interaction of FEDERAL*SPECIFIC*SIZE

	df	-2LL	p-value
Model without three-way interaction term	6	21.55	0.00
Model with three-way interaction term	7	22.94	0.00
Improvement in likelihood-ratio chi-square with three-way interaction term	1	1.40	0.24

Follow-up Two-Way Interaction Analysis				
Effect	Beta	S.E.	Wald	p-value
FEDERAL	0.28	0.09	9.84	0.00
SPECIFIC	0.02	0.07	0.13	0.72
FEDERAL*SPECIFIC	0.03	0.04	0.52	0.47

Table 11 Moderated Hierarchical Regression on Three-Way Interaction of FEDERAL*COMPLEX*SIZE

	df	-2LL	p-value
Model without three-way interaction term	6	27.13	0.00
Model with three-way interaction term	7	27.72	0.00
Improvement in likelihood-ratio chi-square with three-way interaction term	1	0.59	0.44

Follow-up Two-Way Interaction Analysis				
Effect	Beta	S.E.	Wald	p-value
FEDERAL	0.29	0.11	7.78	0.00
COMPLEX	0.07	0.04	3.43	0.06
FEDERAL*COMPLEX	0.04	0.03	1.42	0.23

Hence, the effect of technological uncertainty on the relationship of federal regulator influence to outsourcing is significantly different between large and small banks. Two-way interaction of FEDERAL*UNCERTAIN for large and small banks shows that uncertainty significantly strengthens large banks' conformity to federal regulators' influence. Accordingly, H5 is supported. As technological uncertainties escalated, large banks adhered more closely to sourcing arrangements advocated and legitimized by federal regulators.

Supplier Presence (SUPPLIER). Three-way interaction effect of FEDERAL*SUPPLIER*SIZE is not significant ($p > 0.50$, Table 13) implying that the effect of

alternative external service providers on the relationship of federal regulator influence to outsourcing is independent of bank size. The two-way interaction of FEDERAL*SUPPLIER is not significant ($p > 0.97$). H6 is not supported. Regardless of bank size, supplier presence has no moderating effect on the bank conformity to federal influence.

Bank Size

In contrast to the results for peer influence, we find little support for the hypothesized effects for bank size. Of the hypothesized moderator variables, only technological uncertainty had a strengthening effect on large banks' conformity to federal influence on outsourcing.

Table 12 Moderated Hierarchical Regression on Three-Way Interaction of FEDERAL*UNCERTAIN*SIZE

	df	-2LL	p-value
Model without three-way interaction term	6	38.35	0.00
Model with three-way interaction term	7	42.48	0.00
Improvement in likelihood-ratio chi-square with three-way interaction term	1	4.13	0.04

Follow-up Two-Way Interaction Analysis									
Effect	Beta	Large Banks			Small Banks			p-value	
		S.E.	Wald	p-value	Beta	S.E.	Wald		
FEDERAL	0.21	0.26	0.62	0.43	0.29	0.12	6.37	0.01	
UNCERTAIN	0.19	0.08	5.68	0.02	0.20	0.07	9.42	0.00	
FEDERAL*UNCERTAIN	0.15	0.08	3.55	0.05	0.01	0.04	0.13	0.72	

Table 13 Moderated Hierarchical Regression on Three-Way Interaction of FEDERAL*SUPPLIER*SIZE

	df	-2LL	p-value
Model without three-way interaction term	6	32.67	0.00
Model with three-way interaction term	7	32.95	0.00
Improvement in likelihood-ratio chi-square with three-way interaction term	1	0.28	0.59

Follow-up Two-Way Interaction Analysis				
Effect	Beta	S.E.	Wald	p-value
FEDERAL	0.27	0.09	8.80	0.00
SUPPLIER	0.11	0.03	9.92	0.00
FEDERAL*SUPPLIER	0.00	0.02	0.00	0.97

Discussion

In the preceding analysis, we examined the strength of critical contingencies that moderate the institutional influences on IS outsourcing. Our objective was to understand how firms respond to institutional influences under conditions characterized by both hyper-competition and high institutional influence. Figure 2 summarizes the strength of those contingencies.

Two major findings emerged from the study. First, we find that different sources of institutional influence evoke different strategic responses. When institutional pressures involved potential regulatory sanction, banks adhered more to institutional demands and responded less to strategic economic contingencies. When institutional pressures involved mimicry of peers, banks responded more to strategic economic contingencies and

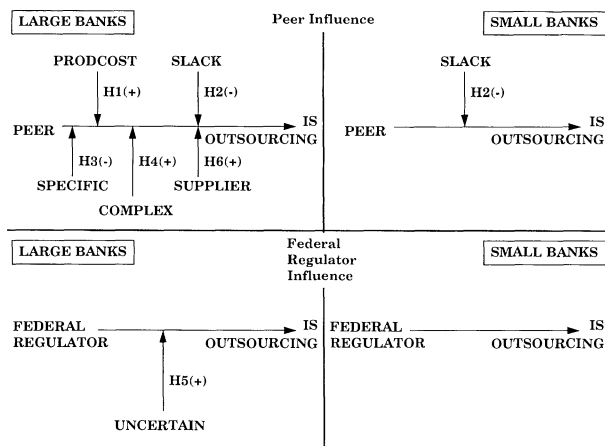
less to institutional pressures. Second, we find large banks temper their strategic responses more than small banks in the presence of institutional pressures from peers.

