Public sector unions and public spending*

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Abstract. This study examines the influence of public sector unions on the expansion of the public sector. Based on public goods theory, our paper models how unions influence the supply of and demand for public sector activities. On the demand side, public sector unions are special interests which advocate public sector expansion to policy makers; on the supply side, they exert pressure to maintain and expand monopoly powers. Empirical evidence supports the hypothesis that a positive relationship exists between public sector unionism and public spending.

1. Introduction

Over this century, the public sector (all levels of government) in the United States has grown from approximately 10 to 35% of gross domestic product. Little or no attention, however, has been given to how public sector unions affect public sector expansion. Public sector unionism, unlike unionism in the private sector, has been sharply rising. In the early 1960s, for example, only 10 to 12% of public employees were unionized but, by the mid-1980s, membership had risen to about 33 percent of all public employees.

Executive Order 10988, signed by President Kennedy in 1962, formally recognized unions in the federal sector. According to most accounts, this action was a catalyst at the state level where many laws were passed during the 1960s and 1970s to permit and encourage public sector unions. During this period, public sector unions went through a major transition – from informal employee associations to full-fledged bargaining units with well-honed lobbying and public relations departments. This era witnessed the rise of high profile entities, such as the American Federation of State, County and Municipal

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Employees, the National Education Association, and the American Federation of Teachers.

Economic theory suggests that unions are organizations that provide public goods. Labor unions, through collective action, may be able to secure benefits that an individual might not be able to obtain. Based on public goods theory, we model how unions influence the supply of, and demand for, public spending. On the demand side, public sector unions are potent special interests that signal their preferences for public sector expansion to policy makers. On the supply side, public sector unions exert pressure to maintain and expand their monopoly powers. Vehement opposition to school-choice initiatives and privatization, as well as union efforts to increase collective bargaining strength and striker protection, attest to these efforts.

While previous studies have concluded that various public sector unions have raised wages and employment for their members, our paper provides a model which suggests that public sector unions are also interested in expanding the overall role of the public sector in the economy.[1] In other words, we argue that preferences for public sector expansion are not limited to the labor markets in which union members are employed. Our model provides testable hypotheses about how unions affect the equilibrium size of the public sector. Empirical evidence at the state and local levels of governments during the 1980s supports the conclusion that a positive relationship exists between public sector unionism and public spending.

2. Unions and public goods

To understand how public sector unions influence the size of the public sector, it is useful to recognize that unions provide public goods to their members. In the parlance of public finance, public goods are nonrival in consumption. Benefits tend to be nonrival because, when membership grows, benefits are not reduced for any existing member. In effect, marginal costs of providing benefits to additional members are very low, if not zero.

One benefit of organizing workers is the ability to generate large amounts of information on issues that affect members' interests. For example, while an individual may not find it advantageous to comb through thousands of pages of pertinent federal and state legislation, a union's small research team may cheaply produce clear and concise analysis through an informational arm of the union. When spread over thousands of members, the cost of this service is minimal for union members. Similarly, a union can hire lobbyists and public relations experts to advocate legislation that benefit members at small expense to each member.

One potential problem is the free-rider effect: consumers of public goods

have an incentive to free ride since it is difficult to exclude non-contributors from enjoying benefits. For example, establishing collective bargaining procedures is a formidable task for unorganized workers. If union support is voluntary, participation may be minimal, even though a collective effort would result in net benefits for the group. One solution is a union that internalizes the free-rider problem through compulsory dues and other organizational means. In response to free-rider problems, unions can also provide goods that are nonrival or partially exclusive, such as technical and advisory services, pensions, and data collection and analysis. Moreover, unions may lobby for favorable legislation that excludes nonunion members.

