Arbitration and the Incentive to Bargain: 
The Role of Expectations and Costs*

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This study examines, within the context of a model developed recently by Farber and Katz, the role of expectations, uncertainty, and costs on the incentive to bargain. It is shown that experience with a compulsory arbitration process can best be viewed as creating opposing effects on the frequency of use. While decreased uncertainty will reduce incentives to bargain, the convergence of expectations can work either to increase or decrease arbitration usage over time. Empirical evidence, while suggestive, is found to be too limited to draw strong conclusions on the relative magnitude of these effects. In addition, the paper incorporates arbitration costs into the bargaining model, and the effects of costs on arbitration usage and on the outcomes of negotiated settlements are examined. Available evidence on the magnitude of direct arbitration costs is then summarized. Because these costs are often low and provide little incentive to bargain, the authors suggest a policy approach for levying costs on the parties.

I. Introduction

Much attention has been given to the use of compulsory arbitration procedures in the public sector as a means of resolving labor-management disputes. A number of alternative arbitration techniques have been proposed and these have usually been evaluated in terms of three criteria. The most frequently used criterion involves the incentive a technique provides for negotiating settlements rather than relying on third-party awards. Thus, a good arbitration procedure is believed to be one that is rarely invoked [Long and Feuille (1974, p. 202) and Nelson (1975, p. 53)]. A second criterion involves the "neutrality" of the procedure with regard to outcomes relative to those which would occur in the absence of the procedure.

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Two factors make this criterion difficult to operationalize. The first is that an arbitration procedure affects settlements reached short of arbitration as well as outcomes actually imposed by arbitrators. The second factor is that arbitration is often adopted as an impasse procedure precisely in the hope that it will not have a "neutral" impact on settlements. The third criterion by which arbitration techniques are evaluated is Pareto Optimality. This requires that an arbitration procedure be judged by the quality of settlements, both arbitrated and negotiated, which it produces. Relatively little work has focused on the efficiency aspect of various arbitration schemes.\(^1\)

In a recent article, Farber and Katz (1979) developed a model of bargaining where the usage rate of an arbitration procedure is dependent on the outcomes expected by the parties, the parties' uncertainty regarding those outcomes, and the degree of risk aversion displayed by the parties.\(^2\) They showed that the presence of an arbitration procedure similarly affects both arbitrated and negotiated settlements such that their outcomes will converge as uncertainty is reduced. Based on their model, Farber and Katz argued that an arbitration procedure will encourage negotiated settlements to the extent that risk aversion dominates and that there is uncertainty regarding the arbitrator's behavior. They concluded that as the parties become familiar with arbitrators and arbitration procedures, uncertainty will decrease and this may cause reliance on the arbitration procedure to increase. This suggests, they concluded, the need to preserve uncertainty regarding the arbitration process in order to maintain incentives for negotiated settlements.

The purpose of this paper is two-fold. First, it is shown that within the framework of the Farber-Katz bargaining model, increasing familiarity with an arbitration process will have an \textit{a priori} indeterminate effect on usage, conceivably causing decreased rather than increased reliance on direct third-party settlements. Decreased usage is likely to occur if the expectations of relatively "optimistic" parties converge rapidly relative to the expectations of "pessimistic" parties and to the decreases in uncertainty about potential arbitrated outcomes. Such a model can be used to interpret the available evidence on arbitration usage rates. Secondly, direct costs to the parties of using the arbitration procedures increase the likelihood of negotiated settlements by increasing the size of the contract zone. We believe it is worthwhile to incorporate costs into the model and to investigate their magnitude and effect under current arbitration statutes. In addition, we examine alternative schemes for manipulating the direct cost of arbitration to the parties.

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\(^1\)Two exceptions are Crawford (1979a) and Donn (1977). Both examined forms of multiple-offer final-offer arbitration.