Strategic Responses to Federal Regulator Influence

Regardless of their sizes, all banks tended to acquiesce to federal regulators' influence. Technological uncertainty strengthened conformity in large banks, while other moderators neither strengthened nor weakened conformity. Our results are consistent with the arguments of Oliver (1991) and Pfeffer and Salancik (1978) and evidence reported by Meyer and Rowan (1977). Organizations strongly prefer certainty, stability, and predictability. Acquiescence is one strategy for gaining stability. As perceived technological uncertainty increases, banks tend to accede to regulator's expertise and counsel on IS sourcing. Such acquiescence can be interpreted as a way of gaining control or stability in an increasingly unpredictable technological environment, and also a way of gaining social and political legitimacy to prevent disciplinary action for disregarding regulators' counsel.

The non-significant effects of other moderators on institutional influences from federal regulators suggest that, despite deregulation trends in the last decade, banks continue to operate in an environment governed by federal regulators. The continued presence of regulation in the banking industry may unintentionally impede banks from responding strategically to hypercompetitive pressures. As noted in our introduction, the increasing infiltration of nonbank competitors as alternative financial service providers forces banks to cope with radical redefinition of market boundaries, and compete with novel financial services offered by non-bank competitors. Rigid regulation may restrict a set of allowable new organization forms and force banks to compete on unequal grounds. The issue for banks is not the choice of the most efficient organizational form, but the choice of the most efficient within a subset of legitimately sanctioned organizational forms.

Figure 2 Models Based on Research Findings



Strategic Responses to Peer Influence

Banks responded more strategically to peer influence. For large banks, mimetic pressures in IS outsourcing were tempered by individual banks' strategic assessments of relative gains in production economies, in financial capacity to resist institutional influence, and transaction cost considerations of asset specificity, functional complexity, and supplier presence. For small banks, financial capacity to resist institutional influence weakened mimetic pressures.

Perceived Gain in Production Economies. Under intense competition, firms attempt to obtain all factors of production at the lowest possible price to achieve the least costly methods of operation. In banks, IT was the most significant noninterest expense. Cost containment of IT therefore posed the greatest challenge in the management of bank operations. With service providers offering significant production economies, banks conformed more readily to peer influence to outsourcing.

Financial Capacity to Resist. Despite peer pressures, banks with working capital or slack resources sought greater autonomy and control over IS services by building up an internal IT capability. An internal IS function also symbolizes firm growth, advancement, and prestige (Huber 1993).¹⁰ In contrast, banks in financial distress embraced institutional norms of outsourcing. By selling off computer assets and laying off IS employees, banks acquire immediate working capital. In effect, financial statements at the outset of the outsourcing arrangement are typically inflated (GAO 1992, p. 4).

Transaction Costs Associated with Conformity. Consistent with transaction cost arguments, supplier presence significantly strengthened large banks' conformity to peer outsourcing. Supplier presence in the IT services industry is on the increase. Hit by low margins in hardware sales, traditional hardware suppliers such as IBM, Digital, Hewlett-Packard, and others have moved rapidly into provision of IT services. Their presence strengthens and creates greater competition within the IT services industry. When individual banks perceive that enough service providers are available to ensure adequate competition for external IS services, they are more likely to conform to institutional norms of outsourcing.

The results also show that asset specificity weakened conformity. To reap greater economies, service providers commodify and standardize IS services rather than offer unique IT services (Dearden 1987, Salzman and Rosenthal 1994). In effect, service providers erode the specificity of IT assets and undermine the strategic value of IS in creating unique and differentiated products and services. Hence, banks that competed on differentiated products and required unique IS resources to develop such products were less influenced by peer outsourcing pressures.

Contrary to transaction cost analysis, the results show that increasing functional complexity strengthened conformity to peer influence in large banks. Undoubtedly, functional complexity creates contracting difficulty and

causes banks to internalize IS services. However, many banks seemingly lacked the internal IS ability to cope with increasing functional complexity exacerbated by automated islands of software applications dispersed geographically across diverse network platforms and computer configurations. Lacking systems integration skills, banks would outsource their IS functions to specialized external IS service providers. In effect, functional complexity actually strengthened rather than weakened banks' conformity to peer outsourcing pressures.

Differential Strategic Responses of Small and Large Banks

We found large banks tempered their responses to peer pressures more than small banks. One explanation is that IS is more strategic in large than in small banks. Small banks tend to regard IS as backroom cost-reduction machinery rather than a strategic competitive weapon (Fraser and Kolari 1985). Also, IS is not as functionally complex in small banks as in large banks ($t = 2.52, p < 0.01$). In terms of IS costs as a percentage of total operating expenses, small banks spent only about half as much on IS as large banks. Consequently, small banks may find it unnecessary to evolve non-imitative, frame-breaking strategies for IS. Simply adhering to peer norms suffices. Large banks not only employ IT for backroom support, but also exploit IS for developing new financial instruments and services (Fraser and Kolari 1985). Merely adhering to peer norms on sourcing may impede large banks' abilities to develop IT-intensive financial instruments. Accordingly, differential strategic values of IS in large and small banks could explain the differences in the moderator effects on peer outsourcing.

Another explanation is that large banks, by virtue of their size and market power in the banking industry, consider themselves the innovators, leaders, and role models for other banks. Therefore, under conditions of hypercompetition, rather than merely mimicking institutional peers, large banks would attempt to reshape institutional rules and models by building in their own goals, actions, and procedures directly into the institutional environment. This explanation is consistent with Oliver's (1991) argument that large organizations need not necessarily conform passively to institutional influences, but have discretion and can proactively shape institutional norms.