3. The relative organizational advantages of public sector unions

The major benefit of public sector unions are their ability to organize public sector employees into large voting and "grass roots" blocs that signal members' desires to policy makers. The greater the number of members, the more powerful are these signals. In other words, public sector unions are special interest groups (Olson, 1965). Public sector employees have powerful incentives to become politically active. By rallying employees for common purposes, unions internalize free-rider effects that normally arise among unorganized workers. Benefits to organization are clear. For example, a citizens' initiative to cut taxes or cut public spending may threaten public sector wages or employment. A high level of political activism may be required to defeat such a measure. Unions deal with such situations by collecting monetary contributions and in-kind efforts from members. It is no secret that unions can be quite successful in handling such problems. Union participation in political fund-raising often approaches very high levels with participation often exceeding 80% of members (California Commission on Campaign Financing, 1985). Public sector unions often outspend their opponents in such campaigns.

As special interest groups, public sector workers are linked by common bonds: they may believe that their role in providing goods and services to the public requires more stability in their employment; they may believe that unionization will increase their pay and benefit packages; or they may believe that their unions can improve public policy. It has also been suggested that public sector unions are better able than ordinary citizens to understand service needs and to ensure efficient service provision (Zax and Ichniowski, 1988). Whatever the motivations, public sector unions are powerful pressure groups.

Public sector unions may also have special advantages, relative to private sector unions, in organizing workers, as evidenced by union penetration trends. Public sector union membership rose from 900,000 in 1960 to 6.4 million members in the 1980s. Public sector union penetration (the share of state

and local public sector workers in unions) rose from 10.8% in 1960 to about 37% in 1992. During the same approximate period, union penetration in the private sector fell from a high of 36% in 1953 to 16% in 1990 (Troy, 1988).

Benefits and costs of collective action appear more favorable in the public sector. Favorable legal changes, which gained momentum in the 1960s, appear to have facilitated what is otherwise a natural and dynamic process of organization among public sector employees. There are three possible reasons for why public sector unions may have organizational advantages over their private sector counterparts. First, public sector unions exist in less competitive environments. If wage gains exceed productivity gains in the private sector, the financial positions of both employees and managers are threatened; but, in the public sector, such pressures can be deflected by "tax push" – passing "excessive" wage increases to taxpayers or increasing debt. In a study of comparable public and private sector jobs, Brunelli and Cox (1992) show that state and local public sector salaries have significantly outpaced private sector salaries during the past decade and that public sector salaries are generally higher than private sector salaries for comparable jobs. Public sector employees also face less pressure from competitive suppliers. Private sector employers can turn to other sources of labor supply or relocate to states or countries with lower labor costs, but these options are generally not available for public managers. Typically such action can be taken only by political action, such as privatization initiatives. Moreover, collective bargaining procedures in the public sector often cover nonunion employees as well, thus precluding nonunion employees from wage competition with union employees.

Second, public employees vote more often than voters employed in the private sector (see Bush and Denzau, 1977; Bennett and Orzechowski, 1983; and Gramlich and Rubinfeld, 1982). Bennett and Orzechowski (1983), for example, show that public sector employees participate in elections at a 40% greater rate than private sector employees. This enables public sector employees to achieve greater political leverage on policy makers and increases the relative pay-off to organizing public employees. Third, with a loose connection between productivity and wages, public managers pose less resistance to unionization than private sector managers. In effect, across-the-board wage increases are less harmful to allocative efficiency in this "sheltered" labor market.[2]

4. Unions and public sector size

4.1 Demanders of public programs

Public sector employees are commonly believed to favor an expanding role for the public sector (Tullock, 1974; and Buchanan and Tullock, 1977). This view predicts that public sector unionism exerts a positive influence on demand for

public programs through their voting and lobbying efforts. As casual support of this hypothesis, a strong positive correlation has been shown between per capita state debt and the scope of collective bargaining statutes (Indiana Chamber of Commerce, 1992). In states with no collective bargaining statutes, average per capita state debt was $916; but, in states where all public sector employees are covered by such statutes, average per capita state debt was 250 percent higher, or $2,264 per resident.

It should be noted that opposite motivations may explain why public employees favor public sector expansion. One view is that incomes and power of public employees rise with public sector expansion. The other view is that, because they genuinely believe they improve resource allocation in the economy, public employees feel that social welfare rises with expansion of their control over resource allocation. Notice that, although these views assume opposite motivations, both predict that public employees favor expansion of the public sector.

