CONTRACTUAL COMPLEXITY IN STRATEGIC ALLIANCES

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Abstract

In contrast to prior studies examining strategic alliances as discrete structural alternatives, we investigate their contractual features. A focus on the contractual provisions that firms use permits a more fine-grained understanding of alliance design than is allowed by current taxonomies of collaborative agreements. The analysis examines the dimensionality of the contractual complexity construct and uses transaction cost theory to understand the determinants of firms' adoption of different contractual provisions for their collaborative agreements.

Short title: Alliance contracts

Keywords: alliance design; contracts;

INTRODUCTION

Although contractual forms and governance structures both shape economic exchanges, they serve different purposes. While the former specify the allocations of rights, responsibilities, risks, and rewards, the latter can be seen more broadly as institutional modes (Williamson, 1979) that establish the context of exchange through a "system of rules plus the instruments that serve to enforce the rules" (Furubotn & Richter, 1997: 5). Indeed, a focus on discrete governance structures in strategy research has contributed important insights into the efficiency implications of choices such as partnering versus acquiring, outsourcing versus vertical integration, and engaging in foreign direct investment versus licensing. James (2000) suggests, however, that previous studies relying on transaction cost theory to study the mechanisms of governance are sometimes limited in implying that contractual forms are necessarily governed by one structure or in testing alternative contractual forms based on the type of governance structure that exists. To the extent that multiple contractual alternatives exist across different governance structures, it is plausible that there is not a one-to-one mapping between contractual form and governance structure, the relationship between governance and control is more complicated than often depicted in prior research, and contract and governance have different antecedents.

One of the consequences of not separating contract from governance is a useful, yet simplified, depiction of increasing managerial control as one moves from market-mediated to internalized exchange along the governance continuum. For instance, equity alliances are viewed as conferring greater control than non-equity alliances due to the introduction of incentive alignment through shared ownership and the presence of a joint board (e.g., Hennart, 1993; Chi, 1994). In reality, however, significant contractual heterogeneity may exist within these discrete governance structures. In our case, although some non-equity alliances do involve contracts that are comparatively simple, others have numerous and stringent provisions embedded in them that afford parties more control over resources.

In this paper, we separate contract from governance by examining the incidence and drivers of various contractual provisions used by firms in the design of their strategic alliances.

In particular, we examine contract complexity which we treat as a characteristic of contracts that captures the number and stringency of the provisions included in a contract. A contract with many, highly stringent provisions is more complex than one with few, less stringent provisions. One related but different characteristic is contractual completeness, which captures both term specificity and contingency adaptability (Luo, 2002). While contract complexity is a feature of the contract as such, contract completeness is relative to the attributes of the transaction that is contracted. For instance, a contract governing a simple transaction may not be complex, but yet complete.

Our study extends previous research on the economics of contracts, which tends to examine contracts in one of two ways. Some studies investigate contractual complexity in very global terms by assessing summary indicators such as the length of a contract (e.g., Joskow, 1988) or the degree to which parties designed clauses in anticipation of future contingencies (e.g., Macneil, 1978). Other studies examine contractual provisions in a particularistic fashion by assessing individual terms such as territorial restraints in licensing agreements (e.g., Mueller & Geithman, 1991), up-front fees and royalty rates in franchising agreements (e.g., Lafontaine, 1992), or contract duration in supply agreements (e.g., Joskow, 1987) while divorcing these specific terms from other, potentially related features of contracts. Our first purpose in this paper is to investigate the degree to which contractual complexity is a multidimensional rather than a unidimensional construct as assumed in prior research. We do so by collecting and exploring primary data on firms' usage of eight different provisions ranging from notification and auditing rights to obligations concerning proprietary information to clauses for termination.

In doing this, our study also advances research on strategic alliances and work on contracts in the strategy literature. Whereas the literature on alliance design emphasizes the selection of an archetypal alliance structure (e.g., Killing, 1983; Hennart, 1988; Hamel, 1991) managers have considerably more latitude in designing collaborative agreements to allocate responsibilities, monitor operations, and control resources. Assessing alliances in a more fine-grained fashion through the contractual provisions that managers have at their disposal therefore

offers the potential of understanding alliance design better and ultimately offering more detailed guidance to managers seeking to build collaborative agreements.

We also contribute to the alliance literature by examining the theoretical determinants of contractual complexity, which constitutes our second purpose in this paper. The scant work on alliance contracts looks at how contract characteristic explain or relate to other alliance traits or outcomes (Parkhe, 1993; Deeds and Hill, 1998; Reuer and Ariño, 2002). Only recently researchers have focused on alliance contract characteristics as an effect to be explained (Luo, 2002; Ryall and Sampson, 2003). Yet, contract design entails significant costs (Ring, 2002), and it is important to understand under what conditions it is worth for companies to bear them. In developing hypotheses on the antecedents of contractual complexity in alliances, we extend recent strategy research that has examined the implications of contractual complexity (e.g., Poppo & Zenger, 2002; Reuer & Ariño, 2002). In this respect, our study parallels recent research that has begun to examine conditions under which firms make different types of transaction-specific investments rather than viewing asset specificity as a purely exogenous variable (Bensaou & Anderson, 1999).

In the next section, we consider the purposes of contractual provisions in alliances and use transaction cost theory to explain conditions under which alliance contracts will be more or less complex. A subsequent section describes the survey we administered as well as the multivariate techniques used to model alliance contracts. After a presentation of the study's results, a section on the study's implications concludes.

THEORY AND HYPOTHESES

Although strategy research typically applies transaction cost theory *across* governance structures to investigate the relative efficiency implications of market, hybrid, and hierarchical governance, we apply this theory *within* governance structures to address the contractual provisions that firms use to manage their exchange relationships. The basic proposition that stems from this theory as applied to the economics of contracts is that greater contractual safeguards will be warranted as the risk of opportunistic behavior increases. These contractual

provisions can be costly to negotiate, monitor, and enforce, yet these costs are efficient for firms to bear when the safeguards act to reduce the costs and performance losses from exchange hazards such as hold-up, moral hazard, and resource appropriation (e.g., Macneil, 1978; Heide, 1994). As the risk of opportunistic behavior falls, however, the costs of negotiating, monitoring, and enforcing contracts that are more complex may be avoided by relying upon comparatively simple contracts (e.g., Joskow, 1987).

This proposition closely parallels the fundamental notion of discriminating alignment as applied across governance structures, which asserts that efficiency is enhanced when the mechanisms of governance and transactional attributes are appropriately aligned (Williamson, 1991). More specifically, when excessive safeguards and other governance mechanisms are put in place for relatively simple transactions, partners bear the effects of bureaucracy in the form of additional governance costs, whereas insufficient safeguards and other governance mechanisms can result instead in firms' heightened exposures to exchange hazards. Firms therefore trade off governance costs on the one hand with the threat of opportunism on the other. In the subsections that follow, we identify several conditions that are likely to influence the threat of opportunistic behavior and the costs of contracting.

