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ABSTRACT

This paper presents results from a controlled laboratory study of bargaining behavior and dispute rates under three types of arbitration procedures. Two of these—conventional and final-offer arbitration—are commonly used in practice, while an innovative procedure called "Combined Arbitration" (Brams and Merrill 1986) is not currently used. Combined Arbitration combines the rules of the two most commonly used forms of binding arbitration (conventional and final-offer arbitration) in such a way as to generate convergent final offers in theory. Controlled laboratory results show, however, that disputes are *most* likely in Combined Arbitration and least likely in conventional arbitration. These results challenge the theoretical predictions of Combined Arbitration as well as the hypothesis that final-offer arbitration would be more likely to reduce disputes compared to conventional arbitration. The results may be consistent with the hypothesis that disputants are relatively optimistic about the arbitrator's notion of a fair settlement. Implications of these findings are also discussed.

JEL codes: J5, C9, C7

Key words: dispute resolution, arbitration, bargaining, experiments

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1. Introduction

Alternative dispute resolution (ADR) is of immediate interest due to the widespread use and attraction of ADR, which is used to help resolve disputes in labor/management relations, commercial and insurance disputes, and domestic disputes, among others. Commonly used ADR procedures include mediation, fact-finding, and arbitration. Of these, only binding arbitration guarantees settlement of the dispute since the settlement is determined by the arbitrator in the event of bargaining impasse. That said, researchers and practitioners have noted that the effectiveness of an arbitration procedure may lie in its ability to induce *negotiated* settlements (see, e.g., Stevens 1966). The identification of the most effective arbitration procedure is then desirable for two reasons. First, effective procedures imply more negotiated settlements, and disputants generally prefer to dictate their own settlement. Second, invoking arbitration with less frequency implies a significant savings in terms of time and money costs.

In this paper I present the results from a controlled laboratory test of disputant behavior under three different arbitration rules. This lab study generates original data that compares the two most commonly used forms of arbitration, conventional arbitration (CA) and final-offer arbitration (FOA), to an innovative procedure called "Combined Arbitration" (CombA). In CA, the arbitrator is free to impose any settlement on the disputants, whereas the rules of FOA stipulate that the arbitrator is constrained to choose one of the disputants' final offers. Brams and Merrill (1986) devise the CombA procedure by combining the rules of CA and FOA in a way that generates the theoretical prediction that disputants' final offers converge to agreement.[1] The rules of CombA are simple. If the arbitrator's notion of a fair settlement lies *between* the

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[1] Brams and Merrill also suggest a modified version of CombA that does not yield theoretically convergent final offers, but may involve less uncertainty for the disputants than the standard CombA procedure. I test CombA along with the modified CombA procedures in Dickinson (2001), and the results suggest that dispute rates are significantly lower under basic CombA than under modified CombA. For this reason the basic CombA procedure was chosen as the most effective of the CombA procedures for purposes of the continued investigation.

disputants final offers, then the rules of FOA are used. Otherwise, the rules of CA are used. If it can be determined empirically that disputant behavior is in agreement with their theory, then CombA offers a potential major advantage over commonly used arbitration procedures in that it is more likely to induce a voluntary settlement by the disputants.

A primary goal of this paper is to report results comparing dispute resolution under the innovative CombA procedure with commonly used arbitration procedures. A secondary goal is to provide a controlled comparison of the two commonly used procedures, CA and FOA. This is necessary because the existing research contains mixed or inconclusive reports on the effectiveness of CA versus FOA, and this debate is far from resolved. Feuille (1975), for example, reports results based on field data that support the contention that FOA is invoked less frequently than CA, whereas Feigenbaum (1975) notes that many forms of FOA used in practice are not actually pure FOA mechanisms.[2] Empirical studies based on field data may then be guilty of comparing apples and oranges by lumping together quite distinct forms of arbitration under the title of "FOA". More recent research has used lab studies or mock negotiations to compare the effectiveness of different ADR procedures. Notz and Starke (1978) generally conclude that there is more concessionary behavior under FOA than under CA, while Ashenfelter et al. (1992) find higher dispute rates under FOA than CA.

Ashenfelter et al. is the first laboratory study comparing alternative arbitration procedures—CA and FOA are included in their comparison—that mechanizes the arbitrator

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[2] He notes that in Eugene, Oregon, the FOA procedures originally allowed each disputant to submit two final offers. The FOA system used in Michigan functioned more like mediation-arbitration by allowing the arbitrator to pick and choose final offers among specific issues.

decision-making process.[3] Others use a mock negotiations format and typically leave the arbitrator decision-making process uncontrolled, which confounds the interpretation of the data. Nevertheless, the dispute rate results from Ashenfelter el al. are open to an alternative explanation given the way in which information was provided to the subjects about the arbitrator decision-making process.[4] The end result is that additional data comparing CA and FOA would also be useful in our collective attempts to determine which set of arbitration incentives generates the lowest dispute rates.

The testing of promising innovative procedures like CombA seems prudent. In essence, millions of dollars in dispute are allocated each year through commonly used arbitration procedures which have been shown to theoretically *not* induce convergence of the disputants' bargaining positions. CombA is theoretically shown to induce convergence of final offers, and therefore eliminate the need to invoke the procedure. Such a result would have large implications for dispute resolution in practice, and controlled experiments offer a relatively low-cost method of generating initial data on promising new procedures.

2. Motivation

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[3] Ashenfelter et al also examine a procedure called tri-offer arbitration, in which the arbitrator is constrained to choose either one of the disputant's final offers or the recommendation of a neutral fact-finder (note that the fact-finder is essentially an arbitrator who makes a non-binding recommendation).

[4] Specifically, while the Ashenfelter et al (1992) design presents arbitrator information in their CA treatment by means of a table of 100 draws from the distribution used to simulate the arbitrator's notion of a fair settlement, pairs of final offers are shown along with the resultant arbitrator choice under FOA—this is a *different* information provision process from that used in the CA treatment. Subjects may form expectations of arbitrator settlement distributions differently under the different information provision process of CA and FOA. These different expectations may then be responsible for the differences in settlement rates, among other things, between CA and FOA in their study. Indeed, if the information provision under FOA causes subjects to create expectations that the arbitrator distribution of fair settlements is of lower variance than it is in CA (which is likely given that the most extreme potential settlement values in FOA are not determined by the arbitrator's notion of a fair settlement but rather by the disputants' final offers), then the disputants' uncertainty about the arbitrator is not controlled for across treatments. The results of Farber and Katz (1979) are worth noting here. More uncertainty about the arbitrator's distribution of fair settlement, *ceteris paribus*, increases the contract zone for mutually beneficial negotiated settlements. While a positive contract zone does not guarantee a negotiated settlement, it would not be illogical to conclude that the perceived lesser uncertainty under FOA, which would cause a smaller contract zone between the disputants, might therefore lead to the higher dispute rate in FOA that Ashenfelter et al (1992) report.

