

**The Effect of Collective Bargaining on Teacher Pay:**

**A Review of the Evidence <sup>1</sup>**

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## **Abstract**

This analysis examines the effect of collective bargaining on teacher pay in the light of an early theory of teacher bargaining power. Trends in the salaries of teachers are discussed, and the methodology and results of major studies are critically analyzed. The problems with existing research are noted and suggestions for researchers and all partisans are presented.

In the 1960s and early 1970s, many observers predicted that the growth of collective bargaining in public education would lead to significant salary gains for organized teachers. Some scholars who held this view theorized that teacher organizations would be much less constrained by market factors than unions in the private sector. The lack of market constraints would enable organized teachers to achieve a level of bargaining power not generally possessed by unions in the private sector. In addition, teacher bargaining power would be enhanced by the ability of teacher organizations to operate more effectively in the political arena than private-sector unions.

This view was expressed most forcefully in a well-known book by Wellington and Winter, who argued that:

*... to the extent union power is delimited by market or other forces in the public sector, these constraints do not come into play nearly as quickly as in the private .... Market-imposed unemployment is an important restraint on unions in the private sector. In the public sector, the trade-off between benefits and employment seems much less important. Government does not generally sell a product the demand/or which is closely related to price. There are usually not close substitutes/or the products and services provided by government and the demand/or them is relatively inelastic. <sup>2</sup>*

Non-union competitors-actual or potential-according to Wellington and Winter, limit union demands in the private sector. "But no such restraint limits the demands of public employee

unions." Consequently, the "transplant" of the private-sector model of collective bargaining to the public sector "would leave competing groups in the political process at a permanent and substantial disadvantage," claimed Wellington and Winter.<sup>3</sup>

If this theory of public-sector bargaining is valid, one would expect to observe compensation levels for organized teachers substantially above the levels they would have obtained if they had never engaged in collective bargaining. This paper will review the sizable body of empirical research that has examined the effect of teacher bargaining on salaries.<sup>4</sup> The consensus view in this research is that teacher bargaining has *not* resulted in significant salary gains for organized teachers. Rather, the effect of teacher bargaining on salaries appears to have been extremely modest—possibly even nonexistent—and clearly less than the overall effect of private-sector unionism on private-sector wages.

The existing research is subject to criticism and qualification. But if, in fact, teacher organizations have had only a minor effect on salaries, what is the explanation? Why have the expectations of the prognosticators of the 1960s not been supported by subsequent empirical research? After a review of the evidence on teacher salaries, an attempt will be made to answer these questions. It should be noted at the outset that this paper will focus only on teacher salaries even though salaries are only one part (albeit the most important part) of the total compensation package. This focus on salaries is necessitated by the virtual absence of systematic research on the effects of teacher bargaining on pensions, health insurance, and other "fringe" benefits.<sup>5</sup>

## TRENDS IN TEACHER SALARIES, 1967-80

The average annual salary of classroom teachers in the United States for the school years of 1967-68 through 1979-80 is presented in Table I. Average salaries more than doubled over this period, from \$7,423 in 1967-68 to \$16,001 in 1979-80. This is an annualized rate of increase of about 6.3 percent per year. But the table also shows the impact of price inflation on the purchasing power of teacher salaries. When average teacher salaries are deflated by the Consumer Price Index, it is clear that the average teacher's *real* salary is actually lower now than it was a dozen years ago. In real terms, the average salary of teachers peaked in 1972-73 just prior to double-digit inflation becoming a way of life in the U.S.). Since that year, the average teacher has lost over \$1,000 in real purchasing power (a loss of about 13.4% in real dollars).<sup>6</sup>

Another way of looking at the trend is to compare average teacher salaries with the "intermediate family budget." This budget, constructed annually by the Department of Labor, is

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intended to represent the amount of income required for a family of four to live in a "solidly middle-class but not affluent fashion."<sup>7</sup> Over the period of 1967-80 as can be seen in Table 2, the average teacher's salary never equaled the level of income in the intermediate budget. Because the United States has become a nation largely consisting of two-earner households, the significance of this finding may be discounted. But the trend in the ratio of average teacher salary to the intermediate budget is difficult to dismiss. In the late 1960s and early 1970s this

ratio generally increased (reaching 89% in 1972-73), but by 1979-80 the ratio had fallen to 78 percent.

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So it appears that over the period 1967-80 teacher salaries did not keep abreast with inflation and fell further behind the level of income prescribed by the Department of Labor as appropriate for a middle-class family. But it is clear that other groups of workers suffered the same fate. Indeed, many workers lost more real income than teachers. Moreover, the evidence discussed so far does not actually speak to the question of the effects of bargaining on teacher salaries. One can argue that teachers would have fared even less well had the majority not had the advantage of organized representation.

One indirect way of assessing the effects of bargaining on teacher compensation is to compare the salary levels of teachers to the earnings levels of other highly organized workers. In Table 3, average teacher salary is compared with the average weekly earnings of (1) all production workers, (2) production workers in the motor vehicles and equipment industry ("autoworkers"), and (3) production workers in the blast furnace and basic steel industry ("steelworkers"). The author has served as a neutral in many teacher bargaining impasses and seldom, if ever, have steelworker and autoworker wages been considered an appropriate comparison for school teachers (especially by school board members!). Yet the comparisons are instructive if only because they illustrate that some highly unionized groups have been able to

withstand the ravages of inflation to a greater extent than others. The analysis in Table 3 shows that teachers enjoyed a substantial salary advantage over autoworkers and steelworkers in the early 1970s, but by 1978 there was virtually no difference between teacher and autoworker earnings, and steelworkers were actually earning more than teachers.<sup>8</sup> More recent data (not included in Table 3) indicate that steelworkers earned an average weekly wage of \$433 in January of 1980. Thus, steelworker earnings increased by 160 percent between 1970 and 1980, while teacher salaries increased by about 42 percent and prices by 105 percent over the same period.

As the analysis in Table 3 reveals, even the differential between teachers and "all production workers" (a group that clearly contains many nonunion workers) narrowed considerably during the 1970s. Indeed, there is even evidence that the salary differential between teachers and other government employees shrank over the past decade. For example, in 1971 teachers earned 25% more than other full-time state and local government employees, but by 1978 the differential was 19.5%.<sup>9</sup> Some would argue that the large wage gains that certain heavily unionized workers have won in recent years have caused a significant contraction in their employment opportunities. Whether American steel and auto producers have lost their competitive edge against foreign manufacturers because of union-won wage increases is a question beyond the scope of this paper. The point that is germane to this paper is that teacher bargaining apparently has not served to keep teachers' salaries ahead of blue-collar earnings, especially the earnings of blue-collar workers represented by notably powerful unions. This is probably not a result that Wellington and Winter would have predicted.

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Another, admittedly crude method of assessing the influence of teacher bargaining on salaries is to compare trends in the salaries of organized teachers with trends in the salaries of their unorganized colleagues. The following analysis was carried out: states were classified according to whether they had a relative level of teacher organization above or below the national average, and then teacher salary changes were compared for the two groups of states. The results of this analysis are summarized in Table 4. It turns out that for states with above-average teacher organization rates, salaries increased by 51.5% over the period 1972-73 to 1978-79, while for states with below-average organization rates, salaries increased by 48.5% over the same period. But note that states with *above*-average organization rates paid *lower*

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salaries in 1972-73 than states with below-average organization rates. The higher rate of salary increase in highly organized states merely allowed teachers in these states to catch up with, and finally overtake, the teachers in the less organized states.<sup>10</sup> Whether the different experience of teachers in the two sets of states is the result of teacher bargaining is, however, highly problematic.

