

## STRATEGIC ALLIANCE CONTRACTS: DIMENSIONS AND DETERMINANTS OF CONTRACTUAL COMPLEXITY

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*In contrast to prior studies examining strategic alliances as discrete governance structures (e.g., alliances vs. M&A, equity vs. non-equity agreements), we investigate their particular contractual features. The analysis examines the dimensionality of the contractual complexity construct and investigates the determinants of firms' adoption of various contractual provisions. We find two underlying dimensions of contractual complexity, based upon the enforcement and coordination functions of different contractual provisions. The evidence reveals that firms' usage of particular contractual provisions is a function of asset specificity as well as whether the alliance's duration is pre-specified or open-ended. The findings also speak to the debate surrounding the roles of prior ties and trust for alliance governance. Firms that have collaborated with each other in the past are not less likely to negotiate enforcement provisions; rather, repeat collaborators are less likely to adopt contractual provisions that are informational in nature and are geared to the coordination of the alliance. Copyright © 2007 John Wiley & Sons, Ltd.*

### INTRODUCTION

Research on strategic alliances has been concerned with their efficiency implications compared to alternative organizational arrangements (e.g., organic growth, M&A) as well as with the relative efficiency of distinct classes of alliances (e.g., equity vs. non-equity collaborations). The literature moved quickly beyond addressing the general merits or drawbacks of alliances (e.g., Pfeffer and Nowak, 1976) in order to frame and address firms' alliance investment and structuring decisions in more powerful, comparative terms: first, when should firms invest in alliances instead of alternatives such as acquisitions (e.g., Williamson,

1991; Teece, 1992; Reuer and Koza, 2000)? Second, conditional upon the decision to partner, when should firms employ one form of alliance rather than another (e.g., Hennart, 1993)? The dominant taxonomy of alliances used in empirical research collapses numerous forms of alliances into two broad categories, also arrayed along the familiar markets–hierarchies continuum: non-equity alliances, or purely contractual agreements, vs. equity alliances, which involve greater hierarchy due to shared ownership and control (e.g., Oxley, 1997; Sampson, 2004).

The efficiency of individual alliances also hinges upon the particular contractual provisions that firms put into their collaborative agreements, yet this third facet of alliance governance has received very little research attention to date. Omitting contractual details from models of alliances may be of little consequence if specific contractual elements map over in a simple, one-to-one manner to alternative alliances arrayed along the governance

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continuum, as captured by the equity/non-equity dichotomy or some other taxonomy (e.g., Anderson and Schmittlein, 1984; Holmstrom and Milgrom, 1994; James, 2000). However, the number and heterogeneity of contractual supports for alliances suggest that formal governance mechanisms vary a great deal within alliance classes, and that it is plausible that some non-equity alliances may in fact offer partners fairly substantial control just as some equity alliances may be subject to fairly low levels of control, which runs counter to typical depictions of these two classes of collaborative agreements in the literature. It is therefore possible that some non-equity alliances might be more governance intensive than some equity alliances. Moreover, it is also quite likely that alliances' contractual designs are related to many of the core constructs that occupy center stage in alliance research such as relational governance mechanisms, capabilities, transactional attributes, alliance adaptation, and so forth. This observation raises important questions concerning not only model specification, but also the inferences drawn in the literature about the relative importance of specific structural and process variables, the functioning of relational and formal governance mechanisms, and so forth.

In this paper, we investigate the particular provisions that firms incorporate into their alliance contracts. The first objective of this study is to advance research on the governance of strategic alliances by studying the design of collaborative agreements using a contractual lens. Managers have considerably more latitude in building strategic alliances compared to the way alliance design is typically portrayed in the literature as a discrete governance structure choice. For instance, even within the non-equity or equity category of collaborative agreements, there are myriad ways that firms can craft alliances. By examining the heterogeneity in alliance contracts, we are able to begin to accommodate the degrees of freedom executives have in designing their collaborative agreements.