There is certainly no lack of interest in ADR procedure, arbitration among them. It can be said, unequivocally, that ADR use is on a dramatic rise in response to a growing discontent with the costs and delays of traditional litigation. The Justice Department, for example, diverted 1,800 cases in litigation to ADR in 1998, up from just over 500 in 1995 (*Dispute Resolution Times)*. The CPR Institute for Dispute Resolution reports that 56% of federal judges favor court ADR use, 97% of corporate executives favor ADR, and thousands of companies and law firms have signed a policy statement promising to explore or advise clients about ADR (www.cpradr.org/why_adr.htm). Also, a key component in administering many states' (and Canada's) automobile lemon laws is the use of arbitration, either through manufacturer-sponsored programs or state administered lemon law arbitration programs. The use of ADR is also getting a boost from the growth of Internet sales traffic. Online dispute resolution can be found at www.SquareTrade.com, www.Cybersettle.com, and www.ClickNSettle.com, to name a few Web sites.

The attraction of any ADR procedure lies in the belief that it can help resolve disputes more effectively and efficiently than otherwise would be the case. One should note also that ADR procedures, such as arbitration, are not just reserved for the settlement of disputes involving small sums of money. Professional baseball players use salary arbitration to allocate millions of dollars in dispute, the arbitration of labor contract terms covering large numbers of workers can also involve millions of dollars, and arbitration was used to recently award "$16 million to the heirs of Abraham Zapruder for the sale to the U.S., government of Zapruder's historic home movie..." capturing the assassination of President John F. Kennedy (*Dispute Resolution Times*).[5] Even the average smaller sums of money handled in online ADR are, on the

[5] To note some perhaps more intriguing instances of arbitration, Ashenfelter et al (1992) reports that a type of arbitration was used to hand the death sentence to Socrates in ancient Athens, and President George Washington's

aggregate, quite large. The online dispute resolution company Cybersettle.com, for example, is now used by nearly 500 insurance companies, has 16,000 current users in its system, and is already responsible for over $37 million worth of settlements. Part of the attraction of ADR is its promise to not only improve relations, but to also save time and money.

In studying arbitration specifically, researchers have shown an interest in examining the game theoretic incentives of CA and FOA. The general argument is that CA may tend to "chill" negotiations as disputants expect an arbitrator to split the difference of their final positions. Farber's (1981) examination of CA concludes that what may appear to be splitting the difference may in fact be disputants strategically bracketing their final offers around the expected arbitrator award. Nevertheless, the result still implies nonconvergence of final bargaining positions in CA, and so the potential for different arbitration rules that might induce convergence has always been attractive. Indeed, some public sector labor disputes were being resolved using forms of FOA only a few years after Stevens (1966) originally suggested FOA as a new form of arbitration more likely to induce agreement than CA. The stream of research that followed showed that FOA did not induce convergence in theory. Farber (1980), Crawford (1979) and Brams and Merrill (1983) show that Nash equilibrium final offers in FOA will generally not converge to agreement unless there is complete certainty about the arbitrator's notion of a fair settlement.

Empirical research has also examined outcomes under FOA and CA (Feuille (1975) and Ashenfelter and Bloom (1984), e.g.). Field research has also provided results that simplify the effective use of laboratory methods in generating data complementary to the existing field data. Specifically, empirical studies of arbitrator behavior (see Ashenfelter and Bloom (1984), and Ashenfelter (1987)) have revealed that acceptable arbitrator behavior contains a random

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will calls for the use of arbitration in the event that disputes arise over the interpretation of his will (contained in the records of Fairfax County, Virginia).

component that is symmetric around the disputants' estimation of the median value of potential arbitrator settlements. In other words, as noted in Ashenfelter (1987), arbitrators are statistically exchangeable in the limit. Such arbitrator exchangeability implies that a three-party bargaining environment can be simplified by drawing arbitrator decisions, z, from a fixed distribution $f(x)$. This feature of the arbitration environment is noted and utilized by Ashenfelter et al (1992), and it is an important distinction between their experiments and those in which arbitrator behavior is uncontrolled (that is, experiments which involve arbitrator role playing).[6] I exploit this feature in the experimental design used to test these arbitration procedures.

The fact that field data support the use of a fixed distribution of arbitration settlements in controlled experimental data generation opens a door for more controlled studies of disputant behavior, holding constant the arbitrator decision-making process.[7] The use of experiments to generate original data comparing CombA to CA and FOA is necessary for an even more practical reason. There is, to date, no known use of CombA in practice, and so field data on the procedure is non-existent. Experiments offer the *only* way to generate data on CombA, which can begin to shed some light on how disputants respond to the incentives of CombA. The limitations on the available field data dictate that experimental methodology be used as a way to generate initial data. The results of such research on innovative arbitration procedures are useful in that they lower the risk of potential trial implementation of new arbitration procedures like CombA.[8]

3. Framework

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[6] Example of such experiments involving role-playing include Neale and Bazerman (1983), Grigsby and Bigoness (1982), and Notz and Starke (1978)

[7] This may be important not just to control the decision-making process of the arbitrator, but also as a way of avoiding the potential differences in the decision-making of student-arbitrators and actual arbitrator. This difference is documented in Oswald (1991).

Consider the framework for bargaining behavior motivated by Farber (1980), which incorporates the stochastic nature of arbitrator decisions into the dispute resolution process. Disputants each have a desired level of one quantifiable variable, x. Disputant A desires a low level of x such that utility to disputant A is $U_a(x)=-x$ (or some parametric shift of this), while disputant B desires a high level of x such that $U_b(x)=x$. Assuming that disputants cannot perfectly forecast the arbitrator's notion of a fair settlement for x in any given case, the disputants' common estimate of the arbitrator's notion of a fair settlement is modeled as a density function $f(x)$. As previously noted, arbitrators are statistically exchangeable in the limit, and so the function $f(x)$ allows the complete description of arbitrator behavior in theory and the mechanization of the arbitrator's behavior for the experimental environment.

This framework is potentially limiting given that it views all negotiations as win-loss bargaining. Current theories of bargaining philosophies note, however, that even if bargaining contains other components of interest (such as attempts to structure attitudes and/or the potential for creative solutions that might be classified as win-win bargaining) it is likely the case that a zero-sum component of the negotiations still exists in more complicate negotiations (see Walton and McKersie (1965)). This research can then be considered more relevant to understanding disputant behavior in more traditional win-loss bargaining environments.

In a zero-sum game framework where disputants possess a common estimate of $f(x)$, predicted disputant behavior differs across arbitration procedures. In CA, the original arguments were that arbitrators would merely "split the difference" as they compromised between the disputants' final bargaining positions. On the other hand, Farber (1981) offers an alternative explanation that the disputants bracket their final offers around the expected arbitrator award.

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[8]A recent example of the costliness of ad hoc trial and error can be found by examining online dispute resolution. For example, ClickNSettle.com recently switched their online computerized mediation procedure away from a 3-

Farber shows that the less weight the arbitrator places on the disputants' final offers, the larger is the resultant contract zone, assuming disputants are uncertain about the arbitrator's notion of a fair settlement. This suggests that dispute rates may be biased downward in CA if draws from a fixed distribution are used to simulate arbitrator behavior.[9] It should be noted, however, that the exact same process is used across arbitration mechanisms in the design I present, and so controlled comparisons are still internally valid across arbitration procedures. The implicit assumption that arbitrators do not weigh the quality of offers is extreme, but it serves to help maintain control of the simplified bargaining environment.