The actual contents of alliance contracts may serve several important functions in managing exchange hazards. As one example, parties to an alliance use the contract to set forth their mutual rights and obligations through the specification of inputs to the alliance, processes by which exchanges will occur and any disputes will be resolved, and expected outputs from the joint undertaking. The alliance contract establishes the scope of the collaboration as well as a division of labor by detailing partners' individual roles and responsibilities. It also lays out constraints and obligations external to the alliance proper. For instance, before the alliance is operational, firms can limit information disclosures and, during the operation of the alliance, the contract may specify how the parties will interact with third parties, whether other divisions of the firms, alternative suppliers, or the court system. The contract can also specify the way in which the alliance will end, firms' subsequent claims on intellectual property, and possible

limitations on firms' competitive and hiring practices through noncompete and nonsolicitation agreements, respectively. As discussed below, such functions of alliance contracts can be useful in mitigating exchange hazards such as hold-up, moral hazard, and resource appropriation.

Transaction-Specific Investments

Prior research on the complexity of contracts argues and finds that asset specificity is an important contractual attribute affecting contract design (e.g., Joskow, 1988). When asset specificity is low, resources can be readily deployed to other relationships or businesses, and partner identity is not important (Klein, Crawford, & Alchian, 1978; Williamson, 1991). Because the partner is not in a position to attempt to hold-up the firm, the firm also has no incentive to bear the costs associated with building a more complex contract in an effort to stabilize the relationship. However, when a firm makes transaction-specific investments in an alliance, the partner can threaten to terminate the alliance, which would result in the firm giving up the value of specialized assets. Faced with such threats, managers must therefore weigh the value losses they would experience from hold-up behavior with the additional costs of negotiating safeguards into their alliance contracts *ex ante*. As the potential value loss increases with investments in specific assets, managers will find it beneficial to negotiate more complex contracts to cover the consequences of breach and termination as well as the processes by which such threats will be handled (Dyer, 1997; Poppo and Zenger, 2002). For example, partners can specify rights to first refusal on a joint venture's shares, ownership on intellectual property, the means by which an alliance will be terminated, a buyout price on the alliance, and so forth. By specifying the consequences of breaches to the agreement or termination, parties can exchange hostages that promote the continuance of the collaborative agreement. Firms can also spell out in the alliance contract the processes by which disputes will be resolved internally or adjudicated by third parties (e.g., Williamson, 1983). The additional costs of building such provisions intthe alliance contract will be justified for alliances involving a greater threat of opportunistic behavior due to transaction-specific investments. Therefore:

Hypothesis 1: The contractual complexity of an alliance will be positively related to asset specificity.

Prior Ties

Although the threat of opportunism will be a function of the particular attributes of the alliance in question, it can also be shaped by firms' prior collaborative histories with one another. For example, transaction cost research that considers the functioning of relational contracts suggests that repeated exchanges between firms induce cooperation since the possibility of breaking off relations serves as a self-enforcing sanction (e.g., Telser, 1980). Firms that invest in relationships with new partners, by contrast, support these relationships with formal contractual provisions instead and rely upon a well-functioning court system for enforcement (Johnson, McMillan, & Woodruff, 2002).

Management research suggests two distinct mechanisms through which successive collaborative relationships between firms can reduce behavioral uncertainty and therefore enable firms to avoid the costs of designing more complex alliances. First, previous work has emphasized that trust emerges from successive collaborative relationships between firms and substitutes for more elaborate governance. Gulati (1995), for instance, shows that firms with prior collaborative agreements tend to choose nonequity alliances over equity alliances (c.f., Oxley, 1997). In an analysis of Japanese automakers' networks, Dyer (1997) suggests that these firms have lower transaction costs than their U.S. counterparts because they engage in repeated exchanges. Goodwill trust is an efficient substitute to formal contractual provisions because the firms have already invested in relationship building and have borne set-up costs, which would need to be incurred for alternative safeguards (e.g., Klein, 1980). Related evidence from buyer-supplier relations confirms that interorganizational trust allows firms to economize on negotiation costs (Zaheer, McEvily, & Perrone, 1998). In sum, repeat alliances present less adverse selection problems in partner choice (Oxley, 1997), and pose less moral hazard concerns (Gulati, 1998) than first time alliances because a partner's behavior is more predictable, as is its competence for delivering the expected contributions (Ring, 2002).

Second, prior strategic alliances between firms can lead to the development of interorganizational routines, which can also reduce behavioral uncertainty as well as allow firms to avoid the costs of detailing mechanisms for monitoring and coordination (Gulati, 1998; Zollo, Reuer, & Singh, 2002). As firms enter into successive collaborative agreements with each other, partners develop a better understanding of each other's procedures, management systems, cultures, and so forth. The mutual understanding that develops can help firms mitigate coordination, conflict resolution, or information gathering problems that formal contractual provisions can otherwise address. Parkhe (1993) shows that partners' cooperative history reduces coordination efforts and compliance costs; in turn, these diminish the need for contractual safeguards. When the parties share a history of frequent exchange in which promises have been fulfilled, contract negotiation costs are lower (Ring, 2002). Dyer and Singh (1998) similarly suggest that the relationship-specific knowledge that develops from frequent and intense partner interactions builds a firm's relational capabilities, which can enhance the efficiency of alliances. Whether prior strategic alliances between firms enhance the development of interorganizational trust and/or routines, such prior collaborative relationships can be helpful in reducing behavioral uncertainty and allowing firms to avoid the costs of more complex collaborative agreements. We therefore predict:

Hypothesis 2: The contractual complexity of an alliance will be negatively related to the number of prior alliances between the partners.

Time Boundedness

Partners' choices relating to the contractual design of a strategic alliance will not only reflect their history of collaboration with each other, but also their expectations for the alliance's future since such expectations shape the costs of incorporating more complex provisions into an alliance contract as well as the threat of opportunistic behavior. Although previous research often does not trace out the implications of partners' expectations for the future, important differences exist across collaborative agreements that are open-ended in duration and alliances that are designed to operate for a pre-specified length of time (e.g., Williamson, 1991). We

develop the argument that the presence or absence of such time bounds on collaborative agreements will affect the contractual complexity of alliances because of the impact firms' future expectations have on both the cost of contracting and the threat of opportunistic behavior.

Strategic alliances that are designed to operate for a pre-specified length of time will tend to be subject to lower levels of market uncertainty than alliances with open-ended durations. For time-bound alliances, partners are better able to anticipate different future states and efficiently specify their duties and rights under these different states (e.g., Noldeke & Schmidt, 1995). Because partners have negotiated explicit time bounds on their alliances, they are also more likely to be cognizant of closely related concerns covered in alliance contracts such as ownership of proprietary technology, disclosures of confidential information, and the alliance's termination. For collaborative agreements in which firms place no bounds on the duration of the alliance, however, it can be costly to predict future economic conditions and craft contractual provisions that provide appropriate responses. The need for contractual adaptation is greater in unpredictable environments (Luo, 2002). As a result of these transaction costs, firms tend to rely on incomplete contracts under these circumstances (Crocker & Reynolds, 1993).

