

Strategic Alliances:
Form, Autonomy, And
Performance

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Abstract

Industry conditions affect the likelihood of success in using strategic alliances more strongly than whether the venture involves shared-equity (rather than non-equity arrangements) or high operating autonomy. Similarly, industry conditions affect the likelihood of shared-equity ventures and high autonomy more strongly than sponsoring firms' traits or particular combinations of sponsoring firms.

STRATEGIC ALLIANCES: FORM, AUTONOMY, AND PERFORMANCE

Joint ventures are agreements among firms to work together to attain some strategic objective. The United States has seen a virtual explosion in the 1980s in the use of shared-equity joint ventures and other forms of strategic alliance. In a pre-1975 sample of 26 U.S. industries (Duncan, 1980), strategic alliances represented no more than 2 percent of all the U.S. firms or divisions of firms listed (by 4-digit SIC code in the Dun & Bradstreet Million Dollar Directory). By 1985, almost 8 percent of all U.S. firms or divisions of firms in those industries were strategic alliances (Harrigan, 1988; Pate, 1969).

For many firms, strategic alliances have increasingly become a supplement to (if not a replacement for) the role of acquisitions in their diversification strategies. The number of strategic alliances announced in Predicasts' F & S Index of Corporate Change has increased by 6 percent from 1984 to 1985, and increased by 21 percent from 1985 to 1986. A straight-line interpolation of first quarter data for 1987 suggests that the number of joint ventures (and other forms of strategic alliance) will increase by another 21 percent from 1986 to 1987. Strategic alliances have become especially popular within industries where competition has become more challenging (Berg, Duncan & Friedman, 1982; Business International, 1987; Harrigan, 1985b). As firms in increasing numbers of U.S. industries face shorter product lives, economic maturation, deregulation, import competition, and blurring boundaries between

industries that were once technologically distinct, more and more firms are candidates for strategic alliances (Harrigan, 1987; Orski, 1980).

This paper documents how industry conditions affect (1) the form of strategic alliance sponsoring firms embrace, (2) how much operating autonomy their jointly-sponsored venture enjoys, and (3) whether venture success is associated with particular patterns of industry traits, venture form, and operating autonomy. It contrasts the use of shared-equity joint ventures with non-equity forms of strategic alliance.

HYPOTHESES

Profitability Potential. This study of strategic alliances is concerned with the choice of venture form employed -- whether it is a shared-equity form of venture or a non-equity venture -- and whether that form changes within industries of diverse profitability potential. The notion that an industry's structural traits determine its profitability potential draws on a body of research from industrial organization economics (which has been applied to the formulation of corporate strategy by Porter (1980) and many others).

Briefly, we expect that changes in the industry forces that determine an industry's profitability potential will affect (1) whether sponsoring firms will use the shared-equity form of strategic alliance (or a non-equity form), (2) whether they will grant substantial operating autonomy to their ventures (regardless of their ownership form), and (3) whether particular combinations of venture form (and autonomy) are more

successful in particular types of industries than other combinations. We expect these industry forces to affect the choice of venture form and autonomy more strongly than sponsoring firms' traits or particular combinations of sponsoring firms (Harrigan, 1986). Industry forces are also expected to affect the likelihood of success in using strategic alliances more strongly than whether the venture involves shared equity (rather than non-equity arrangements) or high operating autonomy.

Strategic Flexibility. We assume that firms sponsoring strategic alliances will seek to maintain their strategic flexibility as they venture because they are risk-averse (Harrigan, 1985a). Sponsoring firms are expected to prefer the form of strategic alliance that seems to be less risky in light of surrounding industry conditions. (For example, I expect they will prefer highly flexible arrangements when they venture into highly volatile competitive situations. Field interviews with managers who formed strategic alliances suggested that flexibility concerns underlie many firms' decisions concerning which form of venture to employ and how much autonomy to grant them. Implications of these preferences are developed in the hypotheses which follow.)

Sustaining Competitive Advantage. Sponsoring firms are also assumed to want control over their sources of competitive advantage when they venture (Porter, 1985). Their preferences for control are expected to affect the operating autonomy granted to their ventures. (A venture's autonomy determined whether the venture (a) shared physical facilities, personnel, distribution channels, and/or intelligence with one or more of its sponsoring firms, or was in some other way a captive of its sponsors,

or (b) was free to use other market access, other marketing campaigns, outside suppliers (or distributors), outsiders' technical standards or technology, and/or hire personnel from the outside.) In particular, shared-equity joint ventures that parallel (or are closely related to) the activities of sponsoring firms' ongoing business units are expected to enjoy less operating autonomy than shared-equity joint ventures that are less related to sponsoring firms' activities. Because strategic alliances often evolve into "separate" organizational entities, the risk of unintended bleedthrough of sponsoring firms' proprietary knowledge to related ventures is especially high. Because sponsors are assumed to prefer close controls over ventures sharing resources that are critical for successful competition (assets, personnel, information, market access, et cetera), only parallel but non-equity ventures (those where sponsoring firms' employees manage the venture's activities) were expected to enjoy high operating autonomy.

Asymmetries in Sponsors' Relationships with Their Ventures

Asymmetries in Horizontal Linkages with Ventures. Non-equity ventures were expected to be sufficient when both sponsors were horizontally-related to their venture. Non-equity ventures were more likely to reduce the destructive competition that could arise between parallel business units when horizontal ties existed between both sponsors and the venture (Duncan, 1982). Because the threat of jealousies (by sponsoring firms' wholly-owned business units) regarding the venture's activities was expected to be greater between firms that were both horizontally-related to their venture, low operating autonomy was

expected. A negative relationship with venture form and autonomy was expected.

Asymmetries in Vertical Linkages with Ventures. Non-equity ventures were not expected to be sufficient when both sponsors were vertically-related to their venture. Instead, buyer-seller (vertical) relationships between sponsor and venture were expected to increase the need for equity ownership. Because a formal buyer-supplier relationship between sponsors and their venture was more likely to exist where both firms were vertically related to their venture (Blois, 1972; Stuckey, 1982), a positive relationship with venture form was expected; the venture was expected to have low operating autonomy if it provided inputs for (or consumed outputs from) sponsoring firms.

Asymmetries in Relatedness Linkages with Ventures. Relatedness between sponsor and venture was expected to reduce the need for equity ownership. Because the venture was expected to be more likely to generate animosities (between sponsors' wholly-owned business units) where the venture's facilities and activities duplicated those of its sponsors (Wells, 1984), low operating autonomy was expected. A negative relationship with venture form was expected. The greatest venture autonomy was expected where the venture's activities were not related to the ongoing activities of its sponsors.

Partner-to-Partner Relationships

Horizontal Partners. Horizontally-related partners -- those firms engaged in making the same products, serving the same markets, using the same technologies, and engaging in the same kinds of competitive activities -- were expected to be less likely to use shared-equity joint ventures. Their need for shared-equity joint ventures was less because horizontally-related firms were expected to be more likely to be more similar in their outlooks and value decisions more similarly than were partners that were not horizontally-related. Symmetries between sponsoring firms were expected to increase a venture's flexibility (because decisions could be made more frictionlessly in such ventures than where asymmetries were significant). This assumed convergence in decision-making was expected to give such ventures greater competitive flexibility, since it was assumed to allow ventures to reach consensus faster (Ferguson, 1981). Ventures sponsored by competitors were expected to enjoy greater operating autonomy because sponsors' outlooks were assumed to be so similar that less day-to-day negotiation of decisions was expected.

Vertical Partners. Vertically-related partners -- those firms having a buyer-seller relationship with each other -- were also expected to be less likely to use shared-equity joint ventures. Strategic flexibility concerns were assumed to be paramount in this case. Shared-equity joint ventures are more difficult to dissolve if they go awry, and competitive conditions in many industries make the risks of such inflexibility too high to accept any longer. Hence non-equity ventures were

expected to be preferred where sponsoring firms are vertically-related.