The fact that states with somewhat lower salaries in the early 1970s were the states with somewhat higher levels of teacher organization suggests the hypothesis that low salaries may be an important factor causing teachers to organize. If this is true, however, it complicates

the task of isolating the effect of teacher bargaining on compensation. In the statistical studies that will be summarized in the next section of this paper there is the assumption (either explicit or implicit) that teacher organization is an *exogenous* influence on teacher salaries. For teacher organization to be exogenous, the level of organization should influence salaries, but salaries should not influence the level of organization. But if teacher organization is *endogenous*--that is, if the level of organization is a function of salaries--the statistical results lose both "their casual implications and their statistical accuracy." <sup>11</sup>

The possible endogeneity of unionism requires that econometric studies of the influence of unionism on wages use at least a two-equation system: one equation would make unionization a function of wages (and other relevant variables), and the second equation would make wages a function of unionization. The failure to use such an approach *if* unionization is truly endogenous results in "simultaneous-equations bias." Almost all of the studies summarized in the next section may suffer from such a bias.

## **STUDIES OF THE INFLUENCE OF TEACHER BARGAINING ON SALARIES:**

### **METHODOLOGICAL CONSIDERATIONS**

All the evidence reviewed to this point provides only inferential evidence of the influence of teacher bargaining on salaries. An accurate estimate of the bargaining (or "union") effect requires the use of more sophisticated statistical techniques. In order to get a "true" measure of the bargaining effect we need a measure of salaries determined under collective bargaining,  $S_b$ , and a measure of salaries for the same group of workers if they had *never* bargained,  $S_{nb}$ . Then  $S_b - S_{nb}$  would be an accurate measure of the effect of bargaining on

salaries. But  $S_a$  is not directly observable—one can never really know what an organized group of workers would have received if the group had never been organized. What we can generally observe is  $S_c$ , the salary level of a group of unorganized workers that is comparable to the organized group.

But  $S_b - S_c$  is not likely to be an unbiased estimate of the bargaining effect for at least two reasons. First, and probably most important, the effect of bargaining is likely to have some affect on the salaries of the *unorganized* group. Thus  $S_c$  may be higher or lower than it otherwise would be in the absence of bargaining. This phenomenon is known as the "spillover" effect. Second, it is difficult to match organized and unorganized groups that are identical except for the fact that one group bargains and the other does not. It is necessary to have a theory of wage determination that allows the researcher to specify the important observable variables, in addition to bargaining, that influence salaries. Most theories suggest that worker characteristics (such as education, experience, race, sex, and place of residence) and employer characteristics (such as size, financial capacity, and other indicators of the employer's demand for labor) will have an important bearing on salaries. Public policy, political, and structural factors (such as whether or not a school district has the authority to set tax rates and raise its own revenues) may also influence salaries. If all theoretically justified factors that influence salary outcomes are not properly controlled, estimates of the true effect of bargaining can be seriously biased.

The typical approach, then, is to specify a regression of the form:

$$S_{b,c} = a_0 + \sum_{i=1}^n a_i x_i + b T + e,$$

where  $S_{b,c}$  are the salaries of a sample of union and nonunion workers, the  $x_i$ 's are a set of  $n$  explanatory variables other than bargaining,  $T$  is a measure of unionism or bargaining, and  $e$  is the error term; also,  $a_0$  is the constant, the  $a_i$ 's represent the set of coefficients of the explanatory variables, and  $b$  is the coefficient of the bargaining variable and permits an estimate of the effect of bargaining on salaries controlling for other explanatory variables. This is the functional form generally used in regression studies of teacher salaries. Note that spillover is not (directly) accounted for in regression studies that use this functional form.

A diligent search of the literature uncovered 16 studies that use the methodology just described; they are summarized in Table 5.<sup>12</sup> Aside from sharing a common quantitative methodology, these studies vary greatly in terms of the samples used, the time period covered, the specification of dependent and explanatory variables, and in other particulars. In fact, one must have serious reservations about some of the studies examined here, but the author has elected to be inclusive in his survey.

It should first be noted that all the studies are basically cross-sectional in nature. Earlier in this article time series data on teacher salaries were examined, but there is no regression study of teacher salaries that uses time-series data. Most of the studies examined a sample of observations in a single school-year; two exceptions were Frey and Schmenner (both of whom

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used pooled cross-section and time-series data). Most looked at salary levels, but three (Lipsky and Drotning; Balfour; Baugh and Stone) also examined salary *changes*. The school year examined was either in the late 1960s or early 1970s. The latest year examined in any of these studies was 1977 (by Baugh and Stone). Clearly, then, we know very little about the effect of teacher bargaining on salaries in recent years. It is difficult to do a study with more recent data because teacher bargaining is now so widespread that finding an appropriate control group of unorganized teachers represents a sticky (but not insolvable) methodological problem.

Next, the studies summarized in the table vary greatly in terms of the unit of observation and the nature of the sample. The earliest study, by Kasper, used state-level observations. Two later studies (Balfour; Mitchell) also used the state as the unit of observation. Some researchers have criticized this approach because teacher salaries are determined not at the state level but, rather, at the school district level. Also, the use of state-level averages obscures the significant degree of intrastate variation of teacher salaries and other independent variables. Moreover, state-level average salaries are actually weighted averages of the salary levels of both organized and unorganized teachers within the state, and so a significant amount of intrastate spillover would seriously bias estimates of the "true" bargaining effect. Consequently, most studies of the effect of teacher bargaining on salaries use the school district as the unit of observation. One group of studies used an interstate sample of school districts (Thornton; Baird and Landon; Schmenner; Gustman and Segal), and a second

group used an intrastate sample of districts (Hall and Carroll; Lipsky and Drotning; Treacy et al.; Frey; Chambers; Zuelke and Frohreich; Gallagher). Only the studies by Holmes and by Baugh and Stone use the individual teacher as the unit of observation. The advantage of using samples of teachers is that the researcher can capture the direct effect of individual teacher characteristics (such as age, sex, education, and experience) on salaries. The disadvantage is that it becomes difficult, if not impossible, to control for the effects of other relevant variables (such as district characteristics, labor market structure, political factors, and the like).

There are competing claims as to the virtues of using either an interstate or intrastate sample of districts. For example, on the one hand an interstate sample reduces the problem of spillover. If an interstate sample included both District A, an organized district in New York, and District B, an unorganized district in Texas, it is unlikely that the salaries of the teachers in District B are significantly affected by the existence of bargaining in District A. But such an assumption is certainly more tenuous if both District A and District B are in the same state. On the other hand, an interstate sample complicates the problem of properly specifying the explanatory variables (the  $x_i$ 's) in the regression model. State-level public sector bargaining laws, for example, probably have some influence on salary determination but theories of how this influence should work are weak or non-existent, which means that it is difficult to know how to specify a variable representing statutory law for inclusion in the estimating equation. Use of an intrastate sample of districts does not present this difficulty since state-level laws and policies presumably apply equally to all districts in the state. Problems of accounting for the

influence of variations in school district governance, state funding formulas, and political factors on teacher salaries are also more readily handled if an intrastate sample is used.