Our second objective is to extend previous empirical research on the economics of contracts in general, which tends to examine contracts in one of two opposing ways. On the one hand, some studies have investigated contractual complexity in very coarse, 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). However, in the alliance context as well as in other contracting settings, contracts are comprised of numerous provisions that can serve very different purposes that may or may not align well with the particular theory being used. As a consequence, aggregate models of contracts can mask the effects of certain variables on the adoption of particular contractual provisions. Recently, Poppo and Zenger (2002) have called for research that examines particular provisions in contracts rather than relying on such global indicators of contractual complexity. At the opposite extreme, other studies have done this by investigating individual provisions such as territorial restraints in licensing agreements (e.g., Mueller and 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). Many studies have yielded important insights into the details of contracts by following this approach, yet it has the drawback of divorcing these specific terms from other, potentially related features of contracts. We therefore wish to combine some of the best elements of both approaches by investigating how various types of contractual provisions bundle together and by assessing whether contractual complexity is a multidimensional or unidimensional construct.

We also aim to contribute to the literature on alliances and contracts by examining the theoretical determinants of contractual complexity. The scant work on alliance contracts looks at how contractual characteristics explain alliance outcomes or what triggers changes to alliance contracts (Parkhe, 1993; Deeds and Hill, 1998; Reuer and Ariño, 2002; Reuer, Zollo, and Singh, 2002), and only recently have researchers focused on the determinants of alliance contractual design (Luo, 2002; Ryall and Sampson, 2003). To examine the antecedents of the contractual provisions firms use in their alliance contracts, we first consider the transaction-specific investments firms make in their alliances. Our study also joins recent work examining whether relational governance substitutes for or complements formal governance mechanisms (e.g., Poppo and Zenger, 2002; Mayer and Argyres, 2004) and work considering whether priorities generate trust and/or interorganizational routines for partners (Zollo, Reuer, and Singh, 2002).

The core findings are that contractual complexity is a multidimensional construct, and that different dimensions of contractual complexity have unique

antecedents. The results also show that the incidence of seven out of eight contractual provisions does not differ systematically across non-equity and equity alliances. One dimension of contractual complexity captures enforcement provisions that relate to intellectual property and severe breaches that can necessitate termination or third-party adjudication. Transaction-specific investments encourage greater usage of such provisions, as would be anticipated. In contrast to prior research on trust and alliance governance, however, prior ties have no bearing on firms' usage of these provisions. The second dimension of contractual complexity concerns less stringent provisions that are informational in nature and are geared more to the coordination of the alliance. Consistent with the argument that prior alliances between firms generate interorganizational routines, repeat collaborators are less likely to adopt such provisions. Finally, we also investigate the potential self-enforcement of strategic alliances and find that different contractual provisions are more or less likely to govern collaborative agreements that are designed for a set period of time vs. those that are open-ended. For instance, time-bound alliances are more likely to employ more enforcement provisions than alliances with no pre-specified duration.

The remainder of the paper is organized as follows: in the next section, we develop three hypotheses on the drivers of contractual complexity in alliances. A subsequent section devoted to methodology sets forth the details of our research design. Results are then offered on the incidence of various contractual provisions in alliance agreements, the relative frequencies of these provisions across equity and non-equity alliances, and the different tests of alternative ways of modeling alliance contracts. We then present multivariate findings from aggregate and disaggregate models of alliance contracts to investigate the antecedents of contractual complexity in alliances. A concluding section notes some of the implications of the study for research on alliance governance and points out several opportunities for future research on the contractual foundations of collaborative agreements.

## 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, this theory has also been applied *within* these types of governance structures to address the contractual provisions that firms use to manage their exchanges. 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 (e.g., Macneil, 1978; Heide, 1994). As the risk of opportunistic behavior falls, however, the inefficiencies associated with negotiating, monitoring, and enforcing contracts that are more complex may be avoided by relying upon comparatively simple contracts (e.g., Joskow, 1987).

