DISPUTE RESOLUTION IN VERTICAL EXCHANGE RELATIONSHIPS

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ABSTRACT

Scholarly interest in private settlement of contract disputes has generated a rich body of theory but relatively few empirical studies. We address this gap by exploiting a unique dataset capturing *actual* dispute resolution procedures in a sample of contract disputes between vertical exchange partners. We observe the highest rates of private dispute resolution in disputes involving *either* the simplest contracts *or* the most complex contracts in our sample. We argue that this pattern is consistent with a combination of motivations for private resolution: cost-avoidance for simple disputes, and enhanced flexibility for disputes involving particularly complex contracts. We also compare different private dispute resolution procedures and find that arbitration is in some respects closer to litigation and in other respects closer to mediation or negotiation. Our findings are consistent with the argument that disputing firms are able to effectively educate arbitrators and mediators in a way that is not feasible for judges in a court of law.

Long and sustained interest in contract dispute resolution has generated a large theoretical literature in law and economics. Traditional research in this area takes as a starting point the substantial fixed costs associated with litigation and assumes that parties to a contract dispute will act rationally and agree to settle a dispute privately in order to avoid litigation costs (Landes 1971). Theoretical efforts have then focused on identifying situations where uncertainty and other information problems cause contracting parties to have divergent expectations regarding the outcome of potential litigation, hence reducing (or eliminating) their ability to reach an acceptable private settlement, and increasing the likelihood that a dispute will in fact end in litigation (Priest and Klein 1984; Babcock et al. 1995).

Some recent work by legal scholars and organizational economists has highlighted a different motivation for private dispute resolution in exchange relationships, however. Here, the assertion is that disputants eschew litigation because of deficiencies in the ability of the court to effectively adjudicate disputes involving complex contractual relationships (see, for example, Richman 2004). In this view, the probability of private dispute resolution is *increasing* in the complexity and uncertainty of the exchange – i.e., in the very types of situations identified as making private settlement more difficult in the traditional view.

In this paper we reconcile these seemingly contradictory views of litigation vs. private dispute resolution by combining insights from standard theoretical models of settlement and litigation with the contemporary focus on the limitations of court-ordering for complex transactions. We predict a U-shaped relationship between contract

complexity and the likelihood of private dispute resolution. Our empirical analysis, exploiting a unique dataset with information on 102 disputes arising in vertical relationships, confirms this relationship. We observe the highest rates of private resolution (negotiation, mediation, or arbitration) in disputes involving *either* the simplest contracts *or* the most complex contracts in our sample. We argue that this pattern is consistent with a combination of motivations for private dispute resolution: cost-avoidance for simple disputes, and enhanced flexibility for disputes involving highly complex contracts.

In further analysis highlighting the relationship *among* alternative private dispute resolution procedures, we find that arbitration is in some respects closer to court ordering than to mediation or negotiation: simple cost avoidance appears to be more likely to lead to mediation or negotiated settlements than to arbitration, perhaps because arbitration incurs fixed costs on a par with litigation. Arbitration is nonetheless still more common than court adjudication for many of the most technically complex cases (as are mediation and negotiation), suggesting that the disputing parties themselves are better able to handle technically complex disputes, and that they are able to effectively educate arbitrators and mediators in a way that may not be feasible for judges in a court of law. These differences are also reflected in a higher degree of tailoring in the settlements resulting from private dispute resolution procedures compared to court-ordered judgments.

Our study underscores the notion that private ordering arises systematically and predictably in different contracting contexts, and begins to disentangle possible motivations for choosing among the different dispute resolution mechanisms available to

contracting firms. This provides an important empirical base for continuing theoretical discussions regarding efficient (ex ante *and* ex post) governance of vertical exchange relationships.

The remainder of the paper is organized as follows: In Section 1 we present the theoretical background that forms the context for our study, and develop our hypotheses. Section 2 details the empirical analysis. Limitations and possible extensions are discussed in Section 3 and Section 4 concludes with implications for future research.

1. THEORETICAL BACKGROUND

Traditionally, theories of private dispute resolution (settlement) have taken as their starting point the observation that litigation entails large fixed costs.[1] These fixed costs create a "bargaining surplus" that can be shared by the parties if a negotiated settlement is achieved and the dispute is terminated before it goes to trial. Indeed, early research in this tradition (e.g., Gould 1973; Landes 1971; Posner 1973), "simply assumed that a settlement would take place…whenever the expected cost attached by the plaintiff to a possible trial exceeded the expected benefit attached by the defendant to such a trial," (Bebchuk 1984, p. 404). In this view, nonsettlement – i.e. litigation – occurs *only* when other considerations overwhelm the basic incentives to settle.

Several theories have been advanced to delineate conditions likely to undermine parties' incentives or ability to settle. Divergent expectations theories (e.g., Priest and

[1] These fixed costs include both direct costs of lawyers' and executives' time during the pre-trial discovery phase and the trial proceedings themselves as well as indirect and opportunity costs stemming from the delays that are endemic to court proceedings.

Klein 1984) focus on the role of uncertainty in leading to different expectations regarding the likely result of litigation. Divergence may also be exacerbated by self-serving biases in estimating likely outcomes (Babcock et al. 1995). Theories focusing on information asymmetry further suggest that private information may result in nonsettlement due to strategic signaling games being played in pursuit of information rents (Bebchuk 1984; P'ng 1983). Empirical studies of trial selection and adjudication rates have produced mixed findings relative to the predictions of these models (see, Kessler, Meites, and Miller 1996 for a summary of the evidence). In part these mixed findings reflect difficulties in obtaining case-specific information relevant to the main parameters in the theoretical models, so that most studies rely on conventional wisdom regarding, for example, the degree of uncertainty over adjudicated outcomes of different types of cases (Siegelman and Waldfogel 1999).

In the context of vertical exchange relationships, evidence from prior empirical studies in organizational economics indicate that technical sophistication and other complexities of exchange transactions are positively associated with uncertainty and information asymmetries (Kalnins and Mayer 2004; Mayer and Argyres 2004; Monteverde and Teece 1982). This association implies that as the complexity of a given exchange increases, the probability of divergent expectations regarding litigation outcomes and the possibility of strategic signaling in pursuit of information rents also increases (all else equal). This in turn suggests that the likelihood that transacting parties are able to settle a lawsuit is highest for simple transactions, where uncertainty and

asymmetric information are low, and will decrease for more complex transactions involving greater informational lacunae.

Avoiding the fixed cost of litigation is not the only potential advantage of negotiated settlement of contract disputes, however. Recent legal research has increasingly highlighted the informational advantages of private ordering arrangements that can lead to settlements better tailored to the joint needs of the contracting parties, in addition to saving costs. Simon Johnson and colleagues, for example, argue that the outcomes of negotiated dispute settlement are frequently superior to litigated outcomes because, "First…participants [in a dispute] are more expert than courts at monitoring other participants' conduct. Second, their decisions can be more nuanced than the binary decision of liability or no liability that the court must make. Third, they can consider information that cannot be introduced in court, such as impressionistic evidence about business trends or judgments about the quality of items sold. They can base their decisions on a firm's behavior over time, on probabilistic patterns that would not be admissible evidence in court." (Johnson, McMillan, and Woodruff, 2002, p. 229)

This reasoning resonates strongly with discussions of dispute resolution in organizational economics, particularly transaction cost economics (e.g., Williamson 1991). Here, courts are viewed as the default dispute resolution mode for simple "classical" contracts, but are thought to be generally ineffective when it comes to adjudicating disputes involving highly idiosyncratic transactions and complex contracts. In this case parties are expected to move towards a "neoclassical" contracting regime (Williamson 1991), where the contract is more accurately viewed as an adjustable

framework rather than as a blueprint to be executed (Llewellyn 1931).[2] Because courts are particularly ill-equipped to render the kinds of nuanced solutions required for effective adaptation in this neoclassical contracting regime, disputes must instead be settled via "private ordering" (i.e. private dispute resolution) rather than through litigation (Williamson 1991, pp. 272–73).