Implications

Several theoretical implications can be derived from the study. From a theory-building standpoint, our study

adhered to suggestions by Oliver (1991), Eisenhardt and Brown (1992) and Hesterly et al. (1990) that studies of organizational phenomena should not be constrained by any single theoretical framework. Rather, to ensure a complete understanding of any phenomenon, including strategic response to institutional influences, conceptual models must be informed by synthesized formulations of explanations from disparate theories. By concentrating on an industry that is both hypercompetitive and highly institutionalized, we were able to juxtapose theories that emphasize the effects of institutional influences and strategic choices on organizational actions.

First, our study addresses one of the fundamental critiques of organizational theories in strategic behavior—that the reasoning is biased heavily in favor of managerial purpose and choice (e.g., Child 1972, Donaldson 1991). Such theories are predicated on the assumption that organizations have full discretion to implement the most efficient organizational choices in light of changing environmental influences. That bias has unfortunate consequences. Granovetter (1985, 1992) exhorted that when researchers adopt an under-socialized conception of economic actions, their analyses of strategic behavior tend to overemphasize managerial choice and ignore tempering effects of non-efficiency goals such as legitimation, approval, and power. In our study, we avoided atomizing organizational response to hypercompetition by positioning the choice of a new organization form, IS outsourcing, as socially embedded in an institutional network or relationships with external constituents.

Second, our study also addressed the major criticisms of institutional theory. Compared with strategic choice theories, institutional theory is predicated on a diametrically opposite but equally restrictive assumption—oversocialization and organizational passivity. In fact, its failure to address strategic behavior is regarded the Achilles' heel of institutional theory (Oliver 1991, Perrow 1985, Scott 1995). We demonstrated that by grafting managerial considerations of economic factors as moderators of institutional theory, we could apply institutional and economic theories concomitantly to shed light on the strength of conformance or resistance to institutional pressures.

We found that a bank's conformity to institutional pressures depends on the type of institutional influence and the relative power of the bank. Although strategic economic considerations arising from hypercompetitive pressures override peer influence, those considerations are tempered by potential legal sanctions from federal regulators. Future research should recognize the dif-

ferent sources of isomorphic pressures, and differentiate the extent to which such pressures are tractable to strategic responses of individual firms from the extent to which those pressures constrain strategic responses.

In terms of analytical implications, the results underscore the complexity of organizational analysis and suggest that a superficial examination of relationships among organizational factors could be misleading. In reality, effects are often embedded in or intertwined with others, and researchers need to develop analytical strategies to disentangle underlying interacting and multiplicative relationships among variables. Our results show that under hypercompetition, when variables are most likely to interact with each other in complicated ways, caution is essential in interpreting main effects alone.

Finally, one important managerial implication that can be drawn from our results is that, in light of hypercompetitive pressures, mimetic pressures toward homogeneity of organizational practices and structures often must be countered by recognition of strategic economic considerations. Hence, organizations should be cautious when imitating strategies or when learning vicariously from the experience of peers. Especially for small organizations, which tend to exhibit substantial follower behavior, more proactive evaluation of the efficiencies and effectiveness of alternative organizational arrangements is warranted to ensure a timely strategic response to the environment.

Appendix A: Summary of Measures

Construct	Measures
Information Systems Outsourcing	<p>Please check the box which best describes the PRIMARY way in which your bank's computer data processing facilities are managed and operated. CHECK ONLY ONE BOX</p> <p>[]1 You have your own INTERNALLY MANAGED, IN-HOUSE computer data processing operations; i.e., <i>you manage and operate computer hardware and software with internal information systems personnel.</i></p> <p>[]2 Your BANK HOLDING COMPANY or PARENT BANK provides you with computer services; i.e., <i>an information systems subsidiary or division in your bank holding company or parent bank performs the data processing services.</i></p> <p>[]3 Other BANKS (including bank offering correspondent services) provide you with computer services; i.e., <i>your computer services</i></p>

are offered by banks other than your parent bank. These banks may be, but are not necessarily, your correspondent banks.

[]4 External SERVICE BUREAUS provide you with computer services; i.e., you do not have in-house computer data processing. Your bank uses external non-bank service bureaus for computer services.

[]5 You have FACILITIES MANAGEMENT with information technology service providers that are not owned by a bank; i.e., you have in-house computing facilities but control and management over daily computer services are assigned to external non-bank information technology service providers, such as EDS, Systematics, Perot Systems, etc.

[]6 You share information systems services with other banks with similar information systems requirements in a JOINT-VENTURE, COOPERATIVE COMPUTER SERVICE arrangement; i.e., you enter into a joint venture with other banks with similar data processing requirements. Each bank then shares out the costs of computer services.

[]7 Other arrangement

PEER INFLUENCE
(Cronbach alpha = 0.67)

The item below is 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

“Successful peer banks almost all outsource their data processing services.”

