

## WELLINGTON-WINTER REVISITED: THE CASE OF MUNICIPAL SANITATION COLLECTION

LINDA N. EDWARDS and FRANKLIN R. EDWARDS\*

---

This study examines the hypothesis advanced by Wellington and Winter that public sector unions have greater power than private sector unions to raise wages. To test this hypothesis the authors use a unique body of 1974 data on several aspects of residential solid waste collection in 175 cities, 95 with public collection systems and 80 with private systems. In both groups of cities some work forces are unionized and some are not. The authors' analysis shows that unionization raises the wages of sanitation workers in the public sector by considerably more than it raises the wages of such workers in the private sector, thus providing strong support for the Wellington-Winter thesis.

---

**I**N THEIR seminal book, *The Unions and the Cities* (1971), Wellington and Winter gave academic respectability to the notion that labor unions in the public sector are able to exert excessive power on state and local governments. Their thesis was that such unions enjoy certain bargaining advantages that are not available to unions in the private sector and as a consequence public sector unionism "would leave competing [private] groups in the political process at a permanent disadvantage."<sup>1</sup>

---

\*The authors are, respectively, an associate professor at Queens College of CUNY and a professor at the Columbia University Graduate School of Business. An earlier version of this paper was presented at the 1980 annual meeting of the American Economic Association in Denver. The authors would like to thank Randi Beeber, Anjum Bhatia, and Michael Manhart for research assistance; E. S. Savas for making his data available to them; and Orley Ashenfelter, James Brown, Elizabeth Durbin, Robert Lipsey, and Sharon Smith for helpful comments. This study was supported by a grant from the Alfred P. Sloan Foundation.

---

<sup>1</sup>Harry Wellington and Ralph K. Winter, *The Unions and the Cities* (Washington, D.C.: The Brookings Institution, 1971), p. 30.

A decade has passed since the controversy over the Wellington and Winter (W & W) thesis first surfaced. During this time there has been in the United States a steady and rapid growth in public sector unionism, far outpacing that of private sector unions. Approximately 50 percent of the work force at each level of government—federal, state, and local—is now represented by a union. In the private sector, in contrast, unions represent less than 25 percent of the work force and the extent of their coverage is diminishing rather than increasing. A tantalizing inference that might be drawn from these divergent trends is that public sector unions do indeed have greater power and are able, therefore, to offer greater benefits than private unions.

The consensus of previous empirical studies that focus on wage rates, however, is just the opposite: public sector unions do not appear to be more successful in raising wages than do private sector unions.<sup>2</sup> We

---

<sup>2</sup>This conclusion is based primarily on comparisons of the results of studies of public sector unionism

believe, however, that none of the past studies succeeds in adequately testing the Wellington and Winter thesis. It is of great importance in any comparison of the compensation effects of public versus private sector unions to standardize for differences both among industries and among workers, but few studies have been able to do this. Data availability has generally restricted researchers to comparing workers in different industries and occupations, and at different levels of government. Efforts to control for relevant differences have not been totally satisfactory.<sup>3</sup>

In this study we utilize a body of data that

---

with those of other studies of private sector unionism. See Paul Weiler, "Public Unionism and Public Finance," paper presented at the Conference on Urban Finance, Center for Law and Economics, Columbia University, New York, October 1979; Daniel J. B. Mitchell, "The Impact of Collective Bargaining in the Public Sector," in Benjamin Aaron et al., *Public Sector Bargaining*, (Madison, Wisc.: Industrial Relations Research Association, 1979), pp. 118-49; and the papers cited in footnote 3.

<sup>3</sup>The relevant studies are Walter Fogel and David Lewin, "Wage Determination in the Public Sector," *Industrial and Labor Relations Review*, Vol. 27, No. 3 (April 1974), pp. 410-31; Daniel S. Hamermesh, "The Effect of Government Ownership on Union Wages," in Daniel S. Hamermesh, ed., *Labor in the Public and Nonprofit Sectors* (Princeton: Princeton University Press, 1975); Myron D. Fottler, "The Union Impact on Hospital Wages," *Industrial and Labor Relations Review*, Vol. 30, No. 3 (April 1977), pp. 342-55; Sharon P. Smith, "Government Wage Differentials," *Journal of Urban Economics*, Vol. 4, No. 3 (July 1977), pp. 248-71; and David Shapiro, "Relative Wage Effects of Unionism in the Public and Private Sectors," *Industrial and Labor Relations Review*, Vol. 31, No. 2 (January 1978), pp. 193-204.

Only Fottler and Hamermesh examine workers in a single industry in a narrow occupational range. In Hamermesh's work, all wage information is for unionized workers and so his results simply provide evidence concerning public/private wage differentials for unionized workers. Fottler examines "nonprofessional employees" in hospitals in a small sample of cities. He reports that unionism has a larger effect on wages of workers in private hospitals than of those in public hospitals and he therefore concludes that his findings are not supportive of the W & W hypothesis. Fottler's choice of industry, however, is not appropriate for testing the W & W hypothesis because most private hospitals in the United States are not-for-profit institutions. Fottler is actually comparing the public and not-for-profit sectors, rather than the public and private for-profit sectors implicitly called for by the W & W hypothesis.

better enables us to standardize for such differences. These data are for workers in a single homogeneous occupation, refuse collectors, in the residential solid waste collection industry. Residential solid waste is collected in some cities by local government agencies and in others by private firms. Further, a significant proportion of the cities in both groups have unionized work forces. Thus, we can compare the wage effects of public and private sector unionism in the *same* industry and for workers who perform *identical* tasks. While even these data fall short of the ideal, they are, we believe, the best data yet available for testing the Wellington and Winter thesis.