In final offer arbitration, final offers based on risk neutrality are calculated in Farber (1980), among others, and it is shown that optimal offers not convergent, but rather separated by an amount that is increasing in the variance of the arbitrator's settlement distribution. Specifically, if m is the median value of $f(x)$, then the final offers are given by

$$(1) \qquad (x_a^*, x_b^*) = \left(m - \frac{1}{2f(m)}, m + \frac{1}{2f(m)} \right)$$

Brams and Merrill (1986) calculate the equilibrium final offers of CombA, and show that final offers converge to the median value of $f(x)$ for risk neutral disputants. That is, $(x_a^*, x_b^*)=(m,m)$. Based on these theoretical predictions, a key hypothesis or this study is that dispute rates will be lowest in CombA.

The original idea behind the suggestion that FOA would increase voluntary settlements is that FOA eliminates the "middle" of the arbitrator settlement distribution, thereby increasing uncertainty relative to CA. It has been noted that FOA also *decreases* uncertainty by also

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round model after only two months of (not very effective) use.

[9] Babcock et al (1995) show, however, that a positive contract zone does not guarantee a settlement, or a quick one when it occurs. Their results do show that larger contract zones are more likely to generate quicker settlements when the exact size of the contract zone is uncertain. Though the design in the present paper is one of uncertain contract zones, I do not systematically alter the size of the contract zone for this study.

eliminating the tails of the distribution (Farber and Bazerman (1989)). Perhaps herein lies the open debate as to whether or not FOA will produce higher or lower dispute rates than CA. CombA, however, increases uncertainty both by eliminating the center of the distribution and by preserving the possibility of extreme outcomes in the tails of the arbitration settlement distribution. Brams and Merrill note that it is precisely this possibility of a settlement more extreme than either final offer—along with the elimination of compromise settlements—that drive the convergence property of CombA. The general intuition of the predicted dispute rates can be thought of as based on the degree of uncertainty created for the disputants.

4. Experimental Environment

The experimental environment is motivated by Ashenfelter et al (1992). Subjects are randomly and anonymously matched with a counterpart for twenty 2-minute rounds, and subjects bargaining over the value of a variable, x.[10] Communication is not allowed during the experiment other than the numeric messages transmitted through the subjects' computer terminals—the computer application transmits messages over the Internet as a way of networking the subjects together in the experiment. Disputant A in the experiment is given a payoff sheet that shows how cash experimental earnings linearly increase as x decreases, whereas disputant B's payoffs linearly increase in x. Each subject is aware that counterpart earnings move opposite his/her own earnings, but the subjects are unaware of the level of counterpart payoffs for different values of x. As is true with the theoretical predictions based on zero-sum bargaining, subjects are aware that their own gain is their counterpart's loss at the margin, but payoff levels are private information to simulate the real world asymmetry that exists in assessing the value that your bargaining counterpart may place on the object of negotiations

[10] Pilot experiment determined that 2-minute rounds were sufficient to allow subjects to negotiate a settlement if they truly desired to. This determination was based, in part, on subject comments following the pilot experiments.

One additional detail of the environment is meant to simulate the real world uncertainty that often exists in knowing your counterpart's reservation value. Disputant A is instructed to bargain for $x \in [200,700]$, whereas disputant B is instructed to bargain for $x \in [300,800]$. Again, the theoretical predictions are not altered by this particular detail of the zero-sum game, but this detail is meant to improve the external validity of the data generated in this environment since real-world bargainers would likely not have full information on their counterpart's target bargaining range. Further, the asymmetric bargaining ranges will help avoid rule-of-thumb outcomes of a simple 50-50 split of the "pie".[11] The "pie" over which the disputants bargain in each round is a $2.00 pie which would be equally split among the disputants at x=500. Each one-unit change in x increases or decreases disputant payoffs by one-half cent. Subjects are reminded that their counterpart's bargaining range may not be the same as their own, and payoffs were *not* truncated at zero in the event that subjects agreed to values of x outside of their bargaining range (e.g., if disputant A agrees to x=800, then disputant A (B) receives $-.50 ($2.50) for that round).

Subjects proceed through on-screen instructions that explain in detail all aspects of the experimental bargaining environment.[12] In this environment, disputants are free to exchange numeric offers of x any way they desire. There is no stipulation that offers must "improve" upon previous offers or wait for counteroffers. The standing (most recent) offer of either disputant is displayed at the top of the offer queue, and either disputant can accept his/her counterpart's

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[11] Ashenfelter et al (1992) similarly expressed this concern over mechanical settlements to "split-the-pie". They chose to make the arbitrator's mean value of the settlement distribution higher than the midpoint of the disputants' bargaining range. This feature might make it more difficult for disputants to reach an agreement, and so the present environment may suffer from the same bias towards disagreement. However, comparisons across procedures are still valid.

[12] Copies of the experimental instructions can be viewed at http://www.usu.edu/~econmhr/instructions.html.

standing offer. Sample bargaining screens are displayed in the general instructions to highlight these important details.

Upon finishing general instructions, the subjects proceed through instructions specific to the dispute resolution procedure that will be used in the event that no agreement on the value of x is reached by the end of the bargaining round. Unlike in Ashenfelter et al, each bargaining pair completes 5 consecutive rounds of each of 4 dispute resolution procedures—CA, FOA, CombA, and no arbitration (NA)—to create a within subjects design. Subjects were unaware that 5 rounds of each treatment would be completed. In naturally occurring environments, bargaining impasse still occurs even in the absence of ADR procedures such as arbitration. Arbitration's primary disagreement costs are in terms of uncertainty (as noted by Farber and Katz (1979)), whereas strikes and lockouts, for example, produce more certain monetary costs of disagreement. For this reason, I include a NA treatment in which disagreement generates a payoff of zero to both disputants for that round.

In the arbitration treatments, which different pairs complete in randomized order, subjects are given information about the nature of the arbitrator decision-making process by means of a table of 100 numbers. The table is generated from the same distribution that describes the arbitrator's notion of a fair settlement. In all arbitration treatments, this distribution is a normal distribution with mean=500 and standard deviation=60—this parameterization generates predicted final offers under FOA of x_a=425, and x_b=575, whereas under CombA final offers are predicted to converge to x_a=x_b=500. Subjects are informed that these numbers are the last 100 draws from the same distribution that is used in the specific arbitration procedure that will determine their settlements. In CA, the value drawn from the preferred settlement distribution would determine the settlement. In FOA, the value drawn is compared to the disputant final

offers, and the final offer closest to the arbitrator draw is chosen as the settlement. In CombA, the instructions are also appropriately altered to describe the use of CA whenever the arbitrator draw is more extreme than either final offer, and the use of FOA when the arbitrator draw lies between the two final offers. The instructions describe each arbitration procedure in generic language, and the experiment and instructions contain only context-neutral (e.g., words like dispute, arbitration, union, etc. are not used)

A key distinction between this design and the design presented in Ashenfelter et al is that the way in which information about the arbitrator decision-making process is identical across treatments. Ashenfelter el al alter the way in which the information is provided to the subjects across arbitration treatments. While their reasoning is not without merit—their purpose is to mimic they way in which disputants might gather information about arbitrator decisions from field data—the result is an uncontrolled variable in the design which might be responsible for some of the data generation process. The design I present eliminates the potential that subjects create different expectations of arbitrator behavior across treatments. In my case, it is serves another very practical purpose. Since no field data exists on CombA, one cannot simulate how subjects might gather information on arbitrator decisions from field data.