\(^2\)The decision to bargain or to go to arbitration is similar to the decision in legal conflicts to settle out of court or to go to trial. The most complete theoretical treatment of the decision to settle or to go to trial is Gould (1973). Also, see Posner (1977, pp. 434-443).
II. *Expectations, Uncertainty, and Arbitration Usage*

Farber and Katz developed a model of arbitration usage in which each party maximizes its expected utility in the presence of uncertainty. The parties form expectations about the arbitration process such that \( Y_{af} \) and \( Y_{bf} \) represent party a’s and b’s prior expectations of the arbitrator's decision of a’s share of a fixed “pie” of size one, while \( \sigma_a^2 \) and \( \sigma_b^2 \) represent the variances of these prior expectations. Party b’s share of the award is simply \( 1 - Y_{ab} \) where \( Y_{ab} \) is the arbitrator’s award to party a.

If the parties are risk averse, they will be willing to settle for a certainty outcome in negotiations which is less than their expected arbitration award. As derived by Farber and Katz, this implies:

\[
Y_{as} = Y_{asF} + (1/2)\sigma_a^2\delta_a \tag{1}
\]

where \( \delta_a \) is a measure of absolute risk aversion of party a and \( Y_{as} \) is the minimum share of the pie party a will accept in preference to insisting on arbitration. If party a is risk averse (\( \delta_a < 0 \)), then \( Y_{as} < Y_{asF} \), with the amount \( Y_{asF} - Y_{as} \) representing the payment party a is willing to make to avoid the risk of arbitration. Of course \( Y_{as} > Y_{asF} \) if party a is a risk lover (\( \delta_a > 0 \)). Similarly for party b:

\[
Y_{bs} = Y_{bsF} - (1/2)\sigma_b^2\delta_b \tag{2}
\]

where \( Y_{bs} \) represents the maximum share party b would be willing to give party a while still preferring a negotiated settlement.

Thus a contract zone, \( \Delta \), can be defined as the range of potential settlements lying between party a’s minimum certainty award, \( Y_{as} \), and party b’s maximum acceptable award to party a, \( Y_{bs} \). Specifically:

\[
\Delta = Y_{bs} - Y_{as} = Y_{bsF} - Y_{asF} - (1/2)(\sigma_a^2\delta_a + \sigma_b^2\delta_b) \tag{3}
\]

If \( \Delta > 0 \) there exists a contract zone such that we should frequently (but not always) observe a negotiated settlement, while if \( \Delta < 0 \) there is no contract zone and arbitration will be used. Expression (3) shows that a negotiated outcome is more likely the relatively more pessimistic are the parties regarding the arbitrator’s award (i.e., the greater is \( Y_{bsF} - Y_{asF} \)), the greater is the uncertainty surrounding these expectations, and the greater the degree of risk aversion.

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1 The assumption of a fixed pie in the Farber-Katz model makes the bargaining one dimensional. Thus, all settlements are Pareto optimal, i.e., one party can only be made better off at the expense of the other. This is not the case in the multi-dimensional model presented in Crawford (1979a). However, the Crawford model cannot easily be used to treat uncertainty.

2 Absolute risk aversion is defined as \( -U''(x)/U'(x) = -\delta \), for any arbitrary utility function \( U(x) \) and is believed to decline with wealth. Risk aversion implies \( \delta < 0 \) while risk loving implies \( \delta > 0 \).

3 Crawford (1979b) presented one view of why parties might fail to settle even with a positive contract zone present. Walton and McKersie (1965) presented yet another approach, while Schelling (1963) developed the argument in a more general context.
At this point it is worth noting an apparent contradiction within the Farber-Katz paper. At one stage they indicated that the parties will always locate a positive contract zone if one exists [Farber and Katz (1979, p. 58n)]. However, if a positive contract zone guaranteed negotiated settlements, decreased uncertainty could not possibly increase the use of arbitration in cases where risk aversion dominates and the parties’ expectations have in fact converged (thus implying $\Delta > 0$). If they had really meant this, the rest of their paper would make little sense since the size of the contract zone would then be irrelevant. That is, only the existence of a positive contract zone would matter since its existence would guarantee that arbitration is not used. However, throughout the rest of their paper (e.g., pp. 58, 63), Farber and Katz clearly implied that they expected the usage rate of arbitration to be an inverse function of the size of the contract zone. Presumably, they had in mind the notion that bargaining strategy creates incentives for misrepresentation and this reduces the probability of locating an existing positive contract zone to less than one. However, that probability then becomes a direct function of the size of the contract zone. We interpret their bargaining model in this manner.