Fixed cost avoidance does not explicitly enter into any of these arguments regarding the superior capabilities of private ordering for complex disputes. Indeed Barak Richman (2004, p. 2366) categorically rejects the importance of fixed litigation costs in his discussion of private ordering systems, asserting that "[w]hat truly drives the creation – really, the necessity – of private enforcement systems is the incapacity of public courts to assure transactional security. Administrative savings from private enforcement are only a secondary, albeit useful, consequence that emerges after the need for private ordering becomes apparent."

Recognizing the limited competence of the courts in settling complex contract disputes does not necessarily imply that the fixed costs of litigation are irrelevant, however, as the two motivations for avoiding litigation logically apply over different ranges of contractual complexity: over the *lower* range of complexity settlement may

[2] A "classical" contract carefully delineates the nature of the exchange transaction, with the obligations of each party explicitly written "within the four corners of the document" (Macneil 1978, p. 856). For these simple transactions, non-compliance with contractual obligations is readily observable, breaches are easily verified by the court, and the rules of contract law can be strictly applied and enforced. For more complex transactions involving significant bilateral dependence, Williamson (1991) argues that classical contract law (and public ordering of disputes) can be maladaptive: strict interpretation of the terms of the contract may force premature termination and may effectively hinder the adaptation needed to bring the exchange back into line with the needs of the two parties. As a result "perceptive parties reject classical contract law and move into a neoclassical contracting regime because this facilitates continuity and promotes efficient adaptation" (Williamson 1991, p. 271).

indeed be motivated by the desire to avoid the fixed costs of litigation; it is only in the *higher* range of contractual complexity that we would expect private dispute resolution procedures to be employed as mechanisms to overcome the limited competence of the courts to settle complex disputes. Thus, at one end of the spectrum we would expect disputes involving very simple exchange relationships to be settled entirely by private means as parties are able to reach agreement and avoid the costs of litigation; at the other end of the spectrum, the courts should also be absent from the dispute resolution process as firms recognize the limits of the court to handle disputes involving complex relationships and instead craft private dispute resolution processes to facilitate the nuanced understanding required for settlement of these cases. Litigation is then most likely to be observed in the middle range, where firms may underestimate the difficulties of reaching private settlement, or overestimate the competence of the court in resolving a dispute involving a transaction of intermediate complexity. This combined argument thus leads to the following testable hypothesis:

> Hypothesis 1: There is a U-shaped relationship between the probability of private dispute resolution (versus litigation) and the complexity of the contracting relationship.

Another distinctive feature of recent discussions about alternative contract dispute resolution processes by legal scholars and organizational economists is a move beyond the simple dichotomy of litigation versus settlement. We now see consideration of different private dispute resolution modes, including mediation and arbitration, in

addition to negotiated settlement. Among these third-party dispute resolution alternatives, mediation is quite close to private negotiation since the third party involved is little more than a facilitator for a negotiated settlement. As defined by Marc Galanter (1981, p. 586), for example, mediation is "a non-judicial mode of conflict resolution in which a neutral third party employs non-adversarial techniques in order to reconcile the conflicting positions held by the parties…[The] mediator is not subject to the constraints of either contract or statute and thus has broad powers to encourage settlement...The sole purpose of a mediator's intervention is to facilitate and encourage an expeditious settlement actually forged by the parties themselves."

Arbitration fits less easily into a simple litigation versus settlement view of contract dispute resolution. Again, using Galanter's (1981, p. 586) definition, "Arbitration is a non-judicial proceeding in which disputing parties submit their conflict to an impartial person or group of persons for a final and binding resolution instead of to a judicial tribunal and must be invoked by voluntary agreement of the parties… [The] arbitrator may consider rules of contract law, practice, custom, and general principles of equity, as well as personal concepts of justice, public policy, logic and ethics."

As the above definition suggests, arbitration may itself involve quite elaborate procedures, and the attendant high fixed costs and delays associated with the proceedings may approach those of litigation. However, in other respects arbitration fits squarely in the private dispute resolution category – particularly as it relates to the ability to deal effectively with complex transactions and yield nuanced results. In making the case for arbitrated settlement of complex disputes, for example, Oliver Williamson (citing Fuller,

1963) argues that, "there are open to the arbitrator…quick methods of education not open to the courts. An arbitrator will frequently interrupt the examination of witnesses with a request that the parties educate him to the point where he can understand the testimony being received…The end result will usually be a clarification that will enable everyone to proceed more intelligently with the case" (1991, pp. 272–73). Moreover, as Walter Mattli (2001, p. 920) notes, "[u]nlike judges in public courts, who follow fixed rules of procedure and apply the laws of the land, arbitrators can dispense with legal formalities and may apply whatever procedural rules and substantive law that best fit a case."

This combination of high cost and high tolerance for complexity and nuance, suggests that arbitration may be very useful for disputes involving complex exchange transactions but less useful in simple cases where settlement is primarily motivated by fixed cost avoidance. This in turn suggests the following additional hypothesis:

> Hypothesis 2: The use of arbitration will be most prevalent for highly complex contract disputes.

2. EMPIRICAL ANALYSIS

2.1. Sample and Empirical Approach

Our empirical analysis examines actual dispute resolution procedures adopted in a sample of disputes arising in vertical exchange relationships. One of the authors was granted access by a French law firm to all legal files concerning such contract disputes handled by the firm between 1991 and 2005. A total of 102 disputes, involving 178 firms,

were analyzed using data collected through the law firm.[3] Data collection took place over a four-month period in 2005. This period of immersion enabled the researcher to gain insights into the legal regime relevant to the contracts under dispute,[4] and to understand the practices and routines of the law firm, through daily informal conversations with lawyers and administrative staff. Additional interviews were conducted with lawyers and law professors specializing in contract law.

The data collection process yielded unusually detailed information on contractual characteristics and resolution of the dispute in each case. Data obtained from the legal files includes all documents issued by each party to the contract and exchanged during the dispute resolution process, as well as additional information requested by the lawyers, such as the initial context of the contracting relationship, the origin of the conflict, and its evolution. Due to the highly confidential character of the data the researchers were not able to speak directly to the contracting firms, nor is it possible to identify the companies in the sample by name.

Our dataset offers some distinct advantages over datasets used in previous empirical studies of private dispute resolution, but also has some limitations. The

[3] Cases involving more than two parties and contracts unrelated to vertical inter-firm relationships were excluded from consideration at the beginning of the data collection process.

[4] Many of the firms involved in the contracts in our sample are from outside France but all of the contracts are subject to French contract law; litigation, where it occurs, takes place in French courts. While there are some differences between the operation of a civil law system such as that found in France and the common law system found, for example, in the US, (see Yelpaala, Rubino-Sammartano, and Campbell 1986; Deffains and Kirat 2001) we do not believe that the legal setting interferes with inferences drawn from our analysis. This issue is explored further in the final section of the paper where limitations and extensions of the research are discussed.

limitations relate primarily to the source of the data: a single law firm. Our relatively small sample size is one important consequence of this choice; another is that we only observe disputes that have escalated to the point where lawyers are involved, at least to some limited extent. It is important to note in this regard, however, that the majority of prior dispute settlement studies rely on samples of cases actually filed with the court – a significantly more restrictive sampling frame (see, e.g., Johnson and Waldfogel 2002; Kessler, Meites, and Miller 1996).

The disadvantages associated with our data source also have some compensating advantages, as our focus on a single law firm goes some way to mitigating any potential impact of lawyer preferences or reputation on dispute outcomes. Our focus on contract disputes arising in the course of vertical exchange relationships also eliminates some potential sources of unobserved heterogeneity in legal decision standards and other factors that may impact settlement rates (Siegelman and Waldfogel 1999). Although we do not know whether the law firm has interacted with the other lawyers involved in a dispute in the past (something that has been found to influence the likelihood of settlement, see Johnson and Waldfogel 2002), there are no instances of repeated disputes involving the same parties *within* our sample. We are able to observe whether the law firm represented the plaintiff or the defendant in each of the sample disputes (48 and 54 cases respectively) and we find no systematic difference in the likelihood of different dispute resolution modes between the two subsamples.