4.2 Suppliers of public programs

Bureaucracy theory hypothesizes that public employees possess sufficient monopoly power over labor supply with which to expand public spending beyond levels desired by voters (Borcherding, Bush and Spann, 1977). This may occur for a variety of reasons. Perhaps the most important stems from the mandatory collective bargaining status that most public sector unions possess. This status, along with the ability to pass "excessive" wage increases to the public through expansion of taxation or public debt, may rapidly expand public sector costs. Wages and benefits of public employees typically account for over 70 percent of state and local government budgets and such powers may expand public spending (Baird, 1991). Various studies have demonstrated that, when unionized, public sector workers earn higher compensation and experience higher employment than when public sector workers are not unionized. For example, firefighters (Ashenfelter, 1971; Ichniowski, 1980; and Ehrenberg, 1973), teachers (Gallagher, 1978) and police officers (Trejo, 1991) have been shown to benefit from unionization in the public sector. Expenditures of municipalities have also been shown to be positively influenced by unionization (Zax and Ichniowski, 1988).

Another hypothesis attracts great attention. The price-effects hypothesis argues that, because government is less capital-intensive than the private sector, productivity in the public sector lags behind the private sector (Baumol, 1967). Lower productivity is believed to be a result of the public sector being more service-oriented than the private sector. Even without expansion in numbers of programs, this hypothesis predicts that costs grow faster in the public

sector. The price-effects hypothesis, in effect, offers a non-institutional theory of public sector expansion. Public sector expansion occurs "naturally" when public employees are lured from the more-productive private sector to work in the less-productive public sector. The "price-effects" hypothesis predicts that a natural cost-push dynamic is endemic to the public sector apart from institutional biases. Notice that, if institutional elements, such as unionism, are not important influences on public sector size, then public sector expansion would not be strongly correlated to public sector unionism. However, if unionism is a statistically significant determinant of public sector size, institutional elements are important as well.

5. An empirical model of public spending

We have indicated how unionism may affect demand for, and supply of, public programs and, in this way, unionism is hypothesized to be positively related to the size of the public sector. Public sector size is measured by public spending in our empirical model. On the demand side, greater unionism is hypothesized to lead to larger public sectors. On the supply side, greater unionism is hypothesized to lower supply and, along an inelastic demand, to rising public spending as well.[3]

The following models of public spending are estimated by OLS for 1983, 1984, and 1985:

$$EXP1_i, EXP2_i = f(POP_i, Y_i, DENSITY_i, CEN_i, GRANTS_i, LIBERAL_i, UNEM_i, UNION1_i) \quad (1)$$

$$EXP1_i, EXP2_i = f(POPi_i, Y_i, DENSITY_i, CEN_i, GRANTS_i, LIBERAL_i, UNEM_i, UNION2_i) \quad (2)$$

where

$EXP1_i$ = spending of state and local governments as a percentage of gross state product;
$EXP2_i$ = per capita spending of state and local governments;
POP_i = population in 1000s;
PCY_i = per capita personal income;
$URBAN_i$ = percentage of population that lives in urban areas;
CEN_i = percentage of expenditures spent by state government;
$GRANTS_i$ = federal grants as a percentage of revenues of state and local governments;
$LIBERAL_i$ = index of liberal tendencies of U.S. Senators;

$UNEM_i$ = unemployment rate;
$UNION1_i$ = percentage of wage and salary public employees who are union members;
$UNION2_i$ = percentage of wage and salary public employees covered by a union contract.

Two normalization specifications for public spending are considered: division by gross state product (GSP) and by population.[4] Data (except GSP_i, $LIBERAL_i$, $UNION1_i$ and $UNION2_i$) are obtained from appropriate years of the *Statistical Abstract of the United States*. Data on GSP_i are obtained from U.S. Department of Commerce (1986). Estimation for three different periods, 1983, 1984 and 1985, is based on ease of data availability. All states except Alaska and Hawaii are included in the data set. These two states appear to be outliers and are often excluded from studies that estimate public spending.[5] Significance of estimated coefficients is based on two-tailed tests at the .01, .05, and .10 levels.