The presence or absence of time bounds on alliances can affect not only the cost of contracting, but also the threat of opportunism. As emphasized in the transaction cost literature on self-enforcing contracts, in open-ended alliances the potential gains from future collaboration provide a safeguard against opportunistic behavior designed to capture more proximate payoffs (Telser, 1980). Hill (1990) suggests that opportunism is viable if the future is *not* important to the provoker. Parkhe (1993) shows that long time horizons decrease uncertainty regarding potential opportunism; in turn, this diminishes the need for complex contracts. By contrast, time-bound alliances do not have the same shadow of the future and do not support a tit-for-tat equilibrium of cooperation that can keep opportunism in check (Axelrod, 1984). As a consequence, it is more difficult for the collaborative agreement to be self-enforcing, and formal contractual provisions may be required to safeguard the strategic alliance. Taken together, the arguments above suggest that alliances designed to operate for a pre-specified length of time are

more likely to involve greater contractual complexity than alliances with open-ended durations because time-bound alliances involve lower costs of negotiating more detailed contracts and are also subject to a greater threat of opportunistic behavior.

Hypothesis 3: The contractual complexity of an alliance will be greater for time-bound alliances than open-ended collaborative relationships.

Strategic Importance of the Alliance

Finally, we expect that strategic alliances that are more strategically important to the firm will justify the additional costs of more complex contracts. Several decades ago, the prototypical alliance was a joint venture by a multinational corporation (MNC) into a developing country, involving a one-way transfer of technology from the MNC to the local affiliate. The MNC may have formed the joint venture outside the firm's core business, and the firm likely invested in the alliance primarily, if not solely, for the purposes of accessing the local market and responding to a local government's restrictions on foreign direct investment (e.g., Stopford & Wells, 1972). Given the peripheral nature of many of these investments, exchange hazards were unlikely to have a large impact on the organization and its competitiveness.

Increasingly, however, alliances are between actual or potential competitors, involve two-way knowledge transfers, have global market aspirations, and rely on considerably more complex deal structures in terms on the number of partners or auxiliary collaborative agreements (e.g., Hagedoorn, 1993; Gomes-Casseres, 1996). As a reflection of these changes, firms are adopting a more disciplined means of formalizing alliance procedures for selecting partners and negotiating collaborative agreements (e.g., Harbison & Pekar, 1998) and are implementing positions or functions dedicated to forming strategic alliances (e.g., Kale, Dyer, & Singh, 2002). Partners are therefore more exposed to the hazards such alliances pose (Koza & Lewin, 1998; Singh & Mitchell, 1996), which include the risk of having a competitor appropriate key strategic resources (Khanna, Gulati, & Nohria, 1998; Branstetter & Sakakibara, 2002). Firms are therefore justified in bearing additional costs to clarify rights and obligations concerning the scope of the alliance (Borys & Jemison, 1989), ownership claims on proprietary technology

provided to or created during the alliance, and the management of the alliance's termination. In light of these risks, managers will also have an incentive to detail the ways in which strategically important alliances will be monitored and any disputes that arise will be resolved as the alliance evolves (Ring & Van de Ven, 1994; Doz, 1996). Additionally, strategically important alliances tend to involve more complexity (Hagedoorn, 1993). Reaching agreement for establishing mutual consent is more costly in complex deals (Ring, 2002). The strategic importance a firm places upon an alliance reflects the firm's attitude and commitment to it (Deeds and Hill, 1998). The more valuable the contributed resources, the more protracted contract negotiations will be (Ring, 2002). This implies that managers will be more willing to dedicate the additional resources that negotiating a complex contract entails when it refers to a strategically important alliance. We therefore hypothesize:

Hypothesis 4: *The contractual complexity of an alliance will be positively related to its strategic importance.*

METHODS

Data

Sample. In order to identify a population of collaborative agreements to target for this study, we used Funk and Scott's (F&S) Countries Index – Europe to find Spanish firms forming strategic alliances. This data source provides brief entries on corporate news, which is gathered from trade journals, major business newspapers, business magazines, special reports, and publications issues by government agencies, industry associations, and independent organizations. The data collection was carried out in 1994 and focused on alliances formed between 1986-1992, which corresponds to the period between Spain's admission to the European Community in 1986 and the establishment of the Single European Market in 1992. Thus, the selected time period could be expected to present significant alliance activity by firms due to the opportunities and threats posed by the opening of markets and increased competition. This focus on Spanish firms' alliances also facilitated the follow-up process as one of the authors lives in

Spain, thereby increasing the odds of obtaining a satisfactory response rate. We identified firms engaging in 674 dyadic alliances, but due to financial considerations, we focused the data collection efforts on industries more active in alliances. According to the F&S Countries Index, the industries most active in alliance formation included energy (i.e., petroleum and electricity), chemical and allied products, machinery expect electric, electronic equipment, transportation and equipment, communications, and financial and other services. This search yielded a target population of 436 alliances formed by 346 firms.

Questionnaires were sent out to the firms in which a key informant directly related to the alliance could be identified. Alumni from the MBA or executive program of the author who lives in Spain were asked to determine the manager in the firm most familiar with the alliance. In those companies with no alumni, cold calls were made to executives listed in the Dun and Bradstreet Directory. Of the 189 surveys mailed, 91 responses were obtained, representing a 48 percent response rate. The high response rate may be attributed to the steps taken to locate appropriate respondents, the follow-up procedure of making supplemental phone calls (Dillman, 1978), and guarantees of confidentiality and access to the study's findings. Six firms reported on two alliances, two firms reported on three alliances, and the other firms reported on a single alliance. Of the six firms reporting on two alliances, the same key informant responded on four of the alliances. Of the two firms reporting on three alliances, in one case the key informant responded on all of the alliances, and in the other case one person answered two questionnaires. In order to determine if the presence of multiple alliances affected the results, we randomly chose one alliance per firm and obtained the same multivariate findings as those presented below. In the same way, we randomly chose one respondent per firm, and the interpretations presented below continued to hold. An open-ended question was asked to determine the position of the key informant, and we obtained a range of answers ranging from CEOs to divisional VPs to a Director of Marketing. In order to determine whether the status of key informants influenced the results, we conducted two-sample t-tests and chi-square tests for the continuous and categorical variables used in our study, respectively, and did not find any systematic

differences in responses across general and functional managers. As a further check on this issue, we also determined that the inclusion of a control variable for respondent status did not change our results and was itself insignificant.

As an illustration of the competence and appropriateness of key informants, 91 percent were involved since the formation of the collaborative agreement, and on average respondents had been involved with the alliance for 4.9 years. Because reliance on key informants offered the best way to elicit accounts of alliance design due to the confidential nature of alliance contracts and the lack of such information in secondary sources, we took several steps in an attempt to reduce errors in retrospective accounts (e.g., Huber & Power, 1985; Miller, Cardinal, & Glick, 1997). These included carefully identifying the most knowledgeable respondent, motivating respondents to provide accurate information by offering our results to them, removing disincentives to respond accurately by ensuring that the responses will be kept confidential, providing explanations for the survey items, and using pre-tested and structured questions. Usable data were available for 88 strategic alliances.

Survey instrument. Preliminary versions of the questionnaire were reviewed by business scholars to ensure face validity. The survey was then translated into Spanish and reviewed by two Spanish-speaking researchers. The translated survey was pre-tested with six Spanish executives experienced in managing alliances, and several changes were made after the pre-testing stage. The final Spanish version was then reverse translated into English by a person unfamiliar with the study, and there was a high degree of correspondence between the Spanish and English versions.

We performed a number of tests to assess the validity of the data. First, to examine the data's external validity, we examined secondary data provided by the Sistema de Análisis de Balances Ibéricos (SABI) database for information corresponding to the survey items. In particular, we assessed whether or not the responding firm is state-owned and whether the partner firm is a Spanish company, a subsidiary, or a foreign company, and we found matches for 98 and 96 percent of the cases, respectively.