The contracts included in our sample encompass a variety of vertical exchange relationships and involve firms in a considerable variety of industries. Table 1 provides

the distribution of dispute resolution modes observed in the sample and breaks this down across four types of exchange relationships (i.e., distribution contracts, and three types of supply contracts, for intermediate products and components used in production, for information technology – software development and implementation, – and for other services, primarily consulting).

< Table 1 about here >

Perhaps not surprisingly, given the involvement of lawyers, the majority of disputes end in litigated outcomes.[5] However, a large minority – 41 cases – are settled via private dispute resolution procedures: 13 through arbitration, 5 in mediation, and 23 through negotiated settlement. This reinforces the notion that there are strong incentives to settle even quite serious disputes via private dispute resolution processes.

In keeping with our primary focus on the differences between public and private dispute resolution modes, in our first set of analyses we collapse arbitration, mediation, and negotiation into a single category and use a binomial probit model to estimate the probability of private dispute resolution versus a litigated outcome; in subsequent analysis we also explore the relationship among the different private dispute resolution modes, estimating multinomial logit models using the disaggregated categories of private dispute resolution.[6]

[5] The fact that our sample is limited to cases where lawyers are involved means that we observe only a censored portion of the range of actual disputes. We discuss this issue (and the possible selection biases that may result) in the final section of the paper.

[6] Note that the dispute resolution modes shown in Table 1 are reflective of the *final* outcome of dispute resolution. This is in line with prior research (e.g., Siegelman and Waldfogel 1999) and with the main focus of our study. It does however raise the question of whether, in some cases, settlement occurs in the eleventh

In terms of the types of relationships involved in the contracts under dispute these are roughly evenly split across distribution contracts (35.3%), production supply contracts (29.4%), and IT contracts (26.5%), with a smaller number of contracts for consulting and other services (8.8%). The only significant difference in the resolution mode across these four contract types is that production supply contracts are slightly more likely to be arbitrated and less likely to be litigated. To control for potential differences in common practice that might affect the frequency with which different dispute resolution modes are observed across different types of transactions we include transaction type as a control variable in some of the regressions reported below.

Table 2 shows the industry affiliation of the 178 firms involved in the contracts in the sample. The majority of the firms are involved in manufacturing, with industrial and commercial machinery being the most frequently-represented industry at the 2-digit SIC level (14% of the sample firms). The "Other Manufacturing" category includes firms from a wide variety of manufacturing industries, with no other single 2-digit industry accounting for more than 5% of the total sample. Retail firms are also well-represented, as are other service firms, a category that includes consulting firms. Again there are very few observable differences in the dispute resolution mode adopted in cases involving firms in different industries in our sample, but industry controls are nonetheless included in some of the regressions reported below.

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hour of litigation, and is thus qualitatively different than other dispute resolution processes that take place entirely beyond the purview of the court. We explore this possibility in additional analysis where we distinguish between "pure" private dispute resolution modes and "mixed" modes where private dispute resolution takes place within the context of ongoing litigation. See more on this on pages 30-31, below.

< Table 2 about here >

2.2. Measures

From the data obtained from the legal files, along with supplementary data from archival sources, we construct the following operational variables for our empirical analysis:[7]

Dispute resolution mode: The primary dependent variable used in our empirical analysis is *Private Dispute Resolution*, a dichotomous variable that takes a value of 1 if the dispute was settled by private negotiation, arbitration or mediation; *Private Dispute Resolution* = 0 if the dispute ended in litigation and a judicial ruling. In subsequent analyses we further disaggregate private dispute resolution modes and construct an additional dependent variable *Dispute Resolution Mode*, a categorical variable that takes a value of 0 for litigation, 1 for arbitration, and 2 for a mediated or privately negotiated settlement (i.e. a settlement reached without formal involvement of third parties other than the two firms' lawyers).[8]

Complexity of the contract: Identifying appropriate measures that capture the complexity of the contracting relationship between the parties to a dispute is challenging, particularly in a context where we do not have direct access to the firms themselves and so cannot gather additional data beyond that included in the case files. We rely here on two measures used in prior studies (described in detail below), based on the complexity

[7] All variables are derived from the case files unless otherwise noted.

[8] Mediation is not broken out into a separate category because there are insufficient cases of mediation in our sample to justify this (only five cases in total).

of the contract under dispute. Moreover, since our hypothesis predicts that the likelihood of private dispute resolution is non-linear (U-shaped) in complexity, we include both the main effect and a square term for each of our two complexity measures: we anticipate a negative coefficient on the main effect and a positive coefficient on the square term in each case.[9]

First, we measure the technical complexity of the exchange by counting the number of contract pages devoted to laying out technical specifications. This is based on the common assumption that exchanges involving more complex technologies and hence more elaborate technical specifications are inherently subject to greater uncertainty and difficulties in interpretation (see e.g., Monteverde and Teece 1982). *Technical Complexity* is calculated as the number of pages of technical detail in the contract.

The second measure of contractual complexity is based on the number of control clauses in the contract (Ryall and Sampson 2006), since this has been shown to correlate closely with the complexity of the underlying exchange transaction (e.g., Reuer and Ariño 2007). Following prior research, the control clauses included in our measure are as follows: (a) right to audit/inspection (e.g., "Firm A maintains the right to audit Firm B manufacturing facility for conformance..."); (b) safeguard clause (e.g., "Upon termination of agreement, the Manufacturer shall repurchase the product stock from the Distributor…"); (c) control / inspection by a third party; (e.g., In a contract between Firm A and Firm B to supply product for final customer Firm C: "Firm C may at all reasonable times visit Firm A facilities and observe the work being performed."); (d) penalty clause

[9] We subsequently relax this functional form restriction to further explore the contours of the empirical relationship, as described in detail below.

(e.g., "If Firm A fails to complete and deliver on the specified dates… Firm A shall pay Firm B liquidated damages at the rate of [x] euros per day of delay"); and (e) termination/resolution clause (e.g., "In the event the obligations of one of the Parties do not comply with the articles referred to hereunder, the contract shall be, if required by the creditor of the said obligations, cancelled, by giving notice of such termination…").

Initial coding of the contracts was undertaken with input from three lawyers (with no connection to the disputes or to the law firm providing the data) and a law professor specializing in contract law. Operational measures resulting from this exercise were then validated by six other legal experts – again professors specializing in contract law. The index variable, *Control Complexity* is defined as: $\sum C_i$; where C_i=1 if provision i exists; C_i=0 otherwise. This is an integer variable ranging from zero to five.

Figures 1 and 2 illustrate the distribution of control clauses in the contracts in our sample: The frequency of individual control clauses is shown in Figure 1a, and the distribution of the *Control Complexity* index is shown in Figure 1b. As indicated in these figures there is significant variation in the frequency with which particular clauses appear in the sample contracts: Over 80% of the contracts include a clause related to termination conditions, while only about 20% of the contracts include a safeguard clause and less than 40% specify control or audit rights for third parties.[10] The sample is also heterogeneous in the composite measure *Control Complexity*, with roughly 10% of the

[10] Exploring the relationship between the presence of individual clauses in the contract and dispute resolution mode represents a potentially interesting avenue for research, but prior studies (e.g., Ryall and Sampson 2006) point to the salience of clusters or syndromes of contract terms – and in particular to the overall complexity of contracts - rather than to the significance of individual terms.

sample contracts having none of the identified control clauses and about the same number having all five; the modal number of control clauses in the sample contracts is 3.

< Figures 1a and 1b about here >

As discussed above, we include both the main effect and a square term for each of our two complexity measures (*Technical Complexity* and *Control Complexity*) to capture the hypothesized non-linear relationship. We anticipate a negative coefficient on the main effect and a positive coefficient on the square term in each case. To further investigate the relationship between complexity and observed dispute resolution mode, in supplementary analysis we relax the functional form restriction imposed by the quadratic formulation and replace the count variables with two series of piece-wise dummy variables: for *Technical Complexity* the series of dummies is based on quintiles in the distribution of the number of pages of technical detail in the contract: for *Control Complexity* the dummy variables indicate whether the contract had 1,2,3,4 or 5 contractual control clauses in total (with 0 clauses being the omitted category).