It also happens that the studies that have used interstate samples have examined only big-city school districts. This obviously limits the generality of these studies' findings. But it is equally difficult to generalize on the basis of a study that examines teacher salaries in the school districts of only one state.

Turning to the measures of teacher salaries used in the various studies, their major limitation has already been noted: namely, the failure to account for the entire compensation package, salaries and fringe benefits alike.<sup>13</sup> This failing is certainly not unique to research on teacher compensation, since it is characteristic of most of the research on the effects of private-sector unions on earnings.<sup>14</sup> Another critical failing is the lack of evidence on the effects of teacher bargaining on *noneconomic* outcomes. Many practitioners and scholars alike believe that the most significant effects of collective bargaining are in the areas of job security, work rules, and the establishment of due process for employees. In fact, some scholars have recently demonstrated that collective bargaining is often (but not always) associated with increases in worker productivity and decreases in turnover—effects that spell real benefits for unionized employers.<sup>15</sup> But there is no evidence on the relationship between bargaining, on the one hand, and turnover and productivity (more precisely, teacher performance and effectiveness), on the other, in public education.

The studies summarized in Table 5 looked only at salaries, but they differ in the precise salary measure(s) used. Some used only base salary (BA minimum), others used base salary plus

certain other salary figures in the teacher salary schedule, and still others used measures of average salary. Again, there are pros and cons on which is the best salary measure to use. In the article that this author wrote with Drotning, it was argued that "use of the teacher salary scale is particularly appropriate, since this is normally the subject of direct negotiation in collective bargaining."<sup>16</sup> But it was pointed out that since a district's actual salary costs depend on the placement of teachers within the schedule (i.e., on the characteristics of the teacher workforce in terms of experience and earned credits), the use of scheduled salaries may give a misleading picture of the true economic benefits (and costs) of teacher bargaining. The average salary actually paid is a much better index of those costs and benefits even though average salary is not the direct subject of negotiations.<sup>17</sup>

The use of an array of figures from the salary schedule, however, allows inferences to be drawn about the effects of bargaining on differentials between more senior and less senior teachers.<sup>18</sup> Studies that have focused only on the BA minimum cannot be used to draw conclusions about the effects of bargaining on the salaries of long-service teachers or teachers with master's degrees. As teacher hiring declined in the 1970s, the BA minimum became an increasingly irrelevant figure for many school districts. Any scholar who undertakes a study of the effects of bargaining on teacher salaries using data from the late 1970s would almost certainly produce meaningless results if she or she focused *only* on the BA minimum.

An important consideration is that of the selection of the variable used to measure the "union" or "bargaining" effect. The specification of this variable is critical since it is the coefficient of this variable that must be used to estimate the effect of bargaining on salaries.

Basically two types of variables have been used: one type uses membership in a teacher organization as a measure, and the other type is based on whether teachers are covered by collective bargaining negotiations or contracts. In the first category, for example, Baird and Landon used two variables; the first measuring the proportion of teachers who were members of the NEA and the second measuring the proportion of teachers who were members of the AFT. Their study is the only one that tried to compare the effects of AFT membership versus NEA membership on teacher salaries. In the second category, district-level studies have generally used a so-called "dummy" variable that classified districts on the basis of whether they did or did not have a collective bargaining contract. Some state-level studies have used the *proportion* of the state's teachers covered by a contract (Kasper; Balfour). Several studies have tried to distinguish different types of contracts (Balfour; Gustman and Segal; Holmes), particularly whether the contract merely provided recognition or was more substantive in nature. Two other studies (Baird and Landon; Chambers) measured the bargaining effect on the basis of whether formal negotiations were held, regardless of whether such negotiations resulted in a signed contract.

Whether the researcher should use a measure based on membership in a teacher organization or coverage by a collective agreement (or some variant of either) depends on the question the researcher is trying to answer. Presumably, the existence of a strong teacher organization can influence salary levels even if the organization does not engage in actual bargaining with the district. In the absence of formal bargaining, teachers must rely primarily on lobbying and presentations to school boards to achieve their salary objectives. If the researcher

is not really interested in the effects of bargaining, but rather in the effects of organized representation on teacher salaries, a membership-based measure of the "union" effect is perfectly acceptable. But if the researcher is in fact interested in the effects of *bargaining* then some measure indicating either the occurrence of bargaining or the existence of a contract must be used.

No information on the other explanatory variables used in these studies is included in Table 5. Exactly which control variables should be entered into the estimating equations is a subject deserving extended discussion, but it will be given only cursory treatment here. Nevertheless, a correct specification of the regression is critical to the accuracy of estimates of the bargaining effect and depends on the researcher's theory of teacher salary determination. Some researchers have used an economic (or market) theory, others have used a bargaining theory, and still others have used *ad hoc* theorizing to select their explanatory variables. The last approach, although common, is least satisfactory. Biases in the estimates of bargaining effects are more likely if the researcher has not based the specification of his or her estimating equations on sound theoretical reasoning.

Certain independent variables have been used with great frequency. They include measures of:

1. *The district's ability to pay (e.g., state aid, "true" tax rates, and so forth).*
2. *Labor market structure (particularly, measures of the district's "monopsony power").*

3. *The area's per capita or median income.*
4. *Alternative wage rates in the relevant labor market (e.g., the wages of managers, accountants, or other white collar workers).*
5. *Size (number of students in the district, population in area, and so forth).*
6. *Working conditions (pupil/ teacher ratio, location of district, and so forth).*
7. *Characteristics of the teacher workforce (average years of service of teachers in district, percentage of teachers with Master's degree, and so forth).*

There are clearly other technical questions that must be addressed by the researcher. For example, one important issue is the proper functional form of the estimating equation. Most researchers have used additive models, but some have argued that either a logarithmic or log-linear model is more appropriate.<sup>19</sup> Most have also used reduced-form, ordinary least-squares (OLS) models, which may not be appropriate if any of the independent variables are considered to be endogenous. Hall and Carroll, for example, used a two-stage least squares (2SLS) model: they assumed that teacher salaries and class size are simultaneously determined through the bargaining process. It has already been noted that a 2SLS model would be appropriate if unionism is considered an endogenous variable. But the use of simultaneous equations obviously complicates the researcher's modeling and estimation procedures.

## STUDIES OF THE INFLUENCE OF TEACHER BARGAINING ON SALARIES: RESULTS

Although the research designs of the studies summarized in Table 5 vary greatly, the findings are remarkably consistent. The general conclusion that one must reach is that teacher bargaining has increased salaries above levels that otherwise would have prevailed, but that these increases have been rather modest.

Note that the terms "significant" and "insignificant" in the last column of Table 5 refer to whether the regression coefficients of the "union" or "bargaining" variables in the regression equations proved to be *statistically* significant or not. In more than half of the studies, the effects of bargaining or unionism on teacher salaries was insignificant in most of the statistical tests employed by the authors. Strictly speaking, this means that these researchers found that teacher bargaining had *no* influence on salaries.