### Data

Our data come primarily from information compiled by a nationwide study of solid waste management and cover 175 cities, 95 with public refuse collection systems and 80 with private collection systems.<sup>4</sup> In the latter cities, refuse collection services are contracted out to private firms, each having an exclusive territorial franchise.<sup>5</sup> The data, which are for the year 1974, were obtained by a combination of mail and telephone surveys and in-person interviews. Special care was taken to ensure consistent collection procedures across cities.<sup>6</sup> The

---

<sup>4</sup>E. S. Savas, *The Organization and Efficiency of Solid Waste Collection* (Lexington, Mass.: Lexington Books, 1977). Cities initially selected for interviews include 102 cities with public collection arrangements and 125 cities with private contract collection arrangements. They were chosen from a universe of 2060 local jurisdictions. This universe was constructed to exclude rural areas, very small cities (with under 2500 population in 1970), and cities in SMSAs with 1970 populations greater than 1,500,000. (See Appendices A, B and C of Savas's book for a detailed description of the universe and sampling procedure.) Complete information for our purposes was available for 95 of the 102 cities with public collection arrangements. Among the 125 contract cities, usable responses came from only 92, of which 85 had complete data for the variables used in our study.

<sup>5</sup>When there were several firms servicing a single city, data were taken, whenever possible, from the largest firm.

<sup>6</sup>For a further description of the data collection techniques, see Savas, *The Organization and Efficiency of Solid Waste Collection*. Appendices A, B, and C.

sample cities are all located in Standard Metropolitan Statistical Areas and are widely dispersed among regions of the country. The cities with private collection systems are less likely to be located in the southern region of the United States, however.

A wide range of data was obtained for both groups of cities. Employee data include monthly salaries of garbage collectors, hours worked per week, vacation days per year, sick-leave days, absenteeism, the number of full-time equivalent employees (both collectors and truck drivers), and whether or not any of the workers were union members.<sup>7</sup> For public workers, data were also collected on all fringe benefits, such as social security, insurance coverage, and retirement plans. In addition, there are extensive data for all cities describing the output and the equipment used. These survey data are supplemented with census data on local population characteristics and general environmental conditions.

#### Modelling the Estimation of Union-Wage Effects

In order to estimate the effects of unionization on wages in either the public or private sectors, it is necessary to hold constant other factors that account for differences in wage levels across cities. To accomplish this we utilize two models of wage determination. The first is the "integrated market" model, which assumes that the specific labor market being studied is fully competitive and integrated with the overall local labor market and that the solid waste collection industry uses a small part of the total unskilled local labor pool. In this model, therefore, the labor supply curve facing the collection industry is assumed to be perfectly elastic. The second is the "segmented market" model, which assumes that the labor market under study has some type of

effective barrier to prevent it from being fully integrated with the local unskilled labor pool. In this model, therefore, the labor supply curve is assumed to be upward sloping, which implies that conditions that affect the demand for the final product will also affect the wage rate.

Since the collection of solid waste is essentially an unskilled occupation, we would expect the integrated market model to be the most applicable. It has been suggested, however, that public sector labor markets are effectively segregated from private labor markets.<sup>8</sup> If this contention is correct, the segmented model would be more appropriate for cities in which solid waste collection services are provided by a public agency. We will, therefore, provide estimates of the union effect using both types of models.

*The integrated market model.* In an integrated labor market the basic wage-determination equation for the average wage of sanitation workers in any city is

$$(1) \frac{\text{Sanitation Wage } (W)}{\text{Opportunity Wage } (OW)} = \alpha \exp(\beta U + \epsilon)$$

where the respective wage rates ( $W$  and  $OW$ ) are total hourly compensation inclusive of fringe benefits;  $\alpha$  represents the compensating taste differential reflecting local workers' preferences for garbage collection versus other employment;<sup>9</sup>  $U$  is a dichotomous variable that equals one when sanitation workers in that city are unionized and zero otherwise;  $\beta$  is a parameter that measures the impact of unionization on the relative wage rate, where  $\beta \approx (\exp \beta - 1)$  and the expression in parenthesis equals the percentage by which the average union wage differs from the average nonunion wage; and  $\epsilon$  is a random error term that

<sup>8</sup>Ronald G. Ehrenberg, "Municipal Government Structure, Unionization, and the Wages of Firefighters," *Industrial and Labor Relations Review*, Vol. 27, No. 1 (October 1973), pp. 36-48. His argument is that cities are such large employers in local labor markets that they influence the wage level. It has also been argued that individuals are not indifferent between public and private employment. If so, the resulting distribution of tastes for public employment would also be sufficient to create an upward-sloping curve of labor to the public refuse-collection industry.