Per capita income (PCY_i) is hypothesized to exert a positive influence on public spending. This expectation is based on Wagner's Law which argues that, as income in the industrialized economies grows, there is an increasing demand for public spending. Population (POP_i) and urban density ($URBAN_i$) are also demand-side variables and are hypothesized to exert positive influences on public spending.[6]

Brennan and Buchanan (1980) hypothesize that centralization influences public spending.[7] This hypothesis follows from the Leviathan view of government that assumes that policy makers are narrowly self-interested in their desire to expand the public sector. Under the Leviathan view, fiscal centralization (CEN_i) indicates the monopoly power of policy makers and is hypothesized to positively influence public spending. A counter hypothesis predicts that, because centralization allows governments to exploit economies of scale, a negative relationship exists between centralization and public spending (Oates, 1985).

The Leviathan view has been extended to the relationship between intergovernmental grants and public spending. If grants ($GRANTS_i$) lower financing burdens, as perceived by taxpayers, public spending may rise (Winer, 1983; and Logan, 1986) and a positive relationship is therefore hypothesized. There is a potential simultaneity problem, however, because some of the possible determinants of federal grants are also included as regressors. An instrumental variable for grants is therefore estimated and used throughout the regressions reported in this paper. The following right-hand-side variables form the instrumental variable: PCY_i, $URBAN_i$, $UNEM_i$ and the previous year's value of $GRANTS_i$.

$LIBERAL_i$ is an index of the liberal tendencies of U.S. Senators provided

Table 1. Summary statistics for 1985

Variable	Mean	Std. Dev.	Maximum	Minimum
SPENDING (% OF GSP)	11.5	1.5	14.4	8.4
SPENDING (per capita)	1815.6	367.3	3172.5	1264.4
URBAN	63.4	22.4	100.0	19.1
CENTRALIZATION	0.64	0.64	0.78	0.53
GRANTS	0.19	0.04	0.31	0.12
LIBERAL	45.93	26.94	93.50	0.00
UNEM	7.06	1.94	13.00	3.90
UNION1	34.67	17.16	71.00	5.80
UNION2	41.72	18.02	79.70	8.40

by the *National Journal*.[8] An index of 50, for example, means that a Senator is more liberal than 50 percent of the Senate on economic issues. This index controls for the possibility that, when states differ in their liberal tendencies, more liberal states might have both larger governments and be less resistant to public sector unions.

$UNEM_i$ is the unemployment rate and controls for the expectation that public sector unions do better in their representation elections and wage bargains during periods of economic expansion.[9] In other words, the unemployment rate controls for the possibility that a positive relation between government size and public sector unionism simply reflects differences in economic performance between states.

$UNION1_i$ and $UNION2_i$ are two alternative measures of public sector unionism. $UNION1_i$ is the percentage of employed wage and salary workers who are union members and $UNION2_i$ is the percentage of employed wage and salary workers who are covered by union contracts. These data are provided in Curme, Hirsch and MacPherson (1990) and count employees who are either members of public sector unions or are covered by a union contract. Due to lack of data on $UNION1_i$ for 1983, its value for 1984 is substituted for that year. Previous discussion leads us to hypothesize positive relationships between these variables and public spending.

Table 1 displays summary statistics for selected variables for 1985. As a share of GSP, the mean value of public spending is 11.5% and ranges from 8.4 to 14.4%. Per capita public spending averages $1,815.60 and ranges from $1,264.40 to $3,172.50. $UNION1_i$ ranges from 5.8% to 71% and has a mean value of 34.7%. $UNION2_i$ ranges from 8.4 to 79.7% and has a mean value of 41.72%. Summary statistics of $URBAN_i$, CEN_i, $GRANTS_i$, UE_i and $LIBERAL_i$ are also displayed.

