

## **Empirical evidence on the publicness of state legislative activities\***

RANDALL G. HOLCOMBE  
RUSSELL S. SOBEL

*Department of Economics, Florida State University, Tallahassee, FL 32306-2045*

Accepted 25 March 1993

**Abstract.** Legislation would be a Samuelsonian public good if the cost of creating legislation is not a function of the number of people covered by the legislation. A straightforward test of Samuelsonian publicness is undertaken by estimating the cost of producing legislation as a function of population and other variables, using cross-sectional data from the states of the United States for the years 1965, 1975, and 1985. The empirical results indicate that while legislation does have some degree of publicness, legislation is mostly a private good, and that it has been becoming increasingly less public over time.

### **1. Introduction**

Legislative activity can be a public good, following the definition of Samuelson (1954, 1955), if the cost of passing a law is not a function of the number of people covered by the law. Samuelsonian publicness implies a straightforward empirical relationship between the population consuming the good and the cost of producing it. The Samuelsonian publicness of legislation would apply only to the passage of laws, not to their administration or enforcement, because a larger population will create larger administration and enforcement costs to implement the law. This paper is concerned only with the legislative costs involved in producing laws, not the costs of their implementation, and undertakes an empirical investigation of the publicness of legislative activities.<sup>1</sup>

Everyone benefits from living in a society where laws protect the rights of individuals and create an orderly environment in which individuals can interact. If all laws were of this type,<sup>2</sup> one would expect that the amount of legislation demanded would be no greater in large states than in small states, because laws passed to benefit one person provide benefits to everyone.<sup>3</sup> This is the Samuelsonian case, where the total demand for legislation is the vertical summation of individual demands. However, in addition to passing legislation for

\* The authors gratefully acknowledge the helpful comments of Bruce Benson, Tim Sass, and an anonymous referee of this journal.

everyone's benefit, legislatures also pass legislation with the intention of furthering the well-being of special interests.<sup>4</sup> Because special interest legislation does not benefit everyone, and may even harm some individuals, special interest legislation is not a public good.

The demand for a private good, of which special interest legislation is an example, will increase in proportion to population, creating a clear theoretical distinction between the public and private aspects of legislation. This theoretical distinction, based on Samuelson's public goods model, forms the basis of the model in the following section. One reason for working within Samuelson's framework is that the Samuelsonian public goods model has been used for decades as a justification for governmental production.<sup>5</sup> To what degree are legislative activities Samuelsonian public goods with general benefits as compared to private goods aimed at furthering the well-being of special interests? Using Samuelson's model of public goods as a foundation, this question can be addressed empirically.

## 2. The model

State legislative spending is determined in a political framework in which voters have demands for legislative output. Voters will compare their marginal tax prices with the marginal benefits of legislation in order to determine the amount of legislation they desire, following the extensive literature linking the demands of voters to the level of government output.<sup>6</sup> The decisive voter's utility function can be represented by

$$U_i = U_i(X_i, I_i) \tag{1}$$

where  $I_i$  is the quantity of legislative activities consumed by the decisive voter, and  $X_i$  is the amount of other goods consumed. Using  $L$  to represent the total amount of legislative activities produced,

$$I_i = N^{-\gamma}L \tag{2}$$

defines the relationship between the total amount produced and the amount consumed by individual  $i$ , where  $N$  represents the state population.<sup>7</sup> The value  $\gamma = 1$  implies that legislative activities are pure private goods, and  $\gamma = 0$  implies that legislative activities are pure public goods, in the Samuelsonian sense. A  $\gamma$  between 0 and 1 implies a quasi-public good, where a value closer to one indicates that legislative activities are relatively more private.

The decisive voter faces a budget constraint

$$Y_i = P_x X_i + T_i P_L L \quad (3)$$

where  $Y_i$  is the voter's disposable income,  $P_x$  is the price of other goods  $X$ ,  $T_i$  is the voter's tax share, and  $P_L$  is the price per unit of legislative activities.

