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COLLECTIVE BARGAINING AND PUBLIC EDUCATION:

A PUBLIC CHOICE APPROACH

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Abstract

This paper applies the theory of bureaucracy to a collective bargaining arrangement in the public education labor market. A cyclical voting model is used to explain homogeneous wage demands by education associations. The bilateral monopoly problem is explored under the assumption that educators bargain as "Niskanen-type" bureaus when local school boards lack the ability to quantity adjust between bargaining periods. Increased appropriations to educators are shown to accrue only to existing organization members with no new teachers hired to share in the gains. The results imply that arguments for lower student-teacher ratios are spurious, while the appropriation gains from collective bargaining could represent social waste.

INTRODUCTION

The functional distribution of income treats the value of factors of production as derived from the value of the output which they produce.¹ A notable exception is the public education labor market. Absent a definition of output which can be successfully measured, the profession relies on experience and formal training as proxies for value. The wage scale in the nation's public schools is based only on seniority and education. Given this institutional setting, the technique of this paper is to treat bargains for entry wage and wage increases as determined by the median voter in a political allocation process, wherein teachers request across-the-board increases divorced from productivity.

The education association can be viewed as performing several functions in the process. First, it acts as an information bearing vehicle which sells the average productivity of its members to the local school board. Second, it attempts to increase the quality of the educator's output by promoting a lower student-teacher ratio. Finally, it attempts to coerce the political machine into granting increases without regard to measurable performance. I will argue that this last function is conducted more fervently than the others and that the determination of the wage paid to public educators is an important topic to be added to the theory of bureaucracy. The paper will use the public choice methodology to explain the flow of funds to education. The major conclusion is an antithesis to arguments that the allocation of resources to this sector is an index of quality or productivity.

First, I discuss the impact of a collective bargaining agreement that meets with the approval of a majority of the organization members

and replaces a productivity based wage scale. Next, agenda control is introduced into the bargaining process and a nontraditional outcome is derived in a bilateral monopoly setting. The paper concludes with a discussion of the implications for public education.

WAGE DEMANDS UNDER COLLECTIVE BARGAINING

Collective bargaining in the public sector, although a relatively recent phenomena, has been the subject of considerable discussion in the economic literature.² The public education market because of its visibility, the proportion of local government expenditures required to support it, and the remarkable ability of the education associations to successfully organize the labor force, has received a large amount of the attention.³ Most of these studies have been empirical and the results inconclusive.⁴ The effect of collective bargaining on industry wages is still at issue, and the effect on fringe benefits has not been examined. No theory exists to explain the incidence of across-the-board wage demands or their pervasiveness in the education industry; nor is there a model which derives the effects of this form of bargaining on prices and outputs in the education labor market.

The failure to address these issues has been characterized as the "union as a black box" weakness or the assumption that "a union is a union is a union."⁵ Unions, however, are democracies wherein all workers receive equal representation and democratic choices imply unique results. A public employee union is not a private employee union and this seemingly trivial, but potentially important, difference may require an altered format for research. Education is a public good and bargains for the supply of public goods require a different calculus than that employed in the private sector.

The national, state, and local education associations bear a close resemblance in structure to their private sector counterparts in the manufacturing and construction industries. The wage demands in the education industry differ, however, in one important respect from those in the private sector. The labor force, which is heterogeneous, presents to the employer a wage demand which is across-the-board or homogeneous at the entry level, and demands equal percentage wage increases for all members. Although there are no apprentice, journeyman, or master educators, the secondary mathematics teacher has measurably different training and skills from the primary kindergarten teacher.⁶ The anomaly is that all teachers request and receive the same entry level wage and ensuing percentage wage increases. Why does a labor force with differential skills and opportunity costs fail to demand a differential wage scale?