As the parties gain information over time about the arbitration process, the parties’ prior distributions will be affected. Their expectations regarding the mean ($Y_{af}$ and $Y_{sf}$) and variance ($\sigma_a^2$ and $\sigma_b^2$) of the distribution of arbitral behavior will converge, and the degree of uncertainty will be reduced. Indeed, Farber and Katz assumed that the expectations as to the mean and variance converged completely to common values ($Y_f$ and $\sigma^2$) while uncertainty still remained ($\sigma^2 > 0$). That is, even though the expectations of the parties are identical, they remain uncertain, in fact, equally uncertain, of the outcome.\(^4\) This assumption reduces the contract zone to

$$\Delta = - (1/2)\sigma^2[\delta_a + \delta_b].$$

Now only uncertainty and risk aversion provide incentives for the parties to negotiate their own settlement. If risk aversion does not dominate (i.e., $\delta_a + \delta_b \geq 0$) or if uncertainty disappears ($\sigma^2 = 0$) then the contract zone disappears and the parties no longer have any reason to prefer negotiated settlements to arbitrated outcomes. Farber and Katz (1979, p. 63) concluded that as uncertainty regarding arbitrated outcomes is reduced, increased usage of arbitration may result.

More realistically, in a context where the size of the contract zone matters, we would argue that experience with an arbitration process should be viewed as creating opposing effects on the frequency of use. On the one hand, the decrease in uncertainty will reduce the incentive for risk-averse parties to negotiate. On the other hand, experience should also cause the convergence of expectations among parties and this can work in either direction. Where the parties are relative

\(^4\)Farber and Katz did not discuss in detail the process by which the parties’ expectations converge while uncertainty remains. Presumably they have in mind a process by which both parties form their expectations in a similar manner and base them on identical information, yet they face an arbitration process with some random element.
"pessimists" (i.e., where $Y_{af} < Y_{bf}$, implying that party $a$ expects to be awarded a smaller share of the pie than party $b$ expects party $a$ to be awarded), the convergence of expectations will increase their tendency to rely on arbitration, reinforcing the impact of reduced uncertainty. Where the parties are relative "optimists" (i.e., where $Y_{af} > Y_{bf}$), the convergence of expectations decreases their reliance on arbitration and makes negotiated settlements more likely. In other words, it is an empirical question whether increased familiarity with an arbitration process will lead to more or less frequent negotiated outcomes and it is a question that may have different answers in different bargaining relationships and at different points in time.

If the dominance of risk aversion can be accepted, then evidence of increased reliance on arbitration would provide support for the position that reduced uncertainty and/or convergence of expectations among pessimists are relatively more important. However, decreased reliance on arbitration over time would indicate that the more important factor is the narrowing of unrealistic expectations that had been causing "optimists" to rely on arbitration. Indeed, it has been suggested that "optimism" is quite prevalent in collective bargaining since during negotiations each party may convince itself more easily than the other party of the rightness of their position.

An empirical test of the relative importance of these opposing effects could focus on changes in usage rates over time, holding constant other determinants of the use of arbitration. The trend in usage rates need not be constant or even unidirectional. For instance, usage rates might initially increase for some period after implementation of new arbitration procedures in response to a large reduction in uncertainty as the procedures are first used. However, usage rates might later begin to decline as unrealistically optimistic expectations about arbitration awards are reduced, thus increasing the size of the contract zone.

There is a small but expanding literature on arbitration usage rates based on the growing number of states that provide arbitration for at least some groups of public employees. However, few states have any lengthly experience with these procedures and fewer can provide data summarizing the experience. Even where evidence is available, the number of observations (separate negotiations under the procedure) is often so small that summary conclusions are difficult. Moreover, if one regards the Farber-Katz framework as appropriate, difficulty in predicting when arbitration will be used is not surprising, given the problems inherent in measuring expectations, risk aversion, and uncertainty. Still, it is useful to examine some of the results which have been presented in the literature.

