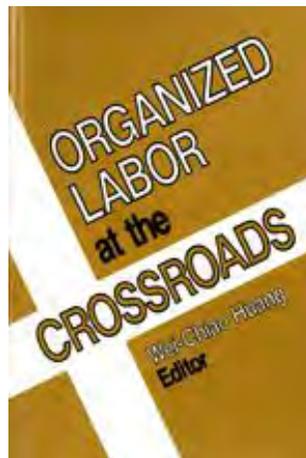

Upjohn Institute Press

Evidence on U.S. Experiences with Dispute Resolution Systems

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Chapter 7 (pp. 139-162) in:

Organized Labor at the Crossroads

Wei-Chiao Huang, ed.

Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 1989

DOI: 10.17848/9780880995412.ch7

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Evidence on U.S. Experiences with Dispute Resolution Systems

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My purpose in this paper is to report the results of recent quantitative analyses of interest arbitration systems operating in the U.S. Arbitration systems for settling wage disputes (“interest arbitration”) in the public sector have operated in some states since the 1960s. Although similar, in that they provide binding resolution of wage (and other employment-related) disputes, the various states have tended to experiment by adopting somewhat different systems. This opens up the possibility of exploring and comparing how the various systems work, and that is the major purpose of the research on which I report below.

The structure of the paper is as follows. I first set out the broader context in which interest arbitration has become a feature of public sector wage determination in the U.S. The purpose of this discussion is to show how these dispute resolution institutions arose in a U.S. context which differs, as we shall see, from the Canadian and British settings. The following two sections of the paper describe analyses of arbitration systems for New Jersey police officers and for Iowa state and local employees. The purpose of these two sections of the paper is to present in a nontechnical manner the statistical operating characteristics of two functioning arbitration systems. I believe even a casual reader will be struck by the statistical regularities the operating characteristics of these systems display. I also believe that even a passing understanding of these operating characteristics will make it clearer just what we can and cannot expect these arbitration systems to accomplish.

In a final section of the paper, I try to extract the general conclusions that are emerging from the new research on interest arbitration systems.

Some of these conclusions are virtually conjectures at this point, while others have a considerable grounding in hard research results.

The Context of Interest Arbitration in the U.S.

I do not intend to survey the detailed evolution of interest arbitration systems in the U.S., as that has been ably accomplished by my colleague Richard Lester in his recently published *Labor Arbitration in State and Local Government*.¹ My goal is instead to give the general context for the arbitration legislation that has been established, and to explain how it tends to operate.

The Right to Strike

For a variety of reasons local and state public sector workers in the U.S. do not have the right to strike (or even to bargain collectively) unless they are specifically given these rights by the state governments in the states in which they negotiate. This situation contrasts sharply with the rights of private sector workers in the U.S. and the rights of private and public sector workers in other countries. In Great Britain, for example, it is taken for granted that both private *and* public sectors workers will collectively bargain and, when a dispute is unresolved, strike their employers. Private sector workers in the U.S. face a variety of labor law regulations, but ultimately these workers may also organize and strike their employers. As in so many other matters of public policy, the Canadian situation seems to fall between the U.S. and British cases. Although private sector workers and many public sector workers have the right to strike in Canada, arbitration is sometimes legislated to replace the strike either on an ad hoc or systematic basis in some of the provinces.

Today the workers in the U.S. public sector do not have the right to strike. In many places public sector workers do not belong to unions or engage in collective bargaining either. In these places, workers who are not willing to accept employer-determined pay scales or working conditions are expected to quit and look for another position. In many places, however, public sector workers have been given the right to

form unions *and* have formed unions that bargain collectively, although they do not have the option to strike. In this situation, one may naturally ask, why are public sector employers willing to submit disputes to arbitration at all?²

Although the varying politics of the various states no doubt plays a role, it seems likely that public employers have grudgingly acquiesced in the establishment of arbitration laws in some states largely to reduce the number of *illegal* strikes that would otherwise have occurred. In effect, the state legislators have often cooperated with public sector unions to design a statute that will settle disputes, rather than allow disputes to drag on indefinitely in the face of employer resistance *and* the illegality of strikes. Subsequently, employer resistance has often diminished.

As a general rule, therefore, U.S. public sector trade unions obtain some leverage in collective bargaining negotiations when the possibility of an arbitrated contract lurks in the background. This may be the reason why interest arbitration of public sector wage disputes is more acceptable to union workers and their leaders in the U.S. than in other countries.

The Structure of Arbitration

The two most common forms of interest arbitration in use in the U.S. are conventional arbitration and final-offer arbitration. Each of these operates much like an informal judicial system. The parties are often represented by attorneys and they present their cases to a neutral arbitrator. In conventional arbitration, the arbitrator may fashion any award deemed suitable, while in final-offer arbitration each party must present an offer and the arbitrator must select one or the other without compromise.

The "Chilling" Effect. In the casual discussion of arbitration systems, it is often claimed that the final-offer arbitration system is more likely than the conventional arbitration system to lead the parties to present reasonable offers for the arbitrator's decision. This conclusion is usually based on a very specific idea of how arbitrators are likely to function in the conventional arbitration systems. The idea seems to be that

arbitrators will, for the most part, attempt to fashion awards that fall precisely in the center of the employer and union offers.³ If we assume parties know this will be the the arbitrator's behavior, they will surely wish to present extreme demands, for the more extreme a party's demand, the more the party gains in the compromise. At the extreme, the parties will present no useful information to the arbitrator on what concessions they might be willing to make. This is sometimes known as the "chilling effect" of arbitration.