This proposition 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 undue inefficiencies, whereas the opposite implies heightened exposure to exchange hazards. In the subsections that follow, we identify several conditions that are likely to influence the threat of opportunistic behavior and the inefficiencies associated with contracting that lead firms to employ more or less complex contracts.

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 themselves, alternative suppliers, or the court system. The contract can also specify the way in which the alliance will end, firms' claims on intellectual property,

and possible limitations on firms' competitive and hiring practices through non-compete and non-solicitation agreements, respectively. As discussed below, such functions of alliance contracts can be useful in attempting to mitigate various exchange hazards.

### Transaction-specific investments

Prior research on the complexity of contracts argues and finds that asset specificity is an important transactional attribute affecting contract design (e.g., Joskow, 1988). When asset specificity is low, by definition resources can be readily deployed to other relationships or businesses, and partner identity and continuity therefore are not important (Klein, Crawford, and 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 in order to capture more value. 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 also 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 in the 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 transactional attributes of the alliance in question, as reflected in Hypothesis 1, it can also be shaped by firms' prior collaborative histories with one another. For example, economics 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 the court system for enforcement (Johnson, McMillan, and Woodruff, 2002).

Management research suggests two distinct mechanisms through which successive collaborative relationships between firms can enable firms to use less complex contracts for a given exchange. First, previous work has emphasized that trust emerges from prior collaborative relationships between firms and that trust substitutes for more elaborate formal governance. Gulati (1995), for instance, shows that firms with prior collaborative agreements tend to choose non-equity alliances over equity alliances (cf. 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 can be an efficient substitute to formal contractual provisions because the firms have already invested in relationship building and have borne set-up costs that would need to be incurred for alternative safeguards (e.g., Klein, 1980). Related evidence from buyer-supplier relations indicates that interorganizational trust allows firms to reduce costly negotiations (Zaheer, McEvily, and Perrone, 1998).

Second, prior strategic alliances between firms can lead to the development of interorganizational routines, independent of trust, and these routines can allow firms to avoid the need to detail mechanisms for monitoring and coordination (Zollo *et al.*, 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 *ex post* coordination, conflict resolution, or information-gathering problems that formal contractual provisions can otherwise attempt to address. Dyer and Singh (1998) similarly suggest that relationship-specific knowledge develops from frequent and intense partner interactions, 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 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, as alluded to above. Exchange relationships that are specifically designed to operate for a pre-specified length of time have been differentiated from those that are open-ended in duration, but this distinction has not been systematically related to the various formal governance mechanisms collaborators have at their disposal and might adopt for a given alliance. We develop the argument that the presence or absence of time bounds on collaborative agreements will have an impact on both the threat of opportunistic behavior as well as the cost of contracting and will therefore shape alliances' contractual complexity. Specifically, we suggest that time-bound alliances experience a greater threat of opportunistic behavior as well as a lower cost of contracting; hence such alliances are likely to rely upon more complex contracts.

First, the presence or absence of time bounds on alliances affects the threat of opportunism. As emphasized in the literature on self-enforcing contracts, in open-ended alliances the potential gains from collaboration in future periods provide a safeguard against opportunistic behavior designed to capture more proximate pay-offs from a partner (Telser, 1980). For example, in Axelrod's (1984) analysis of repeated prisoner's dilemmas, he found

experimental evidence suggesting that partners are willing to collaborate on a continual basis in games with finite ending times, provided the duration of play was uncertain. In games with fixed durations, however, this equilibrium was not sustainable and therefore implied the need for other remedies such as the exchange of hostages to support cooperation (e.g., Williamson, 1983). This result suggests that time-bound alliances are less able to be self-enforcing than open-ended alliances due to the lack of a 'shadow of the future' that can keep opportunism in check (Axelrod, 1984). As a consequence, formal enforcement mechanisms are more likely to be needed in time-bound alliances, whereas self-enforcement might partially substitute for formal governance in open-ended collaborations.