<sup>9</sup>In this specification, workers' taste (or distaste) for this occupation is assumed to be constant across cities.

<sup>7</sup>The survey question was worded to determine if any of a city's collection workers were union members. According to industry observers and members of the Advisory Board of the Columbia Solid Waste Management Project, if one member of a crew belongs to a union it is likely that they all do. Therefore, if the city reported that any workers were union members, we assumed that the entire work force was unionized.

represents all other unmeasured factors that affect relative wages.

This simple model yields the following estimating equation:

$$(2) \ln W = \ln \alpha + \ln OW + \beta U + \varepsilon$$

where  $\ln$  denotes the natural logarithm. The opportunity wage ( $OW$ ) depends both on the prevailing hourly wage rate in other, similar kinds of employment and the probability of obtaining such employment. We use the local wage rate of production workers in manufacturing ( $MW$ ) to represent the prevailing rate and the local employment rate ( $ER$ ), defined as one minus the unemployment rate, to represent the probability of obtaining employment. In addition, two variables are included to allow for the possibility that worker skills or worker tastes for employment in this industry may vary across cities. These two variables, each of which may reflect one or both factors, are the percentage of the local population having fewer than five years of schooling ( $EL$ ), and the percentage of the population that is nonwhite ( $NWP$ ). With these amendments, Equation 2 becomes:

$$(3) \ln W = \alpha_0 + \alpha_1 \ln MW + \alpha_2 \ln ER + \beta U + \alpha_3 NWP + \alpha_4 EL + \varepsilon.$$

The random error term,  $\varepsilon$ , is assumed to have the usual properties. A priori, we expect  $\alpha_1 > 0$ ,  $\alpha_2 > 0$ , and  $\beta > 0$ . We have no hypothesis about  $\alpha_3$  or  $\alpha_4$ .

*The segmented market model.* Unlike the integrated model, the segmented market model requires the addition of variables associated with the demand for labor. Typically, the derived demand for labor depends on the demand for the final product—in this case, garbage collection services—and on the prices of other inputs. Following Edwards and Stevens<sup>10</sup> and Stevens,<sup>11</sup> the primary exogenous determinants of the

aggregate demand for the final product “solid waste collection services” are the number of households in the locality to be served ( $NHH$ ) and the local median family income ( $Y$ ).<sup>12</sup> The only relevant input price besides the wage is the cost of capital. This is assumed to be equal for all cities.<sup>13</sup> Finally, we include two exogenous characteristics of the locality that may affect the efficiency of labor in collecting garbage. These are the household density in the locality ( $DEN$ ) and the population of the associated SMSA ( $POP$ ). Differing amounts of labor may be needed to collect a given volume of refuse in more densely populated cities or in larger urban areas. The resulting equation to be estimated is

$$(4) \ln W = \gamma_0 + \gamma_1 \ln MW + \gamma_2 ER + \beta U + \gamma_3 NWP + \gamma_4 EL + \gamma_5 \ln NHH + \gamma_6 \ln Y + \gamma_8 \ln DEN + \gamma_9 \ln POP + \varepsilon',$$

where  $\varepsilon'$  represents a random error term with the usual properties.

Several important assumptions are embedded in Equations 3 and 4. First, differences in the local price level are assumed to be fully reflected in the level of the local manufacturing wage rate. Second, the manufacturing wage rate is assumed to be a good proxy for the relevant opportunity wage. Finally, the logarithmic specifications of these equations assume that unions affect wage levels by a constant proportion in all cities.<sup>14</sup>

In all of the above equations, the dependent variable,  $W$ , should represent total

<sup>10</sup>Franklin R. Edwards and Barbara J. Stevens, “The Provision of Municipal Sanitation Services by Private Firms: An Empirical Analysis of the Efficiency of Alternative Market Structures and Regulatory Arrangements,” *Journal of Industrial Economics*, Vol. 27, No. 2 (December 1978), pp. 133–47.

<sup>11</sup>Barbara J. Stevens, “Scale, Market Structure, and the Cost of Refuse Collection,” *Review of Economics and Statistics*, Vol. 60, No. 3 (August 1978), pp. 438–48.

<sup>12</sup>Since we assume that there are no close substitutes for solid waste collection, we include no other final product prices. Although some studies of public service demand also use the municipal budget or “tax base” as exogenous demand determinants, we view these variables as endogenous. We did experiment with other exogenous demand factors—local temperature ranges and average precipitation—but they had no significant impact on wages (see Stevens, “Scale, Market Structure, and the Cost of Refuse Collection”).

<sup>13</sup>Edwards and Stevens, “The Provision of Municipal Sanitation Services by Private Firms,” and Stevens, “Scale, Market Structure, and the Cost of Refuse Collection,” also make this assumption.

<sup>14</sup>Estimation of log-linear wage functions, which is common, implicitly assumes that the underlying demand and supply functions are multiplicative.