It is sometimes said that final-offer arbitration is not so likely to produce a chilling effect on bargaining because the parties would be unlikely to take an extreme position for fear that the arbitrator might select a more reasonable offer made by the other party. It is easy to see that this conclusion is also arrived at by assuming that arbitrators behave in a specific way. In particular, how are we to suppose an arbitrator determines that one offer is more reasonable than another? The natural equivalent to assuming that the arbitrator splits the difference in conventional arbitration is to assume that the arbitrator flips a fair coin to choose a final offer. If this were the arbitrator's behavior, however, it is obvious that, instead of rewarding moderate behavior, the arbitrator would be rewarding the party making the more extreme demand with a 50 percent chance of success! Apparently, the alleged superiority of final-offer arbitration depends on the assumption that arbitrators will *change their behavior* when confronted by the final-offer arbitration procedure.

The Effect of Arbitral Uncertainty. Of course, this discussion of conventional and final-offer arbitration depends entirely on the characterization of arbitrators as simply "splitting the difference" in one way or another between the parties' offers in determining awards. Many arbitrators, and some scholars, have begun to assert that this is not the way that arbitrators behave in any actual ongoing arbitration system. Instead, it is argued that arbitrators appear to behave in a similar way regardless of the type of systems under which they are asked to operate. In this view the arbitrator first arrives independently at some notion of a "reasonable" award based on the facts of the individual case. Although precisely how a reasonable award is fashioned is not completely specified, it seems very likely that, whatever the procedure,

it will produce awards that differ from place to place and from arbitrator to arbitrator. It also seems likely that some of these differences in arbitrators' preferred awards will remain unpredictable both to the parties and to outside observers.

In conventional arbitration, the arbitrator then proceeds to fashion an award that may, to some extent, take into account both the positions of the parties *and* the arbitrator's own determination of a reasonable award. Under final-offer arbitration, on the other hand, an arbitrator will choose whichever final offer is the closer to the arbitrator's own determination of a reasonable award. Given the uncertainty associated with an arbitrated award, according to this analysis, we can expect a considerable incentive for the parties to negotiate their own settlement, regardless of whether the arbitration system is conventional or final-offer. There is, therefore, no "chilling effect" caused by the existence of either arbitration system. The chilling effect disappears so long as arbitrators introduce exogenous information into their decisions in a way that is to some extent unpredictable by the parties. It is this uncertainty about their prospects that gives the parties an incentive to negotiate their own settlement in order to avoid the gamble an arbitrator's decision represents.

This discussion is a far cry from the simple analysis of the "chilling effect" of conventional arbitration with which I started. If it is a correct description of the way the arbitration process actually works, then it is clear that the simpler comparison of conventional and final-offer arbitration with which I started may be quite misleading. Moreover, the correct comparison between what may be expected under these two arbitration institutions will be considerably more complicated, and perhaps less conclusive. Which of these two analyses of the way arbitrators behave are we to accept?

Ad Hoc versus Systematic Arbitration. In my view, both of these analyses have merit in the situations they were designed to describe. The confusion arises from failing to specify whether the analysis is to be applied to (a) an ongoing arbitration system where the parties will bargain repeatedly in the face of the same fixed, systemwide rules, or to (b) an ad hoc, one-time arbitration of a single dispute where the

parties had no prior reason to suspect the dispute would be submitted to arbitration. It is, of course, very unlikely that situation (b) will occur more than once!

To see how the confusion may arise, consider a situation where the parties bargain with offer and counteroffer to a stalemate. Suppose that, contrary to the expectation of the parties, arbitration of the dispute is imposed by a third party, and that the arbitrator is made aware of the positions of the parties at the point of stalemate. Since the parties had no reason to suppose an arbitrator would be brought to the scene, there is no reason for the arbitrator to suppose that the positions of the parties represent a mere bargaining posture. Instead, the arbitrator will assume that the parties' positions reflect reasonable concessions from both sides. Under these circumstances, it will be natural for the arbitrator to propose a settlement that "splits-the-difference" or lies midway between the positions advanced by the parties at the point of stalemate.⁴ It is also clear, however, that this procedure will only work once. In future bargaining, the parties will expect the arbitrator to proceed the same way and "split-the-difference" in fashioning an award. This will, of course, give the parties the incentive to make extreme offers purely for the sake of impressing the arbitrator at the point of compromise. This is, of course, the "chilling effect" alleged to result from conventional arbitration. Final-offer arbitration is a natural proposal to remedy this situation, but its effectiveness depends on the assumption that the arbitrator does not merely flip a fair coin to make a decision. Thus the advantage of final-offer arbitration is entirely a result of the assumption that the arbitrator changes behavior under one system as opposed to another.