Second, in order to assess potential nonresponse bias, we tested for possible differences between early and late respondents, under the assumption that late respondents are more similar to non-respondents than early respondents are to non-respondents (Armstrong & Overton, 1977). In particular, we tested for differences in firm size based on number of employees, and we examined the sectoral distribution of alliances. A one-way analysis of variance (ANOVA) for firm size across early and late respondents yielded an insignificant F-value of 0.67. Chi-square values comparing the sectoral distribution of alliances for early and late respondents as well as for respondents and non-respondents were similarly insignificant (i.e., 8.54 and 13.52, respectively), again providing no evidence of response bias.

Finally, although our dependent variables are objective indicators of the contractual provisions that firms put into their alliance agreements, we addressed the possibility that consistency artifacts and common methods bias may influence our models. Beyond arranging questionnaire items so that subjective items appear prior to questions on the contractual design and governance of alliances (e.g., Salancik & Pfeffer, 1977), we used Harman's (1967) single-factor test to assess whether a significant amount of common variance exists in the data (e.g., Podsakoff & Organ, 1986). Unrotated factor analysis using the eigenvalue-greater-than-one criterion revealed four factors, and the first factor explained only 21.0 percent of the variance in the data, indicating that the findings cannot be attributed to common methods bias.

Model Specification and Measures

Contractual complexity. In contrast to prior economics research that examines very global measures of contractual complexity such as contract length (e.g., Joskow, 1988) or examines individual contractual terms, we utilized a series of indicators of contractual provisions, which lend themselves to aggregated analysis as well as more disaggregated modeling of alliance contracts. The provisions which we focus on were developed in a study by Parkhe (1993). Specifically, he developed a checklist of contractual safeguards obtained from a computer-assisted search of the legal literature (e.g., Macneil, 1978, 1981; Narasimhan, 1989; Practicing Law Institute, 1986) and documented the following eight provisions: (1) periodic

written reports of all relevant transactions, (2) prompt written notice of any departures from the agreement, (3) the right to examine and audit all relevant records through a firm of CPAs, (4) designation of certain information as proprietary and subject to confidentiality provisions of the contract, (5) non-use of proprietary information even after termination of agreement, (6) termination of agreement, (7) arbitration clauses, and (8) lawsuit provisions. These different types of alliance safeguards are arrayed in increasing order of strength or severity, so a weighting scheme for the stringency of contractual provisions can be adopted to arrive at a global measure of contractual complexity, as follows:

(1) Contractual complexity (weighted) = $\frac{1}{36}\sum_{i=1}^{8} D_i$,

where D_i equals i if the ith provision was employed, and zero otherwise (Parkhe, 1993). In other words, D_i equals one if the first provision was employed, zero otherwise; two if the second provision was employed, zero otherwise; and so on. The summation term therefore ranges from 0 to 36, and the division by 36 yields a measure ranging from zero to one. When the variable takes on a value of zero, none of the eight provisions listed above are in place. When the variable assumes its maximum value of one, all of the eight provisions appear in the alliance agreement.

It is worth noting that the use of this proxy for contractual complexity can effectively be seen as a joint test for the weighting scheme employed and for the unidimensionality of the contractual complexity construct. As a consequence, in order to explore the robustness of our results and in an attempt to address explicitly these auxiliary assumptions, two additional types of analysis were performed. First, we constructed the multivariate models using an unweighted measure of contractual complexity as the dependent variable. This alternative measure tests whether the weighting scheme matters by examining if the effects of the individual covariates remained the same when the contractual provisions were instead assumed to be equivalent in stringency. This measure for contractual complexity was calculated as follows:

(2) Contractual complexity (unweighted) = $\sum_{i=1}^{8} X_i$,

where X_i equals 1 if the ith provision was employed, and zero otherwise. The summation ranges from zero to eight, and specifications reliant on this dependent variable were estimated using ordered logit models.

In order to examine whether the effects of the theoretical variables vary across the eight individual provisions, one could estimate eight separate models for these indicator variables and use a multivariate probit model to exploit potential correlations in the disturbances in order to enhance the efficiency of the estimates. As a practical matter, however, this modeling approach requires more statistical power than we have with our sample, and one of our objectives is to test explicitly whether contractual complexity should be considered a unidimensional or multidimensional construct rather than only rely on either completely aggregated or completed disaggregated models.

In order to do this, we first used exploratory factor analysis to examine the correlations among the contractual provisions. A problem arises, however, because the contractual provision dummies violate the assumption of multivariate normality in standard factor analysis. While prior studies often have factor analyzed such discrete data, one can calculate an appropriate matrix of tetrachoric correlations, which can be used as an input into factor analysis. Tetrachoric correlation analysis essentially uses data in 2x2 contingency matrices to arrive at estimates of the Pearson correlations that one would obtain had the variables been continuous, bivariate normal, and linearly related (e.g., Drasgow, 1988). In the case of each of the eight provisions, partners have a range of alternatives in designing these provisions by using particular terms to specify alliance safeguards. In the case of alliance termination, for instance, a recent contract we reviewed had a full seventeen pages devoted to this issue, covering terms such as the specification of a call option and the establishment of a holding company, a put option held by a partner, preemption rights on assets, tag-along and drag-along rights for a minority investor, and conditions surrounding the transfer of shares and the assignment of the contract.

The tetrachoric correlations among the eight contractual provisions were calculated as follows: if a, b, c, and d represent the number of observations in the cells of a 2x2 contingency

matrix, and x_1 and x_2 represent latent variables defining a two-dimensional space, then the tetrachoric correlation is the correlation r that satisfies:

(3) $$\frac{a}{N} = \int_{-\infty}^{z_2}\int_{-\infty}^{z_1}\phi(x_1, x_2, r)dx_1dx_2,$$

where N is the total number of observations, $\phi(x_1, x_2, r)$ is the bivariate normal p.d.f., and z_1 and z_2 are the cutoff values that divide the two-dimensional space into four quadrants whose probabilities equal the probabilities in the four cells of the 2x2 matrix (similar equalities are specified for the relative frequencies $\frac{b}{N}$, $\frac{c}{N}$, and $\frac{d}{N}$). The tetrachoric correlation can be found through various approximation techniques, such as the cosine-pi formula, graphic estimates, or iterations using the tetrachoric expansion series to approximate the bivariate normal integral (see Brown, 1977 for numerical solution techniques). For our application, we used the POLYCHOR macro (v1.2) in SAS to estimate the matrix of tetrachoric correlations for the eight indicators of contractual provisions in strategic alliance agreements.

Explanatory variables. The first variable that we included in the multivariate models to test H1 is *Asset specificity*, which was constructed as an unweighted index based on four indicators, each of which were measured on a five-point scale ranging from negligible to substantial: "Our investment in dedicated personnel specific to this venture is…," "Our investment in dedicated facilities specific to this venture is…," "If we decided to stop this venture, the difficulty we would have in redeploying our people and facilities presently serving the venture to other uses would be…," and "If this venture were to dissolve, our non-recoverable investments in equipment, people, etc. would be…" (e.g., Anderson & Weitz, 1992). The Cronbach alpha for this index is 0.74, suggesting that it demonstrates satisfactory reliability (Nunnally, 1978). In an unrestricted factor analysis, these items loaded on a single factor with an eigenvalue of 2.21 based on the eigenvalue-greater-than-one criterion, and the factor loadings for the items were 0.75, 0.82, 0.67, and 0.72, respectively.