*Table. Union Wage Effects in Cities with Public and Private Provision of Solid Waste Collection Services.<sup>a</sup>*  
(absolute *t*-statistics in parentheses)

<i>Equation</i>	(1) <i>UPU</i>	(2) <i>UPR</i>	(3) <i>NUPR</i>	(4) (2)-(3)	(5) (1)-(4)
3	.166** (3.51)	.202** (3.55)	.150** (3.19)	.052 (1.02)	.114* (1.66)
4	.096* (1.95)	.085 (1.39)	.117** (2.48)	-.032 (.60)	.128* (1.95)

<sup>a</sup>The coefficients in columns (1) through (3) are approximately equal to the proportionate difference in the wage associated with a city's being in the respective class as compared to being a city with a nonunionized public collection force. The exact proportion is given by  $(\exp \beta - 1)$  where  $\beta$  represents the regression coefficient of the relevant dummy variable.

\*Significant at the 10 percent level in a two-tailed test.

\*\*Significant at the 5 percent level in a two-tailed test.

worker compensation, including both money wages and fringe compensation. In our empirical work, however, we use money wages only. Fringe benefit data are not available for employees of private collection firms. Later in the paper we further examine this issue and conclude that at least for the solid waste collection industry, this data omission is unlikely to prejudice our results.

### Empirical Estimates

Estimates of how unionism affects the wages of public and private workers can be obtained by assuming that the factors that determine wages in the public and private sectors are identical and that only the effect of unionization differs.<sup>15</sup> This assumption yields an empirical specification in which the single union variable (*U*) in the preced-

ing wage determination equations is replaced with three dichotomous variables, which distinguish among four types of cities: cities with private collection and unionized employees (*UPR*); cities with public collection and unionized employees (*UPU*); cities with private collection and nonunionized employees (*NUPR*); and cities with public collection and nonunionized employees (embedded in the constant term). The relative effect of private versus public unionism can then be determined from estimates of the coefficients of these variables using the two wage-determination equations described earlier and the entire sample of cities. These estimates are shown in the table.<sup>16</sup> (The full equations from which these coefficients are excerpted appear in Appendix Table A3.)

The relevant comparison is between columns (1) and (4). Column (1) contains the coefficient of *UPU* and represents the (approximate) proportionate change in the hourly wage associated with unionism in the public sector. Column (4) represents the corresponding proportionate change for workers in the private sector.<sup>17</sup> Union

<sup>15</sup>It has been argued that wage settlements between municipalities and public sector workers may be affected by two institutional considerations not present in the private sector: the form of local government and the employees' civil service status (see Ehrenberg, "Municipal Government Structure, Unionization, and the Wages of Firefighters"). In some preliminary work using the same data and focusing only on public sector workers we found that neither of these variables had a significant impact on money wages, nor did their inclusion alter the coefficient of the union variable. (Linda N. Edwards and Franklin R. Edwards, "The Effects of Unionism on the Money and Fringe Compensation of Public Employees: The Case of Municipal Sanitation Workers," mimeo, Queens College, CUNY, 1979.)

<sup>16</sup>A list of all the variables, their definitions, and their sources appears in Appendix Table A1. Appendix Table A2 shows the means and standard deviations of these variables computed for both the public and private sector sample cities.

<sup>17</sup>To see why this is so, recall that the coefficient of *UPR* represents the (approximate) proportionate dif-

effects in the public sector range between 10 and 17 percent, depending on the model used, and are always statistically significant. In contrast, the union effects in the private sector range from approximately - 3 percent to + 5 percent and are never significantly different from zero. Thus, in both models the union effect on wages in the public sector is larger than it is in the private sector, with the difference being between 11 and 13 percentage points. Moreover, this difference is statistically significant.

The implication of these results is that public sector unions do enjoy more power than do private sector unions. Further, the magnitude of the difference in union effects seems especially notable because workers in the public sector do not have the legal right to strike yet those in the private sector do.<sup>18</sup>

The preceding estimation procedure, and the associated statistical findings, depend critically upon the validity of pooling the data for cities with private sanitation services and those with public services and of estimating a single, identical equation for all cities. A recent study by Smith suggests that this procedure may not be appropriate.<sup>19</sup> To assess the suitability of this procedure for our data we conducted a test of the

---

ference between the average sanitation wage in cities where collection is done by unionized private workers and in cities where collection is done by nonunionized public workers. Similarly, the coefficient of *NUPR* represents the (approximate) proportionate difference between the average sanitation wage in cities where collection is done by nonunionized private workers and in cities where it is done by nonunionized public workers. Subtracting *NUPR* from *UPR*, therefore, yields the (approximate) proportionate difference between the hourly wage of sanitation workers in cities where collection is done by unionized private workers and in cities where it is done by nonunionized private workers.

<sup>18</sup>In 1974-75, only eight states permitted public workers to strike, and none permitted a public employee strike without requiring some type of procedure—advance notice, mediation, or arbitration, for example—between a bargaining impasse and a work stoppage (see David Lewin, "Collective Bargaining and the Right to Strike," in A. Lawrence Chickerling, *Public Employee Unions* (Lexington, Mass.: Lexington Books, 1976), p. 156.