Contractual coordination mechanisms: Given the fixed costs associated with litigation, we expect that transacting parties will prefer to take actions ex ante to facilitate ex post private ordering wherever possible. Prior research suggests that one way that firms do this is to add coordination or informational clauses into the contract (Reuer and Ariño 2007, p. 315; Salbu 1997). To the extent that such clauses have the effect of decreasing the informational asymmetries or divergence in expectations regarding litigation outcomes that can impede private settlement, we would expect the inclusion of such clauses to increase the probability of private dispute resolution, *ceteris paribus.* We

therefore include a measure of contractual coordination mechanisms as an important control variable in our analysis.

Following prior research (e.g., Argyres and Mayer 2007) we assess contractual coordination mechanisms by examining whether or not the contract includes four key groups of clauses: (a) assignment of roles and responsibilities (e.g., "…All development work will be performed by Developer or its employees at Developer's offices or by approved independent contractors who have executed confidentiality and assignment agreements that are acceptable to the Client."; (b) indications of duration and conditions of renewal (e.g., "This Agreement is made for a term of three years. The Agreement shall be renewed automatically at the end of three years unless…"); (c) operational coordination related to reassignment of tasks among participants (e.g., "Upon completion of Phase 1, Parties agree to discuss the allocation of resources to the task."); (d) strategic coordination, (e.g., "The 2^{nd}-stage specific objectives will be defined by the Parties through mutual consultations after completion of the 1^{st}-stage objectives."). *Contractual Coordination* is defined as: $\sum$ Di; Di=1 if provision i exists; Di=0 otherwise. The result is an integer variable ranging from zero to four. Figure 2a displays the frequency of individual coordination clauses, and the distribution of our Contractual Coordination index is shown in Figure 2b.

< Figures 2a and 2b about here >

Assignment of roles and responsibilities is the most-frequently included coordination clause, appearing in over 80% of the contracts, and clauses related to task reassignments and other operational coordination are the least-frequently observed. There

is significant variation in the overall number of coordination provisions included in the contracts: the distribution is roughly normal, with a mean and median of 2.

In addition to general coordination clauses some contracts contain a specific provision related to dispute resolution. An example of such a clause from our sample states that "Any dispute arising out of or in connection with this Agreement shall be settled without recourse to the courts…" It should be emphasized that the existence of contract terms designating preferred dispute resolution processes are not determinative of the actual dispute resolution mode adopted. This is true not only in our particular sample of alliances but more generally, since "even if the parties have contractually agreed to use one method, they may switch to another if they feel that the latter is more appropriate for a given dispute" (Mattli 2001, p. 920). We nonetheless want to ensure that our empirical results are not simply reflecting the inclusion of an arbitration or mediation clause and so we create a dummy variable, *Dispute Resolution Clause* indicating the presence of such a clause in the contract, and estimate models both with and without this variable included in the regression.[11]

We include a range of additional control variables in our analysis that prior research suggests may be related to dispute resolution mode. First, we distinguish between exchanges specifically designed to operate for a pre-defined length of time and open-ended relationships, to control for the possibility of end-game strategies and more egregious defections from the spirit of the agreement in situations where the endpoint of a

[11] One might expect any dispute resolution clause included in the contract to itself reflect expectations about costs or outcome of potential disputes (see Drahozal and Hylton 2003, for example). And indeed, as one can see in the descriptive statistics in Table 3, the inclusion of a dispute resolution clause is positively correlated with other contractual coordination clauses. This speaks to the potential endogeneity of contract clauses and dispute resolution outcomes, discussed in further detail on pages 30-31, below.

relationship is known ex ante (Arruñada, Garicano, and Vàzquez 2001). *Time Bound* is a dummy variable which takes a value of 1 if the contract indicates a pre-specified duration for the relationship.

We also include information related to the size of the stakes of the two companies in the contract dispute. Given the substantial fixed costs of litigation it is possible that private settlement will be particularly common for disputes involving small sums, particularly in the case of simple transactions. For the cases in our sample we are unable to compute the precise monetary value under dispute (in part because of the multidimensionality of many claims), but we do have information on the total value of the contract. We therefore include *Contract Value* as a control variable, where this is defined as the logarithm of the total value in thousands of inflation-adjusted euros.

In some dispute settlement models, settlement is not possible because asymmetry in the stakes of the partners wipes out the bargaining surplus, as one party has more to gain from winning a lawsuit than the other party has to lose, (e.g., Lanjouw and Lerner 1998). Again we cannot measure the parties' relative stakes in the suit directly, but we include a measure of asymmetry in the total *size* of the two firms involved in the dispute which is expected to correlate with the potential impact of a judgment on the financial health of the company (controlling for contract value). This variable is also likely to capture major differences in the level of sophistication of the parties to the dispute, something which may also affect the likelihood of settlement (Kessler, Meites, and Miller 1996). *Asymmetry* is the log of the absolute value of the difference in revenues, in the

year in which the contract was signed. These data were obtained from Bureau van Dijk's ORBIS database.

< Table 3 about here >

Descriptive statistics for all of the variables described above are shown in Table 3.

2.3. Results

Table 4 displays the first set of regression results. The dependent variable in these binomial probit regressions is the dichotomous variable, *Private Dispute Resolution* and a positive coefficient indicates an increased likelihood of private dispute resolution relative to a judicial order resulting from litigation.

< Table 4 about here >

Looking first at Models 1 and 2, with main effects and square terms for both contractual complexity measures (*Technical Complexity,* the number of pages of technical detail, and *Control Complexity,* the number of control clauses in the contract) we see evidence of the hypothesized U-shaped relationship between contract complexity and private dispute resolution. For both measures the main complexity effect is negative, but the square term is positive: as contractual complexity increases, the likelihood of private dispute resolution at first decreases and then increases. Furthermore, these results are robust to the inclusion of dummy variables indicating different contract types (Model 3) or industry affiliations of the exchange partners (Model 4).

Figures 3a and 3b show graphically the relationship between values of *Technical Complexity* and *Control Complexity* and the predicted probability of private dispute

resolution.[12] The inflexion point in the plot with *Technical Complexity* is quite low in the observed range of number of pages of technical detail in the contract, and the U-shape is heavily skewed, suggesting that the most salient effect of increasing technical complexity is to encourage (rather than discourage) the use of private dispute resolution mechanisms. This is consistent with the argument that exchanges involving a high degree of technical complexity tax judges' ability to reach an efficient resolution of the dispute. The curve for *Control Complexity*, on the other hand, is skewed in the opposite direction, indicating that private dispute resolution is particularly easy to achieve in disputes involving relatively simple contracts with few control clauses: along this dimension, the role of private dispute resolution thus appears to be more aligned with avoidance of the fixed costs of litigation; from this evidence it appears that complexity in terms of legal stipulations does not in itself undermine confidence in the competence of the courts.

< Figures 3a and 3b about here >

Models 5 and 6 in Table 4 explore the effects of technical and control complexity more directly, by replacing our aggregate indices (and their square terms) with piece-wise dummy variables as defined in the previous section. Figures 4a and 4b display the graphical results.

< Figures 4a and 4b about here >

Not surprisingly the curves here are not as smooth without the restrictions on functional form, but they are nonetheless broadly consistent with the plots derived from

[12] These plots are based on the specification in Model 1; all independent variables other than the particular variable of interest in the figures are held at their sample means.

the quadratic specifications: For example for *Control Complexity* we see that private dispute resolution is most likely for the very simplest contracts (i.e. for those having *none* of the identified control clauses included), and next most likely for the most complex contracts (i.e. for those with *all* of the identified clauses included). The change in the predicted effect at the lower end of the range is particularly dramatic: for example, in Figure 4b, comparing the simplest contracts with those that include at least one control clause we see a 5-fold drop in the predicted probability of private dispute resolution. As expected, contracts of intermediate complexity are much more likely to be litigated. Indeed, for intermediate values of either *Technical Complexity* or *Control Complexity* the predicted probability of private dispute resolution (holding all other variables at their mean value) is less than 10% in each case.