Second, for time-bound alliances, partners are also better able to anticipate different future states of nature and specify their duties and rights for relevant contingencies (e.g., Noldeke and Schmidt, 1995). By contrast, for open-ended collaborative agreements, it can be costly for firms to anticipate future economic conditions and craft contractual provisions that provide appropriate responses and remedies (Crocker and Reynolds, 1993). 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 open-ended alliances because: (a) time-bound alliances are subject to a greater threat of opportunistic behavior given the limited scope for self-enforcement; and (b) time-bound alliances are easier to design given the enhanced ability of firms to foresee relevant contingencies and arrive at suitable responses.

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

## **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 are gathered from trade journals, major business newspapers, business magazines, special reports, and publications issued by government agencies, industry associations, and independent organizations. The data collection was carried out in 1994 and focused on alliances formed between 1986 and 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-Europe*, the industries most active in alliance formation included energy (i.e., petroleum and electricity), chemical and allied products, machinery except 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 school 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 as well as 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 whether the presence of multiple alliances per firm 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 an array 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 contractual provisions used, 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 (e.g.,  $t = 1.40$ , n.s. for contractual complexity, and  $\chi^2 = 1.1, 0.2, 1.9, 1.3, 0.9, 1.8, 1.8$ , and  $0.4$  for the eight provisions, respectively; all n.s.). As a further check on this issue, we also determined that the inclusion or exclusion of a control variable for respondent status did not change our results and was itself insignificant. Similar insignificant results were obtained for a control for firm tenure as opposed to informant position.

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 and Power, 1985; Miller, Cardinal, and 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 non-response 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 and 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 (n.s.). 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 (n.s.) and 13.52 (n.s.), respectively), again providing no evidence of response bias.

Finally, although our dependent variables are archival 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 and 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 and 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.

### Measuring contractual complexity

#### *Indicators of contractual provisions*

In contrast to prior economics research that examines global measures of contractual complexity such as contract length (e.g., Joskow, 1988) or examines individual contractual terms divorced from other, potentially related clauses, 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; Practising Law Institute, 1986) and documented the following eight classes of 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 the confidentiality provisions of the contract; (5) non-use of proprietary information even after termination of agreement; (6) termination of the 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:

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

where  $D_i$  equals  $i$  if the  $i$ th 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.

#### *Stringency weights and dimensionality*

It is worth noting that the use of this proxy for contractual complexity can also 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 whether 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:

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

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

In order to examine the dimensionality of the contractual complexity construct, we first used exploratory factor analysis to account for potential differences in the correlations among the contractual provisions. One issue that arises, however, is that the contractual provision dummy variables violate the assumption of multivariate normality required by factor analysis. While prior studies have often factor analyzed such discrete data, one can calculate a matrix of tetrachoric correlations, which enable calculation of correlations among dummy variables that can be used in factor analysis. In brief, tetrachoric correlation analysis uses data in  $2 \times 2$  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).

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  $2 \times 2$  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:

$$\frac{a}{N} = \int_{-\infty}^{z_2} \int_{-\infty}^{z_1} \phi(x_1, x_2, r) dx_1 dx_2 \quad (3)$$

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 cut-off values that divide the two-dimensional space into four quadrants whose probabilities equal the probabilities in the four cells of the  $2 \times 2$  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.