Substituting from equation (2), the budget constraint can be rewritten as

$$Y_i = P_x X_i + T_i P_L I_i N^\gamma \quad (4)$$

which through optimization generates the demand equation

$$I_i = I_i(P_x, T_i, P_L, N, Y_i). \quad (5)$$

Assuming that  $P_x$  and  $P_L$  are the same across states, then representing differences in tastes across states as a vector  $A$ , and using a constant elasticity demand function produces

$$I_i = A(T_i N^\gamma)^\alpha Y_i^\lambda \quad (6)$$

Again substituting from equation (2) yields

$$L = A T_i^\alpha N^{\gamma(1+\alpha)} Y_i^\lambda \quad (7)$$

or

$$L = A T_i^\alpha N^\delta Y_i^\lambda \quad (8)$$

where  $\delta = \gamma(1 + \alpha)$ . The voter's demand equation in log form is

$$\ln L = \ln A + \alpha \ln T_i + \delta \ln N + \lambda \ln Y_i \quad (9)$$

The decisive voter's disposable income,  $Y_i$ , is calculated as

$$Y_i = Y_i^* + T_i G - F, \quad (10)$$

where  $Y_i^*$  is gross state median income,  $G$  is federal grants to the state in which the decisive voter lives,<sup>8</sup> and  $F$  is the voter's federal tax liability.<sup>9</sup>  $T_i G$  represents the voter's share of federal grants, which is calculated under the assumption that the voter's benefit share is the same as the voter's tax share. This will be a good approximation if federal funding acts as a substitute for state taxes.<sup>10</sup>  $T_i$  was calculated by taking the effective average tax rate on both income and sales taxes<sup>11</sup> multiplied by the median income to get the median state sales and income tax liability, and then dividing it by

Table 1. Estimates of the 1985 expenditure equations

Independent variable	Coefficient estimates	
Constant	- 19.424** (7.598)	- 15.643* (8.483)
Tax share (T)	- 0.26318*** (0.08545)	- 0.22558** (0.08698)
Population (N) in thousands	0.56954*** (0.1038)	0.44446*** (0.112)
$\gamma$	0.77297**	0.57393***
Income (Y)	1.4948** (0.5717)	1.0845* (0.6482)
DEN	0.064742 (0.07397)	0.054889 (0.08296)
AGE	1.2345 (1.370)	0.54728 (1.354)
NW	0.066301 (0.0778)	0.087772 (0.09004)
LOCAL	- 0.16284* (0.08961)	- 0.19069** (0.09187)
CPOP	- 0.097534 (0.0809)	- 0.066426 (0.0795)
MEMB		0.39611** (0.1916)
BILLS		- 0.0062405 (0.1147)
DAYS		0.14549 (0.1227)
SALARY		0.15961** (0.07131)
BI		0.036086 (0.1488)
R <sup>2</sup>	0.8469	0.8811
Adjusted R <sup>2</sup>	0.8171	0.8382
F-statistic	28.35632	20.52854

Notes. Standard errors are in parentheses and the asterisks indicate significance as follows: \*\*\* = 1%; \*\* = 5%; \* = 10%.

total state general sales and individual income tax revenue.

The variables included to reflect the differences in voter's preferences across states are population density (DEN); median state age (AGE); percent of population non-white (NW); the number of county and municipal governments per square mile of land area in the state (LOCAL), and the growth rate of state population (CPOP). This produces the empirical specification,

$$\ln L = \beta_1 + \beta_2 \ln T_i + \beta_3 \ln N + \beta_4 \ln Y_i + \beta_5 \ln DEN + \beta_6 \ln AGE \\ + \beta_7 \ln NW + \beta_8 \ln LOCAL + \beta_9 \text{CPOP} + \epsilon, \quad (11)$$

where  $\epsilon$  is the error term.

### 3. Model estimation

The model was estimated using state legislative data for 1965, 1975, and 1985, for all 50 states, and the data sources are listed in the Appendix. The model was estimated twice, once as above and once including additional variables to reflect the possibility of differing unit costs in the production of legislation across states. The variables added to account for possible cost differences are total legislative membership (MEMB),<sup>12</sup> total bills enacted during the current session (BILLS), length of the current legislative session in calendar days (DAYS), annual legislative salary (SALARY), and a dummy variable for states with biannual legislative sessions (BI). The quantity of legislative activity  $L$  is measured by total state spending on legislative activities, in thousands, and state population is in thousands. Note that  $L$  includes only the expenditures incurred to operate the legislature, such as legislative salaries, benefits, and per deims, the costs of legislative staffs, postage, phone, and other expenses directly associated with the legislature.  $L$  does not include the costs of any government agencies, the cost of implementing the legislation, any expenses of government programs, or any other costs not directly associated with the operation of a legislature.<sup>13</sup>  $L$  is the budget for the legislature only, and contains no other components of a state's budget.