In practice, the arbitration systems used in the U.S. public sector are not of the ad hoc variety. They are, instead, fully specified systems within which the parties engage in repeated bargaining. It is natural in such systems to carry out private negotiations away from any potential arbitrator's presence so that offers and counteroffers will not be used by one party against the other during any subsequent arbitration hearing. (Indeed, it might be argued that arbitration statutes should be designed to further this purpose, so as to avoid any "chilling effect" of the statute.)⁵ The result is that arbitrators are aware from the outset in these systems that the parties' offers, when presented in an arbitra-

tion proceeding, are designed as bargaining positions. Since arbitrators cannot determine with certainty that the offers presented by the parties are realistic attempts at compromise, it follows that the arbitrator will necessarily be compelled to use external criteria, at least in part, in fashioning an award. This will be the case, of course, regardless of whether the arbitrator is operating under a conventional or final-offer arbitration system. Thus, a continuing arbitration system seems likely to implicitly *require* arbitrators to introduce external criteria in fashioning an arbitration award, regardless of whether there is a conventional or final-offer arbitration system.

Simulation Evidence on Arbitral Uncertainty. These are, of course, abstract arguments. As it turns out, there is considerable evidence emerging to support the view that arbitral uncertainty and arbitrator reference to external criteria are important aspects of the operating characteristics of U.S. arbitration systems. Moreover, arbitrators do not appear to change their decisionmaking when operating under different systems. There is also some evidence that the parties behave as if they understand this to be the case as well. Much of this evidence will emerge below, and here I only wish to give some indications of this evidence by showing its consistency with a recent questionnaire study of practicing arbitrators. This simulation study, by Henry Farber and Max Bazerman,⁶ reports the results of presenting 25 different economic scenarios to 64 actual arbitrators who then fashioned a wage increase award. Arbitrators were asked to fashion (or select) two awards, one on the assumption they were operating under a conventional arbitration system and the other as if they were operating under a final-offer arbitration system. Although there are important limitations to this approach, the results are quite revealing in that they are consistent with, but add considerable detail to, the data available from arbitration systems operating in the field.

A key finding is that when operating under a conventional arbitration system, arbitrators are far more heavily swayed by the facts of the case (as represented by wage rates of comparable workers, the inflation rates and the financial health of the company) than by the last offers presented by the parties. When the difference between the last offers of the parties is small, Farber and Bazerman find that the facts

receive about 75 percent of the weight in the arbitrator's decision, but that this fraction increases the further apart the last offers of the parties. A simple interpretation of this result is that arbitrators view the parties' offers as typically carrying some information about where the parties might truly be willing to settle, but not much. As noted in the discussion of one-shot versus continuous arbitration systems, it seems likely that the weight placed on the parties' offers will be the greater, the greater the likelihood is that the arbitrator may consider the offers as having been made without the presumption they were merely a bargaining ploy. Unfortunately, the setup in Farber and Bazerman's study does not permit this hypothesis to be tested, and the design of such a test, while important, may be difficult.

Farber and Bazerman's results are obtained by experimentally varying the economic environments *and* the final offers that the arbitrators are instructed to consider. By comparing the arbitrators' awards when they face different offers in similar environments, Farber and Bazerman can determine the extent to which differences in the offers arbitrators face influence their awards. Using similar methods, Farber and Bazerman also can determine which parts of the economic environment influence arbitrator decisions. Here they find, as has been reported by others, that recent wage increases in "comparable settings" receive the largest weight in arbitrator decisions, although other factors are also important.

A second important conclusion of Farber and Bazerman's study is that the arbitrators, in their simulations, behaved as if they had selected essentially the same external criteria for an award regardless of whether they were operating under a conventional or final-offer arbitration system. In the case of conventional arbitration, the arbitrator simply imposed a reasonable award after due consideration of the facts and the parties' offers. In the case of final-offer arbitration, the arbitrator selected the parties' offer that was closest to the award the arbitrator would otherwise have imposed under conventional arbitration where the parties' offers were far apart. It follows that the arbitrators were behaving in a fashion that is consistent across institutional structures.

Finally, Farber and Bazerman find that there is considerable variability in the awards that different arbitrators fashion in identical

factual simulations. This suggests, but does not prove, that there may be considerable arbitral uncertainty facing the bargainers in interest arbitration systems. If the bargainers are risk averse, such uncertainty should naturally produce an incentive for negotiated settlements. To determine whether such uncertainty exists, however, would require that two arbitrators be observed to fashion different awards in an actual arbitration case, a situation that we will encounter shortly.

How Arbitrators are Selected and Paid

Unlike the U.K. and Canada, U.S. arbitrators' fees are generally borne by the parties. The fee schedule may be regulated by a state agency establishing a maximum fee, but its payment is generally split equally by the parties.

An important feature of U.S. arbitration systems is that the parties generally play an important role in selecting who shall be the arbitrator in a particular case. I have come to believe that this procedure has an important effect on the stability of the operating characteristics of interest arbitration systems.

The selection of arbitrators usually proceeds in two stages. In the first stage, a third (governmental) organization produces a list of potential arbitrator names that is circulated to the parties. (In the private sector, this function is often served, for a fee, by the nonprofit American Arbitration Association.) In the second step, the parties express their preferences for the arbitrators whose names are on the proposed list. Sometimes the proposed list of arbitrators is simply passed back and forth between the parties, with each party striking one name each time the list is passed, until one name remains. Alternatively, the parties may be asked to veto one or more names from the proposed list, and to rank order the remainder. Subject to an arbitrator's availability, the lowest sum of ranks then determines the arbitrator selected.