Because vertically-related partners were expected to have dissimilar outlooks and to value decisions more differently than sponsoring firms that were not vertically-related (because of the constant tug-of-war between them as buyers and vendors to capture greater profit margins), ventures sponsored by vertically-related firms were expected to have lower operating autonomy. More day-to-day negotiation of operating decisions was expected, especially where the result of cooperation between vertically-related sponsors represented the "bottleneck" step in a vertical chain of processing (Chandler, 1977; Flaim, 1977; Williamson, 1975).

Asymmetries in Sponsors' Attributes

Asymmetries in Sponsors' Nationalities. Ventures sponsored by firms with common national origins were less likely to be shared-equity joint ventures than those formed by sponsoring firms of differing nationalities. Shared-equity joint ventures were expected to be the more attractive venturing to non-U.S. sponsoring firms seeking to make direct investments in the United States. Sponsors with common national origins were expected to grant their ventures higher operating autonomy because their outlooks were assumed to be more homogeneous than those of cross-national alliances.

Sponsoring Firms' Size Asymmetries. Because sponsors of substantially different asset sizes are more heterogeneous in their outlooks,

they were expected to be less likely to form shared equity joint ventures. Because sponsors of substantially different asset sizes are less likely to be able to afford to fund and support their ventures in the same manner, smaller firms risk losing their sources of competitive advantage through shared-equity joint ventures when larger firms raise the ante in funding their venture. Higher venture autonomy was expected because negotiating day-to-day operating decisions between sponsoring firms of great size asymmetries would take so long as to retard the venture's flexibility, hence its effectiveness (Killing, 1983).

Sponsors' Venturing Experience Level Asymmetries. Sponsors of substantially different experience levels in the use of strategic alliances were expected to be more heterogeneous and less likely to form shared-equity joint ventures. Cooperation among sponsors with similar venturing experience levels was expected to increase the venture's operating autonomy because sponsors that were more comfortable with the use of strategic alliances were less likely to second guess each of the venture's decisions.

Industry Dynamics

Changes in Demand Growth. Substantial changes in demand were expected to increase competitive volatility. Shared-equity joint ventures were expected to be too risky to form in such environments. Large changes in demand (and greater competitive volatility) were also expected to reduce the venture's operating autonomy as sponsoring firms kept their ventures closely coordinated to avoid strategic inflexibility.

Changes in the Formality of an Industry's Infrastructure. Substantial structural changes (as an industry evolves from an embryonic one to an established one) in (a) the extent of upstream or downstream vertical integration relationships, (b) extent to which product standards were well-established, and (c) the height of entry barriers leading to a better-established industry structure were expected to reduce the need to form shared-equity joint ventures. Venture autonomy was expected to be low where an industry evolved rapidly from an embryonic infrastructure to a better-established infrastructure as sponsoring firms kept their ventures closely coordinated.

Changes in Competitors' Market Share Concentration. Substantial increases in industry concentration reduce competitive volatility. The emergence of a few leading competitors was expected to encourage the use of shared-equity joint ventures and increase venture autonomy.

Changes in the Pace of Technological Obsolescence. Substantial changes in the rate of technological obsolescence were expected to reduce the attractiveness of shared-equity joint ventures. Rapid technological change increased the difficulty of coordinating a shared-equity joint venture's activities with those of its sponsors. In environments of rapidly-changing technology, non-equity ventures with high operating autonomy (project management organizations) were expected (Gold, 1975).

Changes in the Height of Exit Barriers. Substantial increases in exit barriers -- in the (a) the durability and specificity of physical assets, and (b) the significance of goodwill created by promotional and

advertising investments, for example (Caves & Porter, 1976; Harrigan, 1981) -- decreased an industry's attractiveness. Fewer shared-equity joint ventures were expected in such environments (because they reduce sponsoring firms' strategic flexibility). Less venture autonomy was expected because sponsor and venture must coordinate their activities closely where exit barriers are high to avoid instigating price wars.

Changes in the Relative Importance of Personnel Resources to Value-Added. Substantial increases in the importance of talented personnel to value-creation -- especially in the (a) training and skill levels required of personnel who deal with customers, the (b) importance of product and/or process protection to competitive success, and (c) whether an individual's specific talents added significantly to a product's differentiation -- were expected to increase firms' needs for shared equity joint ventures, including joint ventures with sponsoring firms' entrepreneurial employees. Fears that sponsoring firms would lose their sources of competitive advantage when talented personnel changed jobs were expected to reduce venture autonomy.

Control Variables

The control variables include static estimates of industry conditions -- demand uncertainty, capital intensity, service content of products, customer sophistication, and global markets -- at the time when the venture was formed.

Demand Uncertainty. High demand uncertainty was expected to encourage formation of shared-equity joint ventures in order to reduce demand uncertainties. Because the venture's sponsors were expected to coordinate its actions closely with their own when demand uncertainty was high, a negative relationship with venture autonomy was expected.

Capital Intensity. Technologies using capital-intensive assets were expected to increase formation of shared-equity joint ventures. High venture autonomy was expected because sharing tangible, physical assets was less risky than sharing intangible and easily-appropriated sources of competitive advantage.

Service Content of Products. Formation of shared-equity joint ventures was expected to increase where the coordination needs associated with delivering services of high quality were high. But given the highly-appropriable source of competitive advantage that lies in most service-intensive products, a positive relationship was not expected with venture autonomy.

Customer Sophistication. The presence of highly sophisticated customers was expected to increase formation of shared-equity joint ventures. Autonomy was expected to be high in order for ventures to be flexible enough to satisfy highly-demanding customers.

Global Markets. The presence of diverse geographic markets that accepted standardized products was expected to reduce sponsors' needs to form shared-equity joint ventures. The difficulties of coordinating

actively-involved sponsors' value-creating activities across several geographic boundaries (as would be necessary to pursue aspects of a global strategy) were expected to reduce venture autonomy.

METHODOLOGY

Information about strategic alliances was gathered in three stages: (1) industry vignettes (using archival data); (2) validation and pre-testing (using field interviews); and (3) a three-round delphi-method questionnaire. Hypotheses were tested by studying 895 strategic alliances competing in 23 U.S. industries during the years 1924 to 1985. Although ventures were the unit of analysis, information about venture sponsors was also gathered.

Sample Design. Sample industries were selected according to a taxonomy that was developed from observable traits, including the industries' (1) capital intensity, (2) service content as a proportion of total value-added, (3) pace of technological obsolescence, (4) stage of infrastructure development, (5) product differentiability, (6) customer standardization from one geographic market to another, and (7) growth in unit sales. This design ensured that various features which make industries relatively attractive or unattractive environments for strategic alliances would be represented. These industries included automobiles (3.5% of sample), communications equipment (3.9%), communications services (7.2%), computers and peripherals (4.9%), electronic components (12.1%), engines (4.1%), farm and industrial equipment (1.0%), financial services (8.0%), heavy machinery (3.3%), light machinery (0.6%), medical

products (4.9%), metals fabrication (0.8%), metals processing (1.2%), mining (2.9%), office equipment (4.5%), petrochemicals (14.2%), pharmaceuticals (4.9%), precision controls (3.3%), programming -- firms (0.4%), programming packaging (4.9%), software and databases (2.9%), steel (3.7%), and videotape recorder and videodisc players (2.5%).

Target firms within each industry were selected from announcements of "joint ventures" contained in annual issues of Mergers & Acquisitions and from a special quarterly compilation of "joint venture" announcements contained in the Predicasts' F & S Index of Corporate Change. (Subsequent investigations determined that some of the strategic alliances that were listed as being "joint ventures" did not, in fact, involve shared equity.) Verification yielded 746 announcements of shared-equity joint ventures that were sorted into 52 industry categories. Low response rates eliminated some industries as candidates for further study.

First-stage questionnaires were sent to all sponsoring firms mentioned in connection with a particular venture (regardless of their locations), and yielded usable responses for 559 shared-equity joint ventures. Questionnaires were also sent to sponsoring firms identified with 2,094 non-equity ventures. Helpful managers verified announcements of their strategic alliances and volunteered information concerning additional ventures that had not been announced in either source periodical. Information was gathered for a total of 895 ventures using a three-stage delphi questionnaire. All strategic alliances affected commerce within the United States, regardless of the national origins of each venture's sponsors.