The variable we used to test H2, *Prior ties*, captures previous collaborative relationships between the two parties. We measured prior ties as the number of prior alliances between the

firms (Gulati, 1995). As a check on the robustness of the results for this measure, we also constructed the prior ties measure as a dummy variable to indicate the presence or absence of prior alliances. Moreover, in order to capture the history of collaboration between the firms, we measured the variable as the years the firms had been previously collaborating. In both cases, however, the same interpretations held as presented below.

The measure used to test our third hypothesis is an indicator of whether or not parties put explicit time bounds on the collaborative agreement. Respondents were asked whether or not the agreement was meant to last a definite length of time at the time the contract was signed. The variable *Time bound* was coded 1 for contracts that specified a duration to the alliance, and 0 for contracts for which the duration of the collaboration was open-ended.

Finally, to test the fourth hypothesis, we included a variable to reflect the strategic importance of the alliance (i.e., *Strategic importance*). Respondents were asked to indicate on a five-point scale the importance of gaining competitive advantage through the collaborative agreement when the alliance contract was signed. The measure ranged from a value of one for 'minimal' to 5 for 'vital.' We sought to examine this measure's validity by constructing a scale for the importance of specific strategic goals, which included eight different potential objectives for the alliance (e.g., Contractor & Lorange, 1988): reducing costs, gaining access to a market in the same industry, gaining access to a market in another industry, developing new technologies, blocking the competition, meeting government requirements, developing new skills, and reducing risks. This multi-item scale led to the same interpretations as the single item in the multivariate analyses and was highly correlated with our measure for the strategic importance of the alliance ($r=0.54$, $p<0.001$).

Control variables. In order to account for potential confounds to the theoretical relationships of interest, we included three important control variables into the model specifications. First, we incorporated a control for firm size because for larger firms a given alliance may be less relevant to the firm's strategy and the investments made more redeployable to other operations (i.e., *Firm size*). Moreover, smaller firms may lack the experience, slack

resources, or staff to craft more sophisticated alliance agreements. Respondents were asked to indicate the number of employees in their firm on a 7-point scale. Second, we included a control for cross-border alliances for several reasons. There may be enforceability concerns or legal barriers to negotiating specific provisions into international alliances. However, less information tends to be known about foreign firms than domestic firms, character-based trust tends to emerge between firms that are socially similar (Zucker, 1986), and behavioral uncertainty is apt to be greater for cross-border alliances. The variable *Foreign* assumes a value of 1 if the partners are from different countries, and 0 otherwise. Finally, we introduced a control to indicate whether the alliance was a nonequity or equity agreement since the greater controls attributed to equity alliances may substitute for those contained in alliance contracts. However, equity alliances may also tend to be associated with larger commitments, more complex collaborations, and other exchange hazards that our other covariates do not fully capture. Introduction of this control also deals with the possibility that some provisions may be better suited to the establishment of a separate business entity or to a purely contractual interface between firms. *Equity* takes on a value of 1 for equity alliances, and 0 for nonequity, or purely contractual, agreements.

Model specification. The basic structure of the different models, which test the factors associated with the degree of contractual complexity in strategic alliances, is as follows:

$$\text{(4) Contractual complexity} = \beta_0 + \beta_1\text{Asset specificity} + \beta_2\text{Prior ties} + \beta_3\text{Time bound} + \beta_4\text{Strategic importance} + \beta_5\text{Firm size} + \beta_6\text{Foreign} + \beta_7\text{Equity} + \varepsilon.$$

In the results section that follows, we present three types of models. First, results are presented for ordered logit models relying upon an unweighted measure of contractual complexity as the dependent variable. Second, results appear for OLS models using a weighted measure of contractual complexity as the dependent variable. Finally, results are offered for OLS models for the underlying dimensions of contractual complexity, as determined by the exploratory factor analysis of tetrachoric correlations among the eight contractual provisions. These different models allow conclusions to be drawn about whether the inclusion or exclusion of stringency

weights matter in modeling contracts and whether or not treating contractual complexity as a unidimensional construct potentially masks the effects of the theoretical variables on the ways in which firms design alliance contracts.

RESULTS

Figure 1 presents the distribution of the unweighted measure of contractual complexity. The mean number of provisions put into alliance contracts is 3.7, or slightly less than half of the eight types of provisions in the survey. The figure also indicates that the modal number of contractual provisions is five, and approximately eleven and eight percent of firms have either zero or all of the provisions in their contracts, respectively. The relatively uniform distribution of the provisions highlights the heterogeneity of alliances' contractual forms.

Table 1 provides the relative frequencies for each of the individual contractual provisions. It also presents Chi-square tests and two-sample t-tests to examine whether the proportions of contractual provisions employed by firms or the global measures of contractual complexity vary systematically across nonequity and equity alliances. The most used provision is arbitration clauses (55%), followed by termination clauses (53%), and the least used provision concerns lawsuits between the parties (30%). With only one exception, the usage of these individual contractual provisions does not vary across equity and nonequity alliances. However, firms tend to negotiate auditing rights into contracts in 82 percent of the equity alliances, whereas their usage drops to only 26 percent for nonequity alliances ($p<0.001$). This is consistent with the establishment of a separate business entity in the case of equity alliances.

The relatively uniform and frequent utilization of the eight contractual provisions by firms engaged in interfirm cooperation also suggests the possibility that the individual provisions might often be bundled. Table 2 provides relative frequencies of the contractual provisions, conditional upon the focal provision listed in the first column appearing in the alliance contract. Given differences in the usage of the various contractual provisions, the table also indicates asymmetries in the matrix. In other words, the relative frequency of provision i given that provision j is in the contract often differs from the relative frequency of provision j given that

provision i is in the contract. In the last column, the table indicates the mean unweighted count of the provisions (not including the focal provision) when a particular provision appears in an alliance contract. This value provides an indicator of overall contractual complexity when the focal provision is in place.

Examining each of the columns for maximum and minimum values provides an indication of when a contractual provision tends to be used together with, or separate from, other provisions. For example, the relative frequency of provision four – confidentiality provisions – is as high as 84 percent when restrictions are placed on proprietary information (i.e., provision five) and as low as 50 percent when parties make commitments concerning auditing rights (i.e., provision three). The fact that the conditional relative frequencies in all of the columns are greater than the relative frequencies appearing in Table 1 is suggestive of complementarities among the various contractual provisions.

The data patterns largely confirm the increasing order of stringency of the eight contractual provisions (Parkhe, 1993) if one assumes that firms tend to add contractual items in increasing order of stringency. For example, the usage of the first provision – rights of reports of relevant transactions – is above the mean of 0.46. Conditional upon this provision being used, the mean unweighted count of 3.58 is below the average of 4.31, indicating that contracts tend to be less complex when this provision appears in alliance agreements. Moving toward the opposite extreme, the eighth provision – lawsuit provisions – occurs much less frequently (29.5%), but when it is used, alliance contracts tend to be significantly more complex, as demonstrated by the mean unweighted count of 5.31 (versus an average of 4.31). If the mean unweighted counts are rank-ordered and compared with the ordering of the contractual provisions as presented in the table, the Spearman rank correlation coefficient is 0.69 ($p<0.001$). The most notable exception to this rank ordering is the provision for alliance termination. This provision appears in alliance contracts relatively frequently (53.4%), but when it appears alliance contracts are comparatively less complex, as indicated by the mean unweighted count of 4.02.