At first blush, it may seem surprising that the parties are asked to participate in the selection of the arbitrator. After all, if the parties are in a dispute which they cannot settle, it may seem odd that they are asked to select the arbitrator who will settle it for them. In fact, it is this aspect of the process that underscores the ultimately cooperative nature of arbitration systems.

It seems clear that so long as the parties play so central a role in arbitrator selection, it is likely that arbitrator behavior will contain an essentially unpredictable component. After all, if the arbitrator's position is known, then it is likely that one or the other of the parties will have reason to strike the arbitrator from the proposed list. Apart from this unpredictable component, it is unclear what other factors are likely to determine arbitrator popularity.

In a remarkable study, Bloom and Cavanagh have recently examined the determinants of arbitrator selection using the actual ranking by disputants of arbitrators selected in disputes involving police officers in New Jersey.⁷ The evidence from their study indicates that both parties view the characteristics of individual arbitrators in roughly the same way. This suggests that the parties may be acting in a moderately cooperative way in the selection of arbitrators.

Bloom and Cavanagh ask, and answer, two questions. First, do the parties tend to rank (and hence state their preferences for) the arbitrators on a given panel in a way that is positively or negatively correlated? They find that the parties' rankings are weakly positively correlated. This implies that there is such a thing as "arbitrator popularity." The question then remains, what determines arbitrator popularity? Bloom and Cavanagh find, first, that prior win-loss tallies under final-offer arbitration are uncorrelated with the parties' preferences. This suggests that the parties are not "punishing" arbitrators for previous performance. Bloom and Cavanagh also find that the main determinant of arbitrator popularity is the amount of the arbitrator's prior experience. This suggests that the arbitrator's "reputation" is a key determinant of the parties' preferences.

Although it remains conjecture at this point, it seems likely that there is a connection between (a) the fact that the parties' preferences are a key determinant of arbitrator selection, and (b) the statistical regularity in the operating characteristics of the two arbitration systems described below. In any event, the cooperative nature of arbitrator selection may well be an important factor in the acceptability of arbitrator awards by the parties. At a minimum, it seems clear that this method of arbitrator selection is likely to enhance the feelings of the parties that they will receive a "fair shake" in any arbitration award. It is no doubt such

“feelings” that determine the acceptability of the entire arbitration system.

Final-Offer Arbitration in New Jersey⁸

Unsettled disputes between New Jersey police unions and municipalities have been subject to binding arbitration since 1977. The arbitration law is designed to give the parties considerable leeway in designing their own arbitration mechanisms. When the parties can agree on nothing else, however, their dispute is resolved by final-offer arbitration on the package of economic issues. As table 1 indicates, in 1978 about 35 percent of bargaining cases in New Jersey were settled by recourse to final-offer arbitration, although this percentage has dropped each year since.

Table 1
The Results of Final-Offer Arbitration
of New Jersey Police Disputes

	1980	1979	1978
Proportion of employer victories	.266	.348	.317
Mean of employer compensation offers	5.70%	6.51%	5.01%
Mean of union compensation offers	8.54%	8.29%	7.14%
Mean of final-offer compensation awards	8.10%	7.57%	6.63%
Standard deviation of final offer awards	1.41%	1.48%	1.19%
Proportion of bargaining cases going to final-offer arbitration	.23	.28	.35

The only alternative arbitration mechanism of which the parties have made much use in New Jersey is conventional arbitration. As table 2 indicates, in 1978 about 14 percent of bargaining cases in New Jersey were settled by recourse to conventional arbitration, although this percentage has subsequently stabilized at about 6 to 7 percent.

It is natural for both employers and unions to inquire as to how they typically fare under a final-offer statute. The tabulation of “box scores” or “win-loss” records is inevitable. Even when these tabulations are not publicly available, it appears that they are the subject of considerable informed discussion and folklore.

The first row of table 1 contains the box score for the New Jersey experience. In 1978, arbitrators selected the union offer on total compensation in 68 percent of final-offer arbitration cases. In 1979 and 1980 arbitrators selected the union offer on total compensation in 65 and 73 percent of final-offer cases, respectively. In sum, under the New Jersey statute, union offers have been selected most of the time in final-offer arbitration cases. There is no sign that this is a transitory phenomenon. This raises a question for the evaluation of this arbitration statute. Why have arbitrators most often selected the union offers in the New Jersey final-offer arbitration cases?

A Simple Model

Presumably, most of us expected to see approximately 50 percent of the union offers selected under final-offer arbitration. This is why the considerably higher percentages listed in table 1 seem surprising. To understand why this might not be a reasonable presumption, it is necessary to spell out what underlying model of arbitrator behavior and union and employer behavior we presumed would produce this 50-50 result.

First, it seems reasonable to suppose that a fair arbitrator would be one who considered the objective considerations in a particular case and then settled on what, in the arbitrator’s mind, seemed a preferred settlement. As I have observed, little is known about precisely how arbitrators determine their preferred awards other than the consensus that they represent a sort of “going rate.” Given that the arbitrator has determined a preferred award, however, it seems clear that a fair arbitrator must select whichever offer is closest to it.