#### *Findings on contractual provisions*

The mean number of provisions put into the sampled alliances' contracts is 3.7, or slightly less than half of the eight types of provisions in the survey. The modal number of contractual provisions is five, and approximately 11 and 8 percent of firms have either zero or all of the provisions in their contracts, respectively. The relatively uniform distribution of the provisions therefore highlights the heterogeneity of alliances' contractual complexity.<sup>1</sup>

<sup>1</sup> To consider the bundling of provisions, we also examined the relative frequency of provision  $i$  conditional upon provision  $j$  as well as the mean unweighted count of the provisions not including the focal provision when a particular provision  $i$  is used in an alliance contract. 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 data patterns largely confirm the increasing order

Table 1 provides the relative frequencies of 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

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, conditional upon the first provision being used, the mean unweighted count of 3.58 is below the conditional 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. If the mean unweighted counts are rank-ordered and compared with the ordering of the contractual provisions as presented in the text, 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.

measures of contractual complexity vary systematically across non-equity 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 non-equity 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 non-equity alliances ( $p < 0.001$ ). This is consistent with the fact that equity alliances involve the establishment of a separate business entity.

The matrix in Table 2 provides the estimated tetrachoric correlations among the contractual provisions, and Table 3 presents the results of a principal components factor analysis after varimax rotation. Because the technique described above can produce estimated correlations that

Table 1. Relative frequencies of specific contractual provisions<sup>a</sup>

Provision	Total	Non-equity	Equity	$\chi^2$	<i>t</i> -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
<i>N</i>	88	50	38		

<sup>a</sup>  $N = 88$ . †  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Table 2. Tetrachoric correlations among contractual provisions<sup>a</sup>

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***

<sup>a</sup>  $N = 88$ . †  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Table 3. Varimax rotated factor pattern<sup>a</sup>

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

<sup>a</sup> Bold print indicates the largest factor loading for each contractual provision.

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. 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.

The interpretation and labeling of factors from such analyses is subjective and a matter of judgment, but there are two important findings that are worth noting. First, the provisions load on the two factors in accordance with their order of stringency (Parkhe, 1993). 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 also appears that the two factors deal with qualitatively different types of contractual 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 surrounding partners' knowledge, their behavior outside of the alliance, and severe breaches that would bring about termination or the need to pursue lawsuits or arbitration.

We therefore labeled this factor 'enforcement provisions.' The second factor, by contrast, relates more directly to the monitoring and adaptation of the collaborative agreement. More specifically, variables loading highly on this factor include rights of reports for relevant transactions, notification rights for departures to the agreement, and auditing rights. We therefore labeled this factor 'coordination provisions.'

## Independent variables

### *Explanatory variables*

The first variable that we included in the multivariate models to test Hypothesis 1 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 and 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 Hypothesis 2, *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 those 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.

### Control variables

In order to account for potential confounds to the theoretical relationships of interest, we included five control variables in the model specifications. First, we controlled for the strategic importance of the alliance (i.e., *Strategic importance*). Strategically important alliances can involve greater complexity (Hagedoorn, 1993), affect more organizational units in the firm (Ring, 2002), and expose firms to various competitive risks (Gomes-Casseres, 1996; Singh and Mitchell, 1996; Khanna, Gulati, and Nohria, 1998). 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 1 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 and 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 ( $r = 0.54$ ,  $p < 0.001$ ). Second, we incorporated a control for firm size because smaller firms may lack the experience, slack resources, or staff to craft more sophisticated alliance agreements (i.e., *Firm size*). Respondents were asked to indicate the number of employees in their firm on a seven-point scale. Third, 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. Fourth, we controlled for whether the alliance was horizontal or vertical since the former type of collaboration is more likely to involve overlapping knowledge and lower levels of trust (e.g., Rindfleisch and Moorman, 2003), while the rights and responsibilities of firms tend to be easier to specify for the latter type (e.g., Borys and Jemison, 1989). The variable *Horizontal alliance* takes on a value of 1 for alliances involving partners operating at the same stage of the value chain, and 0 otherwise. Finally, we introduced a control to indicate whether the alliance was a non-equity 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 likely 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 non-equity, 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:

$$\begin{aligned}
 &\text{Contractual complexity} \\
 &= \beta_0 + \beta_1 \text{ Asset specificity} \\
 &+ \beta_2 \text{ Prior ties} + \beta_3 \text{ Time bound} \\
 &+ \beta_4 \text{ Strategic importance} + \beta_5 \text{ Firm size} \\
 &+ \beta_6 \text{ Foreign} + \beta_7 \text{ Horizontal alliance} \\
 &+ \beta_8 \text{ Equity} + \varepsilon \tag{4}
 \end{aligned}$$