The Delphi Procedure. Estimates of the variables described in Table 1 were obtained and refined from interviews and questionnaires using an

Insert Table 1 about here

iterative, delphi-like procedure (Delbecq, Van de Ven, & Gustafson, 1975; Holmer, 1967). For each round of interviews, estimates generated in the previous round of questions were revised (in light of new information). Estimates concerning each venture were scaled relative to competitors. Initial estimates were developed from materials in the public domain, and initial interviews were primarily face-to-face.

Revised estimates of the variables were obtained through further interviews, telephone conversations, follow-up letters, transcripts, and comments on preliminary drafts of each industry vignette. Informants provided information concerning competitive conditions affecting their own and other ventures in their industries, as well as those affecting firms that sponsored other ventures. Newspaper accounts of changes in the ventures (as well as in competition within their industries), price wars, divestitures, and acquisitions documented the changes in strategic alliances that had occurred over time. Additional interviews with industry participants corroborated my interpretations of these events and relative estimates of the variables.

The delphi procedure allowed me to obtain estimates for variables that are not in the public domain and that firms might not collect routinely. By incorporating the opinions of expert judges, it also

allowed me to refine estimates based upon imperfect information. In this case, the judges included the players -- the managers of ventures and sponsoring firms, executives familiar with the target industries (and sponsoring firms), outside suppliers, outside customers, trade association executives, and industry analysts. Because the target industries were highly diverse, different individuals scaled each industry group using delphi procedures.

Building the Database. Preliminary estimates of each variable for each venture were revised by appropriate judges three times. Each time, they were informed of the average value (and range) obtained from judges on the previous round. As the judges reassessed each variable, they discussed their reasoning (thereby providing additional insights concerning strategic alliances and relationships among parties to them). Respondents often converged in their estimates of the relative rankings of firms along various attributes as the delphi rounds progressed. Since the scalings were constrained to values between 01 and 99 for most variables, problems with heteroscedasticity were reduced and observations could be pooled across industries. (Note also that because the data had been sanitized, disguised, and scaled relative to competitors, confidentiality problems were reduced. None of the informants had access to source files other than their own. They were given average estimates per strategic alliance and were not advised of other judges' identities nor scalings.)

After the verification and initialization stages, estimates were obtained during field interviews from informants at 444 of the target

firms. (Many of these firms formed multiple strategic alliances.) Since a delphi procedure was employed, it was possible to piece together information about them even after firms dropped out of my sample. As in most delphi studies, there was a high decay rate as the rounds progressed. The hundreds of judges who participated in the first round became 129 by round three. All judges scaled ventures in their respective areas of expertise.

Limitations

The many differences among industries in structural traits and competitive behaviors, and the many differences in firms' strategic alliances and their relationships with partners and ventures call for conservatism in the degree of confidence that can be placed in these data. Although great care was taken in conducting the study, delphi is an inherently subjective research methodology and the findings should therefore be interpreted with great caution.

Replicating studies that did not question the same managers whom this study interviewed might obtain different estimates of these variables; however, similar values would be likely to result if the study were repeated with other subjects because managers were advised of their own previous estimates (as well as the average and range of estimates supplied by other respondents in their respective industries) as each round of the delphi inquiry progressed. If different industries were used, different estimates might result, but I would expect the relationships between the industry forces and strategic alliances to be similar.

Dependent Variable Construction

Venture form was shown by a dummy variable indicating whether the strategic alliance involved shared equity (joint venture) or not (non-equity ventures). Venture autonomy was estimated by a scaling (from 01 to 99) indicating whether the venture (a) shared physical facilities, personnel, distribution channels, and/or intelligence with one or more of its sponsoring firms, or was in some other way a captive of its sponsors, or (b) was free to use other market access, other marketing campaigns, outside suppliers (or distributors), outsiders' technical standards or technology, and/or hire personnel from the outside. Venture success was shown by a dummy variable constructed by multiplying sponsor 1's judgement of the venture (where a success was coded as "1") by sponsor 2's assessment. This simple test of mutual satisfaction was used because financial performance measures were not available in many of the strategic alliances examined. (Sponsors often cited non-financial performance criteria when assessing venture performance, especially when evaluating the non-equity ventures.)

Independent Variables: Measurement and Rationale

Sponsor-Venture Asymmetry Variables. Independent variables were constructed as follows: (1) Asymmetries in sponsors' horizontal linkages with their venture were shown using an index, a dummy variable indicating whether sponsor 1 was horizontally-related to the venture multiplied by a dummy variable indicating whether sponsor 2 was horizontally-related to the venture. (2) Asymmetries in sponsors' vertical linkages with their

venture were shown using an index, a dummy variable indicating whether sponsor 1 was vertically-related to the venture multiplied by a dummy variable indicating whether sponsor 2 was vertically-related to the venture. (3) Asymmetries in sponsors' relatedness linkages with their venture were shown using an index, a dummy variable indicating whether the activities of sponsor 1 were related to those of its venture multiplied by a dummy variable indicating whether the activities of sponsor 2 were related to those of its venture.

Partner-to-Partner Variables. (4) Horizontal relationships were shown using a dummy variable indicating whether partners were horizontally-related in a substantial portion of their products, markets, technologies, and competitive activities. (5) Vertical relationships were shown using a dummy variable indicating whether partners were vertically-related (that is, have a buyer-seller relationship with each other) in a substantial portion of their business activities. (6) Asymmetries in sponsoring firm nationalities were shown using an index, a dummy variable indicating whether sponsor 1 was a U.S. firm (indicated by "1" if it was a U.S. firm) multiplied by a dummy variable indicating whether sponsor 2 was headquartered in the United States. (7) Sponsor size asymmetry was estimated by using the absolute value of the difference between a scaling indicating the asset size of sponsor 1 and a similar scaling (from 0 to 99) indicating the asset size of sponsor 2. (8) Sponsors' venturing experience level asymmetry was estimated by using the absolute value of the difference between sponsor 1's number of strategic alliances and sponsor 2's number of strategic alliances.

Industry Dynamics Variables. (9) Changes in demand growth were estimated using the percentage change (from 1971 to 1978 and from 1978 to 1985) in sales growth. (10) Changes in the formality of an industry's infrastructure (as it evolved from an embryonic condition to an established one) were estimated using the percentage change (from 1971 to 1978 and from 1978 to 1985) in formality of industry structure (based on a scaling -- from 01 to 99) -- indicating the (a) extent of upstream and/or downstream vertical integration, (b) height of entry barriers, and (c) extent to which product standards are well-established. (11) Changes in industry-wide concentration were estimated from percentage changes (from 1971 to 1978 and from 1978 to 1985) in market shares of the industry's four largest competitors. (12) Changes in the pace of technological obsolescence were estimated using percentage changes (from 1971 to 1978 and from 1978 to 1985) in the number of years between obsolescing product and/or process innovations. (13) Changes in the height of exit barriers were estimated using the percentage change (from 1971 to 1978 and from 1978 to 1985) in an index scaled from 01 to 99: (a) the durability and specificity of physical assets, and (b) the significance of goodwill created by promotional and advertising investment. (14) Changes in the relative importance of personnel resources to value-added were estimated using the percentage change (from 1971 to 1978 and from 1978 to 1985) in an index scaled from 01 to 99: (a) training and skill levels required personnel who deal with customers, (b) importance of product and/or process protection to competitive success, and (c) whether an individual's specific talents add significantly to a product's differentiation.

Control Variables. (15) Demand uncertainty was estimated using a scaling (from 0 to 99) indicating perceived variability in the growth of unit sales in 1985. Demand uncertainty was considered to be high when there were large variations in yearly volumes shipped to the venture's market segments. (16) Capital intensity was estimated using a scaling (from 0 to 99) indicating the relative proportion of capital-to-labor in the value-creating assets used to serve the venture's customers in 1985. (17) The service content of a venture's products was estimated using a scaling (from 0 to 99) indicating the proportion of the product offering that was a service rather than a manufactured product in 1985. Since the effective delivery of services requires careful coordination between owners and ventures of all parts of a value-adding enterprise, the venture autonomy and service content variable were not used together as independent variables in venture success model specifications. (18) Customer sophistication was estimated using a scaling (from 0 to 99) indicating customers' abilities to discern meaningful differences among vendors' products in the market segments served by a venture. (19) Global markets were estimated using a scaling (from 0 to 99) indicating the extent to which standardized products could be sold successfully to customers in diverse geographic markets.