We may suppose that the union and employer also understand this process. Using their best estimates of the arbitrator’s preference they will then shape their own offers. They will understand that a higher offer by either party will increase the probability that the employer’s

offer will be selected. Similarly, a lower offer by either party may be assumed to increase the probability that the union's offer will be selected. As a result, most of us would expect that the union and employer offers would tend to fall equally distant from, but on opposite sides of, the parties' best estimate of the arbitrator's preferred award. If this happens, then, we should naturally expect the union's offer to be selected, on average, in one-half of the cases.

It follows from this discussion that there are two different types of reasons why the union offer may not be selected in one-half of the cases. First, the arbitrators may not follow the decision process set out above. In particular, arbitrators may systematically give less weight to a generous employer offer than to a conservative union offer. If this is the case, then the integrity of the arbitration system is being seriously undermined. One may even wonder how long it is likely to last.

Second, it may be that, for one reason or another, the parties do not typically position themselves equally distant from, but on opposite sides of, the arbitrator's expected award. This could happen for one of two reasons. On the one hand, unions may have a more conservative view of what arbitrators will allow than do employers. On the other hand, unions may be more fearful of taking the risk of losing the arbitrator's decision than are employers. In either case we may expect that the union offers will be conservative relative to the award that arbitrators will typically prefer. Hence, the union offers will be disproportionately selected by the arbitrators.

It is important to inquire as to whether it is possible to distinguish empirically between these two alternative explanations for the disproportionate selection of union offers. If final-offer arbitration is operating alone, it should be obvious that there is no simple way to untangle which of these explanations is correct. After all, to determine whether the union offers are conservative relative to the employer offers we must be able to uncover the central tendency of the arbitrators' preferred awards for comparison. Since these preferred awards are unobservable when final-offer arbitration operates by itself, however, there would be no simple way to do this.

Data Analysis

In New Jersey, the same pool of arbitrators is used in both final-offer arbitration and conventional arbitration cases simultaneously. If we may assume that arbitrators simply assign their preferred awards in the conventional arbitration cases, then the numerical central tendency of these awards can serve as a benchmark for determining whether the union offers are conservative relative to the employer offers. A comparison of tables 1 and 2 reveals that this is indeed the case.

In 1980, for example, the mean employer offer was an annual wage increase of 5.7 percent, while the mean union offer was an annual wage increase of 8.5 percent. According to table 2, however, the mean conventional arbitration award was 8.3 percent. Hence, if we may take the conventional arbitration awards as broadly indicative of arbitrators' preferred awards, it is clear that the union and employer offers were not centered at equal distances from, and on opposite sides of, the arbitrators' preferred awards. Instead, the union offers were very conservative relative to the arbitrators' preferred awards. A comparison of the mean of the union and employer offers with the mean of the conventional arbitration awards in 1978 and 1979 exhibits precisely the same phenomenon.

Table 2
The Results of Conventional Arbitration
of New Jersey Police Disputes

	1980	1979	1978
Mean of conventional compensation awards	8.26%	8.59%	6.55%
Predicted mean of conventional awards using data on final offer arbitration cases only and assuming "fair" arbitrators	8.27%	8.51%	7.41%
Standard deviation of conventional awards	2.10%	2.27%	2.21%
Predicted standard deviation of conventional awards using data on final offer arbitration cases only and assuming "fair" arbitrators	1.48%	2.54%	2.70%
Proportion of bargaining cases going to conventional arbitration	.07	.06	.14

It is possible to test statistically whether it is reasonable to suppose that the final-offer arbitration decisions in New Jersey were generated by a set of fair arbitrators who were systematically applying the conventional arbitration standards. To do this, assume that arbitrators selected whichever offer was closest to their preferred award. Examining the final-offer arbitration data alone, it is then possible to estimate what central tendency (mean) and measure of variability (standard deviation) of arbitrator preferences is most likely to have generated the actual final-offer arbitration decisions observed.⁹ This part of our analysis could be constructed even if final-offer arbitration were the only arbitration mechanism operating.

It is then necessary to compare these estimates from the final-offer arbitration data against the actual central tendency and measure of variability for arbitrator preferences revealed by conventional arbitration data. This part of the analysis is only possible under a statute like New Jersey's. Lines 2, 3, 4 and 5 of table 2 contain the results with which to make the comparisons.

In 1980, for example, the actual mean of conventional arbitration awards was 8.26 percent, while the mean predicted as generating the final-offer arbitration awards if arbitrators were applying the conventional arbitration standards was a remarkably close 8.27 percent. The comparisons for 1979 and 1978 are nearly as close, as can be seen from table 2. For 1980, the actual standard deviation of conventional arbitration awards was 2.1 percent, while the standard deviation predicted as generating the final-offer arbitration awards was a very similar 1.5 percent. The comparisons for 1979 and 1978 are even closer.

In sum, the comparison of the pattern of the final-offer arbitration and conventional arbitration awards explains why the union offers were most often selected by arbitrators. The union offers were very conservative relative to the pool of arbitrators' preferred awards. There is no evidence that arbitrators treat generous employer offers any differently than they treat conservative union offers. Instead, the union offers are most often selected because the frequency of conservative union offers is considerably greater than the frequency of generous employer offers.

This finding does not imply that the New Jersey arbitrators, taken as a group, may not be more (or less) generous than some outside observer of the arbitration process in New Jersey would approve. For example, the analysis implies that the central tendency of arbitrators' preferred awards in 1980 was around 8.3 percent, regardless of whether an arbitrator was working in the final-offer arbitration or conventional arbitration framework. Does this imply that the arbitrators were too generous in their general outlook?