Table 2 displays results of regression analysis on public spending as a percentage of GSP. Contrary to expectations, per capita income exerts negative, and

Table 2. OLS estimations of public spending equations
(Dependent variable: Spending as percentage share of GSP)

	1983		1984		1985	
Constant	18.90*	19.47*	22.12*	18.41*	21.66*	21.43*
	4.35	4.81	5.15	4.37	4.03	4.21
PCY	−.0004	−.0003	−.005**	−.0004***	−.001**	−.001**
	1.61	1.52	2.21	1.88	2.21	2.42
POP	−4E-05	−6E-05	−3E-05	−3E-05	−1E-05	−2E-05
	0.84	1.39	0.68	0.73	0.25	0.32
URBAN	−0.01	−0.01	−0.03**	−0.02	−0.02	−0.02
	0.70	1.14	1.94	1.37	1.25	1.28
CEN	−0.70	−2.92	−0.47	0.27	1.00	0.78
	0.22	0.98	0.15	0.09	0.28	0.23
GRANTS	−0.19**	−0.24*	−0.29*	−0.21**	−0.24**	−0.24**
	2.34	2.95	3.00	2.33	2.32	2.43
LIBERAL	0.01	.0001	0.01	0.01	0.01	0.01
	0.88	0.02	1.65	0.96	1.49	−1.52
UNEM	−0.026	0.03	−0.04	−0.05	−0.13	−0.11
	0.17	0.30	0.39	0.45	0.91	0.75
UNION1	0.06*		0.07*		0.06*	
	4.03		4.87		3.76	
UNION2		0.07*		0.07*		0.06*
		4.86		4.93		4.26
$\bar{R}^2$	0.25	0.45	0.35	0.33	0.18	0.24
s.e.e.	1.25	1.18	1.12	1.14	1.32	1.27
F	3.00	4.05	4.20	3.91	2.29	2.84
n	48	48	48	48	48	48

t-statistics below estimated coefficients.
*, **, *** refer to significance at 1, 5 and 10% levels (two-tailed tests) or greater.

significant, influences on spending in 1984 and 1985. Population and centralization are never found to exert statistically significant influences on spending. Urbanization exerts a statistically significant, and negative, influence in only one estimation. Contrary to expectations, grants exert negative, and generally significant, influences on public spending. The index of liberalism and the unemployment rate are never found to influence public spending. Both measures of unionization always exert hypothesized positive, and highly significant, influences on public spending.

Table 3 displays results of regression analysis on per capita public spending. Per capita income exerts the hypothesized positive, and significant, influence on spending in five of six regressions. While population and centralization continue to exert no significant influences, urbanization exerts, contrary to expectations, negative and significant influences in all estimations. Similar to the previous table, grants generally exert negative and significant influences on

Table 3. OLS estimations of public spending equations
(Dependent variable: Per capita spending)

	1983		1984		1985	
Constant	1597.6**	1342.2	1675.1**	1261.7	961.6	923.6
	2.07	1.67	2.17	1.31	0.77	0.76
PCY	0.10**	0.13*	0.10**	0.09	0.10**	0.10***
	1.12	2.75	2.11	1.64	1.74	1.71
POP	−.003	−0.01	−.002	−.001	−.0001	−.001
	0.31	0.69	0.21	0.05	0.01	0.05
URBAN	−9.21*	−9.35*	−9.26**	−7.58***	−6.99***	−6.94***
	3.56	3.40	3.58	2.30	1.82	1.84
CEN	324.9	151.3	476.9	306.9	434.2	400.3
	0.59	0.25	0.87	0.44	0.52	0.49
GRANTS	−56.2*	−57.1*	−59.3*	−36.2***	−32.6	−32.6
	3.83	3.63	4.04	1.76	1.36	1.39
LIBERAL	−0.49	−1.02	0.14	−1.11	−1.45	−1.49
	0.33	0.63	0.09	0.57	0.65	0.67
UNEM	12.65	21.75	8.64	5.91	27.57	31.94
	0.71	1.18	0.09	0.23	0.80	0.95
UNION1	8.58*		9.58*		8.78**	
	3.15		3.51		2.53	
UNION2		6.97**		10.01*		9.13*
		2.32		3.10		2.81
$\bar{R}^2$	0.51	0.46	0.55	0.38	0.30	0.32
s.e.e.	222.7	233.8	222.6	263.1	307.1	302.2
F	7.2	6.06	4.70	4.54	3.53	3.80
n	48	48	48	48	48	48

t-statistics below estimated coefficients.
*, **, *** refer to significance at 1, 5 and 10% levels (two-tailed tests) or greater.

spending and the index of liberalism and the unemployment rate are never found to influence public spending. Both measures of unionization continue to exert positive, and highly significant, influences on spending.