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Wheeler (1975, 1978) examined firefighter bargaining under factfinding, voluntary arbitration and compulsory arbitration. He found evidence of chilling effects (i.e., less compromise) and narcotic effects (i.e., higher reliance on impasse procedures) under arbitration. However, he adduced no evidence on arbitration usage rates over time.

Anderson and Kochan (1977) examined the impact of arbitration on bargaining in the Canadian Federal Service and found a reasonably clear trend toward greater use of arbitration over the four rounds of bargaining which they studied. The impact of New York State's switch from factfinding to compulsory arbitration as an impasse procedure was analyzed by Kochan et al. (1979). For a two-year period, the evidence was that use of arbitration was increasing. However, this seemed to be a continuation of a growing tendency to bargain to impasse which had begun well before the introduction of arbitration. Kochan and Baderschneider (1978) studied police and firefighter bargaining in New York over the period when the impasse procedure was changed from factfinding to compulsory arbitration. They found a small but significant increase in usage of impasse procedures that could be directly traced to this change. They also found a pattern of "reusage," i.e., parties which had used arbitration in the previous round of bargaining were, ceteris paribus, more likely to use it again.

However, a recent paper by Butler and Ehrenberg (1980), reanalyzing the same data as did Kochan and Baderschneider, casts strong doubts on the results of all previous studies finding positive narcotic effects. Using more appropriate econometric techniques, Butler and Ehrenberg concluded that while a positive narcotic effect existed during the early years, during later periods the probability of a bargaining unit going to impasse was negatively related to its prior use. This is exactly the pattern of use which we speculated to be likely. Within the context of the model presented above, such a pattern can be explained by an initial large decrease in uncertainty after implementation of a procedure, followed by the narrowing of expectations among "optimistic" parties.

Pennsylvania has recently provided data summarizing their experience from 1968 to 1976 with mandatory arbitration for policemen and firemen [The Govenor's Study Commission (1978)]. Over this period 28.4 percent of cases with police and 36.7 percent of cases with firefighters have been determined in arbitration. While there is a large year to year variation in arbitral usage among both groups, we found no statistically significant time trend using either yearly data or moving averages.

On balance, there seems to be tentative evidence that in the very early stages of bargaining under compulsory arbitration there tends to be either increased usage or relatively little change. This pattern is of course consistent with the position taken by Farber and Katz who stressed the role of decreased uncertainty. We believe, however, that the long run effects of compulsory arbitration may quite possibly be reduced arbitral usage as the expectations of the parties continue to narrow. While results from the Butler and Ehrenberg paper support this inter-
pretation, the evidence up to this point is still sufficiently limited in time and scope so that no strong summary conclusions are warranted.

III. Arbitration Costs and the Incentive to Bargain

The model presented above assumes that arbitration imposes no direct costs on the parties, but the reader should note, as did Farber and Katz (1979, p. 56n), that the existence of such costs would tend to enlarge the contract zone or to create a positive contract zone where none exists. This point deserves fuller examination. It is widely recognized, for instance, that the high costs of going to court in legal conflicts (primarily time and attorney fees) are generally borne by the parties and provide the chief explanation for the overwhelming number of out-of-court settlements. Indeed it is usually argued that civil cases will only go to trial if there are very significant differences in the parties’ expectations or if risk-loving behavior is dominant. Arbitration of labor-management disputes can be analyzed in much the same way.