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 matters 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**

Table 4 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 12. 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. The majority of alliances were horizontal rather than vertical (i.e., 72%), and horizontal alliances were more likely to involve a foreign partner ( $p < 0.01$ ) and be seen as strategically important ( $p < 0.05$ ). Consistent with prior research on alternative alliance governance structures (e.g., Oxley, 1997; Pisano, 1989), equity-based alliances were used over non-equity collaborations when firms make transaction-specific investments to the alliance ( $p < 0.01$ ).

Table 5 presents the results of the multivariate analyses. Models 1 and 2 are estimated using ordered 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),

Table 4. Descriptive statistics and correlation matrix<sup>a</sup>

Variable	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
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. Horizontal alliance	0.72	0.45	0.08	0.09	0.03	0.13	0.14	0.27*	0.12	0.30**	
10. Equity	0.43	0.50	0.11	0.06	0.30**	0.12	-0.11	-0.08	-0.05	-0.12	0.00

<sup>a</sup>  $N = 88$ . †  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Table 5. Estimation results from multivariate analyses<sup>a</sup>

Independent variable	Aggregate analyses				Disaggregate analyses			
	Contractual complexity (unweighted)		Contractual complexity (weighted)		Enforcement provisions (Factor 1)		Coordination provisions (Factor 2)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept(s)	Incl.	Incl.	-0.29 (0.20)	-0.57* (0.22)	-1.70** (0.52)	-2.38*** (0.56)	-1.40* (0.58)	-1.73** (0.63)
Strategic importance	1.01** (0.33)	0.95** (0.33)	0.17** (0.05)	0.16** (0.05)	0.45** (0.14)	0.43** (0.13)	0.21 (0.15)	0.23 (0.14)
Firm size	0.12 (0.10)	0.17 (0.11)	0.02 (0.02)	0.03† (0.02)	0.05 (0.05)	0.07 (0.05)	0.04 (0.05)	0.08† (0.05)
Foreign	0.73 (0.63)	0.83 (0.65)	0.06 (0.11)	0.07 (0.10)	0.04 (0.27)	0.11 (0.26)	0.14 (0.29)	0.09 (0.28)
Horizontal alliance	-0.49 (0.50)	-0.73 (0.52)	-0.05 (0.08)	-0.07 (0.08)	-0.08 (0.23)	-0.16 (0.22)	-0.10 (0.22)	-0.02 (0.21)
Equity	0.74 (0.43)	0.48 (0.46)	0.07 (0.07)	0.03 (0.07)	-0.16 (0.18)	-0.22 (0.19)	0.70*** (0.19)	0.58** (0.18)
Asset specificity		0.15* (0.07)		0.03* (0.01)		0.05† (0.03)		0.04 (0.03)
Prior ties		0.02 (0.11)		-0.00 (0.02)		0.03 (0.05)		-0.13* (0.06)
Time bound		0.62 (0.43)		0.12 (0.07)		0.48** (0.18)		-0.40* (0.18)
$\chi^2$	15.66**	22.19**						
$-2[L(\beta_1) - L(\beta_2)] \sim \chi^2$		7.03†						
F-value			2.83*	2.99**	3.01*	3.53**	3.37**	3.75***
$\Delta F$				2.85*		3.75**		3.66**

<sup>a</sup>  $N = 88$ . †  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

and are 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 enforcement provisions, using the factor scores from the first factor as the dependent variable. Similarly, Models 7 and 8 assess the determinants of the coordination provisions. 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 three theoretical covariates. A likelihood ratio test indicates the modest joint significance of these theoretical variables in Model 2 ( $p < 0.10$ ), and hierarchical  $F$ -tests reveal that the four theoretical variables are jointly significant in Models 4 ( $p < 0.05$ ), 6 ( $p < 0.01$ ), and 8 ( $p < 0.01$ ).