In order to explore further the bundling of contractual provisions in collaborative agreements as well as the dimensionality of the contractual complexity construct, we factor analyzed the matrix of tetrachoric correlations for the eight indicators of contractual provisions (see Tables 3 and 4). The matrix in Table 3 provides the estimated correlations among the contractual provisions. Because this technique can produce estimated correlations that are larger than the Pearson correlations among latent variables, a conservative test is implied for the use of exploratory factor analysis to detect multiple dimensions of contractual complexity for these eight contractual provisions. Table 4 provides the results of a principal components factor analysis after varimax rotation. Factors were retained if their corresponding eigenvalues exceeded one. Together, the two factors that were retained explained 69.1 percent of the variance in the data. Communalities generally exceeded 0.50, with the exception of the first provision – rights to reports of relevant transactions – which had a communality of 0.49, indicating that the two factors capture a significant portion of the variance in each of the eight indicators.

Although the interpretation and labeling of factors is a matter of judgment, there are two noteworthy findings from this analysis. First, the provisions load on the two factors in accordance with their order of stringency. The first three contractual provisions load on a distinct factor, and the last five contractual provisions load on a separate factor. None of the provisions load in a manner inconsistent with their ranked stringency.

Second, it appears that the two factors deal with different types of alliance safeguards. In the case of the first factor, provisions loading highly on this factor are concerned with confidentiality, proprietary information, alliance termination, arbitration, and lawsuits. These provisions deal with concerns about the partner's behavior outside the alliance itself, such as the use of information outside of the scope of the alliance, the ending of the collaborative agreement, and the use of outside parties to resolve disputes. We labeled this factor "partner control provisions." The second factor, by contrast, relates more directly to the monitoring of the collaborative agreement *per se*. Variables loading highly on this factor include rights of reports

for relevant transactions, notification rights for departures to the agreement, and auditing rights. We labeled this factor "operations control provisions."

Table 5 presents descriptive statistics and a correlation matrix for the variables comprising the multivariate models. The average number of prior alliances between partners was 0.52, and the number of prior collaborative agreements ranged from zero to twelve. 19.8 percent of the firms had a prior alliance with each other. The majority of the sampled alliances were cross-border collaborations (i.e., 85%), and firms rated collaborations with foreign partners as being strategically more important than domestic collaborations ($p<0.01$). Roughly half of the collaborative agreements were equity alliances (i.e., 43%), and roughly half of the sample alliances had a pre-specified duration (i.e., 47%). Of those alliances that were time-bound, the average specified duration was 4.9 years. Consistent with prior research on alternative alliance governance structures (e.g., Oxley, 1997; Pisano, 1989), equity-based alliances were used over nonequity collaborations when firms make transaction-specific investments to the alliance ($p<0.01$).

Table 6 presents the results of the multivariate analyses. Models 1 and 2 are estimated using order logit models since the dependent variable, Contractual complexity (unweighted), is discrete (i.e., as given by Equation 2 above). Models 3 and 4 rely on the weighted measure of contractual complexity (i.e., as given by Equation 1 above), and are therefore estimated using OLS. In contrast to Models 1-4, which examine contractual complexity using aggregate analyses, the remaining models examine specific dimensions of contractual complexity, as determined by the exploratory factor analysis. Models 5 and 6 consider antecedents of the partner control provisions, using the scores from factor one as the dependent variable. Similarly, Models 7 and 8 assess the determinants of the operations control provisions for alliance monitoring by using the factor scores from factor two as the dependent variable. Models 1, 3, 5, and 7 serve as baseline models by incorporating the control variables alone. Models 2, 4, 6, and 8 augment the baseline models with the theoretical covariates. A likelihood ratio test indicates

the joint significance of these theoretical variables in Model 2 ($p<0.01$), and hierarchical F-tests reveal that the four theoretical variables are jointly significant in Models 4 ($p<0.01$), 6 ($p<0.001$), and 8 ($p<0.05$).

Our first hypothesis predicted that contractual complexity will be greater for alliances involving transaction-specific investments. The results in Models 2 and 4 provide support for this prediction. The greater the transaction-specific investment in an alliance, the greater the number and stringency of contractual provisions built into the alliance contract (both $p<0.05$). Alliances with assets that more are readily redeployed to other uses, however, tend to rely on fewer contractual provisions. The disaggregate analysis suggest that firms use the more stringent, partner control provisions as asset specificity increases, but the presence or absence of transaction-specific investments has no apparent bearing on the usage of weaker contractual provisions designed for monitoring the alliance's operations.

Our second hypothesis followed prior literature arguing that prior ties can substitute for formal safeguards in alliance contracts. This hypothesis did not receive support in the aggregate analyses, but the differing effects of this variable in Models 6 and 8 suggest that such aggregate treatment of contractual complexity may mask the true influence of prior collaborative relationships. This result reinforces the finding of the factor analysis that contractual complexity should be considered a multidimensional construct. Specifically, prior alliances between firms lead them to specify fewer provisions relating to the monitoring of the alliance ($p<0.05$ in Model 8), but have no bearing on the commitments firms make to each other in terms of the provisions concerning confidential information, proprietary technology, alliance termination, and the adjudication of disputes by third parties.

A similar observation may be made with respect to the influence time bounds have on contractual complexity. Consistent with the predictions of H3, alliance agreements with specified durations will tend to rely more heavily on the partner control provisions ($p<0.05$). However, it is also apparent that the specification of durations for strategic alliances lessens the

usage of operations control provisions for alliance monitoring ($p<0.05$ in Model 8). The findings for the control variables confirm the bivariate result that auditing rights also tend to be more relevant for equity alliances involving a separate business entity rather than a purely contractual interface between collaborators.

Finally, the complexity of strategic alliance contracts reflects the strategic importance of alliances. Consistent with H4, the results in Models 2 and 4 demonstrate that the greater the strategic importance of an alliance, the more complex the alliance contract is in terms of the number and stringency of contractual provisions (both $p<0.01$). The results for Models 6 and 8 suggest, however, that the strategic importance of alliances shapes the usage of the most stringent provisions in alliance contracts, but has no impact on firms' adoption of the weakest provisions for alliance monitoring. It is also worth noting that the diminished significance of the cross-border indicator, as well as the significant correlation between this variable and the alliance's strategic importance, indicates that strategic importance, rather than partner identity *per se*, is more relevant as a factor influencing the design of alliance contracts.