The items below are on a 7-point scale with 1 = extensive insourcing, 2 = moderately insourcing, 3 = little insourcing, 4 = neither insourcing nor outsourcing, 5 = little outsourcing, 6 = moderate outsourcing, and 7 = extensive outsourcing):

“For our computer data processing sourcing arrangement, we have taken the lead of successful peer banks in investigating . . . ;”

“For our computer data processing sourcing arrangement, we have taken the lead of successful peer banks in undertaking”

FEDERAL INFLUENCE
(Cronbach a = 0.88)

The items below are on a 7-point scale with 1 = extensive insourcing, 2 = moderately insourcing, 3 = little insourcing, 4 = neither insourcing nor outsourcing, 5 = little outsourcing, 6 = moderate outsourcing, and 7 = extensive outsourcing):

PRODCOST
(Cronbach a = 0.86)

“Bank regulators such as the Federal Reserve Bank Examiners and the Office of the Comptroller of Currency (OCC) have been proponents of . . . ;”

“Bank regulators such as the Federal Reserve Bank Examiners and the Office of the Comptroller of Currency (OCC) have pressured us to investigate . . . ;”

“Bank regulators such as the Federal Reserve Bank Examiners and the Office of the Comptroller of Currency (OCC) have pressured us to undertake”

The items below 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

(Questions were worded slightly differently depending on whether bank adopted in-house IS services or outsourced. For banks that outsourced, the phrase “would be” was changed to “is” to reflect the situation facing the respondent or the respondent’s context.)

“We have the scale and volume to justify internal data processing management and operations;”

“An external data processing service provider would be able to reduce our hardware costs;”

“An external data processing service provider would be able to reduce our software costs;”

“An external data processing service provider would be able to reduce our information systems personnel costs;” and

“It is cheaper to manage our own data processing facilities and services than to rely on external data processing service providers.”

SLACK RESOURCES
(Cronbach a = 0.43)

Items below 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

“Compared with peer banks, our bank has more money that could be invested in data processing services and operations;”

“We are facing tighter data processing budget limitations than we did three years ago;”

“We have a bigger budget allotted for computer data processing operations than our peer banks.”

ASSETS
SPECIFICITY
(Cronbach
a = 0.56)

Items below 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

“Compared to our peer banks, our data processing facilities and services require technical skills that are relatively unique;”

“To process our data, external data processing service providers would have to make substantial investments in equipment tailored to our needs;”

“Extensive business knowledge that is specific to our business environment is required to manage our data processing operations.”

FUNCTIONAL
COMPLEXITY
(Cronbach
a = 0.80)

Items below 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

“Our data processing operations are more complex than the data processing operations of peer banks;”

“We use more hardware platforms and multiple system configurations than most of our peer banks;”

“Our banking software portfolio is more sophisticated and complicated than those of peer banks.”

TECHNOLOGICAL
UNCERTAINTY
(Cronbach
a = 0.62)

Items below 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

“Compared with experts among external data processing service providers, we have been able to anticipate changes in technological developments in hardware and software for our banking needs;”

“We believe that technological obsolescence of data processing equipment needed by our bank cannot be predicted;”

“It is difficult to foresee and keep up with the developmental changes in information technologies needed to process our bank data.”

SUPPLIER
PRESENCE
(Cronbach
a = 0.84)

Items below 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

“There are a sufficient number of *reputable* external data processing service providers who potentially could provide data processing facilities and services to our bank;”

“There are a sufficient number of *trustworthy* external data processing service providers who potentially could provide data processing facilities and services to our bank;”

“If we decide to terminate in-house computer operations, there are other external data processing service providers who could provide us with the same level of data processing facilities and services;”

(For questionnaires sent to banks that outsourced their IS services, this item would read: “If we terminate our existing external contract, there are other external data processing service providers who could provide us with the same level of data processing facilities and services.”)

Endnotes

¹Bank legislation dates back to the National Bank Act of 1863 and includes the Federal Reserve Act of 1913, the McFadden Act of 1927, the Banking Acts of 1933 and 1935, and the Bank Holding Company Act of 1956. As a result of these laws, banks became subject to strict regulation by three federal agencies: the Comptroller of the Currency, Federal Reserve Board, and Federal Deposit Insurance Corporation. State laws provided parallel systems of regulation, under state banking commissions, for state-chartered banks.

²All commercial banks in the United States belong to the American Bankers Association (ABA). ABA released its member list for his research.

³At the time of the survey, the total number of very large banks in the United States was 85.

⁴A self-report questionnaire was used to measure all variables in the study. Some microorganizational constructs (e.g., job satisfaction, stress, turnover intentions) are especially susceptible to mono method bias or percept-percept inflation. However, Crampton and Wagner (1994) have shown that constructs at macroorganizational levels (e.g., organizational structure, culture) are relatively free of effect-size bias. As our study focused on constructs at the macroorganizational level, we believe it was less susceptible to mono-method bias.

⁵For questionnaires sent to banks that were parent banks, the second option was omitted because the option of an IS subsidiary at the parent bank offering IS services to the parent bank is subsumed under the first option of maintaining in-house computer operations at the parent bank.

⁶Of the 243 banks, 22 relied on their parent banks for IS services. They were dropped from further analyses. The total number of banks in the final sample was revised to 221, of which 99 were large and 122 were small.

⁷The intercorrelation between IS technical skills and business skills was 0.10, between IS technical skills and computer equipment 0.39, and between business skills and computer equipment 0.24.

⁸A combinatorial problem is present when the number of possible interaction terms increases exponentially as the number of independent variables in the model increases.

⁹As our focus is on the moderator effects of the economic variables on the relationship between institutional influence and IS outsourcing, the main effects of the moderator variables on IS outsourcing are beyond the scope of our paper and are not discussed further.

¹⁰Such symbolic value was evident during one of the researcher's on-site visits to banks during the pilot phase of the study. Banks with in-house IT services were eager to parade their latest in-house technology.