After completion of the instructions, the bargaining rounds commence for each disputant pair. After 5 rounds of a particular treatment are completed, a new set of instructions display to explain the change in the dispute resolution procedure that is used to handle disagreement. Upon completing all experimental rounds, each subject fills out a brief on-screen demographic survey, and is then paid his/her earnings privately and in cash.

Experimental data generation is not without its drawbacks. A "no-communication" experiment may seem quite distant from the spirit of real-world negotiations. However, face-to-

face communication would imply a loss of control over the environment as outcomes might be generated, in part, by "...uncontrolled aspects of social interaction" (see Roth (1995)). Demographic variables can be used to control for many measurable differences in the bargaining pairs, but it would be difficult to quantify and control for items such as body language. I do not claim that such items are not of interest, but the point of this study of to conduct the most controlled test possible of behavior under the various forms of arbitration. As such, it is better to remove these items from consideration altogether.[13]

The external validity of experimental data is always a concern as well. While real-world negotiations often have larger stakes, it is ultimately an empirical question whether or not individuals behavior significantly changes given the stakes of the game. It is true, though, that the subjects who participated in these experiments are making real economic decisions with real (salient) cash consequences. Bolton and Katok (1998) highlight the fact that simple lab negotiations have been shown to capture many important feature of field negotiations, and this at least implies that we should not disqualify lab-generated data from consideration as valid scientifically-generated data. Experimental data generation has its costs and its benefits. I believe that the benefits outweigh the costs in this instance. First, experiments generate data at a much lower monetary cost than field experiments. Secondly, while experiments simplify the decision environment, researchers using field data often have to make rather restrictive (implicit) assumptions in their econometric estimations. Finally, in attempting to gather data on innovative institutions not used in practice, such as CombA, experiments offer the only viable way to gather initial evidence on the effectiveness of these innovations.

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[13] Repeated bargaining with the same individual also means that this is essentially a dynamic experiment created to test a static theory. It is noteworthy that experimentalists have documented that individuals in experiments often need several rounds of decision-making in order to learn the environment well enough to give the static theory a

5. Results

The results reported are from 48 student bargaining pairs who completed this experiment during the Spring 2001 semester. Subjects received an average payoff of $18.92 ($\sigma$=$3.34) for participation in the experiment, which lasted about 1 hour and 15 minutes for the average bargaining pair. Figure 1 shows the average dispute rate results from these experiments. In Figure 1, data is averaged across all bargaining pairs and separated by dispute resolution treatment and the within-treatment round (i.e., round 1 in Figure 1 refers to the first round of bargaining in that particular treatment). Two items are evident from Figure 1. First, disputants disagree more when arbitration is used than when the disputed "pie" is destroyed in the event of disagreement. This is consistent with others who have found that arbitration effectively lowers the overall cost of disagreement, and so disagreement occurs more frequently (Ashenfelter et al. (1992) and Dickinson (2001)). We can also see that while the relative effectiveness of each arbitration procedure is not immediately clear, it appears that disputes are, on average, less frequent in CA than in CombA or FOA.

Regression-based analysis can help shed additional light on the comparative effectiveness of the different dispute resolution procedures. The data generated not only allow for analysis of the determinants the probability of a dispute, but they also allow for analysis of the determinants of *negotiated* outcomes. In this analysis, I define a dispute to be an instance in which either the pie is destroyed or arbitration is invoked. Table 2 contains estimates of the probability of dispute, *Dispute* (columns 1 and 2), as well as estimates of the determinants of the time to reach a negotiated settlement when dispute resolution is not invoked, *AgreeTime* (columns 3 and 4) and the determinants of the negotiated level of x, *X-Outcome* (columns 5 and 6). In each case I

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chance (as is done in Ashenfelter et al). Experimental economists often use repetition of the environment to improve the chances of generating high quality experimental data.

estimate a basic model of the treatment effects and then a model that includes a series of variables created describe potentially important characteristics of the bargaining pair. These variables are described in Table 1 and are meant to capture characteristics of the bargaining pair that might proxy bargaining and/or dispute experience as well as other potentially important pair-specific characteristics. Each of the estimation equations in Table 2 accounts for interpair heterogeneity in the data.[14]

Sample selection is an issue in analyzing the *AgreeTime* and *X-Outcome* models since each model is estimated using data produced only when bargaining pairs negotiate an outcome. The two step procedure in Heckman (1979) is used to control for sample selection in the models for columns 3-6, and the coefficients reported are for the *direct* effects of each regressor on the dependent variable.[15] The full set of variables from Table 1, along with the treatment variables, are used in estimating the probits, while the second-stage regressions are estimated using only treatment effect variables (columns 3 and 5) or treatment effect variables plus a subset of Table 1 variables (columns 4 and 6).[16] Interpair heterogeneity in the columns 3-6 models of Table 1 is accounted for through the random effects component of the first-stage probit estimation.

Starting first with the probit equation estimates in columns 1 and 2 we can see that each arbitration treatment significantly increases the probability of a dispute compared to the no arbitration treatment. Further, dispute rates are actually *highest* in CombA, though the coefficient on CombA is not significantly greater than the coefficient on FOA ($p>.25$ for the χ^2_1 (Wald) test statistic on both models in columns 1 and 2). CA increases dispute rates over NA by

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[14] Specifically, the probit equations in columns 1 and 2 are random effects probit estimators since the value of interperiod, but within pair, correlation is statistically significant (p=.00).

[15] Complete results on the regressors' total effects, which include direct effects and indirect effects (via the sample selection term), are available from the author upon request. The key results are largely similar when reporting results on the *total* effects of each regressor on the dependent variable.

[16] The subset of variables omitted is *1job, 2job, 1business, and 2business.*

an amount that is statistically significantly less than the increase in dispute rates under FOA and under CombA.[17] Consistent with both field and experimental research, dispute rates are higher with arbitration than without it (Currie and McConnell (1991), Ashenfelter et al. (1992), Bolton and Katok (1998), Dickinson (2001)). However, the relative effectiveness of the various arbitration procedures is, if anything, opposite that which we expected *ex ante*. More will be said on this in the next section. None of the pair-specific variables analyzed in this sample significantly affect the probabability of dispute.