DISCUSSION

Our study underscores the theoretical and practical importance of separating contractual forms from governance structures. In the empirical context of strategic alliances, the findings reveal that contractual complexity varies a great deal from one alliance to another, and these differences are not captured well by the equity/nonequity dichotomy that has been used in prior research on hybrid organizational forms. In fact, for seven out of the eight contractual provisions studied, significant differences in usage are not observed across equity alliances and nonequity alliances. More importantly, our results suggest that alliance governance structures and contractual forms have unique determinants. We draw upon transaction cost theory to identify some of the key theoretical determinants of the choices firms make when designing their alliance contracts, and we find that asset specificity indeed influences both governance structure as well as the complexity of alliance contracts. However, we also show that while transaction-specific investments stimulate the adoption of the most stringent provisions concerning confidential

information, proprietary technology, alliance termination, and the adjudication of disputes by third parties, transaction-specific investments are not related to other contractual provisions that firms have at their disposal. By contrast, prior research has found that previous collaborative relationships between firms affect alliance governance (Gulati, 1995), yet we find that such collaborative relationships have an influence only on the least stringent provisions that firms use to monitor alliances. Taken together, these results challenge prior research that either implies contractual forms are governed by one structure or tests alternative contractual forms based on the type of governance structure that exists. There is not a simple mapping between contractual form and governance, the relationship between governance and control is more complicated than is often depicted in prior studies, and contractual forms and governance structures appear to have different antecedents.

Concerning the broader literature on the economics of contracts, our analysis is responsive to Poppo and Zenger's (2002) call for research on the specific provisions managers institute into contracts rather than relying upon global measures of contractual complexity. By examining eight types of contractual provisions, our study first examined the implications of alternative weighting schemes for the stringency of provisions. In our investigation of the bundling of contractual provisions, the results provided validation for prior orderings for the stringency of the eight provisions (Parkhe, 1993). However, the stringency-weighted and unweighted indexes of contractual complexity are highly correlated ($r=0.97$, $p<0.0001$) and therefore yield equivalent results in the multivariate models. This suggests that weights for stringency do not provide new information when modeling alliance contracts.

By examining the eight different types of contractual provisions, we were also able to explore the dimensionality of the contractual complexity construct. We noted that prior research either tends to examine contractual complexity in very global terms by assessing summary indicators such as the length of a contract (e.g., Joskow, 1988) or in a particularistic fashion by assessing individual terms divorced from other features of contracts. The results of our factor analysis highlight the value of an intermediate approach. Specifically, the findings show that

neither is the contractual complexity construct unidimensional nor are many indicators of specific provisions required. The multivariate findings echo the need for more disaggregated treatments of contracts by illustrating that the effects of the theoretical variables are masked in aggregate models of contractual complexity, yet their effects become more clear in models that separate the more stringent provisions for firms' commitments external to the alliance itself from the weaker provisions dealing with alliance monitoring.

As one example, we find that prior collaborative relationships between partners have no impact on the global measures of contractual complexity, but such prior alliances reduce the usage of provisions designed to facilitate alliance monitoring. This result is consistent with the view that prior relationships between firms can enhance trust as well as develop interorganizational routines (Zollo, Reuer, & Singh, 2002). However, prior collaborative relationships between the firms have no effect on the institution of provisions relating to confidential information, proprietary technology, termination of the alliance, and reliance on third parties to adjudicate disputes. If trust tends to be lacking for alliances between new exchange partners and more developed for alliances between familiar partners, it is surprising that new exchange parties are no more likely to put such safeguards into their alliance agreements. This result might reflect lower contracting costs for parties with prior alliances. Firms with repeat alliances may avoid some contractual negotiation costs by incorporating into the contract some clauses already included in other mutual contracts. Ryall and Sampson (2003) show that when firms are engaged in multiple alliances with the same partner some "boilerplate" or common terms, such as arbitration clauses, are identical between alliance contracts, and Ring (2002) makes a similar argument on boilerplate provisions. Alternatively, this result might indicate the possibility that firms refine their contractual arrangements as trust develops (e.g., Poppo & Zenger, 2002). Because the measure for prior collaborative relationships captures the effects of trust as well as interorganizational routines, it would be desirable in future research to obtain more direct measures for these constructs coming from different theoretical traditions.

As an additional indication of the relevance of treating contractual complexity as a multidimensional construct, we found that time bound alliances are more likely to be supported by some contractual provisions, but less likely to rely on others. Specifically, firms forming time-bound alliances are more likely to craft alliance agreements that include provisions for confidential information, proprietary technology, the termination of the alliance, and dispute resolution by third parties, which relate to partner control. This result is consistent with managers' desire to design alliances as transitional mechanisms, the lack of a shadow of the future in time-bound collaborations (Parkhe, 1993), and the greater ease of predicting relevant contingencies (Luo, 2002). However, firms are less likely to adopt contractual provisions relating to the monitoring of alliances that have pre-specified durations, which may reflect diminished expectations for adjustment cycles or changes in partners' strategic priorities (Zajac & Olsen, 1993; Ring & Van de Ven, 1994).

Beyond the research suggestions offered above, we see several avenues for additional work on contracts in general and the design of alliances in particular. First, extensions could examine the generalizability of our findings in several ways. It would be worthwhile to investigate whether the same or similar dimensions of contractual complexity are evident for other types of contracts and whether a multidimensional treatment of contractual complexity would change the findings in prior studies of the economics of contracts. Research is also needed on the contractual design of alliances in different countries to examine potential bounds on the generalizability of our results due to Spain's regionalization processes or its legal or cultural environment.

Second, there are opportunities to probe more deeply into each of the provisions we have studied to provide managers with a more fine-grained understanding of alliance design issues. In addition, the design of alliance contracts is only one element of building strategic alliances, so additional research is needed on how other decisions (e.g., organizational structure, partner selection, etc.) relate to contract design.

Third, as we have relied on efficiency arguments and the corresponding reduced-form models that are characteristic of research on the mechanisms of governance, our paper is ultimately silent on the performance or other implications of contractual design in alliances. For instance, one of the key objectives of firms entering alliances is to enhance their flexibility, so attention could be given to whether flexibility losses or other drawbacks accompany greater complexity in alliance contracts. A more complete model, therefore, would incorporate both the causes and consequences of contractual complexity before normative implications may be drawn with confidence. Research in these directions may prove helpful in advancing the theory of the firm by distinguishing governance structures and contractual forms and in moving beyond current taxonomies of alliances to capture the richness of firms' alliance design choices.

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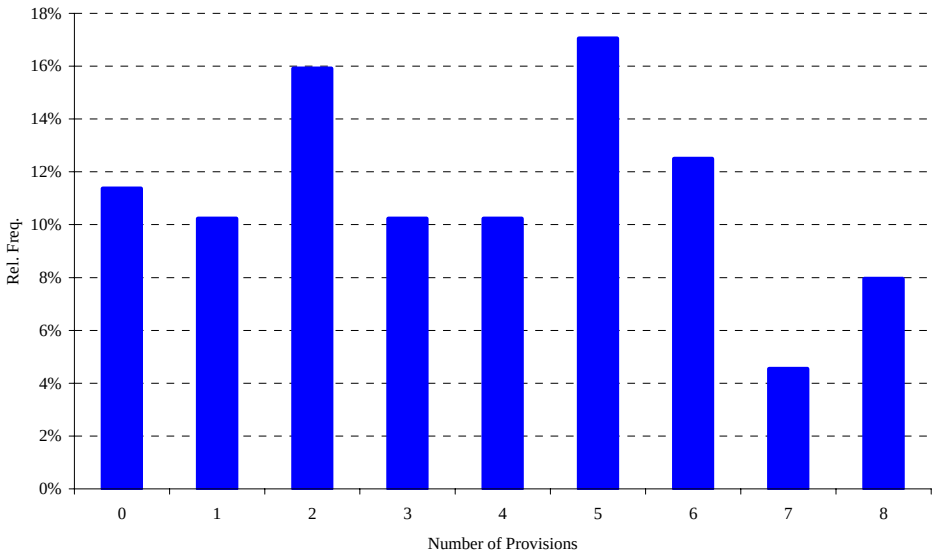
FIGURE 1
Distribution of Contractual Provisions[a]



[a]N=88.