6. Empirical models of public employment and earnings

Our discussion suggests that public sector unions are interested in increasing public sector wage bills. Employment and earnings are two potential avenues for expanding wage bills. The following models of public sector employment and earnings are estimated by OLS:[10]

$$FTE_i = f(POPi_i, Y_i, DENSITY_i, CEN_i, GRANTS_i, LIBERAL_i, UNEM_i, UNION1_i) \quad (3)$$

Table 4. OLS estimations of public employment and earnings equations

	Employment equations FTE per 10,000 population			Earnings equations Average annual (in thousands)		
	1983	1984	1985	1983	1984	1985
Constant	656.8*	829.5*	355.9***	14.63*	22.50*	12.51***
	4.29	4.94	1.90	2.85	4.03	1.73
PCY	0.01	−0.002	0.14	0.001***	0.0002	−0.0005
	0.61	0.24	1.54	1.86	0.79	1.47
POP	−0.001	−0.0004	−0.001	7E-05	0.0001**	9E-05
	0.57	0.28	0.51	1.23	2.31	1.47
URBAN	−1.56*	−2.01*	−1.11***	−0.02	−0.04**	0.01
	3.49	3.64	1.93	0.97	2.06	0.40
CEN	33.4	23.4	29.4	2.11	4.82	5.29
	0.31	0.20	0.23	0.57	1.27	1.13
GRANTS	−7.1**	−10.2*	−10.7	−0.28*	−0.44*	−0.18
	2.44	2.78	0.29	2.92	3.61	1.34
LIBERAL	0.02	0.08	−0.29	.0004	0.01	−0.01
	0.04	0.27	0.85	0.45	0.84	0.61
UNEM	−1.80	−3.56	6.00	0.06	0.11	0.07
	0.50	1.85	1.16	0.47	0.78	0.60
UNION1	−0.08	−0.27	0.53	0.07*	0.08*	0.07*
0.15	0.52	1.02		3.86	4.67	3.44
$\bar{R}^2$	0.19	0.21	0.05	0.68	0.71	0.63
s.e.e.	44.2	42.7	46.2	1.48	1.42	1.73
F	2.41	2.61	1.31	13.68	15.37	10.88
n	48	48	48	48	48	48

t-statistics below estimated coefficients.
*, **, *** refer to significance at 1, 5 and 10% levels (two-tailed tests) or greater.

$$EARN_i = f(POPi_i, Y_i, DENSITY_i, CEN_i, GRANTS_i, LIBERAL_i, UNEM_i, UNION1_i) \quad (4)$$

where

FTE_i = state and local government employment on a full time equivalent basis;
$EARN_i$ = average annual salary of (full-time) state and local government employees.

Breaking out employment and earnings effects helps determine if public sector unions primarily push up wages or also attempt to raise the number of public employees. The former case would be suggested by a positive relation between unionism and earnings, and the latter case would be suggested by a positive

relation between unionism and employment. Either would suggest that unionism raises the costs of providing goods and services through the public sector and therefore would be evidence of a supply-side cause behind the positive relationship between unionism and public sector spending.

Table 4 displays OLS estimates of (3) and (4). Per capita income, centralization, and population do not statistically influence public employment. Urbanization, however, exerts a statistically significant, and negative, influence on employment in all three years. Grants exert a statistically significant, and negative, influence on employment in 1984 and 1985. The index of liberalism, the unemployment rate, and unionism never exert significant influences on public employment. Estimations of (4) show that, in general, per capita income, population, centralization, the index of liberalism, and unemployment are not significantly related to average salaries of government employees. Grants, however, exert statistically significant, and negative, influences in 1983 and 1984. Public sector unionism exerts a highly significant, and positive, influence on salaries.