Farber and Katz (1979) show that since arbitration affects the disputants' contract zone, it likely has the undesirable effect of altering negotiated outcomes, not just arbitrated outcomes. The estimation of the *AgreeTime* and *X-Outcome* equations are meant to explore the potential effects of the arbitration procedures on two key components of a negotiated outcome. The equations estimated in columns 3 and 4 confirm that each of the arbitration procedures significantly affects the time to reach a negotiated outcome relative to the NA treatment. The sample selection term is statistically significant in both the treatment effects and complete models. The use of arbitration significantly lowers the time to settlement by 18%-32% in the model of Column 4 for the 2-minute rounds in these experiments. However, each previous incidence of conflict *increases* time to settlement by almost 5% (column 4). Additionally, the coefficient on *Round* indicates that negotiated settlements occur about 2.8% faster in each round, which amounts to about a 50% quicker settlement under NA in round twenty versus round one of the experiment, *ceteris paribus*.[18] A bargaining pair with at least one female also significantly increases the time to a negotiated settlement by about 10-11% per female in the pair. Dickinson

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[17] For the CA/FOA comparison, p=.03 (column 1) and p=.10 (column 2) for the χ^2_1 test statistic. For the CA/CombA comparison, p=.02 (column 1) and p=.05 (column 2) for the χ^2_1 test statistic.

[18] Given the experimental environment, the coefficient on the variable *Round* may be capturing a pure experience or even a wealth effect.

(2001) confirms an important effect of the gender composition of the bargaining pair, but his results show a significant effect only with one female in the bargaining pair (i.e., a mixed gender bargaining pair). A more careful examination of the gender composition is clearly warranted, although these results at least indicate that gender is likely an important variable that affects the dynamics of negotiations even when gender is unknown by the disputants.[19] The gender results reported may be an indication of inherent differences in bargaining strategies across genders independent of the potentially important effect of knowing the counterpart's gender.

A bargaining counterpart who regularly attends religious services, though not affecting the probability of dispute, significantly increases the time to a negotiated settlement. The variable *1Religious* indicates a mixed bargaining pair of one "religious" individual and one non-religious individual, and so interpretation of this result is somewhat difficult to interpret. Along with gender, this demographic characteristic merits further study as Dickinson (2001) also find a significant affect of religious affiliation on bargaining outcomes. Also, when one of the disputants has been involved in a court case, the time to reach a negotiated settlement significantly decreases by about 8%. In such cases, the court-experienced disputant may be more eager to negotiate the settlement quickly given past court experience, or may be able to more quickly identify the acceptable outcomes given his/her real world dispute experience.

The estimations in columns 5 and 6 indicate that none of the arbitration procedures significantly affects the negotiated level of the x variable. This is fortunate since a documented adverse affect on the negotiated level of x would likely deter the use of the procedure(s) by the adversely affected disputant. The measure of previous conflict is a significant determinant of the negotiated level of x. Its magnitude of about +6 indicates that the level of x significantly increases by 6 units (in NA) with the additional round of disagreement. This may result if

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[19] This is potentially true at a pure behavioral level since gender is anonymous to subjects in these experiments.

disputants A, who seek low values of x, are more averse to bargaining impasse on average. Each instance of impasse might induce disputant A to concede more in negotiations in an effort to avoid costly impasse. Finally, a pair of female disputants significantly decreases the negotiated x by almost 30 units. I have yet to come up with a satisfactory explanation for this result. One should note, however, that the overall second-stage regressions in columns 5 and 6 are insignificant, and so other omitted factors may be determining the negotiated level of x and, if correlated with the regressors, biasing the coefficient estimates the demographic variables in column 6.

In all, the statistical analysis show the following regarding arbitration procedures. The availability of arbitration increases dispute rates versus bargaining impasse that destroys the pie, and of the arbitration mechanisms tested, CA produces the lowest dispute rates while CombA produces the highest dispute rates (though not statistically significantly higher than those in FOA). Arbitration does appear to affect negotiated outcomes, although its only effect is that it is found to *decrease* the time to reach negotiated settlements. None of the procedures tested significantly affected the negotiated level of x. While the affects of arbitration on negotiated outcomes do not appear to be adverse, the comparative effectiveness of the various procedures in lowering dispute rates seems contrary to theoretical predictions and/or the usual arguments about arbitration and the "chilling" effect. While the initial hypothesis of lowest dispute rates under CombA is not supported, I offer a simple hypothesis in the next section that may help shed some light on these results.

6. Disputant Optimism?

A key assumption in most models of bargaining under arbitration is that the disputants possess identical expectations about the nature of the arbitrator uncertainty. Others have

suggested that divergent expectations may be a cause of bargaining disagreement. Farber and Bazerman (1989) note that divergent prior expectations of the arbitrator's notion of a fair settlement is a "...prominent explanation for disagreement in bargaining..." (p.99). Their discussion originates with the idea that divergent expectations can shrink the contract zone and make agreement less likely.[20] Interestingly, enough, the authors conclude that divergent expectations and their hypothesized effect of shrinking the disputants' contract zone cannot by itself explain field data results on dispute rates under CA and FOA.

Babcock and Loewenstein (1997) also approach the topic of divergent expectations by exploring how a "self-serving bias" can generate bargaining disagreements. The self-serving bias results when individuals view as fair that which would benefit themselves more. Neale and Bazerman (1985) study negotiator "overconfidence" in a role-playing experiment and find the overconfident negotiator are less concessionary. Farmer et al (2001) find evidence using field data from Major League Baseball that information asymmetries can lead to optimism that is most prevalent for inexperienced negotiators. A related concept that I consider is that individuals may be optimistic in the sense that they inflate the probability that the arbitrator's notion of a fair settlement is favorable to them. My basic hypothesis is that such "optimism" can, in part, determine which dispute resolution procedure is most preferred by an individual. If optimism implies that a disputant expects some arbitration procedures to generate better average payoffs for him/herself, then the disputant is likely to invoke those procedures more frequently. That is, for a given set of final offers, optimism can imply higher (subjective) expected payoffs under certain arbitration rules.

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[20] Brams and Merrill (1986) actually show that under certain conditions CombA still generates predicted convergent final offers *even if* disputants possess divergent expectations that are not too divergent. The divergence in expectations that they consider is different than what I am hypothesizing here.

First, assume that disputants' average final offers are similar across arbitration procedures. It may seem unrealistic to assume that final offers will be similar across procedures given that this is contrary to the existing theoretical predictions. The data, however, are consistent with the possibility that average final offers are not different across arbitration procedures. Under FOA average final offers for arbitrated outcomes are x=408 and x=573 for disputants A and B, respectively. Under CombA, these same average final offers are x=415 and x=567.[21] These final offers are not statistically significantly different from the predicted risk neutral final offers under FOA except for the average disputant A final offer of x=408 in FOA, which is significantly lower than predicted (the risk neutral final offer predictions in FOA are x=425 and x=575).[22] Dickinson (2001) reports results on CombA and modified forms of CombA and also shows that final offers are generally not statistically different across arbitration procedures, and they are not generally different from the FOA risk neutral predictions, even across treatments that generate significantly different dispute rates. I therefore proceed assuming that disputants may submit relatively similar final offers independent of the arbitration procedure.[23]

Similar final offers across arbitration procedures can imply one of two things. It could imply that subjects are unable to fully understand the procedures and their different incentives. The possibility that I entertain in exploring optimism is that, rather than respond to the procedures' incentives by submitting different final offers, subjects respond to the different incentives by changing their propensity to dispute—this hypothesis is supported by the data.