The costs of arbitration can be incorporated into the Farber-Katz model. Let $C_a$ and $C_b$ represent the net arbitration costs to the parties as shares of the pie in dispute. These costs are net in that any savings in negotiating costs should be subtracted from direct arbitration costs. These costs include the fees of neutral (and perhaps partisan) arbitrators, attorney fees, the cost of transcripts, payment for time lost by witnesses and the cost of the time involved in the entire procedure.\footnote{See Kochan et al. (1979, pp. 144-145), Stern, et al. (1975, pp. 26, 178), and Skelton and Marett (1979, p. 304).} $C_a$ and $C_b$ are not bounded on the 0-1 interval since the costs of arbitration could conceivably be less than negotiation costs ($C_{a,b}<0$) or the costs could be greater than the value of the pie being divided ($C_{a,b}>1$). We shall ignore uncertainty with regard to net arbitration costs, assuming these costs to be fully known in advance. The consideration of this additional source of uncertainty would strengthen the effect of the costs themselves by making arbitration even less likely among risk averse parties.

With arbitration costs included in the model, the minimum certainty settlement for party $a$ becomes

$$Y_{as} = Y_{af} - C_a + (1/2)\sigma_a^2\delta_a$$  \hspace{1cm} (5)

while the maximum share party $b$ will concede is

$$Y_{bs} = Y_{bf} + C_b - (1/2)\sigma_b^2\delta_b$$  \hspace{1cm} (6)

Each party is now willing to settle for less in bargaining than when arbitration was costless, assuming that arbitration has positive net costs. This is reflected in a new and larger contract zone

$$\Delta = (Y_{bf} + C_b) - (Y_{af} - C_a) - (1/2)(\sigma_a^2\delta_a + \sigma_b^2\delta_b)$$  \hspace{1cm} (7)
If we define \( C \) such that \( C = C_a + C_b \) then
\[
\Delta = Y_{bF} - Y_{aF} + C - (1/2)(\sigma_a^2 \delta_a + \sigma_b^2 \delta_b)
\]  
(8)

It is clear from expression (8) that the greater the cost of arbitration borne by the parties relative to the size of the pie being divided, the more likely is a negotiated settlement. Because arbitration costs do not increase proportionately with the size of the settlement, we also predict that arbitration costs will serve as a stronger incentive to negotiate the smaller the union and the smaller the relevant governmental unit or budget. Similarly, we expect that the parties will rarely come to conventional arbitration with positions that are close together since such disputes are likely to be settled without incurring the costs of arbitration.

If we allow the parties' expectations to converge to common values \( Y_{aF} = Y_{bF} \) and \( \sigma_a^2 = \sigma_b^2 = \sigma^2 \) then the contract zone becomes
\[
\Delta = C - (1/2)\sigma^2(\delta_a + \delta_b)
\]  
(9)

In this case a sufficient condition for a positive contract zone to exist is that risk aversion dominate \((\delta_a + \delta_b < 0)\). Thus, where risk aversion dominates and there are positive costs, arbitration usage should be relatively low. Arbitrated outcomes will be preferred only if direct costs and the costs of uncertainty are offset by differences in the parties' expectations; that is, if
\[
Y_{aF} - Y_{bF} > C - (1/2)(\sigma_a^2 \delta_a + \sigma_b^2 \delta_b)
\]

Unfortunately, there is little information available about the magnitude of net arbitration costs. In the states which have compulsory arbitration for at least some public sector employees, some component of direct costs (e.g., arbitrator fees, costs of transcripts) seems to be shared by the parties in nearly all cases. In addition, the parties bear the costs of time and legal fees, though the net part of these costs attributable to the use of arbitration is difficult to ascertain. It seems likely that such costs are substantially larger than the direct arbitrator fees borne by the parties [See Skelton and Marett (1979, p. 304)].

Some estimates as to the absolute costs (as opposed to the costs as a fraction of the size of the pie being divided) can be made from the limited data available with respect to interest arbitration and the larger body of data relating to the costs of grievance arbitration. For example, with regard to the direct costs of arbitration, some reasonable estimates can be made. Data from the American Arbitration Association and the Federal Mediation and Conciliation Service indicate that, in recent years, arbitrators have been charging on average about $240 per day, including both hearing days and study days. In general, FMCS data make clear that hearing days tend to amount to only a little over a third of total days

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charged. The average is about one hearing a day and one and seven-tenths study days per case.\textsuperscript{10} When expenses (travel, meals, etc.) are added in, the total charge per arbitration case (overwhelmingly grievance arbitration) is currently about $900.