<sup>19</sup>Sharon Smith, *Equal Pay in the Public Sector: Fact or Fantasy?* Research Report Series No. 122 (Princeton: Industrial Relations Section, Princeton University, 1977).

homogeneity of the slope coefficients between the public and private subsamples (while still permitting differences between the two sectors in both the constant terms and in the effect of unionization). The hypothesis that the slope coefficients for the two types of cities are identical could not be rejected.<sup>20</sup> Thus, the procedure of pooling the public and private subsamples and estimating a single equation appears sound.

In estimating the separate equations for the subsamples, however, we discovered that the residual variances in the private subsample equations are two to three times larger than they are in the public subsample equations, and that neither of the models we estimated explained much of the wage variation among private-system cities. The reason for the poor performance of these equations for the private subsample is not obvious, especially since the same equations do so well in explaining wage variations among public-system cities.<sup>21</sup> Despite the low  $R^2$ s for the sample of private-system cities, however, the separate equation estimates, shown in Appendix Table A3, do illustrate one thing clearly: unionism always has a significant and substantial effect on wages in the public sector, but not in the private sector. Thus, these results also support our conclusion that public sector unions are more able to raise sanitation workers' wages than are private sector unions.

### Discussion

There are a number of data and methodological issues that, for the sake of completeness, it is incumbent upon us to discuss. We do not, however, believe that they impart an important bias to the foregoing findings.

---

<sup>20</sup>This is true for both models at all conventional levels of significance.

<sup>21</sup>There are differences between the cities with private collection and those with public collection (see Appendix Table A2), but these differences do not suggest any obvious explanations for the low explanatory power of the equations for cities with private collection. It is true, however, that the standard deviation of the sanitation hourly wage is much greater in the private sector than in the public sector (\$1.13 vs. \$.79).

First, unionization is assumed to be an exogenous variable. It is possible, however, that the demand for unionization (and, therefore, the occurrence of unionization) may be greater among poorly paid workers than among highly paid workers. In this case, the residual in the wage equation would be correlated with the union variable, leading to the usual simultaneous equation bias. More specifically, our use of single-equation estimation techniques would result in all union coefficients being biased toward zero. Alternatively, if unionization is more likely where wages are relatively high, the reverse bias would occur.<sup>22</sup> In either case, it is not clear how the possible bias would affect our conclusion because the estimates for both the private and public sectors are infected. In order for our conclusion to change it would be necessary for the simultaneous-equation bias to be considerably larger in the private sector than in the public sector.<sup>23</sup>

Second, the wage variable we use does not include fringe benefits, and if private sector unions are more successful in raising workers' fringe benefits than are public sector unions, our estimates would overstate the relative power of public sector unionism. This seems unlikely, however, given that private sector unions in this industry have failed to affect money wages significantly. Further, all studies of unionism and fringe compensation of which we are aware indi-

cate that if unionism affects worker compensation at all, it affects both money wages and fringe benefits.<sup>24</sup> For example, in our recent study of public sanitation workers, for whom fringe benefits data are available, we found that public sector unionism increased workers' fringe benefits by 27 percent, while affecting money wages by only 9 to 11 percent.<sup>25</sup> Finally, in a special survey of eight cities employing private refuse contractors, four in which employees were unionized and four in which employees were not, we found no significant difference between these two groups of cities with respect to the ratio of fringe benefits to money wages.<sup>26</sup> It seems unlikely, therefore, that the absence of fringe compensation in our wage measure would be responsible for the different wage effects we observe between public and private sector unionism.

Third, there are two possible aspects of worker and managerial response to unionism that are not captured by our methodology: worker productivity may increase (or decrease) as a result of unionization; and firms may systematically raise wages to forestall unionization where that threat exists. Both these possibilities create interpretation problems. If public sector unionism raises worker productivity by more than does private sector unionism, public sector unions may not have a relativity greater

<sup>22</sup>Terry Nichols Clark and Thomas E. Panelas, "Municipal Employees: Passive Servants or Political Activists?" in Terry N. Clark, *Political Processes and Urban Fiscal Strain* (forthcoming, 1981), for example, report that cities in which municipal workers were highly unionized in 1977 were also cities with higher levels of municipal compensation in 1960, before the spread of public unionism. In particular, they find that a variable measuring the degree of organization of municipal employees in 1977 has a coefficient of .25 when the compensation (per employee) of municipal workers in 1977 is the dependent variable, but that this coefficient drops to .13 when the 1960 to 1977 change in compensation (per employee) is the dependent variable.

<sup>23</sup>In our preliminary work on compensation in the public sector (Edwards and Edwards, "The Effects of Unionism on the Money and Fringe Compensation of Public Employees"), we investigated this issue and found that the union effect estimated after taking into account the endogeneity of unionization was virtually the same as the simple OLS estimate.

<sup>24</sup>See Edwards and Edwards, "The Effects of Unionism on the Money and Fringe Compensation of Public Employees"; Casey Ichniowski, "Economic Effects of the Firefighters' Union," *Industrial and Labor Relations Review*, Vol. 33, No. 2 (January 1980), pp. 198-211; Ann Bartel and David Lewin, "Wages and Unionism in the Public Sector: The Case of Police," *Review of Economics and Statistics*, Vol. 63, No. 1 (February 1981), pp. 53-59; and Richard B. Freeman, "The Effect of Unionism on Fringe Benefits," *Industrial and Labor Relations Review*, Vol. 34, No. 4 (July 1981), pp. 489-509.