References

- Aiken, L. S. and S. G. West (1991), *Multiple Regression: Testing and Interpreting Interactions*, Newbury Park, CA: Sage Publications.
- American Banker (1988), *Managing Technology: The Impact on the Bottom Line*, American Banker Technology Survey, New York: Bond Buyer, International Thomson Publishing Corporation.
- (1990), *Managing Technology: CEOs Take Charge*, American Banker Technology Survey, New York: Bond Buyer, International Thomson Publishing Corporation.
- (1991), *Computer Power: How Much Is Too Much?*, American Banker Technology Survey, New York: Bond Buyer, International Thomson Publishing Corporation.
- (1992), *Building Networks: Banks Reach Out to Customers*, American Banker Technology Survey, New York: Bond Buyer, International Thomson Publishing Corporation.
- American Bankers Association (1981), *National Operations/Automation Survey*, Washington, DC: ABA Publication.
- (1986), *National Operations/Automation Survey*, Washington, DC: ABA Publication.
- (1990), *National Operations/Automation Survey*, Washington, DC: ABA Publication.
- Anderson, E. and A. T. Coughlan (1987), "International Market Entry and Expansion via Independent or Integrated Channels of Distribution" *Journal of Marketing*, 51, 1, January, 71–82.
- Baer, H. L. and L. R. Mote (1992), "The United States Financial System," in G. G. Kaufman (Ed.), *Banking Structures in Major Countries*, Norwell, MA: Kluwer Academic Publishers, 469–554.
- Bank Administration Institute (1980), *Automation Alternatives for Community Banks*, Park Ridge, IL: Bank Administration Institute.
- Baumol, W. J. (1959), *Business Behavior, Value and Growth*, New York: Macmillan.
- Blau, P. M. and R. A. Schoenherr (1971), *The Structure of Organizations*, New York: Basic Books, Inc.
- Brandon, D. H. and S. Segelstein (1984), *Data Processing Contracts: Structure, Contents, and Negotiation* (2nd Edition), New York: Van Nostrand Reinhold.
- Burns, A. F. (1988), *The Ongoing Revolution in American Banking*, Washington, DC: American Enterprise Institute for Public Policy Research.
- Carmines, E. G. and R. A. Zeller (1979), *Reliability and Validity Assessment*, Sage University Paper Series on Quantitative Applications in the Social Sciences, series no. 07-017, Newbury Park, CA: Sage Publications.
- Cash, J. I., F. W. McFarlan, J. L. McKenney and M. R. Vitale (1988), *Corporate Information Systems Management: Text and Cases* (2nd ed.), Homewood, IL: Irwin Publishing.
- Child, J. (1972), "Organization Structure, Environment, and Performance—The Role of Strategic Choice," *Sociology*, 6, 1, 1–12.
- Crampton, S. M. and J. A. Wagner, III (1994), "Percept-Percept Inflation in Microorganizational Research: An Investigation of Prevalence and Effect," *Journal of Applied Psychology*, 79, 1, 67–76.
- Cronbach, L. J. and P. E. Meehl (1955), "Construct Validity in Psychological Tests," *Psychological Bulletin*, 52, 281–302.
- D'Aveni, R. A. (1994), *Hypercompetition: Managing the Dynamics of Strategic Maneuvering*, New York: Free Press.
- Dearden, J. (1987), "The Withering away of the IS Department," *Sloan Management Review*, 28, 4, Summer, 87–91.
- DiMaggio, P. (1983), "State Expansion and Organizational Fields," in R. H. Hall and R. E. Quinn (Eds.), *Organizational Theory and Public Policy*, Beverly Hills, CA: Sage Publications, 147–161.
- (1988), "Interest and Agency in Institutional Theory," in L. G. Zucker (Ed.), *Institutional Patterns and Organizations*, Cambridge, MA: Ballinger, 3–22.
- and W. W. Powell (1983), "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality," *American Sociological Review*, 48, 2, 147–160.
- Donaldson, L. (1991), "The Ethereal Hand: Organizational Economics and Management Theory," *Academy of Management Review*, 15, 3, 369–401.
- Eisenhardt, K. M. and S. L. Brown (1992), "Organizational Economics Within the Conversation of Strategic Management: A Commentary," in Paul Shrivastava, Anne Huff and Jane Dutton (Eds.), *Advances in Strategic Management*, Greenwich, CT: JAI Press, 157–162.
- Federal Financial Institutions Examination Council (1992), *Electronic Data Processing Examination Handbook* (January), Washington, DC: Board of Governors of the Federal Reserve System, Publication Services.
- Fraser, D. R. and J. W. Kolari (1985), *The Future of Small Banks in a Deregulated Environment*, Cambridge, MA: Ballinger.
- Galaskiewicz, J. and S. Wasserman (1989), "Mimetic Processes within an Interorganizational Field: An Empirical Test," *Administrative Science Quarterly*, 34, 3, 454–479.
- GAO (1992), *Depository Institutions: Contracting Practices with Data Processing Services*, Report to Congressional Committees, U.S. General Accounting Office, GOA/GGD 92–19.
- Gillis, R. A. and M. Biafore (1993), "Evaluating the Outsourcing Option: Panacea or Placebo," *The Bankers Magazine*, 176, 3, (May–June), 10–15.
- Granovetter, M. (1985), "Economic Action and Social Structure: The Problem of Embeddedness," *American Journal of Sociology*, 91, 3, 481–510.
- (1992), "Economic Institutions as Social Constructions: A Framework for Analysis," *Acta Sociologica*, 35, 1, 3–11.
- Hauck, W. W. and A. Donner (1977), "Wald's Test as Applied to Hypotheses in Logit Analysis," *Journal of the American Statistical Association*, 72, 360, Part 1, 851–853.