Consider, as the initial example, a school system composed of three teachers producing a homogeneous product. Each is an elementary school teacher; however, their productivity is measurably different. The annual wage increase paid to these individuals is productivity based and an increased expenditure on education equal to twelve hundred dollars is to be divided among the three. Let the distribution equal $(2/3, 1/3, 0)$ where the first teacher is the most productive and receives an eight hundred dollar raise, the second teacher is the median producer and receives a four hundred dollar raise, and the third teacher who is the least productive receives no raise at all.⁷ The process is repeated annually with each educator striving to maintain or increase his/her relative productivity. This outcome is the determinate one as long as relative productivities remain constant.

Now introduce a collective bargaining process in which wage demands must receive the approval of a majority of the teachers in the system. The problem is an exercise in game theory and one possible outcome is the distribution $(2/3, 1/3, 0)$ which was observed in the productivity based example. This outcome will now be unstable when relative productivities remain constant.

The least productive teacher can bribe the median producer with an offer of $(0, 2/3, 1/3)$. The most productive teacher receives no increase, the median producer receives an eight hundred dollar increase and the low producer, a four hundred dollar increase. The low and median producers are better off, the most productive teacher is worse off and the distribution is approved 2 to 1. This outcome will also be unstable.

The first teacher can now bribe the third teacher with an offer of $(1/3, 0, 2/3)$. The first and third teachers are better off at the expense of the second and the distribution is approved 2 to 1. The least productive teacher receives the largest raise, the median producer receives no raise, and the most productive teacher receives the median raise. This outcome is also unstable and in the next year the distribution is returned to the original $(2/3, 1/3, 0)$. This three year cycle can be envisioned as continuing through time.

A three teacher system is difficult to imagine. However, the process can be generalized to a larger system. Consider a nine teacher system in which there are heterogeneous inputs. Three of the individuals are secondary mathematics teachers, three are secondary science teachers, and three are elementary teachers. The opportunity cost to enter or continue in the education profession is the income

foregone in the private sector. Due to differential opportunity costs, a productivity based wage scale divides the increases in the manner $(2/9, 2/9, 2/9, 1/9, 1/9, 1/9, 0, 0, 0)$.⁸

Now introduce a collective bargaining process. The bargaining incentives are the same. The recipients of a zero raise will offer to those who receive the median wage an opportunity to replace those who receive the highest wage. A new distribution $(0, 0, 0, 2/9, 2/9, 2/9, 1/9, 1/9, 1/9)$ will emerge. We can generalize to n individuals, disciplines, or departments in the system and three groups will be observed: those who receive the largest increase, those who receive the median increase, and those who receive the smallest increase. Although no teacher wishes to receive the smallest increase, the process which drives the analysis is the vulnerability of those who receive the largest increase. Their continued replacement and the resulting division of all increases among a coalition of the other workers will generate the cyclical process described in the three-teacher system and this cycle can be envisioned as a continuing one in an n teacher system.⁹

We do not observe a three year cycle of wage demands in the public education system. The bargaining process has a stable outcome; teachers demand across-the-board percentage increases divorced from productivity. Although there is no restriction on coalition formation - secondary mathematics and science teachers could bargain as an independent unit - intraunion conflict does not appear to be a major problem. Where that conflict surfaces, the issue is rarely whether the members should bargain collectively; there is almost universal agreement that teachers must remain united on the issue of equal percentage wage increases.

Perhaps agreement is the inappropriate term as there are sanctions for those who aspire to more than mediocrity.