The three studies that used the state as the unit of observation (Kasper; Balfour; Mitchell) all failed to discover significant coefficients for the "union" variables. In the seven studies that used intrastate samples of school districts (Hall and Carroll; Lipsky and Drotning; Treacy et al.; Frey; Chambers; Zuelke and Frohreich; Gallagher), the union variables were mainly insignificant. Even when these authors obtained significant coefficients, the magnitude of the effect was clustered (with one exception) in the 2 to 3 percent range.

Of the four studies that used interstate samples of school districts, three found significant bargaining coefficients (Thornton; Baird and Landon; Schmenner) and one (Gustman and Segal) found seven "union" coefficients to be insignificant and only one to be significant. In

general, however, the four studies that used interstate samples of districts found larger salary effects than the studies that used other types of samples. The estimates in these four studies vary greatly, but are generally larger than 4 percent. This conclusion is consistent with the earlier statement that studies based on interstate samples of school districts are less likely to be biased by the spillover factor.

The two studies that used samples of teachers (Holmes; Baugh and Stone) both found union coefficients that were significant. Although different in several critical respects (Holmes used a sample of Oklahoma teachers while Baugh and Stone used a national sample of teachers drawn from the Current Population Survey), both curiously found that teacher unionism was associated with a 7 percent gain in average earnings in 1974-75.

Baugh and Stone also found that in 1977 union membership was associated with a 21 percent gain in average salary. On the basis of this finding, Baugh and Stone concluded that "unionism now pays." Baugh and Stone attempt to correct for spillover effects in their analysis, but both their study and that of Holmes possibly suffer from biases caused by omitted variables. Both studies use a set of teacher characteristics as control variables in their estimating equations but ignore demand-side, structural, and political variables. The omission of such variables probably biases estimates of the union effect in an upward direction.

Chambers used an intrastate sample of school districts but found larger bargaining effects than other researchers who also used intrastate samples. This is largely because Chambers measured the total effect of bargaining on the salaries of teachers as the sum of the effects of (1) whether the teachers in a district engaged in negotiations or not and (2) the

extent of teacher bargaining in the region of which the district was a part. By picking up the second set of effects, the regional effects of bargaining, Chambers partially corrected for the spillover factor and obtained estimates in the range 6 to 12 percent.

There also appears to be a greater likelihood that the bargaining variable will be statistically significant if the dependent variable is a measure of the salary scale, rather than a measure of average salary. Teacher organizations may have had a significant influence on salary *schedules*, which are the direct subject of negotiations, but school districts retain the flexibility to adjust their demand for (and utilization of) teachers so as to minimize the effect of bargaining on their actual salary *costs*. Average salary is, of course, a measure of those actual costs.

In summary, the weight of the evidence suggests that formal representation and bargaining have not caused teacher salaries (on average) to be more than 4 to 6 percent greater than they would otherwise be. A decade of research has not served to change Kasper's original conclusion: "Given these small estimates, it seems unlikely that bargaining has produced a significant or widespread reallocation of educational resources."<sup>20</sup> This is remarkable, not only because it contradicts the expectations of scholars like Wellington and Winter, but also because these estimates are substantially below estimates of the effects of private sector bargaining on wages.

About 20 years ago, H. Greg Lewis reviewed all the important research on the influence of unionism on wages, conducted his own separate tests, and concluded that *on average* union workers received wages that were 10 to 15 percent higher than the wages of nonunion workers

with similar characteristics. Lewis estimated that some strong unions were able to raise the wages of their members by 25 percent or more.<sup>21</sup> More recently, Boskin estimated that the wage advantage for union members in the craft, operative, and laborer occupations was about 15 to 25 percent.<sup>22</sup> Ryscavage found that the union/ nonunion wage differential for all workers was 12 percent in 1973.<sup>23</sup> Ashenfelter estimated that it was 12 percent in 1967, 15 percent in 1973, and 17 percent in 1975.<sup>24</sup> There appears to be a growing consensus among researchers that, in the light of recent experience, Lewis's estimates must be revised in an upward direction. For private sector workers, the union effect is probably now in the 15 to 25 percent range.<sup>25</sup>

Why is it that teacher bargaining apparently has had only a modest effect on salaries? Why does the bargaining effect appear to be substantially lower for teachers than for workers in the private sector? This author cannot claim to have a complete explanation, but he is prepared to offer a few suggestions and hypotheses.

### **SOME POSSIBLE EXPLANATIONS**

The principal problem in the existing research, it seems, is the failure of most researchers to account for spillover effects. If the salary levels of teachers who are not organized or do not bargain ( $S_c$ ) are higher because of bargaining by organized teachers, the measure  $S_b - S_c$  will be biased in a downward direction. But there is no evidence in the existing studies that a spillover correction would increase estimates of the effect of bargaining on teacher salaries by more than a few percentage points. Although it is possible that spillover is the "whole story," other factors need to be considered.

Some researchers have suggested that the nature of the teacher labor market serves to constrain the effect that bargaining has on teacher salaries. First, teacher labor markets are said to be characterized by "monopsony." A monopsonistic buyer of labor services exercises more discretion over the wages he pays his workers than an employer who operates in a more competitive labor market. Some research suggests that school district monopsony reduces teacher salaries as well as the salary differential between organized and unorganized teachers.<sup>26</sup> Wellington and Winter recognized that public employers often had a virtual monopoly over the provision of certain kinds of services, but they did not recognize that monopsony in the labor market is the other side of the coin. Monopsony power is not thought to be widespread in private-sector labor markets. But if school districts enjoy a measure of monopsony power, it may mean that they are better able to counter the bargaining power of teacher organizations.

Second, the chronic surplus of teachers throughout most of the 1970s probably served to enhance the bargaining power of school districts. The deterioration in the relative salary position of teachers, noted in the first part of this paper, can probably be attributed in part to the growing over-supply of teachers after 1971.<sup>27</sup>

The structure of collective bargaining in public education is probably another factor that has acted as a constraint on the bargaining power of teacher organizations. Contract negotiations occur at the district level. By contrast, in the private sector, bargaining is more likely to occur at a "higher" level. Wage bargaining in the steel and auto industries, for example, is highly centralized. National contracts in those industries have created a standardized wage

structure for autoworkers and steelworkers. Most unions have preferred centralized bargaining structures and bargaining units that are coextensive with the product or labor market.<sup>28</sup>

The highly decentralized, fragmented structure of bargaining in public education may have served to limit the ability of teacher bargaining to influence salaries significantly. This hypothesis is offered tentatively because industrial relations scholars disagree on the links between bargaining structure and union power. In a similar vein, the continuing rivalry between the AFT and the NEA may have hindered the evolution of a consistent, widely-applied bargaining strategy capable of achieving significant salary gains.<sup>29</sup>

Fundamentally, Wellington and Winter overstated the nature of market constraints on private sector unions and understated the nature of political constraints on public sector unions. The tax-payer plays a role in relation to public-sector bargaining analogous to the role played by the consumer in relation to private sector bargaining. Wellington and Winter argued, in effect, that tax-payers in school districts could do less to constrain the demands of teacher unions than the consumers of Chevrolets and Fords could do to constrain the demands of the UAW.