- Heide, J. B. and G. John (1990), "Alliances in Industrial Purchasing: The Determinants of Joint Action in Buyer-Supplier Relationships," *Journal of Marketing Research*, 27, 1, (February), 24–36.
- Hesterly, W. S., J. Liebeskind, and T. R. Zenger (1990), "Organizational Economics: An Impending Revolution in Organizational Theory?" *Academy of Management Review*, 15, 3, (July), 402–420.
- Hosmer, D. W. and S. Lemeshow (1989), *Applied Logistic Regression*, New York: John Wiley & Sons.
- Huber, R. L. (1993), "How Continental Bank Outsourced Its 'Crown Jewels,'" *Harvard Business Review*, 71, 1, (January–February), 121–129.
- Jensen, M. C. (1989), "Eclipse of the Public Corporation," *Harvard Business Review*, 67, 5, (September–October), 61–74.
- Joskow, P. L. (1988), "Asset Specificity and the Structure of Vertical Relationships: Empirical Evidence," *Journal of Law, Economics, and Organization*, 6, 1, 95–117.
- Kanter, R. M. (1989), *When Giants Learn to Dance*, New York: Simon and Schuster.
- Klein, B., R. Crawford, and A. Alchian (1978), "Vertical Integration, Appropriable Rents and the Competitive Contracting Process," *Journal of Law and Economics*, 21, 2, (October), 297–326.
- Lacity, M. and R. Hirschheim (1993), *Information Systems Outsourcing: Myths, Metaphors, and Reality*, New York: John Wiley & Sons.
- Loh, L. and N. Venkatraman (1992), "Diffusion of Information Technology Outsourcing: Influence Sources and the Kodak Effect," *Information Systems Research*, 3, 4, December, 334–378.
- Mahoney, J. T. (1992), "Organizational Economics Within the Conservation of Strategic Management," *Advances in Strategic Management*, 8, 103–155.
- Markus, L. M. and C. Soh (1993), "Banking on Information Technology: Converting IT Spending into Firm Performance," in Rajiv D. Banker, Robert J. Kauffman, and Mo A. Mahmood (Eds.), *Strategic and Economic Impacts of Information Technology Investment: Perspectives on Organizational Growth and Competitive Advantage*, Middletown, PA: Idea Group Publishing, 364–392.
- Masten, S. E. (1984), "The Organization of Production: Evidence from the Aerospace Industry," *Journal of Law and Economics*, 27, 2, 403–417.
- Meindl, J. R., S. B. Ehrlich, and J. M. Dukerich (1985), "The Romance of Leadership," *Administrative Science Quarterly*, 30, 1, 78–102.
- Meyer, J. W. and B. Rowan (1977), "Institutionalized Organizations: Formal Structure as Myth and Ceremony," *American Journal of Sociology*, 83, 2, 340–363.
- Nohria, N. and R. G. Eccles (1992), *Networks and Organizations*, Boston, MA: Harvard Business Press.
- Nunnally, J. (1967), *Psychometric Methods*, New York: McGraw-Hill.
- OECD (1992), *Banks Under Stress*, Washington, DC: Organizational for Economic Cooperation and Development.
- Office of Technology Assessment (1984), *Effects of Information Technology on Financial Services Systems*, OTA-CIT-202, September, Washington, DC: U.S. Government Printing Office.
- ____ (1987), *International Competition in Services*, OTA-ITE-328, July, Washington, DC: U.S. Government Printing Office.
- Oliver, C. (1991), "Strategic Responses to Institutional Processes," *Academy of Management Review*, 16, 1, 145–179.
- Perrow, C. (1985), "Review Essay: Overboard with Myth and Symbols," *American Journal of Sociology*, 91, 1, 51–155.
- Peter, J. P. (1979), "Reliability: A Review of Psychometric Basics and Recent Marketing Practices," *Journal of Marketing Research*, 16, 1, (February), 6–17.
- Pfeffer, J. and G. R. Salancik (1978), *The External Control of Organizations: A Resource Dependence Perspective*, New York: Harper and Row.
- Pisano, G. P. (1990), "The R & D Boundaries of the Firm: An Empirical Analysis," *Administrative Science Quarterly*, 35, 1, 153–176.
- Powell, W. W. and P. J. DiMaggio (1991), *The New Institutionalism in Organizational Analysis*, Chicago: The University of Chicago Press.
- Price, J. L. and C. W. Mueller (1986), *Handbook of Organizational Measurement*, Marshfield, MA: Pitman Publishing.
- Quinn, J. B. (1992), *Intelligent Enterprise*, New York: Free Press.
- Ross, P. H., J. D. Wright, and A. B. Anderson (1983), *Handbook of Survey Research*, San Diego, CA: Academic Press, Inc.
- Rubin, L. S. (1977), "Universities in Stress: Decision Making under Conditions of Reduced Resources," *Social Science Quarterly*, 58, 2, 242–254.
- Salzman, H. and S. Rosenthal (1994), *Software by Design*, New York: Oxford University Press.
- Scott, W. R. (1995), *Institutions and Organizations*, Thousand Oaks, CA: Sage Publications.
- Spector, P. E. (1992), *Summated Rating Scale Construction: An Introduction*, Sage University Paper Series on Quantitative Applications in the Social Sciences, series no. 07-082, Newbury Park, CA: Sage Publications.
- Steiner, T. D. and D. B. Teixeira (1990), *Technology in Banking: Creating Value and Destroying Profits*, Homewood, IL: Business One Irwin.
- Sutton, R. I. and T. D'Aunno (1989), "Decreasing Organizational Size: Untangling the Effects of Money and People," *Academy of Management Review*, 14, 2, 194–212.
- Thompson, J. D. (1967), *Organizations in Action*, New York: McGraw-Hill.
- Tolbert, P. S. and L. G. Zucker (1983), "Institutional Sources of Change in the Formal Structure of Organizations: The Diffusion of Civil Service Reforms, 1880–1935," *Administrative Science Quarterly*, 23, 1, 22–39.
- Tomasko, R. M. (1987), *Downsizing: Reshaping the Corporation of the Future*, New York: American Management Association.
- Ulrich, D. and J. B. Barney (1984), "Perspectives in Organizations: Resource Dependence, Efficiency, and Population," *Academy of Management Review*, 9, 3, 471–481.
- Van de Ven, A. H. and D. L. Ferry (1980), *Measuring and Assessing Organizations*, New York: John Wiley & Sons.
- Walker, G. and D. Weber (1984), "A Transaction Cost Approach to Make or Buy Decision," *Administrative Science Quarterly*, 29, 3, 373–379.