There are two reasons to expect that all parties will agree to receive the same percentage increase as an alternative to participation in the cyclical process. The first is perfect foresight. All of the individuals involved understand the sanctions, envision the game unfolding and opt for the expected value of the increase. The second reason is at best an innocuous and at most a pernicious one. All but one coalition may disappear. There is no pecuniary incentive for work effort as divorcing each educator's remuneration from individual performance leaves the employer no opportunity to identify the marginal employee. Those teachers who are the most productive leave the system and their exit raises the previously median producers to the most productive status. The median, now most productive educators exit and only those with an opportunity cost below the wage paid to the least productive teacher remain in the system. All teachers are average and the average teacher is a poor producer.¹⁰

The distribution of the total wage bill into equal percentage increases poses no problem for a union composed of average teachers; it does pose an incentive problem for a heterogeneous union membership. Cyclical wage bargains imply that educators are treated as homogeneous inputs. If all members of the association are not average, how can the collective bargaining arrangement be viewed so favorably by the above average teacher who does not choose to exit from the profession?¹¹

AGENDA CONTROL

The problem for the school board initially appears as identical to that faced by the employer in the private sector. A wage demand is made

by the union on behalf of its members and although the private sector demand may include various wage scales for differential skills, the alternatives available appear to be the same. The employer must accept the wage increase demanded or offer an alternative increase and entertain the prospect of a strike. There is one important difference, however, between the private sector bargain and the public sector bargain. The employer in the private sector is not asked to accept a total wage bill, instead the demand is for an increase in the per unit wage rate. A decision variable is then left to the discretion of the employer; he can quantity adjust.

Since the corporation president has every aspect of his firm's performance evaluated daily by the market, new hires, layoffs, reductions in the number of shifts worked, the opening and closing of plants are all viable opportunities which can affect the total wage bill between bargaining periods. There is no requirement to make a total evaluation of the labor input's value and this is an advantage which the school board does not enjoy. The school board is asked to approve a total wage bill or total education appropriation at each bargaining session, and in order to do so, calculate the total value of the educator's input. Limiting the bargaining agenda to this dimension requires the employer to choose a total package of education or revert to the purchase of no education at all.

The introduction of this form of agenda control in the education market has as its analogue all-or-nothing budget demands by other bureaus in the public sector. Since educators "do not appropriate any part of the difference between revenues and costs as personal income and the recurring revenue of the organization derives from other than the

sale of output at a per-unit rate," the education association qualifies as a Niskanen bureau.¹² The local association offers a set of activities called instruction and an associated output described as education for a total budget. The association's package offer give it "the same type of bargaining power as a profit seeking monopoly that discriminates among customers or that presents the market with an all-or-nothing choice."¹³ The reason for the educator's differential bargaining power is the failure by the public to present a significant alternative and a general unwillingness to forego the purchase of public education.¹⁴

Consider a local school board as the sole employer of public school teachers and the local association as the sole bargaining agent for employees. The bilateral monopoly problem is represented in Figure I. Wage cycling results in a heterogeneous union membership which treats the labor input to education as homogeneous. The school board faces a horizontal marginal cost curve for labor and the traditional result is somewhere between points B and D.¹⁵

The school board's preferred employment-wage combination is determined by the intersection of the marginal cost and demand curves for labor. Employers offer to hire at L_0 for a wage equal to W_0 at point B. The teacher's preferred combination is at point D and is determined by the intersection of the marginal demand and marginal cost curves for labor. The union offers to supply L_1 teachers for a wage equal to W_1 . The model is indeterminate and who chooses the point between B and D depends on the relation between the returns to, and cost of making a bargaining commitment.

The association is expected to attack the outcome at B on two familiar grounds. First, they would argue that wages are too low, and, second, that student-teacher ratios are too high. An increase in the effectiveness of the union's bargaining prowess should result in a significant increase in wages under the traditional analysis. However, unless all current employees can be protected from layoffs or termination, the student-teacher ratio will rise. Educators, not unaware of this dilemma, bargain in an untraditional manner; they make all-or-nothing offers of a total output for a budget to be divided on an equal percentage increase basis. The all-or-nothing or the average evaluation demand curve is drawn as a reference point for these bargains in Figure I and labeled AON. The area under a coordinate on this curve is equal to the integral under the marginal evaluation or demand curve at the corresponding employment level. The all-or-nothing demand curve allows us to visualize the employer's total evaluation of the education package.¹⁶