Kochan et al. (1979, pp. 142-143) provided evidence that in New York in the late 1970s, the Public Employment Relations Board was paying neutral arbitration panel chairman $150 per day with a mean fee provided of $875. This indicates that the average public sector interest arbitration case may well involve about twice as many total hearing and study days as the typical grievance hearing (the FMCS data include interest arbitration as well as rights arbitration but over 98 percent of the cases reported are rights, i.e., grievance, cases). If we update the New York per diem charge to the currently more realistic $240 per day, and assume the same number of total days as in the New York evidence, we get a direct fee for a single arbitrator of approximately $1,400 per case. If we assume additional arbitrator expenses equal to 12½ percent of the fee (approximately equal to the FMCS average) we get a total charge for the arbitrator of $1,575 per case. Kochan et al. found no other single direct expense that parties using arbitration paid most of the time. Since many states subsidize the use of arbitration by paying all or part of the arbitrator’s fees and/or expenses (e.g. Michigan) and since some of the gross cost of arbitration may be offset against the probability that the costs of continued negotiation would have been substantial, it seems likely that an order of magnitude estimate of five times the arbitrator’s fee, divided equally in most cases between the two parties, may provide a reasonable estimate of the maximum parties might expect to pay for the use of arbitration.\textsuperscript{11}

In many cases these costs can be further reduced. For example, in New York, the parties could, until recently, entirely avoid the arbitrator’s fee by failing to agree voluntarily on an arbitrator and allowing the Public Employment Relations Board to choose one. Kochan et al. (1979, p. 13) found this to have occurred in 68 out of 70 cases. Nor did the highest arbitrator’s fee paid by the Board ever exceed approximately three times the average fee in the sample [Kochan (1979, p. 142)]. In the case of the Canadian public service, arbitration is provided at no financial cost to the parties [Anderson and Kochan (1977, p. 298)].


\textsuperscript{11}Stern et al. (1975, p. 178) estimated the average total fee charged by neutral arbitrators in the early 1970s to be about $350 per case in Wisconsin and about $700 per case in Michigan. This didn’t include fees to partisan arbitrators on Michigan’s tri-partite panels which were often more substantial than the fees of the neutrals. The $5,000 - $10,000 cost per party estimated by Stern, et al. for Pennsylvania is somewhat higher than our estimate, especially considering inflation since the early 1970s. However, in Pennsylvania most parties hired counsel to present their cases and paid for the cost of a partisan arbitrator who was frequently an attorney. Reported costs to municipalities in Pennsylvania averaged about $3,000 per arbitration case for police and $1,500 for firefighters during 1975 and 1976. See Governor’s Study Commission (1978, pp. 27, 47).
While it appears that arbitration costs are often small relative to the size of settlements, some tentative evidence is available that these costs may affect the likelihood of a negotiated settlement. Kochan and Baderschneider (1978), in their study of dependence on impasse procedures in New York State, find a positive simple correlation between city size and reliance on impasse procedures, though this result doesn’t hold up using regression analysis. While they explained this in terms of greater militancy and complexity in the political environments in the larger cities in New York, this observed pattern is consistent with the impact of costs that is hypothesized in our model. Similarly, Stern, et al. (1975, pp. 53, 177) found that arbitration was requested and awards were rendered in Michigan more often in large cities than in small ones. They attributed this relationship, in part, to the relatively greater impact of arbitration costs on small bargaining units. In addition, there is some evidence that unions find these costs to be more bothersome than does management, both with regard to private sector grievance cases and public sector interest cases [Skelton and Marett (1979, p. 306) and Stern et al. (1975, pp. 27, 177)].

Despite this limited evidence that costs do matter, it is probably fair to conclude that in several states, the costs of arbitration provide little disincentive to use the procedure. In fact, Kochan et al. (1979, p. 153) concluded that, “in many cases, one or both of the parties view the procedure as an opportunity to present their case at very low risks and with no costs.”