<sup>25</sup>Edwards and Edwards, "The Effects of Unionism on the Money and Fringe Compensation of Public Employees."

<sup>26</sup>The mean ratio of fringe-to-money compensation in the four union cities is about 27 percent. In the four nonunion cities, it is 21 percent. The variability in this ratio, however, is substantial in both groups of cities and ranges from a low of about 7 percent to a high of 34 percent. This special sample, which was provided to us by E. S. Savas of Columbia University, was a by-product of his NSF project on solid waste collection.

effect on labor costs per unit of output, even if they raise wages by a larger proportion. In such a case, it would be misleading to conclude that public sector unions possess greater power. In the solid waste collection industry, however, we believe the opposite may be nearer the truth: private sector unionism may raise productivity more than public sector unionism. Our data suggest that unionism in the private sector results in the use of relatively more capital (larger and more efficient refuse trucks) and relatively less labor (smaller crew size).<sup>27</sup> For the industry we are studying, therefore, there is no evidence to indicate that public sector unionism raises worker productivity by more than does private sector unionism.

As for the "threat effect" of unionization, similar pressures are present in both the public and private sectors. To the extent that private sector managers have more incentive to forestall unionism, however, and greater flexibility to do so by raising wages (they are not hampered by civil service procedures), this "threat effect" may have a greater impact in the private sector. If so, the union coefficients in the private sector are more likely to be biased toward zero as a result of this threat than are the corresponding coefficients in the public sector. Alternatively, one could argue that if profit considerations and competitive pressures make it more, rather than less, difficult for private companies to raise wages in response to the threat of unionization, the opposite bias would prevail. In sum, it is not obvious how, or even if, an allowance for the "threat" effect of unionization would alter our conclusion.

There are, finally, three relatively minor data deficiencies that need acknowledgment. First, our union variable does not indicate whether or not the union has a col-

lective bargaining agreement with the employer. It indicates only whether or not the employees are union members. If the presence of a bargaining agreement is the more appropriate measure, our union coefficients may understate the true union effects. But, once again, in order for this bias to alter our overall conclusion, it would have to be greater in the private sector than in the public sector.

Second, we use the manufacturing wage to represent the opportunity wage of refuse collectors. If cities with unionized sanitation workers also have a more highly unionized manufacturing work force, the wage in manufacturing will be higher than it would otherwise be, which will result in our obtaining biased estimates of all union effects—public and private. There is no obvious reason why this bias should be greater for the private sector than for the public sector.

Finally, if unionization causes wages to rise, management may respond by trying to hire higher quality labor. A reported positive effect of unionization on wages, therefore, may simply reflect this shift in labor quality when worker skills are not adequately controlled for.<sup>28</sup> Once again, however, the issue is how public managers versus private managers respond to such pressure. It seems to us that the ability of public managers to change the skill mix of their workers in response to wage increases will almost certainly be less than that of private managers. Thus, we would expect a correction for this bias to strengthen our conclusion.

In summary, our results, like those of all empirical studies, are subject to a number of qualifications due to data and methodological problems. However, the potential biases that exist go in both directions, so that we have no reason to suspect our primary conclusion. Indeed, it is important to keep in mind that we may even be understating the relative strength of public sector unionism.

<sup>27</sup>Public sector union cities use trucks with an average capacity of 21 cubic yards, have an average crew size of 3.19 men, and about 89 percent of the trucks used in these cities are of the rear-loading type. The comparable figures for private sector union cities are a 28-cubic-yard capacity, a crew size of about 2 men, and about 70 percent of the trucks are of the rear-loading type. In a future study we plan to explore the issue of unionism and productivity in greater detail.

<sup>28</sup>The education variable used in our equations (*EL*) is not specific to sanitation workers but rather reflects the skill level in the entire labor market.



### Conclusion

This study relied upon a new and previously unused body of data pertaining to the sanitation collection industry to test the Wellington and Winter thesis that public sector unions enjoy greater power than do unions in the private sector. The study's specific focus has been on whether public sector unions have been more successful than private sector unions in raising the wages of refuse collectors, and our empirical findings strongly support the view that they have.

While these findings are supportive of the Wellington and Winter thesis, several caveats are in order. First, wages are only one dimension of the employer-employee relationship. A thorough examination of the W & W thesis should also deal with the relative productivity of public versus private sector unionized workers, but to our knowledge no empirical work has yet dealt with this issue. Second, our findings are for a single type of public sector worker. One would want to see similar studies of other types of public sector workers before drawing firm conclusions. Finally, our results pertain to 1974, and much may have changed since then. The past six years have seen the near-bankruptcy of several major cities and increasing taxpayer resistance to rising public expenditures, of which the "Proposition 13" movement is an obvious manifestation. These trends may be undercutting the power of public sector unions.<sup>29</sup>

To predict whether public sector unions will continue to be relatively more successful at the bargaining table, we need a better understanding of the source of their power. In our view, the scenario described by Wellington and Winter reduces to three economic propositions. First, members of public sector unions are involved primarily in the provision of "public goods," goods that either would not or could not be provided by private markets under conditions of market competition. When these goods are provided by the private sector, they are pro-

vided efficiently only under conditions of monopoly. Government must, therefore, choose either to produce these goods itself or to have them provided by a "regulated" private monopolist. The key point is that public goods carry with them an element of monopoly rent. Thus, because of the nature of the product they are associated with, public employee unions can raise wages to some extent without severe consequences to employment. Or, viewed from a different perspective, they can use their power to capture some or all of the monopoly rent, effecting a transfer of wealth from taxpayers in general to public employees.