Table 2 shows the variables' correlations. They possessed a high degree of multicollinearity -- especially with respect to the control

Insert Table 2 about here

and structural change variables. Many researchers represent the gestalt of industry forces as an index (as would be generated using a factor analysis procedure). Since the individual effects of these industry forces were central to this study, the signs and beta coefficients of multiple specifications of each model were presented -- each omitting some collinear variables.

Model Specification

An ordinary least-squares regression model was chosen to estimate the effects of sponsoring firm industry dynamics on venture form, operating autonomy, and success. An alternative treatment of these data could encompass a factor analysis procedure producing scalings that could be used in subsequent regression models. But because the individual contributions of each class of predictor variable (indicated by their standardized beta coefficients) were of interest, the factor analysis procedure (which might create interpretive difficulties) did not seem to be a superior analytical approach.

The model could be stated in the following form:

$$y_i = a_i + b_{ij} + e_i$$

where y_i equals the dependent variables -- venture form, autonomy, or success, respectively. The independent variables, x_{ij} , correspond to a coding scheme where i (equals 1, 2, ..., 3) represents the structural

equation's number, and where j (equals 1, 2, ..., 19) corresponds to the independent variables as numbered in Tables 1 and 2.

RESULTS

Results from the ordinary least squares models are presented in Tables 3, 4 and 5 and discussed in the following sections. Tables 6 and 7 provide additional results for the venture success models that were obtained by testing subsets of the sample.

Venture Form

Asymmetries in Sponsors' Relationships with Their Ventures. The variable denoting asymmetries in sponsors' horizontal links with their ventures is negatively-signed and statistically significant in venture form model 2 of Table 3, suggesting that ventures that are horizontally-

 Insert Table 3 about here

related to both sponsoring firms tend not to be shared-equity joint ventures. The variable denoting asymmetries in sponsors' vertical links to their ventures is positively-signed and statistically significant, suggesting that ventures that are vertically-related to both sponsoring firms do tend to be shared-equity joint ventures. The sponsoring firms' relatedness to their ventures' activities variable is negatively-signed and statistically significant. Results suggest that sponsoring firms with horizontal (or related) ties to their venture avoid destructive

competition with in-house business units by eschewing shared-equity joint ventures.

Partner-to-Partner Relationships. The variable showing partners' horizontal relationships with each other is negatively signed in Table 3, but it is not always statistically significant. The variable showing partners' vertical relationships with each other is negatively-signed, but it is not always statistically significant. Results suggest that partners that are competitors (or have a buyer-supplier relationship) are less likely to form shared-equity joint ventures than partners that do not have these relationships.

Asymmetries in Sponsors' Attributes. The variable denoting ventures where sponsors are all U.S. firms has conflicting signs in Table 3. It is statistically significant when it is positively-signed. The variable denoting asymmetries in sponsors' asset sizes is negatively-signed and statistically significant. The asymmetries in sponsors' venturing experience levels variable is negatively-signed, but it is not always statistically significant. Results suggest that significant differences in sponsors' asset sizes discourage the use of shared-equity joint ventures, as do significant differences in sponsors' venturing experience levels.

Industry Dynamics Variables. In Table 3, the demand growth variable is negatively-signed and statistically significant, suggesting that shared-equity joint ventures are less likely to be used where demand

fluctuates greatly. Results suggest that big swings in the rate of demand growth encourage the use of non-equity ventures -- short-term sourcing arrangements, temporary cross-marketing arrangements, and other highly flexible forms of strategic alliance -- perhaps as stopgap measures until demand growth stabilizes.

The formality of industry infrastructure variable has conflicting signs in Table 3. Recent infrastructure changes are negatively-signed and statistically significant, while earlier infrastructure changes are positively-signed and statistically significant. Results suggest that shared-equity joint ventures are used more frequently where industry infrastructures are formally-developed than in embryonic industries -- where (a) upstream or downstream vertical integration relationships and (b) product standards, for example, are well-established. Shared-equity joint ventures are less likely to be formed while industry infrastructures are still evolving.

The concentration variable is positively-signed in Table 3, but not statistically significant. Industry concentration does not appear to affect the form of strategic alliance that firms embrace. The pace of technological change variable is negatively-signed and statistically significant in Table 3, suggesting that rapid rates of technological change discourage firms from using highly-inflexible forms of strategic alliances such as shared-equity joint ventures.

The height of exit barriers variable is negatively-signed and statistically significant in Table 3, suggesting that recognizable

increases in the height of exit barriers discourage the use of shared-equity joint ventures. Instead, one infers that firms embrace more flexible forms of strategic alliance when exit barriers rise.

The importance of personnel resources in value creation variable has conflicting signs in Table 3. It is statistically significant when the variable is positively-signed. Results suggest that where the contributions of personnel resources to value-added were important (especially during the period before 1978), they encouraged the use of shared-equity joint ventures.

Control Variables. The demand uncertainty variable is positively-signed and statistically significant in Table 3, suggesting that uncertainty encourages formation of shared-equity joint ventures. The services variable has conflicting signs in Table 3. It is positively-signed when the variable is statistically significant, suggesting that shared-equity joint ventures are used more frequently where services constitute a high proportion of product content. The customer sophistication variable has conflicting signs and is not statistically significant. The global markets variable is negatively-signed and statistically significant, suggesting that non-equity ventures are used to increase firms' strategic flexibility where industries are global.

Summary. As the standardized beta coefficients in Table 3 indicate, the industry variables -- global markets, demand uncertainty, changes in demand growth, changes in the pace of technological obsolescence, and others -- offer greater explanatory power in estimating which form of

strategic alliance will be employed than do the sponsor-venture and partner-to-partner variables. Of these latter variables, the asset size asymmetry variable and asymmetries in horizontal (or related) linkages between sponsor and venture variables offer the greatest explanatory power in the venture form models.

Venture Autonomy

Venture Form. In most of the venture autonomy models presented in Table 4, the venture form variable is positively-signed and statis-

Insert Table 4 about here

tically significant, suggesting that shared-equity joint ventures are associated with greater operating autonomy for ventures. Results suggest that shared-equity joint ventures are more free to use other market access, other marketing campaigns, outside suppliers (or distributors), outsiders' technical standards or technology, and/or hire personnel from the outside than are non-equity ventures.

Asymmetries in Sponsors' Relationships with Their Ventures. The variable denoting asymmetries in sponsors' horizontal links with their ventures is negatively-signed and statistically significant in Table 4. The variable denoting asymmetries in sponsors' vertical links to their ventures is negatively-signed and statistically significant. The variable denoting sponsors' relatedness to their ventures' activities is also negatively-signed and statistically significant. Results suggest that

strategic alliances forming ventures that are horizontally- vertically- or otherwise-related to both sponsors decreases operating autonomy.

Partner-to-Partner Relationships. The partners' horizontal relationships with each other variable is positively-signed in Table 4, and statistically significant. The sponsors' vertical relationships with each other variable is positively-signed and statistically significant. Results suggest that venture autonomy increases where partners are competitors or have a buyer-supplier relationship.

Asymmetries in Sponsors' Attributes. The variable denoting ventures where sponsors are all U.S. firms is positively-signed, but not statistically significant in Table 4. The variable denoting asymmetries in sponsors' asset sizes is positively-signed and statistically significant. The variable denoting asymmetries in sponsors' venturing experience levels is negatively-signed and statistically significant. Results suggest that venture autonomy decreases when sponsors are not equally comfortable with the use of strategic alliances.

Industry Dynamics Variables. The changes in demand growth variable is negatively-signed and statistically significant in Table 4. Results suggest that substantial fluctuations in demand reduce the venture's operating autonomy.