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[21] Unfortunately, the computerized experimental design does not allow for subjects to submit final offers under CA, and so we have no data on disputants' final bargaining positions prior to invoking CA.

[22] The null hypothesis that the average final offer equals 425 is rejected at the p=.02 level for the two-tailed test.

[23] This assumption may be true on average, but not true for any given disputant. It is still the case, however, that the data are more in favor of this assumption than the assumption that disputants submit final offers similar to the theoretical predictions.

Figure 2 shows disputant A's subjective density function for the arbitrator's notion of a fair settlement, z, under what I call disputant optimism. As can be seen, optimism implies that f(z) is perceived to be skewed favorably to disputant A. Disputant B would similarly perceive the distribution as skewed toward higher z values (a mirror image of Figure 2 about the median, e.g.). Final offers of disputant A and B are x_a and x_b and they are positioned symmetrically about the median of the distribution. This description of how disputants might perceive the distribution of z implies optimistic perceptions of the *average* z, but it also involves skewing the distribution as opposed to just shifting the mean of the distribution. If, however, disputants perceive f(z) as skewed in this fashion, then one can easily show that under the linear payoffs in these experiments and for certain shapes of distributions (such as the one shown in Figure 2), the disputants' expected payoffs among arbitrated outcomes are highest in CombA and lowest in CA given x_a and x_b. The basic idea is that compared to CA, in which the given draw of z is the arbitrated settlement for x, FOA would cost disputant A an amount approximated by areas A and C, since draws of z along the horizontal axis in these areas involve higher payoff outcomes for disputant A under the FOA rules than under the CA rules. Similarly, areas B and D represent gains under FOA to disputant A. As long as B+D>A+C (and payoffs are linear in x), disputant A prefers FOA to CA in terms of expected payoff.

Similar reasoning implies that CombA is preferred to FOA for disputant A. The arbitration rules for the center of the distribution—areas B and C—are the same under CombA and FOA, and since A>D disputant A has higher expected payoffs under CombA. Comparing CombA to CA, the arbitration rules for the tails of the distribution are the same, and since B>C disputant A also has higher expected payoffs under CombA compared to CA. Disputant B likewise prefers CombA to FOA, CombA to CA, and FOA to CA if this type of optimism is

present. If certain arbitration procedures generate higher expected payoffs for the disputants, then we would predict that the *preferred procedures would be invoked more frequently*. This would then generate a prediction of highest disputfe rates in CombA, followed by FOA, and the lowest dispute rates in CA. This ordering of dispute rates is completely consistent with these results as well as those reported in Ashenfelter et al (1992).[24] Of course, this is not a general argument or a rigorous proof, but the point I want to make is that disputant optimism could be responsible for the results reported in this paper. Again, note that the disputant optimism hypothesized is different than assuming that disputants have divergent expectations only of the mean of f(z). Figure 2 is based on an assumption of perceived skewed distributions of z that reflect a common estimate of the median of f(z), but optimism as to the shape of f(z).

This is no doubt an ad hoc argument that is constructed, in part, as an attempt to reconcile the data with the theoretical predictions of the various arbitration procedures, and I do not claim this it satisfactorily explains all the data. In all fairness to the theoretical predictions of CombA, the concern for external validity in the experimental design (i.e., presenting past draws from the preferred settlement distribution) perhaps opened the door for such asymmetries in disputant expectations. Therefore, it is not necessarily the case that CombA provides less incentives for agreement when subjects possess the identical expectation assumed in the theory. The theory behind CombA does, however, predict convergence of final offers even under some considerations of asymmetric expectations, and so there is clearly room for more research to help clarify the cause of disputes under this innovative procedure. A more rigorous theoretical examination of all dispute resolution procedures that explores the possibility of some type of

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[24] The highest reported dispute rates in CombA are, however, statistically no different than those in FOA. This is also consistent with the hypothesis of disputant optimism when area A of Figure 2 is only slightly larger than area D (i.e., disputants perceive the f(z) tails as fatter for more personally preferable settlements, but most of the optimism is around the high probability median of the distribution.)

disputant optimism may help resolve the issue more definitively. I believe it would be useful to start incorporating such biased perceptions of reality into our formal theories of dispute resolution, both because such biased perceptions are well-documented and because our existing theories based on symmetric expectations do not always explain the data well.

7. Conclusion

This paper has presented results from a controlled laboratory study of bargaining behavior under commonly-used arbitration procedures as well as under an innovative procedure called Combined Arbitration. While the initial interest in CombA was that it theoretically promised convergence of disputants' final offers, and therefore no need to actually invoke the procedure, the data do not support the theoretical predictions. Specifically, the data show that the same disputant pairs are least likely to dispute using CA, and most likely to dispute using FOA and CombA. The mere existence of arbitration procedures to handle dispute resolution promotes their use, as is evidenced by the fact that *all* arbitration procedures tested significantly increase dispute rates versus resolving disputes by destroying the disputed "pie". Arbitration procedures are found to decrease the time to reach a negotiated settlement, after controlling for sample selection, without affecting the resulting monetary outcome of the dispute. Finally, a history of conflict, female disputant(s), and religious/nonreligious bargaining pair are found to increase the negotiated settlement times, while bargaining experience in the experiment as well as in a naturally occurring environment (i.e., involvement in a court case) decrease negotiated settlement times.

These results are consistent with the existing research of Ashenfelter et al (1992) in that a controlled comparison of FOA and CA generates significantly higher dispute rates in FOA. This by itself is an important contribution to the literature since this result is contrary to the typical

argument that FOA will reduce arbitration's chilling effect on bargaining. While the Ashenfelter el al study generated this same result, the details of their experimental environment left open the door for another logical explanation of this result. The results I report offer additional confirmation that the finding of higher dispute rates in FOA is robust in a controlled setting. An important policy implication is that CA is likely to produce more desirable results since disputants more often negotiate their own settlement rather than let arbitration dictate the settlement. Further, reports of some successes of field use of FOA may be more due to creative modifications of the FOA procedure that render it a rather different arbitration procedure than what the strict rules of FOA dictate (see Feigenbaum, 1975).

The data presented in this paper also provide original evidence on the comparative effectiveness of an innovative arbitration procedure, CombA, on disputant behavior. Unfortunately, dispute rates are found to be higher in CombA than in CA, and at least as high as dispute rates in FOA. The final offers submitted by disputants in CombA are also not significantly distinct from those in FOA.[25] These unexpected results are possibly explained by assuming that disputants are optimistic in assuming that arbitrator notions of a fair settlement are skewed in their favor. The hypothesis is ad hoc, but the data are consistent with a belief in this type of disputant optimism. This may imply that presenting raw information on past arbitrator awards may be limiting in its ability to generate fully informed expectations of arbitrator behavior. Future research will hopefully explore the possibility of disputant optimism as a potential contributor to bargaining impasse, and also a potential cause of differences in the likelihood of dispute across different dispute resolution procedures. This research does,

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[25] This result, in and of itself, may imply that disputants do not gain much information from the table of 100 draws from the arbitrator z distribution. This is not inconsistent with disputants then forming their own optimistic expectation of what the actual arbitrator notion of a fair settlement will be. Future experiments will then need to more directly control for subject expectation in order to conduct pure tests of the theory.

however, highlight that theories based on divergent expectations, self-serving bias, or optimism (or whatever other name we can think of to describe heterogeneous expectations) are likely necessary for satisfactorily understanding of the cause of disputes.