Table 1 presents the results of the regressions for 1985, the results for 1975 are in Table 2, and for 1965 in Table 3. The measure of publicness,  $\gamma$ , was calculated as  $\gamma = \delta/(1 + \alpha) = \beta_3/(1 + \beta_2)$ . F-tests were performed to test whether  $\gamma$  was significantly different from one by testing the linear restriction  $H_0: \beta_2 - \beta_3 = -1$ . The significance level from this test is given with the estimated  $\gamma$ . The test of  $H_0: \gamma = 0$ , is given by  $H_0: \beta_3 = 0$ , which is the normal t-test of the significance of  $\beta_3$ .

These estimates indicate that 1985 legislative activities were somewhere between 57 and 77 percent private, and thus only 23 to 43 percent public. 1975

Table 2. Estimates of the 1975 expenditure equations

Independent variable	Coefficient estimates	
Constant	- 19.953*** (4.449)	- 19.677*** (4.300)
Tax share (T)	- 0.26636*** (0.1039)	- 0.29688*** (0.09158)
Population (N) in thousands	0.56054*** (0.1106)	0.32316*** (0.106)
$\gamma$	0.76405***	0.45961***
Income (Y)	1.7076*** (0.3629)	1.3719*** (0.3735)
DEN	- 0.035677 (0.05939)	- 0.024317 (0.05464)
AGE	0.97641 (0.8186)	0.67798 (0.6938)
NW	0.066020 (0.05601)	0.043763 (0.05704)
LOCAL	- 0.19662*** (0.06792)	- 0.19425*** (0.0603)
CPOP	- 0.065098 (0.06742)	- 0.024182 (0.05535)
MEMB		0.45332*** (0.1292)
BILLS		0.12935 (0.07931)
DAYS		0.061823 (0.08994)
SALARY		0.23016*** (0.06159)
BI		0.032439 (0.09156)
R <sup>2</sup>	0.8951	0.9407
Adjusted R <sup>2</sup>	0.8747	0.9193
F-statistic	43.75242	43.93518

Notes. Standard errors are in parentheses and the asterisks indicate significance as follows: \*\*\* = 1%; \*\* = 5%; \* = 10%.

Table 3. Estimates of the 1965 expenditure equations

Independent variable	Coefficient estimates	
Constant	-10.962** (5.16)	-12.564** (4.901)
Tax share (T)	-0.15365 (0.1317)	-0.24817** (0.1204)
Population (N) in thousands	0.54489*** (0.1546)	0.25577 (0.1624)
$\gamma$	0.643812***	0.34020***
Income (Y)	0.55890 (0.5038)	0.64865 (0.4932)
DEN	0.057050 (0.08326)	0.0068104 (0.08998)
AGE	1.6562 (1.157)	0.62349 (1.132)
NW	-0.00796 (0.0916)	-0.047596 (0.09488)
LOCAL	-0.25334** (0.1087)	-0.21725** (0.09705)
CPOP	-0.002488 (0.04483)	-0.025687 (0.04243)
MEMB		0.51406** (0.2364)
BILLS		0.15365 (0.1319)
DAYS		0.010382 (0.1488)
SALARY		0.31121*** (0.1068)
BI		-0.31241** (0.1567)
R <sup>2</sup>	0.6966	0.8015
Adjusted R <sup>2</sup>	0.6374	0.7298
F-statistic	11.76803	11.1795

Notes. Standard errors are in parentheses and the asterisks indicate significance as follows: \*\*\* = 1%; \*\* = 5%; \* = 10%.

legislative activities were somewhere between 46 and 76 percent private, and 1965 legislative activities were between 34 and 64 percent private. The estimates of  $\gamma$  are higher in the equations without the additional independent variables representing cost factors than they are in the equations without these variables. Within each specification, this number has steadily increased through time, suggesting that state legislatures have become more engaged in private activities over the 20 year period. The 1965 estimate of  $\gamma$  from the second equation is not even significantly different from zero, which would suggest that legislative activities in that year might have been pure public goods. These results indicate that the special interest model of government has been becoming more descriptive of actual legislative activities through time as government activities have become more private.

In addition, the estimates of the tax share elasticity are significant and negative, with magnitudes suggesting that the demand for legislative activities is price inelastic. The estimates of the income elasticity of demand are positive and significant, and are greater than one for the 1975 and 1985 regressions, suggesting that the demand for legislative activities is income elastic. This is an interesting result because many studies that estimate the income elasticity for other (mostly local) publicly provided goods find most public goods to be income inelastic.<sup>14</sup> However, the estimated income elasticity for 1965 was less than one, possibly implying that as state legislative activities have become more private, the income elasticity of demand has become more income sensitive. Because these other studies show the demand for public goods to be more income inelastic, the increasing income elasticity is another reason to believe that state legislative activities have become less public since 1965.