But tax-payers and consumers differ in several significant ways. It is probably easier for tax-payers to organize (into parents' associations and citizens' lobbies, for example) than it is for consumers. Tax-payers elect school board members, but consumers do not elect General Motors' board of directors. Consumers do not vote on the level of corporate expenditures, but in many school districts tax-payers vote on school district budgets. Wellington and Winter cannot be faulted for failing to foresee the resistance and "revolts" of tax-payers in the 1970s,

but it does seem clear that they underestimated the extent to which the political process could serve even more effectively than the market mechanism to limit the demands and achievements of public sector unions.

Finally, it is likely that public policy has limited the bargaining power of teachers. Teachers in general do not enjoy the same legal rights and privileges that have long been the norm for workers in the private sector. In several states teachers lack even the right to bargain. In almost all states, teachers do not have the right to strike. Limitations on the scope of bargaining, on union security provisions, on the enforceability of contracts, and on several other critical dimensions of the bargaining relationship have probably had an impact on the ability of teacher organizations to win sizable salary gains.<sup>30</sup>

The kind of evidence reviewed in this article can be used—indeed, has been used—by both the proponents and opponents of teacher bargaining. Proponents have argued that the limited effect of collective bargaining on teacher pay demonstrates that teacher unions cannot be blamed for rising school taxes and the fiscal distress suffered by many school districts.<sup>31</sup> Proponents have also argued that this evidence justifies attempts to strengthen the institution of collective bargaining in the schools, perhaps by extending to teachers in all states the right to bargain and even the right to strike. By contrast, opponents have argued that the inability of teacher organizations significantly to affect salaries nullifies teachers' need for collective bargaining. In one report by an anti-union group it was argued, "The individual teacher [has] not realize[d] any gain that could not have been obtained in the absence of unionism and collective bargaining," but that organized teachers nevertheless bore "the additional cost of

union dues" and tax-payers endured "more disruptions of the educational process and a lessening of citizen control." <sup>32</sup>

But all partisans should be warned: although the cumulative evidence to date tends to point in one direction, without due recognition of its limitations and fragility the evidence can easily be misused. The evidence reviewed in this paper indicates that it is clearly an overstatement to claim that teacher bargaining has had *no* effect on salaries. The most careful studies-especially those that try to eliminate spillover effects-indicate that teacher salaries are somewhat higher than they would have been in the absence of bargaining. What has surprised researchers is that these bargaining effects are not nearly as large as some feared and others hoped they would turn out to be.

## NOTES

1. The author would like to thank Charles Rehmus, Robert Doherty, Sam Bacharach, and David Helfman for their comments on this paper. A special thanks is owed to Frank Masters, who drew the author's attention to several of the courses cited in the paper and offered comments on an earlier draft. Finally, the author would like to acknowledge his debt to two Cornell graduate students, Ira Saxe and Tim Schmidle, for their excellent research assistance. None of these people, of course, bears any responsibility for any errors of fact or interpretation that remain in the paper.
2. H.H. Wellington and R. K. Winter, Jr., *The Unions and the Cities* (Washington, D.C.: The Brookings Institution, 1971), p. 15, 18.
3. *Ibid.*, p. 18, 30. Similarly, Summers argued that "public sector employee bargaining is, on balance, probably not good for society, and especially not good in a field such as public education ..." See, R. S. Summers, *Collective Bargaining and Public Benefit Conferral: A Jurisprudential Critique* (Ithaca, New York: Institute of Public Employment, New York State School and Industrial and Labor Relations, Cornell University, 1976), p. xi. For contrary views, see C. W. Summers, "Public Employee Bargaining: A Political Perspective," *Yale Law Journal* 83 (1974):1156-1200; and S. Cohen, "Does Public Employee Unionism Diminish Democracy?" *Industrial and Labor Relations Review* 32, 2 (January 1979): 189-195.
4. Two excellent papers that survey the literature on the effect of collective bargaining on public sector wages are D. Lewin, "Public Sector Labor Relations: A Review Essay," *Labor*

*History* 18 (Winter 1977): 133-144; and D. J. B. Mitchell, "The Impact of Collective Bargaining on Compensation in the Public Sector," in *Public Sector Bargaining*, Industrial Relations Research Association Series, Benjamin Aaron et al., eds. (Washington, D. C.: Bureau of National Affairs, 1979), pp. 117-149. These two authors, however, do not specifically focus on the effects of teacher bargaining on salaries, and therefore ignore most of the research cited in this paper.

5. In 1979-80 classroom teacher salaries (not counting fringe benefits) accounted for \$35 billion of the \$82.3 billion expended by the nation's public school systems. Thus, teacher salary expenditures alone were 43 percent of total current expenditures. These estimates are derived from data given in NEA Research Memo, *Estimates of School Statistics*, 1979-80. The only study that systematically examines the influence of teacher bargaining on pensions is A.S. Gustman and M. Segal, *The Impact of Teachers' Unions* (Final Report to the National Institute of Education, U.S. Department of Health, Education, and Welfare, 1976). Gustman and Segal found that teacher organizations "increase considerably the pensions of those teachers who retire after 25 years of service," but "have little impact on the pensions of teachers who have accumulated long periods of services" (p. 126).
6. A cautionary note is in order, however. Because of attrition and turnover, the change in *average* salaries ought to be lower than the change in the *individual* salaries of teachers who continue in employment. Consider the following illustration: The nationwide average starting teacher's salary was \$7,357 in 1972-73. The nationwide average maximum salary of teachers with Master's degrees was \$18,834 in 1979-80. Thus, a

teacher who was hired at the average minimum in the former year and who progressed to the average Master's maximum by the latter year would have enjoyed a salary gain of 156% in nominal dollars, or 41 % in real ( 1967) dollars.

7. See A. C. Orenstein, "Teacher Salaries: Past, Present, Future," *Phi Delta Kappan* 61, 10 (June 1980):677-679.
8. In Table 3 average yearly teacher salaries are divided by 40 to arrive at an estimate of average weekly salary. One can argue that the denominator ought to be higher (say, 52), but of course that would make the comparisons in Table 3 look even worse.
9. According to the Bureau of the Census' "GE Series," instructional personnel had average earnings of \$10,248 in 1971 and \$15,564 in 1978. Full-time state and local government employees had average earnings of \$8,184 in 1971 and \$13,020 in 1978.
10. Organization rates are measured by the percentage of full-time teachers who were members of a teacher organization. The use of membership as a measure of the influence of bargaining has been criticized because there is no necessary correspondence between the level of membership in a teacher organization and the existence of either a teacher bargaining unit or a collective bargaining contract. This issue is discussed further below.
11. D. J. B. Mitchell, *Unions, Wages, and Inflation* (Washington, D. C.: The Brookings Institution, 1980), p. 104. Mitchell discusses the endogeneity problem on pp. 104-111. If the level of teacher salaries partially determines whether or not teachers are organized and engage in collective bargaining, then the union or bargaining variable in a salary regression will be correlated with the error term in the regression, resulting in biased

estimates of the effect of organization or bargaining on salaries. For a recent study of public sector wage determination that attempts to deal with this problem, see A. Bartel and D. Lewin, "Wages and Unionism in the Public Sector: The Case of Police," *Review of Economics and Statistics* 63, 1 (February 1981):53-59.