Second, public sector unions may be better able than private sector unions to capture any available rent because the incentives and goals of public sector managers are likely to differ from those of private sector managers. In particular, public sector managers may have objectives other than cost minimization, such as increasing the size of their bureaucracies, their budgets, or their political constituencies.<sup>30</sup> Public sector managers, therefore, may be less willing to resist excessive wage demands by unions than are private sector managers. They may even find union demands consistent with their own goals.

Third, the ability of public sector unions to capture the monopoly rent is enhanced by their ability to mobilize an effective political pressure group vis-à-vis taxpayers. Members of unions have a considerably larger per capita interest in any public wage policy or settlement than do taxpayers in general. In addition, the existence of a union organizational structure reduces the per capita transaction costs associated with any given political activity. Thus, it is likely that union members will be willing to spend more to

<sup>29</sup>This is suggested in Sanford Cohen, "Does Public Employee Unionism Diminish Democracy?" *Industrial and Labor Relations Review*, Vol. 32, No. 2 (January 1979), pp. 189-95, especially p. 195.

<sup>30</sup>See, for example, Jean-Luc Migue and Gerard Belanger, "Toward a General Theory of Managerial Discretion," *Public Choice*, Vol. 17, No. 1 (Spring 1974), pp. 27-42; Albert Breton and Ronald Wintrobe, "The Equilibrium Size of a Budget-Maximizing Bureau," *Journal of Political Economy*, Vol. 83, No. 1 (February 1975), pp. 195-207; and William A. Niskanen, "Bureaucrats and Politicians," *Journal of Law and Economics*, Vol. 18, No. 3 (December 1975), pp. 617-43.

influence politicians and legislators than will the typical taxpayer. These phenomena, taken together, create an environment in which public sector unions are more likely to make "excessive" demands and public sector managers are more likely to accept them.

Will the fiscal stringency that local governments are now experiencing diminish the power of public unions? One can easily imagine that the specter of bankruptcy could induce a public manager to be more concerned than usual about cost-minimization, since bankruptcy obviously may affect his or her personal and political fortunes. In addition, while the details of city finances may not be well known during normal fiscal times, they quickly draw public scrutiny when bankruptcy threatens. Thus, changes in the incentives of public sector managers and of politicians may result in greater resistance to public sector union power.

A possible strategy to temper the power of public sector unions that is suggested by the results in this paper is to contract out public services to private companies whenever feasible. A policy of competitive bidding for

public service contracts may enable cities to capture all of the monopoly rent associated with public goods. In addition, since private managers would then be substituted for public managers, cost-minimization would become the driving managerial goal. Finally, while private sector unions may also be potent political pressure groups capable of influencing public officials, these officials still have to deal with the managers of private firms, who resist wage increases that reduce profitability. Of course, any move toward a policy of contracting out is likely to be met with strong opposition from those who have the most to lose—the officers and members of local public sector unions.<sup>31</sup>

<sup>31</sup>An interesting case is cited by Donald Fisk, Herbert Kiesling, and Thomas Muller in *Private Provision of Public Services: An Overview* (Washington, D.C.: The Urban Institute, 1978), p. 20. Milwaukee decided in 1968 to contract out its sanitation services. The city was taken to court by the union representing the laid-off sanitation employees on the grounds that the union contract prohibited firing workers with civil service status. The court ruled in favor of the union, and the sanitation workers had to be rehired by the city.

#### Appendix

Table A1. Description of Variables.

Variable	Description
<i>W</i>	Hourly wage rate of refuse collectors, 1974 <sup>a</sup>
<i>U</i>	Dichotomous variable which equals one when city reports that some or all of its sanitation workers are union members, and zero otherwise, 1974 <sup>a</sup>
<i>MW</i>	Hourly wage of production workers in manufacturing in SMSA, 1972 <sup>b</sup>
<i>ER</i>	One minus the unemployment rate of all workers in the SMSA, 1974 <sup>b</sup>
<i>NWP</i>	Percentage of the SMSA population which is nonwhite, 1970 <sup>c</sup>
<i>EL</i>	Percentage of the SMSA population having completed less than 5 years of schooling, 1970 <sup>c</sup>
<i>NHH</i>	Number of households served in the city, 1974 <sup>a</sup>
<i>DEN</i>	Number of households per square mile in the city, 1970 <sup>c</sup>
<i>POP</i>	Total population in SMSA, in millions, 1970 <sup>c</sup>
<i>Y</i>	Median family income in city, 1970 <sup>c</sup>

Sources: <sup>a</sup> Unpublished data described in Savas, *The Organization and Efficiency of Solid Waste Collection* (Lexington, Mass.: Lexington Books, 1977).