- Warren, D. L. (1984), "Managing in Crisis: Nine Principles for Successful Transition," in J. R. Kimberly and R. E. Quinn (Eds.), *Managing Organizational Transitions*, Homewood, IL: Irwin, 85-106.
- Whetten, D. (1980), "Organizational Decline: A Neglected Topic in Organizational Science," *Academy of Management Review*, 5, 4, 577-588.
- White, L. H. (Ed.) (1993), *The Crisis in American Banking*, New York: New York University Press.
- Williamson, O. E. (1985), *The Economic Institutions of Capitalism*, New York: Free Press.
- Zucker, Lynne G. (1977), "The Role of Institutionalization in Cultural Persistence," *American Sociological Review*, 42, 5, 726-743.

Accepted by Arie Y. Lewin; received April 8, 1994. This paper has been with the authors for three revisions.

LINKED CITATIONS

- Page 1 of 4 -



You have printed the following article:

Strategic Response to Institutional Influences on Information Systems Outsourcing

Soon Ang; Larry L. Cummings

Organization Science, Vol. 8, No. 3. (May - Jun., 1997), pp. 235-256.

Stable URL:

<http://links.jstor.org/sici?sici=1047-7039%28199705%2F06%298%3A3%3C235%3ASRTIIO%3E2.0.CO%3B2-N>

This article references the following linked citations. If you are trying to access articles from an off-campus location, you may be required to first logon via your library web site to access JSTOR. Please visit your library's website or contact a librarian to learn about options for remote access to JSTOR.

References

The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields

Paul J. DiMaggio; Walter W. Powell

American Sociological Review, Vol. 48, No. 2. (Apr., 1983), pp. 147-160.

Stable URL:

<http://links.jstor.org/sici?sici=0003-1224%28198304%2948%3A2%3C147%3ATICRII%3E2.0.CO%3B2-S>

The Ethereal Hand: Organizational Economics and Management Theory

Lex Donaldson

The Academy of Management Review, Vol. 15, No. 3. (Jul., 1990), pp. 369-381.

Stable URL:

<http://links.jstor.org/sici?sici=0363-7425%28199007%2915%3A3%3C369%3ATEHOEA%3E2.0.CO%3B2-%23>

Mimetic Processes Within an Interorganizational Field: An Empirical Test

Joseph Galaskiewicz; Stanley Wasserman

Administrative Science Quarterly, Vol. 34, No. 3. (Sep., 1989), pp. 454-479.

Stable URL:

<http://links.jstor.org/sici?sici=0001-8392%28198909%2934%3A3%3C454%3AMPWAIF%3E2.0.CO%3B2-Q>

Economic Action and Social Structure: The Problem of Embeddedness

Mark Granovetter

The American Journal of Sociology, Vol. 91, No. 3. (Nov., 1985), pp. 481-510.

Stable URL:

<http://links.jstor.org/sici?sici=0002-9602%28198511%2991%3A3%3C481%3AEAAASST%3E2.0.CO%3B2-R>

LINKED CITATIONS

- Page 2 of 4 -



Wald's Test as Applied to Hypotheses in Logit Analysis

Walter W. Hauck, Jr.; Allan Donner

Journal of the American Statistical Association, Vol. 72, No. 360. (Dec., 1977), pp. 851-853.

Stable URL:

<http://links.jstor.org/sici?sici=0162-1459%28197712%2972%3A360%3C851%3AWTAATH%3E2.0.CO%3B2-K>

Alliances in Industrial Purchasing: The Determinants of Joint Action in Buyer-Supplier Relationships

Jan B. Heide; George John

Journal of Marketing Research, Vol. 27, No. 1. (Feb., 1990), pp. 24-36.

Stable URL:

<http://links.jstor.org/sici?sici=0022-2437%28199002%2927%3A1%3C24%3AAIPTD%3E2.0.CO%3B2-C>

Organizational Economics: An Impending Revolution in Organization Theory?

William S. Hesterly; Julia Liebeskind; Todd R. Zenger

The Academy of Management Review, Vol. 15, No. 3. (Jul., 1990), pp. 402-420.

Stable URL:

<http://links.jstor.org/sici?sici=0363-7425%28199007%2915%3A3%3C402%3AOEAIIRI%3E2.0.CO%3B2-G>

Vertical Integration, Appropriable Rents, and the Competitive Contracting Process

Benjamin Klein; Robert G. Crawford; Armen A. Alchian

Journal of Law and Economics, Vol. 21, No. 2. (Oct., 1978), pp. 297-326.