12. Sources for the studies summarized in Table 5 are given below the table and will not be repeated here. Not included in this survey are several studies that attempt to assess the effect of teacher bargaining on salaries but do not use regression models to do so. See, for example, T. A. Brown, "Have Collective Negotiations Increased Teachers' Salaries? A Comparison of Teachers' Salaries in States With and Without Collective Bargaining Laws for Public School Personnel, 1961-1971," *Journal of Collective Negotiations in the Public Sector* 4, 1 (1975):53-65; A. W. Smith, "Have Collective Negotiations Increased Teachers' Salaries?" *Phi Delta Kappan* 54, 4 (December 1972):268-270; and C. M. Rehmus and E. Wilmer, *The Economic Results of Teacher Bargaining: Michigan's First Two Years* (Ann Arbor, Mich.: Institute of Labor and Industrial Relations, The University of Michigan-Wayne State University, May 1968).
13. But see Gustman and Segal, *The Impact of Teachers' Unions*, for the effects of teacher bargaining on pensions. Also see M. M. Kleiner and C. E. Krider, "Determinants of Negotiated Agreements for Public School Teachers," *Educational Administration Quarterly* 15, 3 (Fall 1979):66-82. Kleiner and Krider, using data from Kansas school districts, analyze the effect of bargaining of a number of contract outcomes, including salaries, union security, health and welfare plans, grievance procedures, and so forth. They do not provide enough information in their article to allow an estimate to be

derived of the percentage salary differential associated with teacher unionism, and so their study is not included in Table 5.

14. In recent years, efforts have been made to close this gap, particularly by Richard Freeman, James Medoff, and their associates. See, for example, R. B. Freeman, "The Effect of Trade Unionism on Fringe Benefits," National Bureau of Economic Research Working Paper No. 292, October 1978.
15. See C. Brown and J. F. Medoff, "Trade Unions in the Production Process," *Journal of Political Economy* 86, 3 (June 1978):355-378; R. B. Freeman, Effect of Collective Bargaining on Teacher Pay 41 "Individual Mobility and Collective Voice in the Labor Market," *American Economic Review* 66, 2 (May 1976):361-368; a survey of this line of research is contained in R. B. Freeman and J. L. Medoff, "The Two Faces of Unionism," *The Public Interest* 57 (Fall 1979):69-93.
16. D. B. Lipsky and J.E. Drotning, "The Influence of Collective Bargaining on Teachers' Salaries in New York State," *Industrial and Labor Relations Review* 27, 1 (October 1973):19.
17. *Ibid.*, pp. 19-20. We concluded it was better to use both types of salary measure, rather than just one.
18. Several of the studies summarized in Table 5 indicate that collective bargaining has had a greater effect on the salaries of teachers with more years of service and more earned college credits. This suggests that bargaining may have served to widen salary differentials within districts. In a study of Nebraska school districts, using data from 1970-71, Moore found that collective bargaining reduced the secondary-elementary

salary differential by about 6 percent. See G. A. Moore, "The Effect of Collective Bargaining on Internal Salary Structures in the Public Schools," *Industrial and Labor Relations Review* 29, 3 (April 1976):352-362. Of course, this effect would not be found in those states and districts that used a uniform salary schedule before collective bargaining was instituted. Teacher organizations have been strong proponents of uniform salary schedules and have fought for their adoption in areas where they were not being used.

19. A logarithmic model was used by Schmenner. A log-linear model was used by Baugh and Stone, "Teachers, Unions, and Wages," and by Kleiner and Krider, "Determinants of Negotiated Agreements."
20. H. Kasper, "The Effects of Collective Bargaining on Public School Teachers' Salaries," *Industrial and Labor Relations Review* 24, 1 (October 1970):71.
21. H. G. Lewis, *Unionism and Relative Wages in the United States* (Chicago: The University of Chicago Press, 1963).
22. M. Boskin, "Unionism and Relative Wage Rates," *American Economic Review* 62, 3 (June 1972):466-472.
23. P. M. Ryscavage, "Measuring Union-Nonunion Earnings Differences," *Monthly Labor Review* 97, 12 (December 1974):3-9.
24. O. Ashenfelter, "Union Relative Wage Effects: New Evidence and a Survey of Their Implications for Wage Inflation," photocopy, Princeton University, 1976; and *Idem*, "Racial Discrimination and Trade Unionism," *Journal of Political Economy* 80, 3 (May-June 1972):435-464.

25. The voluminous literature on the effect of private-sector unions on wages is surveyed in C. J. Parsley, "Labor Union Effects on Wage Gains: A Survey of Recent Literature," *Journal of Economic Literature* 18, 1 (March 1980): 1-31. Mitchell thinks the union differential is now on the order of 20-30 percent. See Mitchell, *Unions, Wages, and Inflation*, p. 214.
26. See J. H. Landon and R. N. Baird, "Monopsony in the Market for Public School Teachers," *American Economic Review* 51, 5 (December 1971):966-971; and R. N. Baird and J. H. Landon, "The Effects of Collective Bargaining on Public School Teachers' Salaries: Comment." *Industrial and Labor Relations Review* 25, 3 (April 1972):410-417.
27. The NEA has estimated that the number of new teacher hires was about equal to the number of new college graduates who had prepared for public school teaching in the late 1960s. But for the period 1971-79 the picture was dramatically different: there were about twice as many newly trained teachers as there were jobs available for them. The NEA projects that this over-supply of teachers will diminish somewhat in the mid-1980s, but will not disappear. National Educational Association. *Teacher Supply and Demand in Public Schools*, 1978 (NEA Research Memo, 1979)
28. See, for example, A. R. Weber, "Stability and Change in the Structure of Collective Bargaining," in *Challenges to Collective Bargaining*, Lloyd Ulman, ed. (Englewood Cliffs, N. J.: Prentice-Hall, 1967), pp. 13-36; and T. A. Kochan, *Collective Bargaining and Industrial Relations* (Homewood, Ill.: Richard D. Irwin, 1980), pp. 84-123.
29. But some researchers have concluded that, historically, union rivalry within certain industries led to greater union militancy, and was therefore associated with larger wage

gains. See, e.g., H. M. Levinson, *Determining Forces in Collective Wage Bargaining* (New York: John Wiley, 1966). In public education the effect of organization rivalry on bargaining power remains an open question.

30. Clearly, however, teacher bargaining is deeply rooted in some states even though statutory support of bargaining is weak or non-existent. This is the case in Ohio and Illinois, for example.

31. Mitchell says "there does not appear to be justification for the viewpoint that [public-sector] unionization must inevitably lead to a looted treasury." Mitchell, "The Impact of Collective Bargaining on Compensation," p. 214. Gallagher used multivariate statistical techniques on a sample of Illinois school districts and found that teacher bargaining per se was associated with school taxation levels that were 5 to 12% higher than would otherwise have been expected. See D. G. Gallagher, "Teacher Negotiations, School District Expenditures, and Taxation Levels," *Educational Administration Quarterly* 15, 1 (Winter 1979):67-82.

32. Public Service Research Council, "Issue Analysis: The Effect of Collective Bargaining on Teacher Salaries," September 1978, pp. 3-4. The Public Service Research Council is the sponsor of "Americans Against Union Control of Government," a lobbying group.