The coefficient estimates on LOCAL, the number of county and local governments per square mile of state land area, are all negative and significant. A possible Tiebout type reason is that if the activities of county and municipal governments are competitive products, legislatures that have to compete with more local governments will be forced by competitive pressures to lower their costs and thus have lower legislative expenditures. Alternatively, it may be the case that state legislatures with fewer local governments have higher legislative expenditures to compensate for the decision-making costs associated with goods and services that are produced by lower level governments in less centralized states. In all years, in the second equations, the variables for membership and salary are all significant and positive confirming a priori expectations that they would be directly related to costs and thus legislative expenditures.

#### 4. Conclusion

Following the Samuelsonian definition, a public good has the characteristic that the marginal cost of an additional consumer of the good is zero. Legisla-



tion would seem to be as close to a public good as one could find since once a law is passed, it costlessly covers as many people as are in the law's jurisdiction. This includes only the cost of passing the law, not the cost of implementing and enforcing it. A straightforward empirical implication is that after adjusting for the effects of group size on the average cost of legislation, the cost of legislation should not increase as the size of the group increases. An empirical investigation shows that this is not the case. Legislation is not a Samuelsonian public good.

If legislation fails this test, what government output could qualify as a public good in the Samuelsonian sense? The fact that the total cost of producing government output is an increasing function of population is obvious for most government output, and means that most government output does not fit the Samuelsonian definition of publicness. Legislation would seem to be one area in which this relationship between cost of production and population would not necessarily hold, but the empirical evidence shows that using Samuelson's definition, legislation is primarily a private good. The Samuelsonian public goods argument has been used for decades as a rationale for government activity, and if legislation is not a public good, there is reason to question the entire public goods rationale for government.<sup>15</sup>

The finding that legislation does not conform to the Samuelsonian definition of a public good fits within the special interest model of legislation which argues that legislatures tend to cater to special interests rather than pursuing the general public interest. In 1985, over half of state legislative activities were private goods in the Samuelsonian sense, and that over the past 20 years, state legislative activities have become more private. Special interest legislation has always been a part of American democracy, as Hughes (1977) and Holcombe (1992) note, but these results suggest that the special interest model of government has been becoming more descriptive of actual legislative activities in recent years.

## Notes

1. Of course, the passage of legislation has no value unless the legislation is enforced, so for legislation to be demanded, demanders must believe it will be enforced. However, enforcement costs are easily separated from the costs of producing laws, which is what is examined here.
2. The type of legislation that is a public good falls under the heading of what Hayek (1973) calls rules and order.
3. This statement must be qualified because the lower per capita cost of producing public goods for larger groups can result in an increase in the quantity demanded. This qualification is embodied in the empirical model developed below.
4. There is an extensive literature discussing the special interest theory of legislation. One of the first formulations of the interest group theory of legislation is McCormick and Tollison (1981). For other examples, see Weingast, Shepsle, and Johnsen (1981) and Holcombe (1985). Benson