TABLE 1
Relative Frequencies of Specific Contractual Provisions

Provision	*Total*	*Nonequity*	*Equity*	χ^2	*t value*
1. Rights to reports of relevant transactions	0.49	0.46	0.53	0.38	
2. Notification rights for departures from the agreement	0.45	0.44	0.47	0.10	
3. Auditing rights	0.50	0.26	0.82	26.28***	
4. Confidentiality provisions	0.45	0.50	0.39	0.96	
5. Restrictions on proprietary information	0.42	0.40	0.45	0.20	
6. Termination provisions	0.53	0.58	0.47	0.98	
7. Arbitration clauses	0.55	0.52	0.57	0.30	
8. Lawsuit provisions	0.30	0.30	0.29	0.01	
Contractual complexity (weighted)	0.45	0.43	0.47		-0.50
Contractual complexity (unweighted)	3.69	3.46	4.00		-1.04
N	88	50	38		

[b]N=88. † p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

TABLE 2
Bundling of Contractual Provisions

		Conditional Relative Frequencies of Other Provisions								
Provision	*# in Effect (%)*	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*Mean Unweighted Count*
1. Rights to reports of relevant transactions	43 (48.9)	--	0.51	0.60	0.51	0.44	0.53	0.60	0.37	3.58
2. Notification rights for departures from the agreement	40 (45.5)	0.55	--	0.68	0.63	0.55	0.60	0.65	0.48	4.13
3. Auditing rights	44 (50.0)	0.59	0.61	--	0.50	0.52	0.59	0.73	0.45	4.00
4. Confidentiality provisions	40 (45.5)	0.55	0.63	0.55	--	0.78	0.75	0.75	0.50	4.50
5. Restrictions on proprietary information	37 (42.0)	0.51	0.59	0.62	0.84	--	0.76	0.84	0.51	4.68
6. Termination provisions	47 (53.4)	0.49	0.51	0.55	0.64	0.60	--	0.79	0.45	4.02
7. Arbitration clauses	48 (54.5)	0.54	0.54	0.67	0.63	0.65	0.77	--	0.48	4.27
8. Lawsuit provisions	26 (29.5)	0.62	0.73	0.77	0.77	0.73	0.81	0.88	--	5.31
Averages	40.6 (0.46)									4.31

TABLE 3
Tetrachoric Correlations Among Contractual Provisions[c]

Provision	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
1. Rights to reports of relevant transactions							
2. Notification rights for departures from the agreement	0.18*						
3. Auditing rights	0.32**	0.48***					
4. Confidentiality provisions	0.18*	0.47***	0.14†				
5. Restrictions on proprietary information	0.07	0.40***	0.32**	0.86***			
6. Termination provisions	0.00	0.20*	0.18*	0.59***	0.57***		
7. Arbitration clauses	0.18*	0.30**	0.54***	0.56***	0.72***	0.73***	
8. Lawsuit provisions	0.27**	0.56***	0.56***	0.63***	0.62***	0.57***	0.71***

[c]N=88. † p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

TABLE 4
Varimax Rotated Factor Pattern[d]

Provision	*Partner Control Provisions (Factor 1)*	*Operations Control Provisions (Factor 2)*	*Communalities*
1. Rights to reports of relevant transactions	-0.07	**0.69**	0.49
2. Notification rights for departures from the agreement	0.33	**0.63**	0.51
3. Auditing rights	0.21	**0.82**	0.71
4. Confidentiality provisions	**0.85**	0.15	0.75
5. Restrictions on proprietary information	**0.89**	0.15	0.81
6. Termination provisions	**0.85**	-0.03	0.72
7. Arbitration clauses	**0.80**	0.34	0.76
8. Lawsuit provisions	**0.70**	0.55	0.79
Eigenvalue	3.52	2.01	
Percent of Variance	43.98	25.07	
Cumulative Percent of Variance	43.98	69.05	

[d]Bold print indicates the largest factor loading for each contractual provision.

TABLE 5
Descriptive Statistics and Correlation Matrix[e]

Variable	*Mean*	*S.D.*	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
1. Contractual complexity (unweighted)	3.69	2.41								
2. Contractual complexity (weighted)	0.45	0.33	0.97***							
3. Asset specificity	9.07	3.37	0.30*	0.27*						
4. Prior ties	0.52	1.83	0.04	0.04	0.08					
5. Time bound	0.47	0.50	0.14	0.18	0.01	-0.01				
6. Strategic importance	3.54	0.76	0.39***	0.38***	0.15	0.01	0.01			
7. Firm size	4.47	2.08	0.05	0.06	-0.33**	0.17	0.03	-0.19		
8. Foreign	0.85	0.36	0.23†	0.21†	0.02	-0.09	-0.03	0.36**	0.11	
9. Equity	0.43	0.50	0.11	0.06	0.30**	0.12	-0.11	-0.08	-0.05	-0.12

[e]N=88. † p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

TABLE 6
Estimation Results from Multivariate Analyses[f]

Independent Variable	*Aggregate Analyses*				*Disaggregate Analyses*			
	Contractual complexity (unweighted)		*Contractual complexity (weighted)*		*Partner Control Provisions (Factor 1)*		*Operations Control Provisions (Factor 2)*	
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
Intercept(s)	Incl.	Incl.	0.25* (0.12)	-0.56* (0.22)	-0.28 (0.32)	-2.35*** (0.56)	-0.70* (0.30)	-1.73** (0.63)
Firm size	0.02 (0.10)	0.15 (0.11)	0.01 (0.02)	0.03† (0.01)	0.01 (0.05)	0.07 (0.05)	0.01 (0.04)	0.08† (0.05)
Foreign	1.26* (0.58)	0.59 (0.63)	0.18† (0.10)	0.04 (0.10)	0.39 (0.26)	0.06 (0.25)	0.28 (0.25)	0.08 (0.26)
Equity	0.56 (0.43)	0.40 (0.43)	0.05 (0.08)	0.02 (0.07)	-0.18 (0.20)	-0.23 (0.19)	0.69*** (0.19)	0.58** (0.18)
Asset specificity		0.14* (0.07)		0.03* (0.01)		0.05† (0.03)		0.04 (0.03)
Prior ties		-0.00 (0.11)		-0.00 (0.02)		0.02 (0.05)		-0.13* (0.06)
Time bound		0.51 (0.43)		0.11 (0.06)		0.46* (0.18)		-0.40* (0.18)
Strategic importance		0.85** (0.33)		0.15** (0.05)		0.41** (0.13)		0.22 (0.14)
χ^2	5.39	20.31**						
$-2[L(\beta_1) - L(\beta_2)] \sim \chi^2$		14.92**						
F value			1.18	3.31**	1.19	3.98**	4.86**	4.36***
ΔF				4.71**		5.81***		3.42*

[f]N=88. † p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

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