The union makes an all-or-nothing offer to supply L_0 teachers for a total education appropriation of $OEBL_0$. The school board desires to hire the L_0 teachers and places a total value of $OEBL_0$ on their services. Rather than forego the alternative of receiving no services at all, the board agrees to the proposal. The total wage bill is OW_1CL_0 and the wage paid to each teacher is $W_1L_0/L_0 = W_1$. There is no conflict with regard to the wage and no teachers are terminated. The total appropriation is increased by W_0EB due to the all-or-nothing bargaining arrangement. Since W_0EB is equal to W_0W_1CB the additional appropriation is just sufficient to increase the L_0 teachers' wage from

W_0 to W_1 . Differential bargaining power has an asymmetrical impact; wages are increased and the student-teacher ratio is unaffected.

Although agenda control in the bargaining process may placate the above average educator who is deprived of a productivity based wage increase, the education association's appeal for increased appropriations could rest on more altruistic grounds. One widely accepted index of quality education is a low student-teacher ratio and presumably the additional monies could have been spent to hire additional teachers.

Consider a union which characterizes a lower student-teacher ratio as a bargaining success. The all-or-nothing wage proposal for quality education could contain an offer to supply L_2 teachers at a wage equal to W_0 . There is no conflict with regard to the wage paid, however, the increase in employment is unattractive to the school board and to the existing union membership. Acquiescence to the union's proposal of more teachers for more money would result in inefficiency in the education system. The inefficiency is equal to the area BFG. Although the total appropriation is equal to the total value placed on education, for any teacher hired in excess of L_0 , the marginal value to the employer is less than the marginal cost of an additional hire. The union membership objects for a separate reason. The increased appropriation necessary to expand employment from L_0 to L_2 is equal to the area L_0BFL_2 . Since $BFG = W_0EB = W_0W_1CB$, agreement at point F rather than at point C transfers possible gains from existing to new organization members.¹⁷

Although I have made no survey of union proposals, union demands for increased wages are well publicized while offers to supply more teachers are not. Abundant but imperfect information suggests bargains

are for point C. A bargaining success is characterized by the education association as an increase in the total wage bill to be divided among the existing members with no additional members hired to share in the gains. Demands for lower student-teacher ratios may be vacuous and perhaps serve to distract attention from the total wage bill.

The important point is that resources will be dissipated by the current members of the organization to capture the area $W_{OE}B$ rather than the area BFG. The large number of educators present as delegates and alternates at the Democratic National Convention suggests that a sizeable amount of resources are expended in this manner. The above average producer can turn his energies to more than one task and bargains for point C allow the association to harness the energy of the most productive teacher for the lobbying effort. The area $W_{OE}B$ could represent a waste rather than a transfer of resources.¹⁸

CONCLUSION

In this paper I have followed a methodological approach which is consistent with the Theory of Public Choice. I offered an understanding of one institution that has emerged in the area of public education. Cyclical voting among union members results in a bargaining arrangement wherein the education association treats all teachers as average producers and makes an all-or-nothing wage demand for increased education appropriations. This institution differs fundamentally from conventional wage demands in the private sector. The inability of the school board to quantity adjust between bargaining periods limits the agenda to be considered in a manner which mitigates the employer's bargaining position. Agenda control has important results for the taxpayer-voter who consumer public education.

First, a sharing arrangement devoid of any response to productivity may erode the quality of education produced. Good teachers are increasingly difficult to hire and this difficulty is accentuated by a collective bargaining agreement. Second, the total wage bill and the tax bill required to finance it are substantially increased in an all-or-nothing wage demand environment. Finally, support for a lower student-teacher ratio, although desirable from a quality education viewpoint, may not be a goal of the professional organization representing public school teachers. The major inference of these results is that collective bargaining in the public sector is a more powerful tool in the hands of an education association than that possessed by its counterpart in the private sector.