The framework used here provides no answer to this question, and no doubt different answers would be given from different perspectives. The basic point, however, is that this issue cannot be settled by an appeal to win-loss tallies under final-offer arbitration either. Only an analysis of actual awards and an appeal to some external criterion of fairness can answer the question of whether the arbitrators have behaved in a more (or less) generous fashion than is desirable.

Final-Offer Arbitration and Conventional Arbitration Compared

The conservative union behavior revealed in tables 1 and 2 results in a paradox. Unions actually received lower average wage increases under the final-offer arbitration provisions than under the conventional arbitration provisions of the New Jersey statute. For example, in 1980 the mean of the actual final-offer arbitration awards was 8.1 percent, but the mean of the conventional arbitration awards was higher at 8.3 percent. The union offers are accepted in a vast majority of the final-offer arbitration cases, but average union wage increases are lower under final-offer arbitration than under conventional arbitration. Although conservative union offers increase the likelihood of acceptance, this is not enough to offset the lower wage increase that is won. Appearances are indeed deceiving!

The result is that the union bargainers have taken a small loss in their mean wage increases under final-offer arbitration relative to what would have prevailed under conventional arbitration. It is also clear from a comparison of tables 1 and 2, however, that the union bargainers have gained something in return under final-offer arbitration.

In 1980, for example, the standard deviation of conventional arbitration awards was 2.1 percent, but the standard deviation of final-offer

arbitration actual awards was only 1.4 percent, and the same discrepancy exists in 1979 and 1978. Thus, what the union bargainers gave up by way of a decrease in the mean award under final-offer arbitration they made up by a reduction in its variability. The union bargainers have bought "insurance" with their conservative offers, albeit at a cost in their wage settlements. This suggests that union bargainers may be more risk averse than employer bargainers in New Jersey.

Tri-Offer Arbitration in Iowa¹⁰

The data describing the operating characteristics of the New Jersey arbitration statute are an early indication that arbitration systems are especially amenable to convincing statistical analyses. Precisely why this should be the case is not yet known. Nevertheless, it is important to establish that this is a general characteristic of such systems by examining data from other operating systems to the extent this is possible. Some preliminary work has been done in the analysis of a quite remarkable statute for interest arbitration that has existed in Iowa since 1976.

The structure of the Iowa statute provides the opportunity to examine three important questions about the way arbitration systems work. In the Iowa system, the parties have the option of negotiating a system of their own choosing, and in some cases this has led to the adoption of final-offer arbitration. Hence, it is possible to compare the results of the preceding analysis in New Jersey with some additional data from Iowa. Second, the system used in Iowa in most cases is designed (surely not intentionally) so that it is possible to observe two independent neutral arbitrators' observations on the same dispute. This provides an opportunity to assess the existence and extent of genuine arbitral uncertainty that exists in the arbitration system. Finally, the Iowa system has operated long enough that it is possible to generate several years of time-series data for the purpose of assessing the way in which arbitration awards respond to changes in economic circumstances.

Structure of the Tri-Offer Arbitration System

As noted, the Iowa statute allows the parties considerable leeway in the design of a system for settling a dispute. If the parties do not agree to an alternative procedure, however, they are compelled to resolve their dispute by a two-step, tri-offer system. Under this system, the parties are first provided a fact-finder to propose the terms on which the dispute might be settled. After the parties have seen the fact-finder's proposal, they may negotiate their own settlement. If they do not agree on a settlement, the parties are compelled to submit their best offers to a second arbitrator. The second arbitrator must select the employer's offer, the union's offer, or, in a novel twist, the arbitrator may select the earlier fact-finder's proposal. Obviously, the extent to which the second arbitrator does not concur in the fact-finder's proposal is a measure of the degree of arbitral uncertainty that exists in the system.

Undoubtedly, the rationale of the two-step procedure is the recognition that disputes may arise because one or the other of the parties is poorly informed about the likely results of an arbitrated outcome. The fact-finder's proposal should serve to inform the parties of the likely outcomes. If this does not resolve the dispute, however, it is ultimately arbitrated.

The Fact-Finder Proposals

Over the period 1976–83, some 302 cases were submitted to the Iowa fact-finders. Of these, 181 (or 60 percent) were settled after the fact-finder's recommendation was submitted. This suggests that the information produced for the parties by the fact-finders may be an important ingredient bringing the parties to a settlement.

Table 3 contains the time-series of data on the average compensation increase proposed by the fact-finders in Iowa over the period 1976–83. There is one important conclusion suggested by these data: The typical fact-finder's proposal does move systematically over this period, ranging from a high of 9.4 percent in 1980 to a low of 3.5 percent in 1983. A casual analysis suggests that fact-finder proposals move in a way quite similar to wage settlements in the rest of the economy, but perhaps with a lag. Further analysis of this issue is clearly required. The important point is that the fact-finders are not suggesting awards that are con-

tinuously at extremes relative to those generated in other parts of the economy. It is natural to inquire, therefore, as to the relationship between these fact-finder proposals and the awards that appear under arbitration.