IV. Arbitration Costs and Public Policy

An important policy question is whether larger costs should be imposed on the parties in order to encourage negotiated settlements. To provide an answer to this question, several issues must be addressed. First, to what extent are negotiated settlements preferable to arbitrated ones? Second, how responsive are the parties to changes in arbitration costs; that is, how much would the costs have to be increased to obtain a given decrease in arbitration usage rates? Finally, how will changes in the level and allocation of arbitration costs affect the outcome of negotiated settlements?

The advantages of negotiated rather than imposed third-party outcomes have been discussed extensively in the literature and need not be reviewed here. It will suffice to note that students of industrial relations in the United States and elsewhere have found a myriad of reasons for preferring negotiated over arbitrated outcomes. Of course, as Farber and Katz made clear, negotiated settlements are not independent of the behavior of arbitrators.

While we know that increased costs are likely to encourage negotiated settlements and reduce reliance on arbitration, empirical evidence is too limited to

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12Niland (1976) provided an excellent summary of these arguments.
enable us to estimate the responsiveness of the parties to higher costs. Most experts in this area do argue that labor and management should at least pay the full cost of arbitration. Given that negotiated outcomes are generally preferred to arbitration, we have few qualms in charging the parties more than the direct costs. Moreover, increased imposition of costs on the parties will provide valuable evidence regarding just how responsive arbitration usage is to these changes. Revenues collected would presumably go into general revenues, rather than into the budget of the administrative agency charged with determining arbitration costs.

The design of legislation assigning costs to the parties can be expected to affect negotiated outcomes. Imposing costs on the parties changes the position and increases the size of the contract zone and will thus affect the negotiated settlement in accordance with these changes and their relative bargaining strengths.

The effects of arbitration costs on negotiated outcomes can be shown more precisely within the context of the Farber-Katz model. Letting $Y_n$ be the negotiated settlement and $\Phi$ be the proportion of the contract zone captured by party $a$, we know that

$$Y_n = Y_{na} + \Phi \Delta$$

where $Y_{na}$ is the minimum certainty settlement acceptable to part $a$, and $\Delta$ is the positive contract zone.\(^\text{13}\) After substituting for $Y_{na}$ and $\Delta$, assuming that both parties' expectations of the arbitrator's award converge to $Y_F$, and rearranging terms, we obtain:\(^\text{14}\)

$$Y_n = Y_F + (1/2)\sigma^2[(1 - \Phi)\delta_a - \Phi \delta_b] - [(1 - \Phi)C_a - \Phi C_b]$$

If we take the derivatives of $Y_n$ with respect to $C_a$ and $C_b$ we obtain:

$$(\partial Y_n/\partial C_a) = -(1 - \Phi)$$

$$(\partial Y_n/\partial C_b) = \Phi$$

The interpretation of these results is straightforward. Costs imposed on party $a$ will increase the contract zone from below by an equivalent amount. Thus the negotiated settlement will decrease by that amount times the proportion of the contract zone captured by party $b$ (i.e., $1 - \Phi$). For instance, imposition of direct costs of $100 on party $a$ will decrease the negotiated settlement by $60 if $\Phi = .4$. Likewise, costs imposed on party $b$ will increase the contract zone from above, thus increasing the negotiated settlement. For instance, a $100 cost to party $b$ would increase the negotiated settlement by $40 if $\Phi$ were .4. An equal splitting of the $100 cost such that each party paid $50 would have a net effect of lowering the negotiated settlement by $10.

\(^\text{13}\)Relative bargaining strength, as measured by $\Phi$, is not affected by the imposition of costs. Rather, arbitration costs affect outcomes by changing the size and position of the contract zone.

\(^\text{14}\)This expression differs from equation (22) in Farber and Katz by its inclusion of the last expression in brackets showing the effects of arbitration costs.
It can be seen that in general, any arbitration cost scheme which imposes equal costs on the parties will have a neutral effect on the negotiated outcome only if the parties have equal bargaining strengths ($\Phi = .5$). In the event that a city had greater bargaining strength than a union, higher costs would have to be imposed on the city in order to maintain neutrality. Of course, the converse is true if the union had greater bargaining strength.