- 1 Milton Friedman, Price Theory: A Provisional Text (Chicago: Aldine Publishing Company, 1962), 226.
- 2 See A. Lawrence Chickering, ed., Public Employee Unions (San Francisco: Institute for Contemporary Studies, 1976); Ronald G. Ehrenberg, "The Demand for State and Local Government Employees," American Economic Review, Vol. 63, No. 3 (June 1973), 366-379; David Shapiro, "Relative Wage Effects of Unions in the Public and Private Sectors," Industrial and Labor Relations Review, Vol. 31, No. 2 (January, 1978), 193-204; Thomas A. Kochan and Hoyt N. Wheeler, "Municipal Election Bargaining: A Model and Analysis of Bargaining Outcomes," Industrial and Labor Relations Review, Vol. 29, No. 1 (October 1975), 46-66.
- 3 The expenditures on education during 1980-81 comprised 54 percent of the total expenditures by local government. Fifty-nine percent of the expenditures on education were for instructional personnel. For examples of the application of the theory of public choice to education see E.G. West, "The Political Economy of American Public School Legislation," Journal of Law and Economics, Vol. 10 (October 1967), 101-128; Robert J. Staaf, "The Public School System in Transition: Consolidation and Parental Choice," in Thomas E. Borchering, ed., Budgets and Bureaucrats: The Sources of Government Growth, (Durham, North Carolina: Duke University Press, 1977), 130-147; Robert J. Staff, "The Growth of Educational Bureaucracy: Do Teachers Make a Difference?" in Borchering, ed., Budgets and Bureaucrats: The Sources of Government Growth, 148-168.

4 For a recent summary of the empirical work see David B. Lipsky, "The Effects of Collective Bargaining on Teacher Pay: A Review of the Evidence," Educational Administration Quarterly, Vol. 18 (Winter 1982), 14-42. See also Hirschel Kasper, "The Effects of Collective Bargaining on Public School Teachers' Salaries," Industrial and Labor Relations Review, Vol. 24, No. 1 (October 1970), 57-72; Robert J. Thornton, "The Effect of Collective Negotiations on Teachers' Salaries," Quarterly Review of Economics and Business, Vol. 11, No. 4 (Winter 1971), 37-46; John H. Landon and Robert R. Baird, "Monopsony in the Market for Public School Teachers," American Economic Review, Vol. 61, No. 5 (December 1971), 966-971; Gary A. Moore, "The Effect of Collective Bargaining on Internal Salary Structures in the Public Schools," Industrial and Labor Relations Review, Vol. 29, No. 3 (April 1976), 352-362; Joy G. Chambers, "The Impact of Collective Bargaining for Teachers on Resource Allocation in Public School Districts," Journal of Urban Economics, Vol. 4, No. 3 (July 1977), 324-339; W. Clayton Hall and Herman E. Carroll, "The Effect of Teachers' Organizations on Salaries and Class Size," Industrial and Labor Relations Review, Vol. 26, No. 2 (January 1973), 834-841; William J. Moore, "An Analysis of Teacher Union Growth," Industrial Relations, Vol. 17, No. 2 (May 1978), 204-215; Charles R. Perry, "Teacher Bargaining: The Experience in Nine States," Industrial and Labor Relations Review, Vol. 33, No. 1 (October 1979), 3-17; Alexander B. Holmes, "Union Activity and Teacher Salary Structure," Industrial Relations, Vol. 18, No. 1 (Winter 1978), 79-85; Robert J. Thornton, "The