Our first hypothesis predicted that contractual complexity will be greater for alliances

involving greater 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  $p < 0.05$ ). By contrast, alliances with assets that are more readily redeployed to other uses tend to rely on fewer contractual provisions. The disaggregate analysis suggests that firms use the more stringent provisions to enforce collaborative agreements 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 coordinating 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 can 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 coordination 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 enforcement (e.g., 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 that the time bounds variable has on contractual complexity. Consistent with the predictions of Hypothesis 3, alliance agreements with specified durations will tend to rely more heavily on the more stringent enforcement provisions ( $p < 0.01$ ). However, it is also apparent that the specification of durations for strategic alliances reduces the usage of the provisions for coordinating the alliance's operations ( $p < 0.05$  in Model 8).

Turning to the controls, it is interesting that the indicator differentiating equity and non-equity alliances is insignificant in the aggregate models of contractual complexity as well as in the models for the most stringent provisions relating to the enforcement of the collaborative agreement. However, this variable is positively related to the use of coordination provisions designed for the monitoring and adaptation of alliances (i.e.,  $p < 0.001$  in Model 7 and  $p < 0.01$  in Model 8). This finding likely reflects the bivariate result noted earlier that auditing rights in particular tend to be more relevant for equity alliances involving a separate business entity than for purely contractual alliances. The opposite pattern of results applies for the control for the strategic importance of the alliance: this variable is positive and significant in the aggregate models in Models 1–4 (all  $p < 0.01$ ), yet the results from the disaggregate models indicate that the strategic importance of alliances shapes the usage of the most stringent provisions in alliance contracts related to enforcement ( $p < 0.01$ ), but has no impact on firms' adoption of the weakest provisions for alliance coordination.

## DISCUSSION

### Contributions and Implications

Our findings reveal that contractual complexity varies a great deal from one alliance to another. The fact that research has largely ignored alliance contracting and, more importantly, the fact that these differences are not captured by the equity/non-equity dichotomy so commonly used in empirical research raises important questions in alliance research. For instance, the possibility exists that established empirical relationships between the *what* (e.g., resources being exchanged, scope of collaboration, etc.), the *how* (e.g., governance), and the *who* (e.g., partner selection) of strategic alliances, as well as their effects on performance, might be subject to misattributions without accounting for the various contractual provisions that firms can put into collaborative agreements.

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 provisions divorced from other features of contracts. The results of our factor analysis highlight the value of an intermediate approach that examines multiple, specific provisions. This analysis suggested that there are at least two distinct classes

of contractual provisions in alliances. Enforcement provisions are the most stringent provisions that deal with intellectual property as well as more severe breaches that involve lawsuits and third-party adjudication, whereas coordination provisions are the weaker, informational provisions concerning the monitoring and adaptation of the alliance.

It is also interesting that the two different groups of contractual provisions have unique determinants. We draw upon transaction cost theory to identify some of the key theoretical drivers of the choices firms make when designing their alliance contracts, and we find that asset specificity indeed influences the complexity of alliance contracts, in particular firms' adoption of the most stringent provisions concerning confidential information, proprietary technology, alliance termination, and the adjudication of disputes by third parties. Future research could probe additional exchange hazards within the transaction cost framework (e.g., frequency, uncertainty, information asymmetries) and examine how they influence the design of alliance contracts. However, while prior research has found that previous collaborative relationships between firms affect alliance governance (Gulati, 1995), we find that such collaborative relationships have an influence only on the *least* stringent provisions that firms use to coordinate alliances. These findings on how prior ties have a differential impact on coordination and enforcement provisions appear to be consistent with Williamson's (1985: 64–65) view that the effectiveness of trust is bounded in cooperative modes of organization. Relational governance therefore may substitute for the weaker contractual provisions but not the most stringent contractual provisions designed for the most severe and costly breaches to the collaborative agreement.<sup>2</sup> Given the recent debate and evidence on whether relational governance and formal governance are substitutes or complements (e.g., Gulati, 1995; Poppo and Zenger, 2002), future research that examines whether relational governance mechanisms substitute or complement distinct types of contractual provisions would be valuable.