Public sector unionism is therefore shown to exert no significant effect on employment, but a significant and positive influence on average salaries. These results therefore suggest that, because unions are successful in raising salaries of all government workers (unionized and not), unions are responsible for pushing up supply costs of public spending programs.

7. Empirical model of functional spending

It is well known that many state and local governments face within-period budget constraints with respect to non-capital spending. Tax, expenditure, and debt limitations have become increasingly common and pose potential problems for those groups, such as public sector unions, who are interested in expanding the public sector. A strong union may therefore attempt to shift the fraction of total public spending on cash transfers and entitlements like AFDC payments (that do not directly benefit the membership) to programs that are relatively heavy demanders of government workers such as education, protective services, etc.

The following equations are estimated to test whether public sector unions favor any spending areas over other areas of spending:

$$EDUC_i = f(POPi_i, Y_i, DENSITY_i, CEN_i, GRANTS_i, LIBERAL_i, UNEM_i, UNION1_i) \quad (5)$$

$$HIGH_i = f(POPi_i, Y_i, DENSITY_i, CEN_i, GRANTS_i, LIBERAL_i, UNEM_i, UNION1_i) \quad (6)$$

Table 5. OLS estimations of functional spending categories, 1985

	Percentage of total spending				Percentage of GSP			
	Education	Highways	Public Welfare	Health & Hospitals	Education	Highways	Public Welfare	Health & Hospitals
Constant	75.2*	23.01*	−0.57	10.07	13.72*	4.37	1.25	1.84
	7.16	3.88	0.05	0.88	5.38	3.40	0.74	1.17
PCY	−0.002*	0.0002	−0.0001	−0.0004	−0.0005*	−4E-05	−0.0001	−0.0001
	3.45	0.56	0.23	0.83	3.91	0.72	1.38	1.38
POP	9E-05	−0.0002*	0.0002**	9E-05	−1E-06	−2E-05**	4E-05**	1E-05
	0.96	3.24	2.58	0.94	0.06	2.16	2.38	0.90
URBAN	−0.09*	−0.09*	0.01	0.04	−0.02*	−0.02*	0.0002	0.003
	2.83	5.09	0.58	1.21	2.94	4.51	0.04	0.70
CEN	12.91***	−11.77*	5.43	−3.26	2.40	−1.49***	0.81	−0.22
	1.86	2.99	0.80	0.43	1.42	1.76	0.72	0.21
GRANTS	−0.90*	−0.02	0.20	0.11	−0.17*	−0.01	0.14	0.01
	4.36	0.10	1.01	0.49	3.42	0.64	0.44	0.17
LIBERAL	0.01	0.003	0.04**	−0.04***	0.01**	0.003	0.01*	−0.004
	1.18	0.30	2.07	1.79	2.21	1.19	2.41	1.56
UNEM	−0.72**	−0.01	−0.18	0.42	−0.15**	−0.02	−0.06	0.06
	2.48	0.07	0.65	1.35	2.11	0.68	1.20	1.34
UNION1	−0.03	−0.01	0.08*	−0.01	0.02*	0.01	0.02*	0.004
	1.12	0.42	2.83	0.49	2.87	1.52	4.36	0.99
$\bar{R}^2$	0.52	0.71	0.46	0.30	0.46	0.61	0.50	0.15
s.e.e.	2.58	1.46	2.52	2.79	0.63	0.32	0.42	0.38
F	7.27	15.22	6.11	2.08	5.98	10.40	6.88	2.05
n	48	48	48	48	48	48	48	48

t-statistics below estimated coefficients.
*, **, *** refer to significance at 1, 5 and 10% levels (two-tailed tests) or greater.

$$PUBWEL_i = f(POPi_i, Y_i, DENSITY_i, CEN_i, GRANTS_i, LIBERAL_i, UNEM_i, UNION1_i) \quad (7)$$

$$HEALTH_i = f(POPi_i, Y_i, DENSITY_i, CEN_i, GRANTS_i, LIBERAL_i, UNEM_i, UNION1_i) \quad (8)$$

where

$EDUC_i$ = education spending of state and local governments
$HIGH_i$ = highway spending of state and local governments
$PUBWEL_i$ = public welfare spending of state and local governments[12]
$HEALTH_i$ = health and hospital spending of state and local governments.