The changes in industry infrastructure variable is negatively-signed and statistically significant in Table 4. Results suggest that as the venture's industry evolves from one with an embryonic infrastructure to a

more established infrastructure, the venture loses its operating autonomy and is brought "back into the fold" of its sponsors' operations.

The changes in competitors' market share concentration variable is positively-signed and statistically significant in Table 4, suggesting that the emergence of a few leading competitors reduces competitive volatility (by raising a pricing umbrella over the industry), and increases the venture's operating autonomy. The changes in the pace of technological obsolescence variable is positively-signed and statistically significant in Table 4, reflecting the higher autonomy that should be enjoyed by ventures in fast-paced industries.

The changes in the height of industry exit barriers variable is negatively-signed and statistically significant in Table 4, reflecting the lower operating autonomy that ventures enjoy in competitive settings where the risks of price-cutting are high. The changes in the relative importance of personnel resources to value-added variable is negatively-signed in Table 4 and statistically significant. (Many of the post-1983 ventures were announced in people-intensive industries where the skills and reputation of personnel resources played relatively greater roles in creating value within ventures. Although those results are not shown here, I found that ventures enjoyed greater operating autonomy in such settings.)

Control Variables. The demand uncertainty variable is negatively-signed and statistically significant in Table 4, suggesting that uncertainty is often associated with low venture autonomy. The services variable is negatively-signed and statistically significant, reflecting

that most of the service-intensive businesses in the sample do not enjoy much operating autonomy. The customer sophistication variable is positively-signed and statistically significant, suggesting that ventures enjoyed greater autonomy in order to satisfy highly-demanding customers. The global markets variable is negatively-signed and statistically significant. Results suggest that ventures did not enjoy operating autonomy when they were part of their sponsoring firms' systems for serving global markets.

Summary. As the standardized beta coefficients in Table 4 indicate, the industry variables -- the earlier changes in the pace of technological change, customer sophistication, global markets, service content, changes in industry concentration, exit barrier heights, demand growth, infrastructure formality, and others -- offer the greater explanatory power in estimating venture autonomy than do the sponsor-venture and partner-to-partner variables. Of these latter variables, the venture form, asymmetries in partners' experience levels, asset size asymmetries, and asymmetries in sponsors' horizontal relationships with their ventures variables offer the greatest explanatory power in the venture autonomy models.

Venture Success

Venture Form and Autonomy. In the venture success models presented in Table 5, neither the venture form nor the venture autonomy variables

Insert Table 5 about here

are statistically significant. Results suggest that ventures could be regarded as mutually successful by sponsoring firms whether they were shared-equity joint ventures (or not) and whether the venture enjoys high operating autonomy (or not).

Asymmetries in Partners' Relationships with Their Ventures. The sponsors' relatedness to their ventures' activities variable is positively-signed and statistically significant in Table 5, suggesting that strategic alliances have a greater likelihood of being successful if they are related to sponsors' ongoing activities. This finding is reinforced by the sign and significance of the variable denoting asymmetries in partners' horizontal links with their ventures. The variable denoting asymmetries in partners' vertical links to their ventures is not statistically significant, however.

Partner-to-Partner Relationships. The partners' horizontal relationships with each other variable is positively-signed and statistically significant in Table 5, as is the partners' vertical relationships with each other variable. Results suggest that venture success is more likely where sponsoring firms are competitors or have a buyer-supplier relationship.

Asymmetries in Sponsors' Attributes. The variable denoting ventures where sponsors are all U.S. firms is negatively-signed and statistically significant in Table 5, suggesting that this attribute detracts from the

likelihood of venture success in the United States. The variable denoting asymmetries in sponsoring firms' asset sizes is negatively-signed and statistically significant, suggesting that this attribute also detracts from the likelihood of U.S. venture success. The asymmetries in sponsors' experience levels variable is not statistically significant in Table 5.

Industry Dynamics Variables. The only changes in demand growth variable that is statistically significant is the pre-1978 one. It is negatively-signed, suggesting that significant fluctuations in demand decrease the likelihood of venture success. The changes in the formality of industry infrastructure variable is negatively-signed and statistically significant, suggesting that evolving industry infrastructures decrease the likelihood of venture success. The changes in competitors' market share concentration variable is not statistically significant.

The changes in the pace of technological obsolescence variable is negatively-signed and statistically significant in Table 5, suggesting that environments of rapidly-changing technology decrease the likelihood of venture success. The changes in the height of industry exit barriers variable is not statistically significant. The changes in the relative importance of personnel resources to value-added variable is positively-signed and statistically significant, suggesting that strategic alliances are more likely to be successful in industries where the skills and reputation of personnel resources are important in creating value.

Control Variables. The demand uncertainty, services, global markets, and capital intensity variables are not statistically significant in Table 5. The customer sophistication variable is positively-signed and statistically significant, suggesting that strategic alliances are likely to be successful in environments where customers are highly-demanding.

Summary. The models of venture success in Table 5 have relatively poor predictive power, as is indicated by the models' low standardized beta coefficient values and low corrected R-squares. As the standardized beta coefficients indicate, the vertical partners and asymmetries in sponsors' relatedness with their ventures variables offer the greater explanatory power in estimating venture success than most of the industry variables. Of these latter variables, the earlier changes in the pace of technological change, demand growth, infrastructure formality, and customer sophistication variables offer the greatest explanatory power in the venture success models.

When stepwise regression (maximum R-square improvement) models of venture success were tested using subsets of the sample, as in Tables 6 and 7, different patterns of significant variables were revealed. All

 Insert Table 6 and Table 7 about here

of the models tested using samples stratified by the time of formation and venture form had higher corrected R-square and F-statistic values than those tested for the full sample in Table 5. The venture autonomy

variable becomes statistically significant in the post-1982 and non-equity ventures subsets. Results suggest that autonomous non-equity ventures were generally less likely to be regarded as mutually successful by sponsoring firms, but autonomous ventures formed after 1982 were more likely to be regarded as being successful.

The asymmetries in sponsors' relatedness to their ventures' activities variable is positively-signed and statistically significant in Table 6 for the pre-1975 and in Table 7 for the shared-equity joint venture subsets. The asymmetries in sponsors' horizontal links with their ventures' activities variable is positively-signed and statistically significant for the pre-1975, post-1982, and non-equity venture subsets. The asymmetries in sponsors' vertical links with their ventures' activities variable is positively-signed and statistically significant only for the post-1983 subset. The asymmetries in unrelated diversification variable is negatively-signed and statistically significant for the post-1978 and joint venture subsets, suggesting that strategic alliances have a lesser likelihood of being successful if they are not related to sponsors' ongoing activities.

The partners' horizontal relationships with each other variable is positively-signed and statistically significant in Table 6 for the pre-1975 and in Table 7 for the non-equity venture subsets. The partners' vertical relationships with each other variable is positively-signed and statistically significant for the pre-1975 subset (the time when the greatest number of vertically-related partners formed their ventures) and for both forms of strategic alliance.

The variable denoting ventures where sponsors are all U.S. firms is negatively-signed and statistically significant in Table 6 for all of the post 1978 subsets and in Table 7 for the non-equity venture subset. The variable denoting asymmetries in sponsoring firms' asset sizes is negatively-signed and statistically significant for the pre-1975 and shared-equity joint ventures subset. The asymmetries in sponsors' experience levels variable is positively-signed and statistically significant for all time subsets (most strongly for the post-1983 subset), but for neither venture form subset.

The changes in demand growth variable is positively-signed and statistically significant in Table 6 for the post-1983 subset. Results suggest that significant fluctuations in demand have recently increased the likelihood of venture success. The changes in the formality of industry infrastructure variable is negatively-signed and statistically significant in most subsets, suggesting that evolving industry infrastructures decrease the likelihood of venture success. The changes in competitors' market share concentration variable is negatively-signed and statistically significant for the post-1982 and non-equity ventures subsets. Results suggest that concentrating industry structures decreased the likelihood of venture success.