FIGURE 1

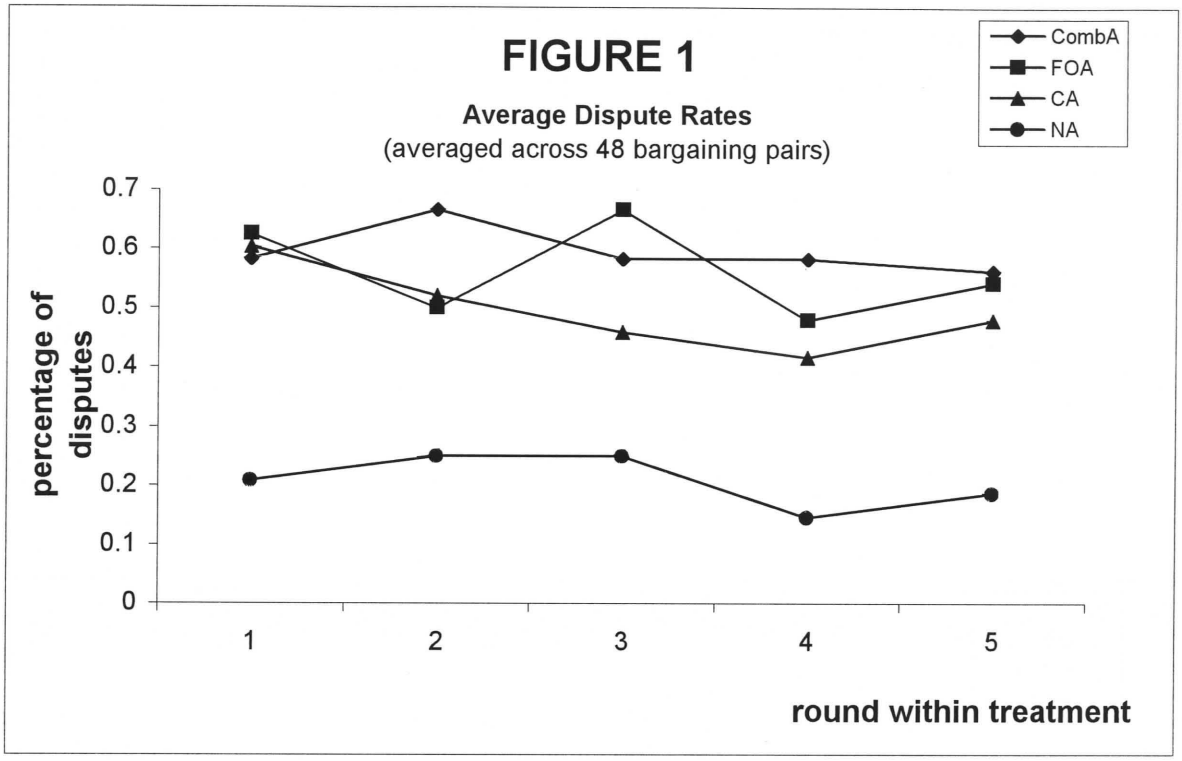

FIGURE 2

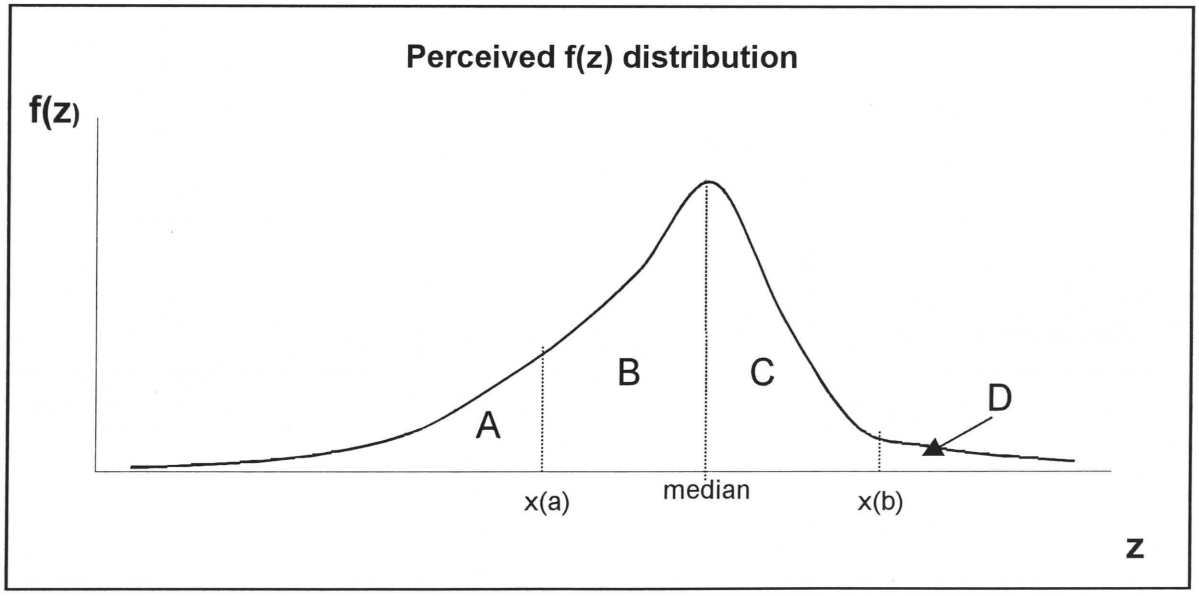

TABLE 1

Variable	Description
1Female, 2Female	Dummy variables=1 if bargaining pair consists of 1 or 2 females
1Business, 2Business	Dummy variables=1 if bargaining pair consists of 1 or 2 business majors
1Religious*	Dummy variable=1 if bargaining pair contains 1 individual who regularly attends religious services
1Job, 2Job	Dummy variables=1 if bargaining pair consists of 1 or 2 current workers
1Court**	Dummy variable= if bargain pair contains 1 individual who has been involved in a court case
1Union, 2Union	Dummy variables=1 if bargaining pair consists of 1 or 2 individuals who have either been a union member, or had a friend or relative in a union
Round	the round of bargaining
ConflictHistory	Variable counting the number of previous rounds in which the bargaining pair has disputed (not reached agreement)

*Due to the relatively large population of Mormon students in Utah, no bargaining pairs exist in this sample in which neither member of the pair regularly attends religious services. 1Religion is then compared to the omitted category of two "religious" disputants in the pair.
**No bargaining pair contained both individuals who had participated in a court case