Spending on these functional categories are normalized two ways: as percen-

tages of state and local government spending and as percentages of GSP. Estimations by OLS in Table 5 are for 1985.[12]

Discussion focuses on the effects of the liberalism, unemployment, and union variables because the effects of other variables generally mirror those of previous estimations. The degree of liberalism exerts a positive and statistically significant influence on the share of public spending devoted to public welfare and for the percentages of GSP devoted to education and public welfare. A significant, and inverse, influence is found between liberalism and the share of spending devoted to health and hospitals. The unemployment rate exerts a statistically significant, and negative, influence only on education spending (under both specifications). Unionism is found to exert a significant and positive influence on public welfare spending (under both specifications) and on the education spending share of GSP.

These results do not suggest support of the hypothesis that public sector unions attempt to shift a greater portion of spending away from transfers and toward spending areas that are more heavily dominated by government employees. While no effects are shown between unionism and spending on highways and health and hospitals, the results show that, with the exception of the share of total spending devoted to education, stronger public sector unions appear to favor spending on public welfare programs.

8. Conclusion

The hypothesized positive influence between unionism and public spending was derived from our model of how public sector unions affect the demand for, and supply of, government. On the demand side, public sector unions are special interest groups who lobby for expansion of the public sector. On the supply side, unions adversely affect productivity and raise costs of providing goods through the public sector. The prediction that public sector unions exert a positive influence on public spending is strongly supported by our empirical analysis of the relationship between union membership and spending of state and local governments. Evidence is also shown to support the hypotheses that unions promote higher salaries and, in this way, supports the supply-side hypothesis that unions raise (salary) costs of providing goods and services through the public sector. Public sector unionism is also found to be positively related to spending on public welfare programs.

Notes

1. For example, firefighters (Ashenfelter, 1971) teachers (Gallagher, 1978) and police officers (Trejo, 1991) have been shown to benefit from unionization.
2. This may also explain why private sector unionism appears to have declined since the 1970s.

For example. Reder (1988) argues that increases in private sector unionization in the 1950s and 1960s are the result of favorable economic trend since, in effect, unions easily ratify market-determined wages in periods of general prosperity.

3. Studies indicate that the elasticity of demand for public programs is roughly $-.40$, which is highly price inelastic (Bergstrom and Goodman, 1973; and Borcherding and Deacon, 1972).
4. Because grants are controlled for on the right-hand side of the equations, and to avoid double-counting, they are substracted from state and local government spending.
5. Exclusion of these two states does not affect the results when public spending as a share of GSP is estimated. Coefficients on UNION1 and UNION2 are never statistically different from zero in regressions of per capita public spending when the two states are included.
6. Musgrave and Musgrave (1988) argue that population increases increase the demand for educational and public services and increasing urban density raises demand for infrastructure.
7. See Joulfaian and Marlow (1991) for a review of the empirical literature on this hypothesis.
8. The simple average of the 1986 scores for both Senators in each state is used.
9. Two other variables were considered to control for interstate differences in economic performance following the 1981–82 recession: changes in unemployment rates from 1982 and real annual growth in GSP since 1982. Since neither were any more statistically significant than the current unemployment rate, we do not display regressions with these alternative control variables.
10. Estimations with $UNION2_i$ were also conducted but are not shown here because they do not alter the empirical results.
11. Public welfare spending includes support of and assistance to needy persons contingent on their need; e.g., cash assistance payments directly to needy persons under categorical and other welfare programs; vendor payments made directly to private purveyors for medical care, burials, and other services provided under welfare programs by welfare institutions. Services directly included under the category "Health" below are not included here.
12. Estimations of these equations for 1983 and 1984, and with UNION2, were also conducted but, because they show similar results, are not reported here.

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