The fact that prior ties are related to coordination provisions is also consistent with the view that prior relationships between firms can stimulate the development of interorganizational routines,

independent of trust. If trust tends to be well developed for familiar exchange partners, it is surprising that parties are not less likely to put stringent safeguards into their agreements relating to the enforcement of the alliance, however. Zollo *et al.* (2002) suggest that prior ties improve partners' interactions and help them coordinate their alliance by refining their understanding of each others' cultures, management systems, capabilities, weaknesses, and so forth. Successive collaborations can also deepen inter-partner communication as well as the tacit development of troubleshooting procedures. They note that such routines can develop with frequent interactions, even at low levels of deliberation or intentionality. It is also possible that firms with repeat alliances may avoid some contractual negotiation costs by incorporating into the contract some provisions 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.

Future research on alliance contracts could also examine whether, and when, managers or firms develop capabilities to craft better contracts (Mayer and Argyres, 2004). We explored more closely nine firms in our sample that had engaged in more than one alliance for which we have contractual data. The average number of provisions used was 4.1 in the first alliance and 4.9 in the second alliance. For three of the eight provisions—auditing rights, termination provisions, and lawsuit provisions—firms that used these contractual provisions in their first alliance used them in every subsequent alliance. While these findings are only exploratory at this stage, they suggest that firms are crafting more detailed alliance contracts in successive collaborations and that certain provisions might be more or less prone to 'boilerplating' than others. Future studies might therefore address the differential impact of contracting experience with a given partner vs. contracting experience with a broader set of partners or adopting a dedicated alliance function (Kale, Dyer, and Singh, 2002). Capability-based views of alliances and contracts might also investigate the roles played by law firms or other intermediaries involved in the contracting process.

As an additional indication of the relevance of treating contractual complexity as a multidimensional construct, we found that time bound

<sup>2</sup> We thank an anonymous reviewer for pointing out this interpretation.

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 the agreement's enforcement. 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 coordination of alliances that have pre-specified durations. This may be due to the fact that such alliances are less likely to evolve in new directions and go through adjustment cycles (Zajac and Olsen, 1993; Ring and Van de Ven, 1994), and hence require fewer coordination provisions to monitor and adapt the alliance. Another explanation for this latter finding is if time-bound alliances are also limited in scope, purpose, or some other dimension not captured by the model, they are less likely to require detailed specifications of coordination provisions.

### Limitations and future research directions

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. For example, firms have considerable latitude in designing

alliances within each of the eight types of contractual provisions examined here. As one illustration, a wide variety of termination clauses for alliances are in use and deal with concerns such as the transfer of ownership, the circumstances permitting termination, and the consequences of termination. Even concerning the transfer of ownership in joint ventures there are many alternatives including pre-emption rights on shares, tag-along and drag-along rights, call and put options, and Russian-roulette clauses. In addition, it is important to emphasize that the design of alliance contracts is only one element of building strategic alliances, so additional research is needed on other alliance design decisions (e.g., organizational structure, boards and committees, company interfaces, staffing) and how they relate to contract design.

Third, as we have relied on efficiency arguments and the corresponding choice models that are characteristic of empirical research on organizational governance, our paper is ultimately silent on the performance or other implications of contractual design in alliances. It would be valuable to quantify the various benefits that firms potentially derive from their alliance design choices. Moreover, one of the key objectives of firms entering into 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. Research in these directions such as these could prove helpful in moving beyond current taxonomies of alliances to capture the richness of firms' alliance design choices that are reflected in the heterogeneity that exists within and across discrete governance structures.

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