Turning to the other variables in the estimations we see that contractual coordination mechanisms are also differentially associated with dispute resolution modes, as we would expect. It appears that ex ante efforts to promote coordination through the contract indeed reduce the likelihood of resorting to litigation ex post: The coefficient on *Contractual Coordination* is positive and significant with or without inclusion of a specific dispute resolution clause (Model 1 and 2 respectively).[13] Thus, while the inclusion of a dispute resolution clause significantly increases the probability of private dispute resolution it does not preclude litigated outcomes, and the impact of the other

[13] In supplementary analysis we also added a square term for *Contractual Coordination*, paralleling the specification for *Contractual Control*. The coefficient on the square term was always insignificant and no other coefficients changed significantly.

contractual coordination mechanisms are still positive and significant, albeit with reduced impact.

With respect to the other variables in the regression, the only other control variable that carries a consistently significant coefficient across the various models is *Time Bound*, and the coefficient here is in the opposite sign than one might expect: contracts that indicate a pre-specified duration for the relationship are more likely to involve private dispute resolution than are open-ended relationships.[14]

Turning now to the analysis exploring the relationship among the different private dispute resolution modes, Model 7 in Table 5a displays the results of a multinomial logit regression where the dependent variable *Dispute Resolution Mode* takes a value of 0 for litigation, 1 for arbitration, and 2 for a mediated or negotiated settlement.

< Tables 5a and 5b about here >

There are a few interesting things to note here: First, *Technical Complexity* operates on the margin between litigation and both of the private dispute resolution categories: for both categories 1 (arbitration) and 2 (mediation/negotiation) the effect of increasing *Technical Complexity* is to first decrease and then increase the likelihood of private dispute resolution. This is consistent with the argument that the firms themselves are better able to handle technically complex disputes, and that they are able to effectively educate arbitrators and/or mediators in a way that is not feasible with judges

[14] One possible explanation for this is that "time bound" contracts are in fact more long-lived than contracts that do not have a term of operation associated with them – some of these latter contracts may indeed imply expectations of continuity, but others may be closer to spot transactions. Without better data on the expected duration of contracts for which no specific term of operation is included we are unable to investigate this issue further.

in a court of law. Second, and in contrast, the only significant effect of *Control Complexity* is to change the probability of negotiation/mediation relative to arbitration *or* litigation. Thus, in this respect, arbitration appears to be closer to litigation than to private negotiation, perhaps because arbitration also involves large fixed costs – and as noted earlier, our initial results suggested that this fixed cost avoidance could be the main motivation for resolving simple disputes via private dispute resolution modes. Table 5b shows the results of a log likelihood test for combining alternatives within the multinomial logit model (where the null hypothesis is that all coefficients except intercepts associated with a given pair of alternatives are 0). Results of this test indicate that the null hypothesis is clearly rejected for mediation/negotiation (category 2) versus litigation (category 0). However, we cannot reject the null hypothesis for pooling of arbitration and litigation (1-0), *or* arbitration and mediation / negotiation (1-2) indicating that, in practice, arbitration is intermediate between the other two categories.[15]

As discussed earlier, our primary interest is in the forum associated with the ultimate resolution of the dispute in question. However, as emphasized in prior research (e.g., Haslem 2005) private settlement may sometimes take place on the eve of a judicial ruling, once a significant proportion of any uncertainties surrounding the likely outcome of the case have been resolved. One could argue that the process leading to this type of private settlement is different in kind from the type of process envisioned in, for example Williamson's (1991) discussion of private ordering in ex post governance of exchange

[15] The statistical implication of the test results is that in this sample arbitration could effectively be pooled with *either* litigation *or* mediation/negotiation as it is not statistically distinguishable from either category even though the other two categories are themselves statistically distinct from each other.

relationships. While we cannot isolate private settlements that are achieved literally on the eve of a judicial ruling in our data, we *can* identify whether disputes were resolved entirely using one particular dispute resolution mode, or whether an additional procedure was used on the road to final resolution of the dispute. Examination of our data reveals some interesting observations: First, in almost all cases that end in litigation there was some period of private negotiation between the two firms involved (and their respective lawyers) preceding litigation. This is as one would expect, given the incentives to settle disputes privately and avoid the fixed costs of litigation if possible. Second, there are no cases that begin in arbitration and then switch to another mode. This is consistent with the rules of binding arbitration which require that, once the parties actually enter into arbitration, they formally renounce the right to pursue other action and must abide by the ruling of the arbitrator. Third, there are a handful of cases (8 in all) where a negotiated settlement occurred in the context of ongoing litigation: these are the potentially troublesome cases for the inferences that we would like to draw from our analysis, since one might argue that the primary dispute resolution mode in these cases is litigation, as settlement may have occurred at the very last minute in the litigation process. Further investigation of the data suggests that this possibility does not significantly change our analysis, however: the settlements that occur in the course of ongoing litigation are indistinguishable from other negotiated settlements in terms of their relationship with our measures of contractual complexity, etc.[16]

[16] This analysis involves estimation of a multinomial regression model where *Dispute Resolution Mode* has an additional category for private settlements reached during litigation. A likelihood ratio test fails to reject the null hypothesis that categories 2 ("pure" mediated or negotiated settlements) and 3 (private settlements

< Table 6 about here >

As a final test of the differences among the various dispute resolution modes we examined the actual settlements as described in the legal files in our sample, and coded the 102 cases to indicate whether the settlement included the following four types of stipulations: (1) monetary damages; (2) a requirement for specific performance by either party based on the terms of the existing contract; (3) renegotiation of the terms of the contract; and (4) a stated intention to continue with the exchange into the future. The results of this coding, summarized in Table 6, again reinforce our contention that the distinction between public dispute resolution (litigated outcome) and private dispute resolution (arbitration, mediation or negotiated settlement) is meaningful: a court-adjudicated judgment is significantly more likely than any other mode to include an award of monetary damages to one of the parties, and is significantly *less* likely to include a stipulation of performance under the terms of the existing contract and/or renegotiation of the contract, or a stated intention to continue with the exchange. Thus private dispute resolution procedures indeed appear to be associated with more nuanced settlements tailored to the changing needs of the contracting parties, and greater continuity in exchange relationships.

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reached during ongoing litigation) should be collapsed into a single category; in contrast, the null hypothesis is clearly rejected for combination of category 1 (litigation) with either of the other two categories.

3. DISCUSSION

Our empirical results support the general contention that enforcement forums play a central role in the functioning of contractual relations. We observe the highest rates of private resolution (negotiation, mediation, or arbitration) in disputes involving *either* the simplest contracts *or* the most complex of the contracts in our sample. This pattern is consistent with a combination of motivations for private resolution: cost-avoidance for simple disputes, and enhanced flexibility for disputes involving particularly complex contracts. We also find that arbitration is in some respects closer to litigation and in other respects closer to mediation or negotiation: arbitration does not appear to offer significant cost advantages over litigation for simple disputes; it is nonetheless more common than litigation for many of the most technically complex cases, indicating that the disputing firms are able to effectively educate arbitrators and mediators in a way that may not be feasible for judges in a court of law.

Before we consider the implications of our study for future research, there are some important limitations that we must address. One such limitation relates to the setting in the French civil law system: Although a significant fraction of the firms involved in the contracts in our sample are from outside France all of the contracts are subject to French contract law, and litigation takes place in French courts. Discussions with legal experts lead us to believe that, for the purposes of our research, there are no material differences in the legal rules governing contracts or dispute resolution in the French civil law system from that found for example in the US common law system (see, e.g., Deffains and Kirat 2001). However, there may be nuanced differences in the norms

surrounding the frequency with which parties resort to mediation and also in the costs and delays associated with litigation. This means that the incentives to settle disputes privately may be even higher in the US system than is the case in our setting (Yelpaala et al. 1986). Thus, although we believe that the idiosyncrasies of the French system do not invalidate the general inferences that we can draw from our study, clearly it would be interesting to replicate the study in a different legal context. Indeed, comparing dispute resolution processes across institutional contexts represents an intriguing avenue for future research.