The changes in the pace of technological obsolescence variable is negatively-signed and statistically significant in Table 6 for the post-1983 and in Table 7 for the non-equity venture subsets. A sinusoidal relationship is suggested for the post-1983 subset, indicating that venture success is especially unlikely in environments of

rapidly-changing technology. The changes in the height of industry exit barriers variable is negatively-signed and statistically significant in the post-1983 subset, suggesting that rising exit barriers decrease the likelihood of venture success. The changes in the relative importance of personnel resources to value-added variable is positively-signed and statistically significant for the post-1978 subsets and for both venture form subsets (albeit with different lag factors). Results reflect the increasing importance of skilled personnel resources in value creation within many industries.

The demand uncertainty variable is statistically significant only in the post-1982 subset. The services variable is statistically significant in the non-equity ventures subset. The global markets variable is statistically significant in the post-1983 subset. The capital intensity variable is statistically significant in each of the time period subsets, but with conflicting signs. Ventures in capital-intensive industries were more likely to be successful if they were formed before 1975. The customer sophistication variable is not statistically significant in the shared-equity joint venture subset.

Three new variables entered the stepwise regression (maximum R-square improvement) models when different subsets were examined -- a variable denoting the timing (relative to the industry's evolution) in forming and terminating strategic alliances, and one indicating the number of venture sponsors. Results suggest that there is a window of opportunity in forming strategic alliances; the negative sign in the post-1978 subset suggests that ventures formed late in an industry's

evolution are less likely to be successful. Results also suggest that ventures with "patient" sponsors are more likely to be regarded as mutually successful; ventures which were given ample time to attain their objectives in the post-1978 subset were more likely to be considered successful, especially if they were shared-equity joint ventures.

CONCLUSIONS

Results from this study suggest that shared-equity joint ventures are more likely to result where (1) sponsoring firms are both vertically-related to the venture, (2) demand for the venture's products is decreasing, and (3) personnel contributions are important to value creation. Venture autonomy is likely to be higher where (1) sponsoring firms are both horizontally-related to each other, (2) industry infrastructures are as yet undeveloped, and (3) technologies change rapidly. Industry variables explained venture form and autonomy choices more strongly than variables describing sponsoring firms' traits, their relationships with their ventures, and relationships with each other.

Results concerning venture success are less clear-cut because the models performed poorly. Results from the full sample suggest that ventures that are related to sponsoring firms' activities are more likely to be successful than those that are unrelated diversifications. Vertically-related partners enjoyed greater venture success than other types of venture sponsors. But when the sample was stratified and stepwise regressions were used to generate the best models, the

sponsor-venture relatedness variables rarely entered (and they were not statistically-significant when they did).

Results suggest that small firms that form shared-equity joint ventures with large firms are inviting disaster. (Similar results are indicated when firms from different national origins do not create shared-equity joint ventures, and this result is strong for the post-1978 subsets.)

Far more industry variables entered the regression models (than sponsoring firm or sponsor-venture relationship variables) when subsets of the sample were tested. Results suggest that most changes in industry conditions decrease the likelihood of venture success. The strongest results suggest that (1) the retention of talented, value-creating personnel is critical for venture success, (2) there is a window of opportunity for creating strategic alliances, and (3) no single venturing strategy remains optimal over time. As industry conditions change, so too must firms' uses of strategic alliances.

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Table 1
Variable Construction and Hypotheses (as They Relate to Venture Form, Autonomy, and Success)

<u>Variable Name</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Expected Sign</u>	<u>Construction</u>	<u>Hypothesis</u>
1. Horizontal Linkages	.4	.5	-	Index: Dummy variable indicating whether sponsor 1 is horizontally-related to venture times dummy variable indicating whether sponsor 2 is horizontally-related to venture.	Non-equity ventures are sufficient when both sponsors are horizontally-related to their venture. Horizontal ties between sponsor and venture reduce venture autonomy.
2. Vertical Linkages	.1	.3	+	Index: Dummy variable indicating whether sponsor 1 is vertically-related to venture times dummy variable indicating whether sponsor 2 is vertically-related to venture.	Non-equity ventures are not sufficient when both sponsors are vertically-related to their venture. Buyer-seller (vertical) relationships between sponsor and venture reduce venture autonomy.
3. Related Linkages	.6	.5	-	Index: Dummy variable indicating whether the activities of sponsor 1 are related to those of its venture times dummy variable indicating whether the activities of sponsor 2 are related to those of its venture.	Non-equity ventures are sufficient when the activities of both sponsors are closely-related to those of their venture. Relatedness between sponsor and venture reduce venture autonomy.

Table 1
Variable Construction and Hypotheses (as They Relate to Venture Form, Autonomy, and Success)

<u>Variable Name</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Expected Sign</u>	<u>Construction</u>	<u>Hypothesis</u>
4. Horizontal Partners	.4	.5	+	Dummy variable indicating whether partners are horizontally-related.	Horizontally-related partners (which are more homogeneous in their outlooks) are less likely to use shared-equity joint ventures, but more likely to grant venture high operating autonomy.
5. Vertical Partners	.3	.4	-	Dummy variable indicating whether partners are vertically-related.	Vertically-related partners (which are more heterogeneous in their outlooks) are less likely to use shared-equity joint ventures and less likely to grant ventures much autonomy.
6. Firm Nationalities	.6	.5	-	Index: Dummy variable indicating whether sponsor 1 is a U.S. firm times dummy variable indicating whether parent 2 is a U.S. firm.	Sponsors with common national origins are less likely to form shared-equity joint ventures but more likely to grant ventures high operating autonomy.
7. Size Asymmetry	20.7	15.8	-	Absolute value of difference between scaling (from 0 to 99) indicating asset size of sponsor 1 and scaling (from 0 to 99) indicating size of sponsor 2.	Sponsors of substantially different asset sizes are less likely to use shared-equity joint ventures, but more likely to grant ventures high operating autonomy.

Table 2

Variable Construction and Hypotheses (as They Relate to Cooperative Strategy Embraced) -- continued

<u>Variable Name</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Expected Sign</u>	<u>Construction</u>	<u>Hypothesis</u>
8. Experience Asymmetry	4.0	4.5	-	Absolute value of difference between sponsor 1's number of strategic alliances and sponsor 2's number of strategic alliances.	Partners of substantially different venturing experience levels are less likely to use shared-equity joint ventures or grant ventures much operating autonomy.
9. Changes in Growth	2.4	8.8	-	Percentage change (from pre-1971 to 1978 and from 1978 to 1984) in sales growth rate.	Substantial changes in demand increase competitive volatility, reduce the attractiveness of shared-equity joint ventures and reduce venture autonomy.
10. Changes in Infrastructure	9.8	8.3	-	Percentage change (from pre-1971 to 1978 and from 1978 to 1984) in the formality of industry structure (based on a scaling -- from 0 to 99 -- indicating (a) extent of upstream and/or downstream vertical integration, (b) height of entry barriers, and (c) extent to which product standards are well-established.	Substantial changes in (a) vertical integration relationships, (b) product standards, and (c) the height of entry barriers leading to a better-established industry structure reduce the need to form shared-equity joint ventures and reduce venture autonomy.

Table 1
Variable Construction and Hypotheses (as They Relate to Venture Form, Autonomy, and Success)

<u>Variable Name</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Expected Sign</u>	<u>Construction</u>	<u>Hypothesis</u>
11. Changes in Concentration	-.89	1.5	+	Percentage change (from pre-1971 to 1978 and from 1978 to 1984) in the market shares of the industry's four largest competitors.	Substantial increases in industry concentration increases the creation of shared-equity joint ventures and venture autonomy.
12. Changes in Technology	1.3	2.6	-	Percentage change (from pre-1971 to 1978 and from 1978 to 1984) in the number of years between obsolescing product and/or process innovations.	Substantial changes in the rate of technological obsolescence reduce the attractiveness of shared-equity joint ventures and increases the difficulty of coordinating venture activities.
13. Changes in Height of Exit Barriers	.14	.3	+	Percentage change (from pre-1971 to 1978 and from 1978 to 1984) in an index: (a) the durability and specificity of physical assets, and (b) the significance of goodwill created by promotional and advertising investments.	Substantial increases in exit barriers decrease formation of shared-equity joint ventures and decrease venture autonomy.