<sup>b</sup> U.S. Bureau of the Census, *County and City Data Book 1977*, (Washington, D.C.: G.P.O., 1978).

<sup>c</sup> U.S. Bureau of the Census, *1970 Census of Population*, Vol. 1, *Characteristics of the Population*, Parts 2-52. (Washington, D.C.: G.P.O., 1973).

Table A2. Means and Standard Deviations of Variables for Full Sample Cross-Classified by Union Status of Employees and Type of City.

Panel A: Cities with Public Collection						
Variable	All Cities (n=95)		Cities with Unionized Work Force (n=45)		Cities with Nonunionized Work Force (n=50)	
	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
W	\$ 3.36	\$ .79	\$ 3.78	\$ .66	\$ 2.98	\$ .69
MW	\$ 3.77	\$ .72	\$ 4.06	\$ .68	\$ 3.50	\$ .65
ER	.957	.014	.957	.013	.956	.015
EL	7.05	7.43	5.75	5.48	8.22	8.78
NWP	11.63	11.76	11.70	12.27	11.56	11.53
U	.47	.50	1	0	0	0
NHH	25,621	45,209	39,569	59,483	12,406	18,831
POP	.499	.419	.580	.442	.426	.385
Y	\$9,285.	\$1,337.	\$9,947.	\$1,110.	\$8,676.	\$1,236.
DEN	3,659	3,447	4,381	3,131	3,052	3,704
SOUTH <sup>a</sup>	.49	.50	.24	.43	.71	.46
WEST <sup>a</sup>	.15	.35	.13	.34	.16	.37

  

Panel B: Cities with Private Collection						
Variable	All Cities (n=80)		Cities with Unionized Work Force (n=27)		Cities with Nonunionized Work Force (n=53)	
	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
W	\$ 4.03	\$ 1.13	\$ 4.22	\$ .98	\$ 3.93	\$ 1.21
MW	\$ 4.08	\$ .55	\$ 4.30	\$ .63	\$ 3.97	\$ .47
ER	.955	.015	.954	.012	.955	.016
EL	3.70	2.82	3.844	2.77	3.62	2.89
NWP	4.22	7.34	5.25	8.73	3.69	6.63
U	.34	.47	1	0	0	0
NHH	11,296	20,365	21,331	31,385	6,184	8,164
POP	.681	.464	.975	.510	.531	.366
Y	\$10,665.	\$1,390.	\$11,494.	\$1,454.	\$10,241.	\$1,173.
DEN	2,903	2,415	4,041	2,884	2,323	1,950
SOUTH <sup>a</sup>	.21	.41	.07	.26	.28	.45
WEST <sup>a</sup>	.27	.45	.26	.45	.28	.45

<sup>a</sup> These two dichotomous region variables are included here for the interest of the reader.

Table A3. O.L.S. Estimates of Text Equations 3 and 4 for Full Sample and for Public and Private Subsamples.<sup>a</sup>  
(absolute *t*-statistics in parentheses)

Sample and Equation	Constant	U	UPU	UPR	NUPR	MW	ER	EL	NWP	NHH	POP	Y	DEN	R <sup>2</sup>	F	n
Full Sample, Equation 3	2.09* (1.81)	—	.166** (3.51)	.202** (3.55)	.150** (3.19)	.465** (4.47)	-1.64 (1.41)	-.005* (1.79)	-.003 (1.52)	—	—	—	—	.35	14.62	175
Full Sample, Equation 4	-1.60 (.97)	—	.096* (1.95)	.085 (1.39)	.117** (2.48)	.294** (2.23)	-2.32* (1.79)	-.002 (.57)	-.008* (1.93)	.129** (2.02)	.013 (.60)	.473** (2.68)	.007 (.39)	.41	11.85	175
Public Sample, Equation 3	3.29** (2.47)	.174** (4.50)	—	—	—	.448** (4.18)	-2.84** (2.12)	-.005** (2.08)	-.001 (.92)	—	—	—	—	.48	18.62	95
Public Sample, Equation 4	-1.51 (.93)	.091** (2.36)	—	—	—	.084 (.67)	-3.69** (2.73)	-.002 (1.05)	-.003** (1.88)	.016 (1.21)	.032 (1.43)	.600** (3.31)	.068** (3.24)	.62	18.32	95
Private Sample, Equation 3	1.55 (.75)	.053 (.83)	—	—	—	.538** (2.15)	-.96 (.45)	-.009 (.71)	-.004 (.75)	—	—	—	—	.07	2.22	80
Private Sample, Equation 4	-2.96 (.85)	-.003 (.04)	—	—	—	.401 (1.44)	-.99 (.41)	-.001 (.04)	-.004 (.69)	.041 (1.36)	-.020 (.46)	.495 (1.45)	-.030 (.95)	.09	1.92	80

<sup>a</sup> The dependent variable (*W*) as well as the following variables are in the form of the natural logarithm: *MW*, *NHH*, *POP*, *Y*, and *DEN*.

\*Significant at the 10 percent level in a two-tailed test.

\*\*Significant at the 5 percent level in a two-tailed test.