**Table 1**  
 Estimated Average Annual Salary of Classroom Teachers in  
 Public Elementary and Secondary Schools in Nominal  
 Terms and in Terms of 1967 Dollars

Year	Average Salary*	Annual Average Salary Increase	CPI** (1967=100)	CPI Increase	Average Salary: 1967 Dollars	Annual Salary Change 1967 Dollars
1967-68	\$ 7,423	—	101.9	—	\$ 7,285	
1968-69	\$ 7,952	7.1%	106.8	4.8%	\$ 7,446	2.2%
1969-70	\$ 8,635	8.6%	113.2	6.0%	\$ 7,628	2.4%
1970-71	\$ 9,269	7.3%	119.0	5.1%	\$ 7,789	2.1%
1971-72	\$ 9,705	4.7%	123.3	3.6%	\$ 7,871	1.1%
1972-73	\$10,176	4.9%	128.2	4.0%	\$ 7,938	0.9%
1973-74	\$10,778	5.9%	139.7	9.0%	\$ 7,715	-2.8%
1974-75	\$11,690	8.5%	155.2	11.1%	\$ 7,532	-2.4%
1975-76	\$12,653	8.2%	166.2	7.1%	\$ 7,613	1.1%
1976-77	\$13,342	5.4%	175.8	5.8%	\$ 7,589	-0.3%
1977-78	\$14,247	6.8%	187.6	6.7%	\$ 7,594	0.1%
1978-79	\$15,040	5.6%	205.2	9.4%	\$ 7,329	-3.5%
1979-80	\$16,001	6.4%	232.7	13.4%	\$ 6,876	-6.2%

\*For the years 1967-68 to 1978-79, average salary is from National Center for Education Statistics, *Digest of Education Statistics, 1980*. For 1979-80, average salary is from National Education Association, Research Memo, *Estimates of School Statistics, 1979-80*, p. 32

\*\*The Consumer Price Index is the U.S. City Average for Urban Wage Earners and Clerical Workers as found in *Monthly Labor Review*, various issues. The index value given is the average of the monthly values from July of one year through June of the following year.

**Table 2**  
Comparison of Average Salary of Classroom Teachers to  
Intermediate Budget for Family of Four, 1967-80

School Year	Average Teacher Salary*	Intermediate Family Budget**	Ratio of Salary to Budget
1967-68	\$ 7,423	\$ 9,076	81.8%
1969-70	8,635	10,077	85.7
1970-71	9,269	10,666	86.9
1971-72	9,705	10,971	88.5
1972-73	10,176	11,446	88.9
1973-74	10,778	12,626	85.4
1974-75	11,690	14,333	81.6
1975-76	12,653	15,318	82.6
1976-77	13,342	16,236	82.2
1977-78	14,247	17,106	83.3
1978-79	15,042	18,622	80.8
1979-80	16,001	20,517	78.0

\*Source: National Center for Education Statistics, *Digest of Education Statistics, 1980* and Table 1 of this article.

\*\*Source: U.S. Department of Labor, Bureau of Labor Statistics, *Monthly Labor Review*, various issues, and *Handbook of Labor Statistics*, various years. For the school years 1967-68, 1969-70, and 1970-71, the intermediate budget figure used is from the Spring of 1967, the Spring of 1969, and the Spring of 1970, respectively. For subsequent school years, the budget figure used is for the fall of the given school year. (No data were available for 1968 or the 1968-69 school year.)

**Table 3**  
Comparison of Average Weekly Teacher Salary with Average Weekly Earnings of  
All Production Workers, Autoworkers, and Steelworkers, 1967-78

	(1) Average Weekly Teacher Salary*	(2) Average Weekly Salary, All Prod. Workers**	(3) Average Weekly Earnings, Autoworkers**	(4) Average Weekly Earnings, Steelworkers**	(5) Col. (1) ÷ Col. (2)	(6) Col. (1) ÷ Col. (3)	(7) Col. (1) ÷ Col. (4)
1967	\$186	\$124	\$145	\$144	1.50	1.28	1.29
1968	199	132	168	154	1.51	1.18	1.29
1969	216	140	171	166	1.54	1.26	1.30
1970	232	143	170	166	1.62	1.36	1.40
1971	243	153	194	178	1.59	1.25	1.37
1972	254	168	221	206	1.51	1.15	1.23
1973	269	181	238	230	1.49	1.13	1.17
1974	292	191	238	259	1.53	1.23	1.13
1975	316	205	260	274	1.54	1.22	1.15
1976	334	227	304	306	1.47	1.10	1.09
1977	356	248	346	339	1.44	1.03	1.05
1978	376	270	368	391	1.39	1.02	.96

\*Calculated by dividing average yearly salary of classroom teachers by 40.

\*\*Source: *Employment and Training Report of the President*, various years. "Autoworker" weekly earnings are average weekly earnings of all production workers in the motor vehicles and equipment industry. "Steelworker" weekly earnings are average weekly earnings of all production workers in the blast furnace and basic steel industry.

**Table 4**  
Average Salary and Percentage Salary Change for States  
with Organization Rates Above and Below the National Average  
Rate of Teacher Organization, 1972-73 to 1978-79\*

	States Above the National Average Organization Rate in 1972-73 (25)	States Below the National Average Organization Rate in 1972-73 (23)
Average Salary 1972-73	\$ 9,379	\$ 9,452
Average Salary 1978-79	\$14,208	\$14,040
Percentage Salary Increase 1972-73 to 1978-79	51.5%	48.5%

\* Rates of teacher organization are measured by the percentage of full-time teachers who are members of an employee organization. These data are given in U.S. Department of Commerce and U.S. Department of Labor, *Labor-Management Relations in State and Local Government-1974*. Salary data are taken from National Education Association, *Estimates of School Statistics*, various years.

**Table 5**  
Summaries of 16 Studies on the Influence of Teacher Bargaining on Salaries

Author(s) and Year Study Was Published*	Unit of Observation	Size of Sample	Year(s) Examined	Salary Variable	Union Variable	Union Effect**
1. Kasper (1970)	All states (including D.C.).	51 States	1967-68	Average classroom teacher salary in state.	(1) Percentage of teachers represented by organization; (2) Percentage of districts with representation; (3) Percentage of teachers covered by agreements.	Insignificant—adds 0 to about 4 percent to average salary.
2. Thornton (1971)	School districts in cities with more than 100,000 population, all of U.S.	83 Districts	1969-70	BS minimum, BS maximum, AM minimum, AM maximum.	Dummy variable (1 = collective bargaining contract).	Significant—adds from 1-4% (except at AM max, where effect is 28.8%) to salary.
3. Baird and Landon (1972)	School districts with enrollments of 25,000 to 50,000, all of U.S.	44 Districts	1966-67	Beginning salary (BS minimum).	(1) Dummy variable (1 = negotiations held); (2) Percentage teachers members of NEA; (3) Percentage teachers members of AFT.	(1) Dummy variable significant—adds 4.9% to minimum salary; (2) Percentage NEA: barely significant; (3) Percentage AFT: insignificant.