Table 3
Fact-Finders Recommendation (Percent Wage Increase)
in Iowa Public Sector Wage Disputes

Year	Mean	Standard deviation	Number of cases
All years	5.96	2.51	302
1976 ^a	6.18	1.75	22
1977	5.22	1.75	29
1978	5.08	1.75	18
1979	6.19	1.75	49
1980	9.44	1.75	37
1981	7.65	1.75	40
1982	5.64	1.75	41
1983	3.51	1.75	66

SOURCE: Tabulations of arbitrator reports, State of Iowa.

a. The results for the years 1976–83 are from a regression that includes a dummy variable. For each year, the standard deviation reported is for the residuals from this regression and thus is the same for each year.

Final-Offer Arbitration

In some circumstances, the parties in Iowa negotiate an arrangement where, by mutual consent, the fact-finding step is eliminated from the arbitration statute. The system is effectively final-offer arbitration when this occurs.

Data on the mean union and employer offers in these cases is contained in table 4. Also contained in the table are the win-loss records under final-offer arbitration in these cases. Having observed that the majority of arbitration decisions in New Jersey are for the union offer, it may come as some surprise that just the reverse is the case in Iowa. As the table indicates, over the period 1976–83, employer offers have been accepted in two-thirds of the final-offer arbitration cases. Does

this mean that the arbitrators in Iowa had a pro-employer bias? Or was it the case that, in contrast to New Jersey, the employer offers were the more reasonable?

Table 4
Cases of Arbitration without Fact-Finding
in Iowa (Percent Wage Increase)

	Offers proposed by unions			Offers proposed by employer			Number of cases
	Mean	Standard deviation	Percent wins	Mean	Standard deviation	Percent wins	
All years	7.54	2.91	34.5	4.89	2.57	65.5	58
1976 ^a	10.61	2.21	0	5.67	1.37	100	5
1977	8.26	2.21	27.3	5.52	1.37	72.7	11
1978	13.89	2.21	100	5.57	1.37	0	3
1979	9.01	2.21	0	6.68	1.37	100	3
1980	10.89	2.21	33.3	8.95	1.37	66.7	6
1981							0
1982	6.91	2.21	25	5.14	1.37	75	16
1983	4.84	2.21	57.1	1.50	1.37	42.9	14

SOURCE: Tabulations of arbitrator reports, State of Iowa.

a. The results for the years 1976-83 are from a regression that includes a dummy variable. For each year, the standard deviation reported is for the residuals from this regression and thus is the same for each year.

If we may assume that the fact-finders' proposals are a reasonable benchmark for arbitrator preferences, then this question may be analyzed in much the same way as it was analyzed in New Jersey. To see how this is done, consider the mean of the union and employer offers for 1976. As indicated in table 4, the union offers averaged 10.6 percent and the employer offers averaged 5.7 percent. To see which of these was the more reasonable we may contrast them against the mean of the fact-finders' proposals in 1976, which was 6.2 percent. Using the fact-finders' proposals as a benchmark, therefore, the employer offers appear considerably more "reasonable" than the union offers. Consistent with this comparison, table 4 indicates that the employer offers were

accepted in all the 1976 cases. Although not so extreme, this same analysis is consistent with the data in each year until 1983. (The exception is 1978, but this involves only three cases.) Thus, in each of the years from 1976 through 1982, the mean of the employer offers was nearer the mean of the fact-finder proposals than was the mean of the union offers. During this period, the employer offers were accepted in 73 percent of the cases.

The exception is 1983, when the union and employer bargainers appear to have changed their offers so that the mean of the union offers was slightly closer to the mean of the fact-finder proposals than was the mean of the employer offers. Remarkably enough, in 1983 the union offers were accepted in 57 percent of the cases. Recall, too, that the fact-finder proposals used to benchmark these results are from entirely independent cases.

Like the data for New Jersey, these results for Iowa strongly confirm the hypothesis that the arbitrators, as a group, are behaving in a manner that is consistent across institutional structures. Thus, the reason why union offers are more commonly accepted by the arbitrators than are employer offers in New Jersey, *and* the reason why employer offers are more commonly accepted by the arbitrators than are union offers in Iowa, is not because the arbitrators in these two states are behaving differently. Instead, the win-loss awards under final-offer arbitration in New Jersey and Iowa are different because the union and employer bargainers are behaving differently in these two states. The union bargainers appear to put forward the more reasonable offers in New Jersey, while the employer bargainers appear to put forward the more reasonable offers in Iowa. Just why this should be the case is an important question for further research.

Tri-Offer Arbitration

The data giving win-loss records for the cases ending in tri-offer arbitration are contained in table 5. Surprisingly, in nearly one-half of these cases the union or the employer final offer coincides with the earlier fact-finder's recommendation. As the table indicates, it was slightly more often the case that the union's offer, rather than the employer's offer, coincided with the fact-finder's recommendations.

Table 5
Tri-Offer Arbitration Results in Iowa

Number of cases	Arrangement of offers	Employer's offer accepted (% of cases)	Fact-finder's recommendation accepted (% of cases)	Union offer accepted (% of cases)
63	Three distinct offers	23.8	63.5	12.7
32	Union offer coincides with fact-finder recommendation	34.4	65.6	65.6
26	Employer offer coincides with fact-finder recommendation	61.5	61.5	38.4

The data in table 5 provide a very strong test of the hypothesis that arbitration decisions contain an element of behavior that is truly unpredictable by the parties. After all, in each of the cases contained in table 5, two independent neutrals examined an identical factual situation. If the arbitrator does not select the fact-finder's recommendation, it appears that two qualified neutrals have disagreed on the appropriate award in the identical case. If this is a fairly common situation, it seems very unlikely that the parties will be able to predict arbitral outcomes with any precision.