TABLE 2

	Dependent Variable ***Dispute***		Dependent Variable ***AgreeTime***		Dependent Variable ***X-Outcome***	
	Probit Model (random effects)		Least Squares Regression (sample selection corrected)		Least Squares Regression (sample selection corrected)	
Independent Variable	Marginal Effect (p-value)		***Direct*** Effects in Regression (p-value)		***Direct*** Effects in Regression (p-value)	
	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Constant	-.29 (.00)*	-.46 (.05)*	63.82 (.00)*	81.97 (.00)*	484.94 (.00)*	498.45 (.00)*
CA	.27 (.00)*	.29 (.00)*	-42.37 (.00)*	-21.90 (.00)*	1.38 (.92)	11.38 (.53)
FOA	.34 (.00)*	.37 (.00)*	-49.08 (.00)*	-31.14 (.00)*	-.12 (.99)	21.40 (.32)
CombA	.38 (.00)*	.41 (.00)*	-59.47 (.00)*	-38.50 (.00)*	-9.74 (.61)	14.27 (.54)
1Female	--	-.09 (.38)	--	13.49 (.00)*	--	-14.40 (.26)
2Female	--	.08 (.55)	--	12.23 (.02)*	--	-28.56 (.07)*
1Religious	--	-.03 (.82)	--	9.17 (.06)*	--	-18.06 (.22)
1Court	--	.06 (.55)	--	-9.98 (.02)*	--	9.81 (.46)
1Union	--	.02 (.92)	--	-5.36 (.16)	--	-6.78 (.56)
2Union	--	.13 (.57)	--	5.11 (.40)	--	-11.78 (.52)
1Business	--	-.03 (.82)	--	--	--	--
2Business	--	.22 (.19)	--	--	--	--
1job	--	.15 (.43)	--	--	--	--
2job	--	.09 (.63)	--	--	--	--
Round	--	-.01 (.28)	--	-3.38 (.00)*	--	-.98 (.49)
ConflictHistory	--	.02 (.36)	--	5.72 (.00)*	--	6.23 (.02)*
λ	--	--	57.51 (.00)*	24.36 (.01)*	15.33 (.48)	-18.83 (.53)
Total N=960 (48 pairs times 20 rounds)	N=960	N=960	N=513	N=513	N=513	N=513
			Model test $F_{4,508}$=28.55 (p=.00)*	Model test $F_{12,500}$=20.30 (p=.00)*	Model test $F_{4,508}$=.28 (p=.89)	Model test $F_{12,500}$=1.36 (p=.18)
Log-likelihood	-538.38	-531.01	--	--	--	--

*Indicates statistical significance at the .10 level of better

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A Comparison of Conventional, Final-Offer, and "Combined" Arbitration for Dispute Resolution*

David L. Dickinson

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ABSTRACT

This paper presents results from a controlled laboratory study of bargaining behavior and dispute rates under three types of arbitration procedures. Two of these—conventional and final-offer arbitration—are commonly used in practice, while an innovative procedure called "Combined Arbitration" (Brams and Merrill, 1986) is not currently used. Combined Arbitration combines the rules of the two most commonly used forms of binding arbitration (conventional and final-offer arbitration) in such a way as to generate convergent final offers in theory. Controlled laboratory results show, however, that disputes are *most* likely in Combined Arbitration and least likely in conventional arbitration. These results challenge the theoretical predictions of Combined Arbitration as well as the hypothesis that final-offer arbitration would be more likely to reduce disputes compared to conventional arbitration. The results may be consistent with the hypothesis that disputants are relatively optimistic about the arbitrator's notion of a fair settlement. Implications of these findings are also discussed.

Ruby

Here is a paper to make an official ERI paper.

Thanks.

David

Keywords: dispute resolution, arbitration, bargaining, experiments
JEL codes: J5, C9, C7

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1. Introduction

Alternative dispute resolution (ADR) is of immediate interest due to the widespread use and attraction of ADR, which is used to help resolve disputes in labor/management relations, commercial and insurance disputes, and domestic disputes, among others. Commonly used ADR procedures include mediation, fact-finding, and arbitration. Of these, only binding arbitration guarantees settlement of the dispute since the settlement is determined by the arbitrator in the event of bargaining impasse. That said, researchers and practitioners have noted that the effectiveness of an arbitration procedure may lie in its ability to induce *negotiated* settlements (see, e.g., Stevens (1966)). The identification of the most effective arbitration procedure is then desirable for two reasons: First, effective procedures imply more negotiated settlements, and disputants generally prefer to dictate their own settlement. Secondly, invoking arbitration with less frequency implies a significant savings in terms of time and money costs.

In this paper I present the results from a controlled laboratory test of disputant behavior under three different arbitration rules. This lab study generates original data that compares the two most commonly used forms of arbitration, conventional arbitration (CA) and final-offer arbitration (FOA), to an innovative procedure called "Combined Arbitration" (CombA). In CA, the arbitrator is free to impose any settlement on the disputants, whereas the rules of FOA stipulate that the arbitrator is constrained to choose one of the disputants' final offers. Brams and Merrill (1986) devise the CombA procedure by combining the rules of CA and FOA in a way that generates the theoretical prediction that disputants' final offers converge to agreement.[1] The rules of CombA are simple. If the arbitrator's notion of a fair settlement lies *between* the

[1] Brams and Merrill also suggest a modified version of CombA that does not yield theoretically convergent final offers, but may involve less uncertainty for the disputants than the standard CombA procedure. I test CombA along with the modified CombA procedures in Dickinson (2001), and the results suggest that dispute rates are significantly

disputants final offers, then the rules of FOA are used. Otherwise, the rules of CA are used. If it can be determined empirically that disputant behavior is in agreement with their theory, then CombA offers a potential major advantage over commonly used arbitration procedures in that it is more likely to induce a voluntary settlement by the disputants.

A primary goal of this paper is to report results comparing dispute resolution under the innovative CombA procedure with commonly used arbitration procedures. A secondary goal is to provide a controlled comparison of the two commonly used procedures, CA and FOA. This is necessary because the existing research contains mixed or inconclusive reports on the effectiveness of CA versus FOA, and this debate is far from resolved. Feuille (1975), for example, reports results based on field data that support the contention that FOA is invoked less frequently than CA, whereas Feigenbaum (1975) notes that many forms of FOA used in practice are not actually pure FOA mechanisms.[2] Empirical studies based on field data may then be guilty of comparing apples and oranges by lumping together quite distinct forms of arbitration under the title of "FOA". More recent research has used lab studies or mock negotiations to compare the effectiveness of different ADR procedures. Notz and Starke (1978) generally conclude that there is more concessionary behavior under FOA than under CA, while Ashenfelter et al. (1992) find higher dispute rates under FOA than CA.

Ashenfelter et al. is the first laboratory study comparing alternative arbitration procedures—CA and FOA are included in their comparison—that mechanizes the arbitrator

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lower under basic CombA than under modified CombA. For this reason the basic CombA procedure was chosen as the most effective of the CombA procedures for purposes of the continued investigation.

[2] He notes that in Eugene, Oregon, the FOA procedures originally allowed each disputant to submit two final offers. The FOA system used in Michigan functioned more like mediation-arbitration by allowing the arbitrator to pick and choose final offers among specific issues.