Perhaps a more important limitation of our study is that we are able only to observe those contracts where cooperation breaks down to a sufficient extent that lawyers become involved, at least in some limited capacity.[17] Furthermore, as Robert Scott and George Triantis (2006, p. 839) suggest, managers and lawyers "do not simply respond to conflict; they have the opportunity to limit or damage problems prospectively through negotiating and drafting. They may tackle prospective conflict at its roots by encouraging clear and concise contract language, realistic risk assessment and allocation, and suitable issue and conflict resolution mechanisms for contractual relationships."[18] It is with this contractual foresight in mind that we avoid making any strong normative claims regarding the observed relationships between contractual complexity and the dispute resolution mode adopted by firms in our sample: both the terms of the contract and the dispute resolution process reflect underlying transactional and relational characteristics,

[17] As noted earlier, this limitation is common to most prior empirical studies of dispute settlement, many of which rely on samples of cases actually filed with the court.
[18] See also Drahozal and Hylton 2003, for discussion of this issue in the context of franchise contracts.

many of which are unobservable, despite the relative richness of our data. To assess the robustness of our results in the presence of this potential endogeneity problem we implemented a statistical test based on a model proposed by Richard Smith and Richard Blundell (1986).[19] The results of this test give no clear indication that endogeneity in fact is a problem in our data, but we recognize our inability to perform a definitive test of this issue. We therefore emphasize that the aim of our analysis is not to establish a *causal* link leading from characteristics of the underlying exchange relationship through contractual terms and on to dispute resolution modes, but rather to explore the extent to which different dispute resolution modes are adopted in different contracting and exchange situations, as predicted by prior theoretical discussions.

4. CONCLUSION

Following and extending Williamson's (1996, pp. 122–23) suggestion that "the incentives of private parties to devise bilateral contractual safeguards is a function of the efficacy of court adjudication, and… varies with the attributes of transactions," we have shown in our empirical analysis that the dispute resolution mode adopted by firms in vertical exchange contracts varies systematically, and that no one method of dispute resolution dominates in all cases. Our findings are thus consistent with Richman's (2004, p. 2332) assertion that "concerns over transactional assurance and contractual enforcement drive firms to adopt private ordering," but we also show that this does not

[19] To implement this test we used the following instruments for our potentially-endogenous complexity measures (*Technical Complexity* and *Control Complexity*): (i) prior contracting history between the firms (Mayer and Argyres 2004; Ryall and Sampson 2006); and (ii) contracting firms based in different countries. Results of this test do not indicate the presence of endogeneity: the test yields a chi-square (2 d.f.) statistic of 0.345, with an associated p-value of 0.842, and the null hypothesis of exogeneity cannot be rejected.

necessarily preclude a role for "efforts to economize on administrative costs." Rather, our findings suggest that economizing on the fixed costs of litigation may indeed be a significant motivation in the selection of dispute resolution mode for relatively simply contracts, and that litigation arises only when uncertainty and complexity increase to sufficient levels to induce information asymmetries and divergent expectations. As complexity further increases, however, incentives to engage in private dispute resolution re-emerge as the context-specific know-how and flexibility required for effective dispute resolution go beyond those that can be accommodated within the constraints of the court and formal judicial procedure.

Despite cautions regarding normative inferences, we believe that the observed relationships between characteristics of the contractual relationship and resolution procedures adopted in our sample of disputes, are in themselves interesting, and lay the groundwork for future research. The ability to manage inter-firm exchange – including contract design – has been proposed as a key to competitive advantage in an increasingly decentralized environment (e.g., Argyres and Mayer 2007). Thus, furthering our understanding of "contracting in its entirety" (Williamson 1985) is an endeavor of continuing importance. Future research should continue to integrate the study of dispute resolution procedures into theories of contract design and implementation.

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Table 1: Contract Types and Dispute Resolution Modes

	Number of Cases Ending in…				
	Litigated outcome	Arbitration	Mediation	Negotiated settlement	*Total*
Distribution contract	22	3	2	9	36
Supply contract – intermediate products	13	8	1	8	30
Supply contract – IT	19	1	2	5	27
Supply contract – other services	7	1	0	1	9
Total	61	13	5	23	102

Table 2: Primary Industry Affiliation of Contracting Firms

	# of firms	% of total
Manufacturing: Industrial & Commercial Machinery (SIC 35)	25	14.0%
Manufacturing: Chemicals & Allied Products (SIC 28)	21	11.8%
Manufacturing: Electronic & Electrical Equipment & Components (SIC 36)	15	8.4%
Manufacturing: Other (SIC 20-39, excluding above)	32	18.0%
Construction (SIC 15-17)	3	1.7%
Retail (SIC 52-59)	26	14.6%
Services (SIC 70-89)	56	31.5%
Total	178	100.0%

Table 3: Descriptive Statistics

Variables	Mean	SD	Min.	Max.	1	2	3	4	5	6
1. Private dispute resolution	0.401	0.492	0	1						
2. Technical complexity	9.205	18.66	1	122	.253*					
3. (Technical complexity)^2	428.6	2105	1	14884	.217*	.939***				
4. Control complexity	2.813	1.487	0	5	.008	.266**	.207*			
5. (Control complexity)^2	10.11	7.602	0	25	.072	.329***	.256**	.952***		
6. Contractual coordination	2.568	1.389	0	5	.204*	.329***	.247*	-.075	-.057	
7. Dispute resolution clause	0.480	0.502	0	1	.252*	.096	.041	-.091	-.078	.475***
8. Contract value	2.422	0.669	.702	4.335	-.095	-.015	-.155	.248*	.132	.125
9. Time bound	0.656	0.477	0	1	.002	-.064	-.061	.676***	.567***	-.377**
10. Asymmetry	7.66	0.965	5.167	10.282	.141	.143	.131	.100	.127	-.040
11. Prior ties	0.323	0.470	0	1	-.054	-.040	.023	-.054	-.051	-.099
12. International	0.460	0.500	0	1	.084	.088	.023	-.162	-.112	.042

Variables	7	8	9	10	11
8. Contract value	.150				
9. Time bound	.297**	.106			
10. Asymmetry	.011	.009	-.023		
11. Prior ties	-.062	.080	-.162	-.041	
12. International	-.062	-.171†	-.119	-.119	-.134

N = 102; † $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 4: Private versus Public Dispute Resolution

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Technical complexity	-.328**	-.319**	-.379***	-.453***		-.336**
	(.096)	(.093)	(.107)	(.122)		(.098)
(Technical complexity)^2	.017***	.017***	.021***	.024***		.018***
	(.004)	(.004)	(.005)	(.006)		(.005)
Control complexity	-1.101*	-1.041*	-1.388**	-1.177*	-1.188*	
	(.459)	(.453)	(.505)	(.517)	(.501)	
(Control complexity)^2	.163*	.154*	.213*	.192*	.201*	
	(.077)	(.076)	(.084)	(.088)	(.084)	
Contractual coordination	.343†	.461**	.503*	.585*	.513**	.357*
	(.188)	(.176)	(.212)	(.243)	(.192)	(.196)
Dispute resolution clause	.762*		.888*	.890*	1.147**	.687*
	(.343)		(.375)	(.397)	(.406)	(.359)
Contract value	-.094	.000	-.153	-.308	-.207	-.156
	(.270)	(.261)	(.286)	(.321)	(.292)	(.284)
Time bound	1.554**	1.330*	1.837**	1.708*	1.888**	1.274*
	(.588)	(.556)	(.638)	(.686)	(.650)	(.674)
Asymmetry	.000	.000	.000	.000	.000	.000
	(.000)	(.000)	(.000)	(.001)	(.000)	(.000)

Table 4 (Continued)

Transaction Type:		
Distribution	.579	
	(.647)	
IT	-.475	
	(.698)	
Production	.833	
	(.648)	
Industry Affiliations:		
Machinery		.389
		(.617)
Chemicals		.234
		(.533)
Electronic Equip.		-.382
		(.619)
Other		.781
		(.528)
Retail		-.889
		(.541)
Services		-1.209*
		(.540)

Table 4 (continued)

Technical Complexity (Quintiles)						
1st Quintile (1 page)					1.856**	
					(.605)	
3rd Quintile (3-5 pages)					-.462	
					(.754)	
4th Quintile (6-13 pages)					-.274	
					(.634)	
5th Quintile (14+ pages)					1.623*	
					(.654)	
Control Complexity (# of clauses)						
1 Control Clause						-1.488†
						(.817)
2 Control Clauses						-1.460*
						(.696)
3 Control Clauses						-1.391
						(.851)
4 Control Clauses						-1.880*
						(.871)
5 Control Clauses						-.899
						(.941)
Constant	-.198	-.257	-.656	.045	-2.324*	.030
	(.651)	(.643)	(.845)	(.899)	(.930)	(.699)
LR χ^2	40.38	35.31	49.70	54.27	57.01	43.46
Pseudo R^2	.293	.256	.361	.400	.414	.316

N = 102; † $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Standards errors are in parentheses.