Table 1
Variable Construction and Hypotheses (as They Relate to Venture Form, Autonomy, and Success)

<u>Variable Name</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Expected Sign</u>	<u>Construction</u>	<u>Hypothesis</u>
14. Changes in the Relative Importance of Personnel Resources to Value-Creation	.03	.2	+	Percentage change (from pre-1971 to 1978 and from 1978 to 1984) in an index: (a) training and skill levels required personnel who deal with customers, (b) importance of product and/or process protection to competitive success, and (c) whether an individual's specific talents add significantly to a product's differentiation.	Substantial increases in the importance of talented personnel to value-creation increase firms' needs for shared-equity joint ventures, (including joint ventures with firms' entrepreneurial employees).
15. Demand Uncertainty	53.7	27.7	+	Scaling (from 0 to 99) indicating perceived variability in growth of unit sales from pre-1971 to 1984.	High demand uncertainty increases firms' propensities to form shared-equity joint ventures.
16. Capital Intensity	54.9	21.8	+	Scaling (from 0 to 99) indicating relative proportion of capital-to-labor in value-creating assets.	Capital-intensity (and inflexible assets) increase the attractiveness of forming shared-equity joint ventures.

Table 1
Variable Construction and Hypotheses (as They Relate to Venture Form, Autonomy, and Success)

<u>Variable Name</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Expected Sign</u>	<u>Construction</u>	<u>Hypothesis</u>
17. Products Are Services	29.6	40.1	+	Scaling (from 0 to 99) indicating proportion of product offering which is a service.	The high coordination needs associated with delivering services of high quality increase the need to form shared-equity joint ventures.
18. Customer Sophistication	60.2	24.1	+	Scaling (from 0 to 99) indicating customers' abilities to discern meaningful differences among vendors' products.	Highly sophisticated customers increase the need for the type of close coordination between sponsor and venture associated with shared-equity joint ventures.
19. Global Markets	62.5	40.1	-	Scaling (from 0 to 99) indicating extent to which standardized products can be sold to customers in diverse geographic markets.	The presence of diverse geographic markets that will accept standardized products reduces the attractiveness of shared-equity joint ventures (and shared decision-making) arrangements.

Table 3
Regressions on Venture Form
(Standardized Betas)

	1	2	3	4	5	6
Horizontal Linkages to Sponsors	--	-0.14 ***	--	--	--	--
Vertical Linkages to Sponsors	0.12 ***	0.09 ***	--	--	0.09 ***	--
Related Linkages to Sponsors	--	--	-0.08 **	--	--	-0.14 ***
Horizontally-Related Partners	--	-0.02	--	--	-0.09 ***	--
Vertically-Related Partners	-0.02	-0.12 ***	-0.03	--	--	-0.08 **
Sponsor Nationalities	--	-0.04	.00	--	--	0.08 **
Asset Size Asymmetry	-0.11 ***	-0.15 ***	-0.13 ***	--	-0.10 ***	-0.23 ***
Experience Level Asymmetry	-0.01	-0.04	--	--	-0.05 *	--
Early Changes in Growth	--	--	--	--	-0.18 ***	--
Recent Changes in Growth	-0.12 ***	--	-0.15 ***	-0.18 ***	--	--
Early Changes in Infrastructure	0.06 *	--	0.06 *	0.04	--	--
Recent Changes in Infrastructure	--	--	--	--	-0.17 ***	--
Early Changes in Concentration	-0.02	--	.00	0.02	-0.02	--
Early Changes in Technology	-0.16 ***	--	-0.15 ***	-0.29 ***	--	--
Recent Changes in Technology	--	--	--	--	-0.22 ***	--
Early Changes in Exit Barriers	-0.17 ***	--	--	--	--	--
Early Changes in the Importance of Value-Creating Personnel Resources	--	--	0.01	-0.02	0.08 ***	--
Demand Uncertainty	0.21 ***	0.09 ***	0.17 ***	0.19 ***	0.21 ***	--
Products Are Services	--	-0.02	--	0.11 ***	0.07 *	--
Customer Sophistication	-0.01	0.01	0.03	-0.03	--	--
Global Markets	-0.21 ***	-0.26 ***	-0.24 ***	--	-0.22 ***	--
Intercept	0.00 ***	0.00 ***	0.00	0.00 ***	0.00 ***	0.00 ***
Corrected R-square	0.24	0.19	0.20	0.14	0.26	0.08
F-Statistic (degrees of freedom)	21.31 (882)	18.81 (883)	18.84 (882)	18.35 (886)	26.38 (882)	20.64 (890)
Significance	***	***	***	***	***	***

Mean = .62 (std. dev. = .48)

*** p = .01 ** p = .05 * p = .10

Table 4
 Regressions on Venture Autonomy
 (Standardized Betas)

	1	2	3	4	5	6
Venture Form	--	0.16 ***	0.10 ***	0.23 ***	0.21 ***	--
Related Linkages to Sponsors	-0.14 ***	--	--	-0.02	--	--
Horizontal Linkages to Sponsors	--	--	-0.33 ***	--	-0.12 ***	--
Vertical Linkages to Sponsors	--	--	-0.19 ***	--	--	--
Horizontally-Related Partners	--	--	0.17 ***	--	--	--
Vertically-Related Partners	0.09 ***	--	0.10 ***	0.04	.00	--
Sponsor Nationalities	0.03	--	0.02	--	--	--
Asset Size Asymmetry	--	--	0.19 ***	--	--	--
Experience Level Asymmetry	-0.09 ***	--	-0.20 ***	-0.15 ***	-0.14 ***	--
Early Changes in Growth	-0.04	-0.16 ***	--	--	--	--
Recent Changes in Growth	--	--	--	-0.18 ***	-0.20 ***	-0.21 ***
Early Changes in Infrastructure	--	-0.11 ***	--	-0.14 ***	-0.13 ***	-0.10 ***
Recent Changes in Infrastructure	-0.22 ***	--	--	--	--	--
Early Changes in Concentration	0.01	0.16 ***	--	0.25 ***	0.24 ***	0.22 ***
Early Changes in Technology	--	0.68 ***	--	0.58 ***	0.57 ***	0.56 ***
Recent Changes in Technology	0.44 ***	--	--	--	--	--
Early Changes in Exit Barriers	-0.24 ***	-0.22 ***	--	--	--	--
Early Changes in the Importance of Value-Creating Personnel Resources	-0.08 ***	-0.08 ***	--	--	--	--
Recent Changes in the Importance of Value-Creating Personnel Resources	--	--	--	-0.05 *	--	-0.01
Demand Uncertainty	0.02	-0.10 ***	--	-0.09 ***	-0.10 ***	-0.09 ***
Products Are Services	--	-0.24 ***	--	-0.17 ***	-0.17 ***	--
Customer Sophistication	0.29 ***	0.24 ***	--	0.21 ***	0.22 ***	0.30 ***
Global Markets	-0.23 ***	-0.32 ***	--	--	--	-0.25 ***
Intercept	0.00 ***	0.00 ***	0.00 ***	0.00 ***	0.00 ***	0.00
Corrected R-square	0.42	0.58	0.15	0.49	0.50	0.44
F-Statistic	49.30	107.54	19.57	69.56	78.68	87.83
(degrees of freedom)	(881)	(883)	(886)	(882)	(883)	(886)
Significance	***	***	***	***	***	***

Mean = 35.3 (std. dev. = 24.8)
 *** p = .01 ** p = .05 * p = .10

Table 5
Regressions on Venture Success
(Standardized Betas)