- Elasticity of Demand for Public School Teachers," Industrial Relations, Vol. 18, No. 1 (Winter 1978), 86-91; William A. Baugh and Joe A. Stone, "Teachers, Unions, and Wages in the 1970's: Unionism Now Pays," Industrial and Labor Relations Review, Vol. 35, No. 3 (July 1982), 368-376.
- 5 David Lewin and Peter Feuille, "Behavioral Research and Industrial Relations," Industrial and Labor Relations Review, Vol. 36, No. 3 (April 1983), 359.
- 6 Different wage schedules do exist for teachers holding advanced degrees; however, the percentage increase in wages does not vary across teachers.
- 7 This game is discussed by James M. Buchanan and Gordon Tullock in The Calculus of Consent (Ann Arbor: University of Michigan Press, 1962) and more recently by Randall G. Holcombe and Asghar Zardkoohi in "On the Distribution of Federal Taxes and Expenditures, and the New War Between the States," paper presented at the Southern Economic Association Meetings, November 1982.
- 8 The incidence of differential opportunity costs is beginning to be recognized in the education market. The City of Richmond, Virginia, offers a \$1,500 bonus to math, science, and special education teachers. This differential pay arrangement has been denounced by the Virginia Education Association as "opposed to the equity teachers have strived so long for."
- 9 Cycling under a standard wage agreement may be more than a theoretical concept. Unless, or until exclusive recognition is granted

- and a single union dominates, groups do shift allegiance among competing labor organizations. This is especially true during the competitive organizing period when unionism first appears. Perhaps this is why some politicians seemingly encourage monopoly unions.
10. Ironically, this result implies a productivity-based wage. Wage increases are not determined by output; however, no worker produces more or less than the average and all workers receive the average increase. Falling S.A.T. scores among applicants to schools of education and the relatively poor academic records of education graduates may be evidence that average performance in the profession is declining.
 11. The contrast is between two possible divisions of a fixed pie; equal shares per teacher, or one where the share is some multiple of the marginal productivity of teaching. A multiple less than one causes a teacher to exit the profession. The efficiency losses due to average rather than marginal evaluation may not represent a net loss. An earlier median voter model argues that bargaining can offset any loss. R.B. Freeman, "Individual Mobility and Union Voice in the Labor Market," American Economic Review, Vol. 66, No. 2 (May 1976), 366.
 12. William A. Niskanen, Jr., Bureaucracy and Representative Government (New York: Aldine & Atherton, 1971), 15.
 13. Ibid., 25.
 14. For examples that recognize this kind of outcome in the public sector, see William A. Niskanen, "The Peculiar Economics of Bureaucracy," American Economic Review, Vol. 58, No. 2 (May 1968), 293-305; Idem., "Bureaucrats and Politicians," Journal of Law and

Economics, Vol. 18, No. 3 (December 1975), 617-643. For an excellent summary of this and other models of agenda control, see Robert J. Mackay and Carolyn L. Weaver, "Monopoly Bureaus and Fiscal Outcomes: Deductive Models and Implications for Reform," in Policy Analysis and Deductive Reasoning, Gordon Tullock and Richard E. Wagner, eds. (Lexington, Massachusetts: Lexington Books, 1978), 141-165.

- 15 For the standard treatment of the bilateral monopoly problem in private labor markets see Allan M. Carter and F. Ray Marshall, Labor Economics: Wages, Employment, and Trade Unionism (Homewood, Illinois: Richard D. Irwin, Inc., 1967), 296-297.
- 16 For an explanation of all-or-nothing, or average evaluation demand curve, see Friedman, Price Theory: A Provisional Text, 14-15.
- 17 In the nonlinear case $W_O W_1 CB$ can be greater than or less than BFG. The gains to existing members could exceed the efficiency loss from additional employment.
- 18 See Richard A. Posner, "The Social Costs of Monopoly and Regulation," Journal of Political Economy, Vol. 83, No. 4 (August 1975), 807-27; James N. Buchanan and Gordon Tullock, "The 'Dead Hand' of Monopoly," Antitrust Law and Economics Review, Vol. 1, No. 4, (Summer 1968), 85-96. The area $W_O W_1 CB$ may underestimate the resources dissipated in the aggregate by competing education associations; see Gordon Tullock, "The Welfare Costs of Tariffs, Monopolies and Theft," Western Economic Journal, Vol. 5, (December 1966), 224-233.