Table 5a: Discriminating Among Private Dispute Resolution Modes

(Baseline category 0 is Litigation)

	Model 7	
	(1) Arbitration	(2) Mediation or Negotiation
Technical complexity	-.573*	-.658**
	(.260)	(.230)
(Technical complexity)^2	.029*	.038**
	(.014)	(.013)
Control complexity	-.888	-2.361*
	(1.142)	(.959)
(Control complexity)^2	.127	.358*
	(.184)	(.164)
Contractual coordination	.427	.650
	(.407)	(.401)
Dispute resolution clause	.551	1.808**
	(.750)	(.720)
Contract value	.023	-.322
	(.563)	(.556)
Time bound	1.939	3.130
	(1.539)	(1.344)
Asymmetry	.001	.001
	(.001)	(.002)
Constant	-1.497	-.657
	(1.510)	(1.399)
LR χ^2	53.55	
Pseudo R^2	.283	

N = 102; † $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Standards errors are in parentheses.

Table 5b: Log Likelihood Test for Combining Categories (Model 7)

Category 0: litigation
Category 1: arbitration
Category 2: mediation or negotiation

Combining Categories:		χ^2	df	$P > \chi^2$
1	2	12.100	10	.278
1	0	9.686	10	.468
2	0	47.686	10	.000

Table 6: Settlement Characteristics for Different Dispute Resolution Modes

	Litigated outcome	Arbitration	Mediation	Negotiated settlement	*Total*
Monetary damages	52 (85.2%)	9 (69.2%)	2 (40%)	15 (65.2%)	78 (76.5%)
Specific performance based on terms of existing contract	12 (19.6%)	8 (61.5%)	4 (80%)	17 (73.9%)	41 (40.2%)
Adjustment of contract terms	4 (6.5%)	4 (30.7%)	2 (40%)	8 (34.7%)	18 (17.6%)
Stated intention to continue exchange	7 (11.4%)	6 (46.1%)	3 (60%)	13 (56.5%)	29 (28.4%)
Total	61	13	5	23	102

Figure 1a: Frequency Distribution of Individual Contractual Control Clauses

(Control clause (*x*) is present in *y*% of the contracts)

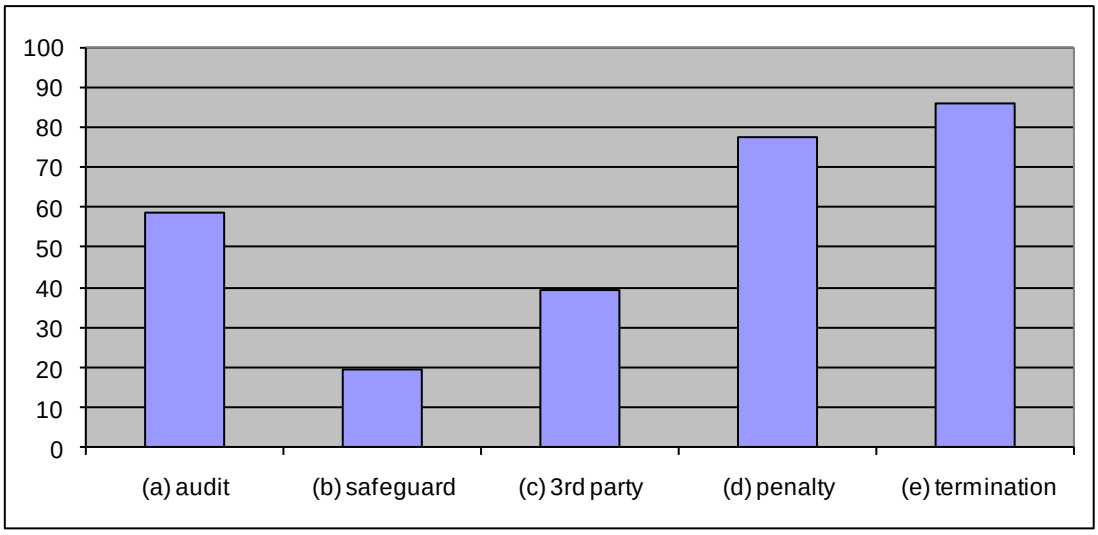

Figure 1b: Distribution of *Control Complexity* Index

(# of contracts with $\sum Ci=x$)

Figure 2a: Frequency Distribution of Individual Contractual Coordination Clauses

(Coordination clause (x) is present in *y*% of the contracts)

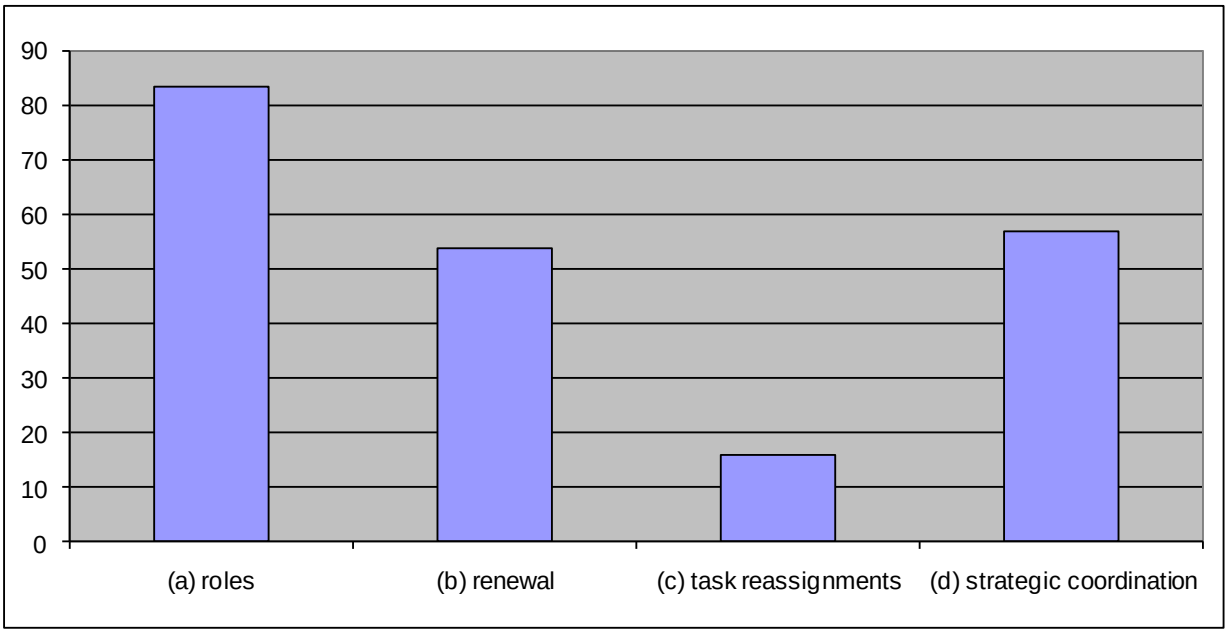

Figure 2b: Distribution of *Contractual Coordination* Index

(# of contracts with $\sum D_i$=x)