	1	2	3	4	5	6
Venture Form	--	--	--	--	0.03	--
Venture Autonomy	0.06	--	--	0.05	0.07	--
Related Linkages to Sponsors	0.09	--	0.14 ***	0.14 ***	--	--
Horizontal Linkages to Sponsors	--	--	--	--	0.14 ***	--
Vertical Linkages to Sponsors	--	--	--	--	--	0.02
Horizontally-Related Partners	0.09 **	--	--	--	--	0.08 **
Vertically-Related Partners	0.17 ***	--	0.12 ***	0.13 ***	0.17 ***	--
Sponsor Nationalities	-0.07 *	--	-0.08 **	-0.07 *	-0.08 **	-0.07 **
Asset Size Asymmetry	-0.07 **	--	--	-0.09 **	-0.09 **	-0.06
Experience Level Asymmetry	-- **	--	0.03	--	--	--
Early Changes in Growth	--	.00	-0.12 ***	--	--	--
Recent Changes in Growth	-0.01	--	--	-0.02	.00	.00
Early Changes in Infrastructure	-0.10 ***	-0.10 ***	--	-0.11 ***	-0.09 **	-0.09 **
Early Changes in Concentration	-0.05	-0.05	--	-0.04	--	--
Early Changes in Technology	-0.13 *	-0.12 ***	--	-0.11 **	-0.11 **	-0.03
Early Changes in Exit Barriers	--	-0.06	--	--	--	--
Recent Changes in Exit Barriers	-0.04	--	--	--	--	--
Early Changes in the Importance of Value-Creating Personnel Resources	--	0.02	--	--	--	--
Recent Changes in the Importance of Value-Creating Personnel Resources	0.06 *	--	--	0.07 *	--	--
Demand Uncertainty	-0.03	-0.05	--	-0.04	--	-0.05
Products Are Services	0.03	0.02	--	--	--	.00
Customer Sophistication	0.03	0.08 **	--	0.03	--	--
Capital Intensity	--	--	--	--	0.01	--
Global Markets	--	0.01	--	-0.01	0.02	--
Intercept	0.00 ***	0.00 ***	0.00 ***	0.00 ***	0.00 ***	0.00 ***
Corrected R-square	0.07	0.03	0.05	0.07	0.05	0.03
F-Statistic	4.51	2.49	8.59	4.79	4.39	3.18
(degrees of freedom)	(879)	(884)	(889)	(881)	(883)	(885)
Significance	***	***	***	***	***	***

Mean = .45 (std. dev. = .50)
 *** p = .01 ** p = .05 * p = .10

Table 6
 Regressions on Venture Success
 (Standardized Betas)

	(Pre-1975 Subset)		(Post-1978 Subset)		(Post-1982 Subset)		(Post-1983 Subset)	
	1	2	3	4	5	6	7	8
Venture Autonomy	--	--	--	--	0.29 ***	0.06	--	--
Horizontal Linkages to Sponsors	0.15	--	--	--	0.16 **	--	--	--
Vertical Linkages to Sponsors	--	--	--	--	--	--	0.16 *	--
Related Linkages to Sponsors	--	0.13	--	--	--	--	--	--
Unrelated Diversification	--	--	-0.08 *	-0.09 **	--	--	--	--
Horizontally-Related Partners	0.22 *	0.28 ***	--	--	--	--	--	--
Vertically-Related Partners	0.36 ***	0.32 ***	--	--	--	--	--	--
Sponsor Nationalities	--	--	-0.12 ***	-0.13 ***	-0.19 ***	-0.20 ***	-0.32 ***	-0.33 ***
Asset Size Asymmetry	-0.16 **	-0.14 **	--	--	--	--	--	--
Experience Level Asymmetry	0.10	--	0.07 *	--	0.12 *	--	0.27 ***	0.22 **
Early Changes in Growth	-0.13 *	--	--	--	--	--	--	--
Recent Changes in Growth	--	--	--	--	--	--	0.29 ***	0.31 ***
Early Changes in Infrastructure	-0.17 **	-0.20 ***	--	--	--	--	--	--
Recent Changes in Infrastructure	--	--	--	--	-0.33 ***	-0.10 **	--	--
Early Changes in Concentration	--	--	--	--	-0.19 ***	--	--	--
Recent Changes in Concentration	--	--	--	--	--	--	-0.27 **	-0.28 **
Early Changes in Technology	--	--	-0.14 **	--	--	--	0.25 **	--
Recent Changes in Technology	--	--	--	--	--	--	-0.42 ***	-0.28 **
Early Changes in Exit Barriers	--	--	--	0.07	0.30 ***	-0.05 ***	--	--
Recent Changes in Exit Barriers	--	--	--	--	--	--	-0.29 ***	-0.20 **
Early Changes in the Importance of Value-Creating Personnel Resources	--	--	--	--	--	--	--	--
Recent Changes in the Importance of Value-Creating Personnel Resources	--	--	0.13 ***	0.14 ***	0.26 ***	0.16 ***	--	--
Demand Uncertainty	--	--	--	--	--	-0.06 **	--	--
Products Are Services	--	--	--	--	--	--	--	--
Customer Sophistication	-0.27 ***	-0.23 ***	0.12 **	--	-0.33 ***	--	-0.32 ***	--
Capital Intensity	0.12	0.17 **	-0.21 ***	-0.16 ***	-0.23 ***	-0.14 ***	--	-0.23 **

Table 6, continued

	(Pre-1975 Subset)		(Post-1978 Subset)		(Post-1982 Subset)		(Post-1983 Subset)	
	1	2	3	4	5	6	7	8
Global Markets	--	--	--	--	--	--	0.15	--
Timing in Formation	--	--	-0.31 ***	-0.31 ***	--	--	--	--
Timing in Termination	0.13 *	--	0.49 ***	0.50 ***	--	--	--	--
Number of Partners	--	--	0.07 *	--	--	--	--	--
Intercept	0.00 ***	0.00 ***	0.00 ***	0.00 ***	0.00 ***	0.00 ***	0.00 ***	0.00 ***
Corrected R-square	0.31	0.28	0.11	0.10	0.17	0.12	0.25	0.18
F-Statistic	6.39	8.22	6.93	8.42	4.83	4.74	3.39	3.32
(degrees of freedom)	(142)	(145)	(548)	(551)	(234)	(237)	(101)	(104)
Significance	***	***	***	***	***	***	***	***
Mean	0.54	0.54	0.45	0.45	0.50	0.50	0.55	0.55
Standard Deviation	(.50)	(.50)	(.50)	(.50)	(.50)	(.50)	(.50)	(.50)

*** p = .01 ** p = .05 * p = .10

Table 7
Regressions on Venture Success (Standardized Betas)

	(Joint Venture Subset)		(Non-Equity Subset)	
	1	2	3	4
Venture Autonomy	--	--	-0.37 ***	--
Horizontal Linkages to Sponsors	--	--	--	0.21 ***
Related Linkages to Sponsors	0.11 ***	0.16 ***	--	--
Unrelated Diversification	-0.10 **	--	--	--
Horizontally-Related Partners	--	--	0.24 ***	--
Vertically-Related Partners	0.14 ***	0.14 ***	0.19 ***	0.18 ***
Sponsor Nationalities	--	--	-0.17 ***	-0.18 ***
Asset Size Asymmetry	-0.12 ***	-0.10 **	--	--
Early Changes in Infrastructure	-0.14 ***	-0.12 ***	-0.12 *	--
Recent Changes in Concentration	--	--	-0.39 ***	-0.16 *
Recent Changes in Technology	--	--	-0.26 ***	-0.28 ***
Recent Changes in Exit Barriers	-0.10 **	--	--	--
Early Changes in the Importance of Value-Creating Personnel Resources	-0.11 **	--	0.14 ***	0.13 **
Recent Changes in the Importance of Value-Creating Personnel Resources	0.15 ***	0.10 **	--	--
Products Are Services	-0.12 ***	--	0.25 ***	0.26 ***
Customer Sophistication	--	--	0.12 **	--
Timing in Formation	--	-0.10 **	--	--
Timing in Termination	0.15 ***	0.25 ***	--	--
Intercept	0.00 ***	0.00 ***	0.00 ***	0.00 ***
Corrected R-square	0.13	0.10	0.18	0.15
F-Statistic	8.29	9.21	6.98	7.95
(degrees of freedom)	(548)	(551)	(325)	(328)
Significance	***	***	***	***
Mean	0.46	0.46	0.44	0.44
Standard Deviation	(.50)	(.50)	(.50)	(.50)