Stable URL:

<http://links.jstor.org/sici?sici=0022-2186%28197810%2921%3A2%3C297%3AVIARAT%3E2.0.CO%3B2-D>

The Organization of Production: Evidence from the Aerospace Industry

Scott E. Masten

Journal of Law and Economics, Vol. 27, No. 2. (Oct., 1984), pp. 403-417.

Stable URL:

<http://links.jstor.org/sici?sici=0022-2186%28198410%2927%3A2%3C403%3ATOOPEF%3E2.0.CO%3B2-O>

The Romance of Leadership

James R. Meindl; Sanford B. Ehrlich; Janet M. Dukerich

Administrative Science Quarterly, Vol. 30, No. 1. (Mar., 1985), pp. 78-102.

Stable URL:

<http://links.jstor.org/sici?sici=0001-8392%28198503%2930%3A1%3C78%3ATROL%3E2.0.CO%3B2-E>

LINKED CITATIONS

- Page 3 of 4 -



Institutionalized Organizations: Formal Structure as Myth and Ceremony

John W. Meyer; Brian Rowan

The American Journal of Sociology, Vol. 83, No. 2. (Sep., 1977), pp. 340-363.

Stable URL:

<http://links.jstor.org/sici?sici=0002-9602%28197709%2983%3A2%3C340%3AIOFSAM%3E2.0.CO%3B2-3>

Strategic Responses to Institutional Processes

Christine Oliver

The Academy of Management Review, Vol. 16, No. 1. (Jan., 1991), pp. 145-179.

Stable URL:

<http://links.jstor.org/sici?sici=0363-7425%28199101%2916%3A1%3C145%3ASRTIP%3E2.0.CO%3B2-X>

Review: Overboard with Myth and Symbols

Reviewed Work(s):

Organizational Environments: Ritual and Rationality. by John W. Meyer; W. Richard Scott; Brian Rowan; Terrence E. Deal

Charles Perrow

The American Journal of Sociology, Vol. 91, No. 1. (Jul., 1985), pp. 151-155.

Stable URL:

<http://links.jstor.org/sici?sici=0002-9602%28198507%2991%3A1%3C151%3AOWMAS%3E2.0.CO%3B2-M>

Reliability: A Review of Psychometric Basics and Recent Marketing Practices

J. Paul Peter

Journal of Marketing Research, Vol. 16, No. 1. (Feb., 1979), pp. 6-17.

Stable URL:

<http://links.jstor.org/sici?sici=0022-2437%28197902%2916%3A1%3C6%3ARAROPB%3E2.0.CO%3B2-U>

The R&D Boundaries of the Firm: An Empirical Analysis

Gary P. Pisano

Administrative Science Quarterly, Vol. 35, No. 1, Special Issue: Technology, Organizations, and Innovation. (Mar., 1990), pp. 153-176.

Stable URL:

<http://links.jstor.org/sici?sici=0001-8392%28199003%2935%3A1%3C153%3ATRBOTF%3E2.0.CO%3B2-U>

LINKED CITATIONS

- Page 4 of 4 -



Decreasing Organizational Size: Untangling the Effects of Money and People

Robert I. Sutton; Thomas D'Aunno

The Academy of Management Review, Vol. 14, No. 2. (Apr., 1989), pp. 194-212.

Stable URL:

<http://links.jstor.org/sici?sici=0363-7425%28198904%2914%3A2%3C194%3ADOSUTE%3E2.0.CO%3B2-N>

Institutional Sources of Change in the Formal Structure of Organizations: The Diffusion of Civil Service Reform, 1880-1935

Pamela S. Tolbert; Lynne G. Zucker

Administrative Science Quarterly, Vol. 28, No. 1. (Mar., 1983), pp. 22-39.

Stable URL:

<http://links.jstor.org/sici?sici=0001-8392%28198303%2928%3A1%3C22%3AISOCIT%3E2.0.CO%3B2-I>

Perspectives in Organizations: Resource Dependence, Efficiency, and Population

David Ulrich; Jay B. Barney

The Academy of Management Review, Vol. 9, No. 3. (Jul., 1984), pp. 471-481.

Stable URL:

<http://links.jstor.org/sici?sici=0363-7425%28198407%299%3A3%3C471%3APIORDE%3E2.0.CO%3B2-H>

A Transaction Cost Approach to Make-or-Buy Decisions

Gordon Walker; David Weber

Administrative Science Quarterly, Vol. 29, No. 3. (Sep., 1984), pp. 373-391.

Stable URL:

<http://links.jstor.org/sici?sici=0001-8392%28198409%2929%3A3%3C373%3AATCATM%3E2.0.CO%3B2-N>

Organizational Decline: A Neglected Topic in Organizational Science

David A. Whetten

The Academy of Management Review, Vol. 5, No. 4. (Oct., 1980), pp. 577-588.

Stable URL:

<http://links.jstor.org/sici?sici=0363-7425%28198010%295%3A4%3C577%3AODANTI%3E2.0.CO%3B2-Z>

The Role of Institutionalization in Cultural Persistence

Lynne G. Zucker

American Sociological Review, Vol. 42, No. 5. (Oct., 1977), pp. 726-743.

Stable URL:

<http://links.jstor.org/sici?sici=0003-1224%28197710%2942%3A5%3C726%3ATROIC%3E2.0.CO%3B2-1>