**Table 5 (Continued)**

Summaries of 16 Studies on the Influence of Teacher Bargaining on Salaries

Author(s) and Year Study Was Published*	Unit of Observation	Size of Sample	Year(s) Examined	Salary Variable	Union Variable	Union Effect**
4. Hall and Carroll (1973)	Elementary school districts in Cook county, Illinois.	118 Districts	1968-69	Average salary in district.	Dummy variable (1 = collective bargaining contract).	Significant—adds 1.8% to average salary.
5. Lipsky and Drotning (1973)	All school districts in New York State (except New York City).	696 Districts	1967-68	BS minimum, BS + 30, 7th step, BS + 60, 11th step. Average salary; Also change in these salaries, 1967-68.	Dummy variable (1 = collective bargaining contract).	(1) Effect in entire sample insignificant; (2) Effect in "medium size districts" significant; (3) Effect on salary change significant. Adds 0-3% to salary levels, 15% to salary changes.
6. Schmenner (1973)	Large city school districts.	80 (pooled cross-section and time series data for 11 cities over 1962-70 period)	1962-70	BA minimum.	(1) Percentage teachers organized by NEA or AFT; (2) Dummy variable (1 = collective bargaining contract).	Significant—adds 12 to 14% to salary if teachers are 100% organized compared to not being organized at all; bargaining impact adds 6.8 to 9.3% to salary.

7. Balfour (1974)	All states (except Alaska; D.C. also excluded).	49 States	1969-70 and 1970-71	Average salary in state in 1969-70 and 1970-71; also percentage change, 1969-70 to 1970-71.	(1) Proportion of state's teachers represented under agreements providing recognition only; (2) Proportion of state's teachers represented under substantive agreements; (3) Sum of (1) and (2); (4) Union membership in state divided by population.	All union variables insignificant, except for change in salaries where union effect is significant and negative.
8. Treacy, Harris, and Blake (1974)	Sample of school districts in Ohio.	225 Districts	1970-71	Average salary.	(1) Dummy variable (1 = district had teacher organization); (2) Dummy variable (1 = district had contract).	Most estimates insignificant—adds 0 to 2.6% to average salary.
9. Frey (1975)	All school districts in New Jersey with more than 750 pupils.	298 Districts	1964-70	BA minimum, BA maximum.	Dummy variable (1 = collective bargaining).	Some estimates significant, others insignificant; adds 0 to 1.4% to salary.

Table 5 (Continued)

Summaries of 16 Studies on the Influence of Teacher Bargaining on Salaries

Author(s) and Year Study Was Published*	Unit of Observation	Size of Sample	Year(s) Examined	Salary Variable	Union Variable	Union Effect**
10. Chambers (1976; 1977)	(1) 39 elementary districts and (2) 50 unified districts, all located in 6 largest SMSAs in California.	89 Districts	1970-71	Starting (i.e., base) salary.	Sum of <i>district</i> and <i>regional</i> effects: dummy variable (1 = formal negotiations) plus fraction of teachers in region covered by contracts.	Significant—adds (1) 12% to salary for elementary districts; (2) 6% to salary for unified districts.
11. Gustman and Segal (1976)	Central city districts in largest SMSAs in U.S.	93 Districts	1971-72	BA minimum, BA maximum, MA minimum, MA maximum.	(1) Dummy variable (1 = "comprehensive" agreement); (2) Dummy variable (1 = "negotiation" agreement).	Insignificant in all cases but one; MA maximum salary increased by 4.7% under comprehensive agreements.
12. Holmes (1976)	Elementary and secondary classroom teachers in Oklahoma.	24,916 classroom teachers	1974-75	Gross yearly earnings.	(1) Dummy variable (1 = any form of union activity); (2) Extent of union activity (4-point scale).	Significant—adds (1) 7.0% to earnings if any form of union activity; (2) 2.2% to earnings if weakest form

13. Zuelke and Froehrich (1977)	Random sample of school districts in Wisconsin.	50 Districts	1972-73	10 measures of average and scheduled salaries.	Index measuring "comprehensiveness of negotiations."	of union activity (calculated on average salary of white male with master's degree and average experience). Insignificant with six salary measures; significant and negative with four (average BA, overall average, minimum BA, and minimum MA).
14. Gallagher (1978)	Sample of school districts in Illinois with enrollment between 750 and 5,000 ADA.	89 Districts	1973-74	BA minimum, BA maximum, MA minimum, MA maximum, MA + 30 min., MA + 30 max.	Dummy variable (1 = collective bargaining contract).	Significant in all cases—adds 1.3% to 4.5% to salary; level and significance of effect directly related to length of relationship.
15. Mitchell (1979)	All states except Hawaii.	49 States	1971-72	Average monthly wage.	Percentage teachers unionized in state.	Insignificant.

Table 5 (Continued)

Summaries of 16 Studies on the Influence of Teacher Bargaining on Salaries

Author(s) and Year Study Was Published*	Unit of Observation	Size of Sample	Year(s) Examined	Salary Variable	Union Variable	Union Effect**
16. Baugh and Stone (1980)	Sample of teachers contained in current Population Survey (CPS) of the U.S. Bureau of Census.	Classroom teachers in May 1974 survey; 1037 classroom teachers in May 1977 survey.	1974 and 1977	Estimated hourly wage; also change in hourly wage, 1974-75 and 1977-78.	(1) Dummy variable (1 = teacher member of union or similar association)—used in wage level regressions; (2) Dummy variable (1 = nonunion teacher joined union in 1975 or 1978)—used in wage change regressions.	(1) Significant in wage level regressions—adds 7% in 1974 and 21% in 1977 to wages; (2) Mixed results in wage change regressions—insignificant in 1974, but significant in 1977; adds 12% to salary of new union member in 1977.

\*If the study is unpublished, the year given is the year the study was completed.

\*\*Significant\* and "insignificant" refer to whether the coefficient of the union variable was statistically significant at better than the .10 level using a one-tailed test.

Sources:

1. H. Kasper, "The Effects of Collective Bargaining on Public School Teachers' Salaries," *Industrial and Labor Relations Review* 24, 1 (October 1970):57-72.
2. R. J. Thornton, "The Effects of Collective Negotiations on Teachers' Salaries," *Quarterly Review of Economics and Business* 11, 4 (Winter 1971):37-46.

## The Effect of Collective Bargaining on Teacher Pay, 42

3. R. N. Baird and J. H. Landon, "The Effects of Collective Bargaining on Public School Teachers' Salaries: Comment," *Industrial and Labor Relations Review* 25, 3 (April 1972):410-416.
4. W. C. Hall and N. E. Carroll, "The Effects of Teachers' Organizations on Salaries and Class Size," *Industrial and Labor Relations Review* 26, 2 (January 1973):834-841.
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8. J. Treacy, R. Harris, and C. Blake, *Salaries, Strikes, Shutdowns, Split Shifts and Collective Bargaining in Ohio Public Schools* (Final Report to National Institute of Education, U.S. Department of Health, Education, and Welfare, 1974), 28 pp.
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10. J. G. Chambers, *The Impact of Collective Bargaining for Teachers on Resource Allocation in Public School Districts*, unpublished manuscript, 1976; see also, J. G. Chambers, "The Impact of Collective Bargaining for Teachers on Resource Allocation in Public School Districts," *Journal of Urban Economics* 4, 3 (July 1977):324-339.
11. A. L. Gustman and M. Segal, *The Impact of Teachers' Unions* (Final Report to the National Institute of Education, U.S. Department of Health, Education, and Welfare, 1976), 149 pp.
12. A. B. Holmes, "Effects of Union Activity on Teachers' Earnings," *Industrial Relations* 15, 3 (October 1976):328-332.
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