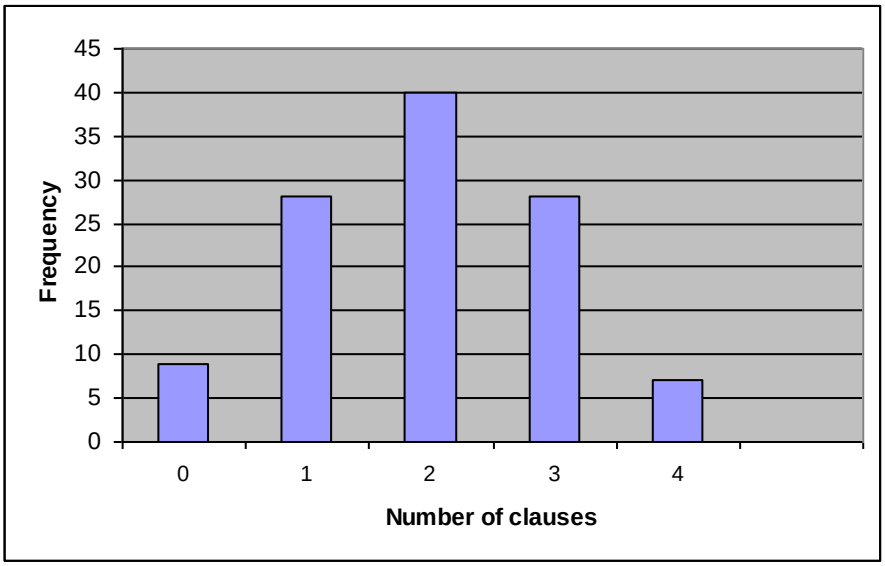

Figure 3a: Change in Probability of Private Dispute Resolution with Increasing Complexity (Quadratic functional form)

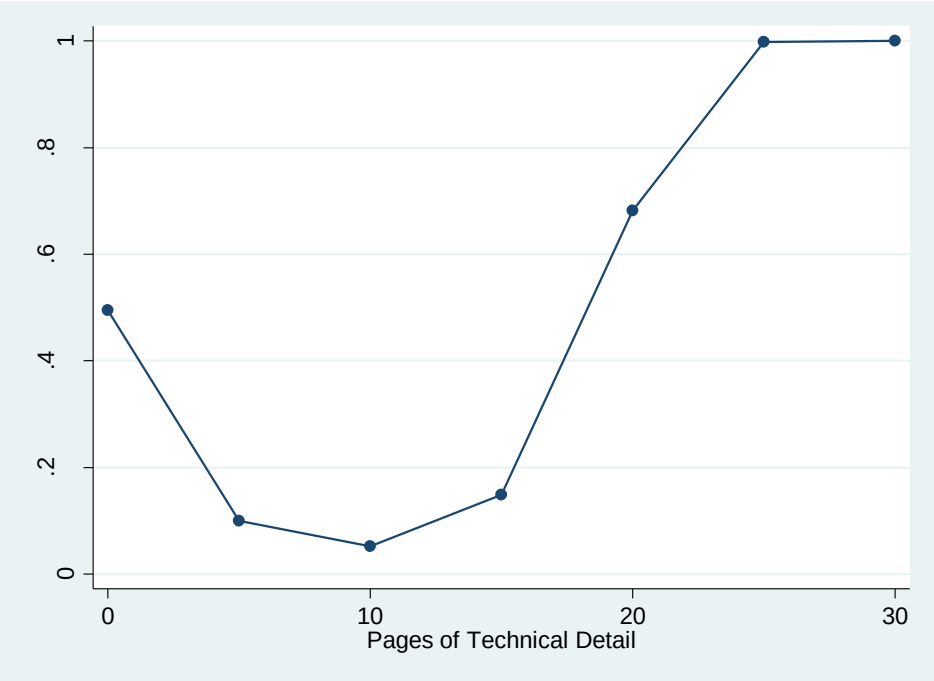

Figure 3b: Change in Probability of Private Dispute Resolution with Increasing Contractual Controls (Quadratic functional form)

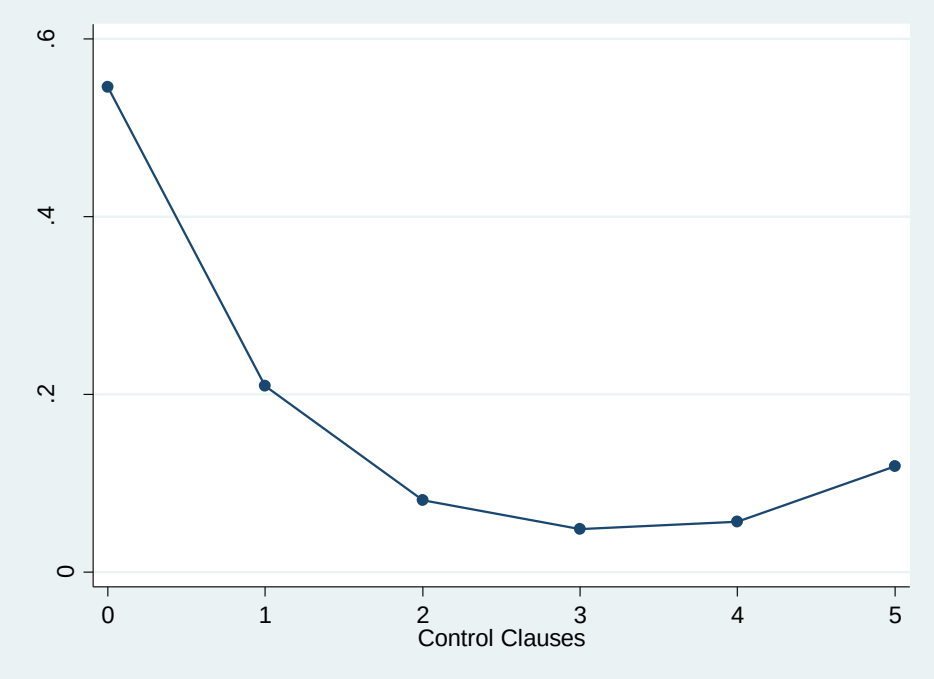

Figure 4a: Change in Probability of Private Dispute Resolution with Increasing Technical Complexity (Dummy Variables Based on Quintiles)

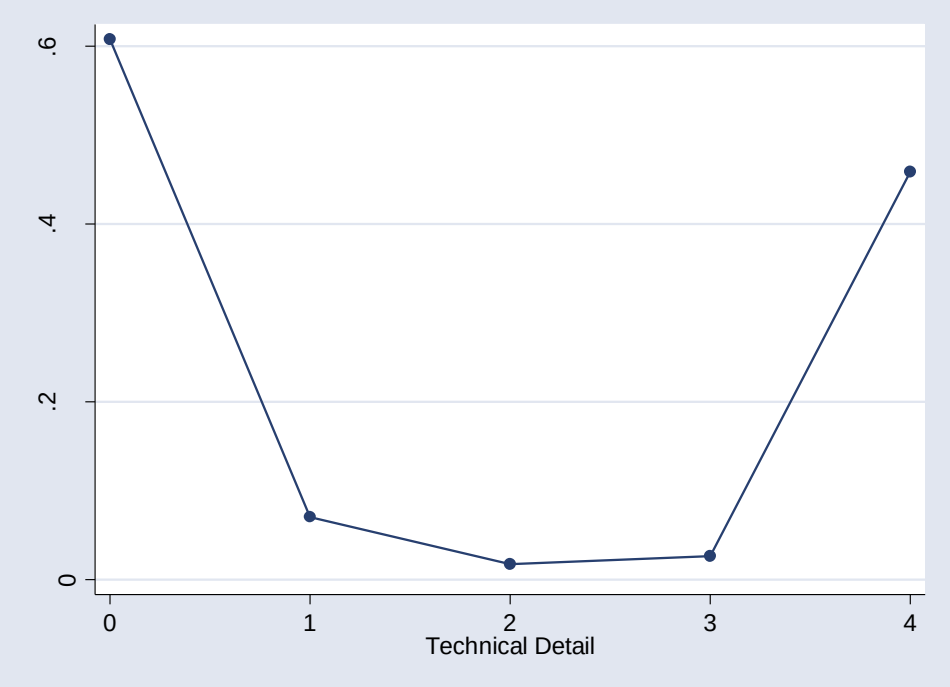

Figure 4b: Change in Probability of Private Dispute Resolution with Increasing Contractual Controls (Dummy Variables)