The first row of table 5 indicates that where there were three distinct offers available for selection, the arbitrator and fact-finder agreed in about two-thirds of the cases. Remarkably enough, the second and third rows of table 5 indicate that, even when union or employer offers coincide with the fact-finder's recommendation, the arbitrator still selects the fact-finder's position in only about two-thirds of the cases. In view of the possibility that arbitrators may be naturally inclined to defer to the fact-finder's proposal, this seems like strong evidence in support of the hypothesis that the parties face some true arbitral uncertainty.

Conclusions

It should be apparent from this brief survey that a great deal has been learned from the interest arbitration systems operating in the U.S. in the public sector. For reasons that still remain unclear, simple statistical analyses continue to confirm a very stable set of operating characteristics for these systems. The data suggest that the arbitrators base decisions partly on the facts of the situation and partly on a unique assessment of what is an appropriate award in a given factual situation. The data also suggest that the determination of an appropriate award is largely independent of the type of arbitration system in which the arbitrator operates. As a result, the variability in the outcomes that exists across arbitration systems is a product either of constraints placed on arbitrator decisions by the institutional setup (for example, the selection of one of two offers under final-offer arbitration) or of differences in the behavior of the parties in response to different institutional setups. Precisely why arbitrator decisions may be characterized in this way is not yet known, but I suspect it is related to the importance of the role assigned to the parties own preferences in determining which arbitrator will have their case. In this sense private arbitration systems have a clear advantage of quasi-judicial or "legal" systems. Although the parties cannot agree on how to settle their dispute, they apparently do often share some common views regarding which neutral party should resolve it for them. It seems very likely that an arbitration system that exploits this fact will enhance its own acceptability.

In my view, the purpose of arbitration systems is to produce the settlement of disputes in a way that is less costly than the alternatives. Whether interest arbitration will grow in popularity depends on whether it is a less costly system than the alternatives *and* on whether the parties are able to obtain the information and experience necessary for determining whether it is less costly. This suggests that any experimentation with arbitration systems should be studied with care so that its costs and benefits can be examined and compared against the alternatives. If successful, the rewards to such study may be of considerable practical importance in reducing the overall cost of disputes in our society.

NOTES

1. See Richard A. Lester, *Labor Arbitration in State and Local Government*, Industrial Relations Section, Princeton University, Princeton, New Jersey, 1984, a book to which much of what follows is deeply indebted. For a survey of Canadian systems see Morley Gunderson, *Economic Aspects of Interest Arbitration*, Ontario Economic Council, Toronto, 1983.

2. This is an important issue, because interest arbitration is an option open to private sector disputants that is rarely used. Just as we may question why interest arbitration is so infrequently used in the private sector, so may we wonder why it is used in the public sector.

3. I have in mind here, and in what follows, the case where a dispute arises over compensation or some other quantitative issue. Obviously, where the issue involves a truly "yes or no decision," such as the granting of dues checkoff rights, final-offer arbitration is the conventional arbitration procedure.

4. In private correspondence J.E. Treble, of the University of Hull, has suggested that the situation I have just described bares some similarity to the state of affairs in late 19th century British coal mining.

5. It is sometimes observed that this is much the same as the principle in the civil law that proposals in settlement negotiations may not be used as evidence in a subsequent trial. This is presumably designed to encourage negotiated settlements of civil suits!

6. H.S. Farber and M.H. Bazerman, "The General Basis of Arbitrator Behavior: An Empirical Analysis of Conventional and Final-Offer Arbitration," Massachusetts Institute of Technology, October 1984.

7. See David Bloom and Christopher Cavanagh, "An Analysis of the Selection of Arbitrators," Harvard University, June 1984.

8. The results in this section of the paper are a product of joint work with David Bloom of Harvard University. See Orley Ashenfelter and David Bloom, "Models of Arbitrator Behavior: Theory and Evidence," *American Economic Review*, March 1984, and Orley Ashenfelter and David Bloom, "The Pitfalls in Judging Arbitrator Impartiality by Win-Loss Tallies under Final-Offer Arbitration," *Labor Law Journal*, August 1983.

9. Greater variability of arbitrator preferences will lead to a flatter slope of the relationship between the probability that an employer's offer is selected and the (average of) the union and employer final offers. Thus, the slope of this relationship in the final-offer arbitration cases is a measure of the (inverse of) the variability of arbitrator preferences. The method of estimation we use is called maximum likelihood, because it assigns values to the mean and standard deviation of arbitrator preferences that are most likely to have generated observed final-offer arbitration data under our assumption about arbitrator behavior. The details of the method we use and some additional empirical material are contained in Orley Ashenfelter and David Bloom, "Models of Arbitrator Behavior: Theory and Evidence," *American Economic Review*, March 1984.

10. The results in this section of the paper are a product of joint work with James Dow of Princeton University and Daniel Gallagher of the University of Pittsburgh.