This leads to the issue of how arbitration costs could be levied so as best to provide additional inducement to negotiate settlements. Kochan et al. (1979, pp. 153-154) have made two suggestions. First, they suggested that the costs of arbitration could somehow be made to depend on unit size, though they do not outline precisely how. Second, they advocated a system that raises the cost to parties which use arbitration frequently. While their first suggestion is useful, the second is not. They provide no arguments to justify charging higher costs to parties that use arbitration frequently. If arbitration usage is costly to society, it would seem to be costly each time it is used and there is no obvious reason to believe arbitration usage is more harmful the third time than the second.

We believe the following proposal merits serious consideration. It involves making the charge for arbitration a direct function not only of unit size, as suggested by Kochan et al., but also of the difference in the positions the parties bring to arbitration.\(^{15}\) For example, if the union is demanding a 10 percent wage increase while management is offering 6 percent, the 4 percent difference could be multiplied by the number of employees and the average current wage, and some proportion of the yearly total could be charged to each party as the cost of using the arbitration procedure. Of course, in real world bargaining situations, there may be disagreement about separate issues which are not all easily translatable into money terms. In this case, the cost may have to be a function of the number of issues in dispute as well as the distance between the parties on money issues.\(^{16}\)

Such a procedure would have two principal advantages. First, it would incorporate an element of the Kochan et al. proposal to base fees on unit size. As the proposal above makes clear, the smaller the number of employees being bargained for, \textit{ceteris paribus}, the less the cost of arbitration. Such a scheme would then help encourage negotiated settlements to a more equal extent for both large and small bargaining units. This contrasts sharply with the current situation where arbitration cost may have virtually no effect on large units. Second, the calculation of costs under this scheme provides incentives for the parties to narrow their differences in order to reduce their costs. Thus, not only is the likelihood of a negotiated settlement enhanced, but when arbitration is used, the offers will be

\(^{15}\)This arbitration cost proposal is developed more fully in Donn and Hirsch (forthcoming).

\(^{16}\)Because bargaining strengths, as outlined in the above model, cannot be directly measured, most jurisdictions will of course choose an equal splitting of costs between the parties. Some jurisdictions might, however, make the political decision to levy the costs unequally as a means of altering negotiated outcomes in a predictable direction.
closer together. Therefore, decision-making for the arbitrator is simplified while the preferences of the parties relative to those of the arbitrator are given greater weight. The general point here is that a desirable characteristic of any policy which encourages negotiation should be that it improves the "quality" (as measured by the influence of the parties' preferences relative to the arbitrator's preferences) of all settlements, including those which are arbitrated. 17

V. Summary

We believe the Farber-Katz theoretical model serves as an excellent vehicle for analyzing the effects of interest arbitration on the incentive to bargain and on collective bargaining outcomes in the public sector. We have argued, however, against focusing on uncertainty as the only source of incentive to reach negotiated settlements. Experience with an arbitration procedure can best be viewed as creating opposing effects on the frequency of use. While decreases in uncertainty will tend to lower the costs of arbitration usage to risk averse parties, the narrowing of expectations among parties creates effects which may either increase or decrease reliance on arbitration. While statistical evidence is suggestive, we do not believe it is sufficient to make a definitive determination as to which effect generally dominates, or to determine the inter-temporal pattern of usage rates.

Finally, we have suggested that incorporation of arbitration costs into bargaining models is appropriate. Not only does such a model help explain current behavior with respect to the impact of arbitration on bargaining, but it is also useful in analyzing and designing public policies with regard to the assignment of arbitration costs.

17Notice that, unlike final-offer arbitration, this proposal induces the parties to make genuine offers without forcing an unpalatable choice on the arbitrator. On the problems which can be entailed in compelling such a choice, see Witney (1973). For an analysis of final-offer arbitration which suggests that it may not produce the hoped for reduction in arbitration usage, see Farber (1980).

REFERENCES


“‘How Compulsory Arbitration Affects Compromise Activity.’” Industrial Relations 17 (February 1978), pp. 80-84.