- and Engen (1988) explicitly model the demand for special interest legislation.
5. See Samuelson (1964) for a comment which makes clear that he means for the mathematical conditions for optimality in public goods production to be interpreted literally, as well as a clear statement that Samuelsonian publicness is not a necessary condition for making public sector production optimal. For present purposes, the key point is that for the Samuelsonian public goods justification for government production to be applicable, the conditions for Samuelsonian publicness must be met, and this is the basis for the model in the following section.
  6. Inman (1978) notes that empirical evidence points toward the median income voter being decisive in majority rule politics. Barr and Davis (1966) and Davis and Hanes (1966) ran early empirical tests on this type of model, and Borcharding and Deacon (1972) and Bergstrom and Goodman (1973) used a similar framework for incorporating political demands into the demand for public goods.
  7. This model follows the outline of Deno and Mehay (1987), and is structured in a manner similar to many public choice models examining government expenditures, as described by Mueller (1989). Other examples include the articles cited in note 4 above.
  8. See Perkins (1977) and Borcharding and Deacon (1972) for a justification of using total federal grants to the state in the voter's state disposable income equation.
  9. The voter's federal tax liability was calculated by multiplying the median income by the average federal tax rate in the relevant bracket. Inman (1978) justifies using median data in voting models such as this.
  10. In theory, federal grants should act as a substitute for state revenues. See Gramlich (1968) and Wilde (1968) for discussions. Models such as Bradford and Oates (1971), Hamilton (1983), and Barnett, Levaggi, and Smith (1991) indicate that federal grants, whatever their form, do not simply substitute for state revenues, however.
  11. The average effective tax rate is taken directly from estimates in Feenberg and Rosen (1985). Their estimates are for 1977 and 1983. The 1977 figures were used in the 1975 regression and the 1983 figures were used in the 1985 regression. For 1965, the estimates were done two ways: using the 1977 figures and extrapolating to calculate 1965 figures.
  12. Upper plus lower house memberships are included, except in Nebraska, which is unicameral.
  13. There are other costs associated with legislative activity that are not included in  $L$ , such as the cost of lobbyists and other rent-seeking costs. Since  $L$  includes only the legislative costs involved in passing laws, it should be close to a public good if the resulting legislation is a public good.
  14. See, for examples, Bergstrom and Goodman (1973), Borcharding and Deacon (1972), and Deno and Mehay (1987). While most publicly provided goods, such as police and fire protection, seem to be income-inelastic, others, such as parks, appear to be income-elastic.
  15. The typical introductory textbook presentation still follows the outline developed by Bator (1958) to describe market failure. See, for example, Gwartney and Stroup (1992: 84–88) which follows Bator's (1958) taxonomy in discussing market failure. This introductory textbook takes a more critical look at the role of government than most, yet still uses the public goods argument as a key element in describing the role of government.

## References

- Barnett, R.R., Levaggi, R. and Smith P. (1991). Does the flypaper model stick? A test of the relative performance of the flypaper and conventional models of local government budgetary behavior. *Public Choice* 69(1) (February): 1–18.
- Barr, J.L. and Davis, O.A. (1966). An elementary political and economic theory of the expenditures of state and local governments. *Southern Economic Journal* 33 (October): 149–165.

- Bator, F.M. (1958). The anatomy of market failure. *Quarterly Journal of Economics* 72 (August): 351–379.
- Benson, B.L. and Engen, E.M. (1988). The market for laws: An economic analysis of legislation. *Southern Economic Journal* 54(3) (January): 732–745.
- Bergstrom, T.C. and Goodman, R. (1973). Private demand for public goods. *American Economic Review* 63 (June): 280–296.
- Borcherding, T.E. and Deacon, R.T. (1972). The demand for the services of non-federal governments. *American Economic Review* 62 (December): 891–901.
- Bradford, D.F. and Oates, W.E. (1971). The analysis of revenue sharing in a new approach to collective fiscal decisions. *Quarterly Journal of Economics* 85(3) (August): 416–439.
- Davis, O.A. and Hanes, G.H. (1966). A political approach to a theory of public expenditure: The case of municipalities. *National Tax Journal* 29(3) (September): 259–275.
- Deno, K.T. and Mehay, S.L. (1987). Municipal management structure and fiscal performance: Do city managers make a difference? *Southern Economic Journal* 53(3) (January): 627–642.
- Feenberg, D.R. and Rosen, H.S. (1985). State personal income and sales taxes: 1977–1983. NBER Working Paper Series, Working Paper No. 1631. National Bureau of Economic Research, Cambridge, MA.
- Gramlich, E.M. (1968). Alternative federal policies for stimulating state and local expenditures: A comparison of their effects. *National Tax Journal* 21(2) (June): 119–129.
- Gwartney, J.D. and Stroup, R.L. (1992). *Economics: Private and public choice*. Fort Worth: Dryden Press.
- Hamilton, B.W. (1983). The flypaper effect and other anomalies. *Journal of Public Economics* 22(3) (December): 347–361.
- Hayek, F.A. (1973). *Law, legislation, and liberty*, Vol. 1. Chicago: University of Chicago Press.
- Holcombe, R.G. (1985). *Public finance and the political process*. Carbondale: Southern Illinois University Press.
- Holcombe, R.G. (1992). The distributive model of government: Evidence from the Confederate Constitution. *Southern Economic Journal* 58(3) (January): 762–769.
- Hughes, J.R.T. (1977). *The governmental habit*. New York: Basic Books.
- Inman, R.P. (1978). Testing political economy's 'as if' assumption: Is the median income voter really decisive? *Public Choice* 33(4): 45–65.
- McCormick, R.E. and Tollison, R.D. (1981). *Politicians, legislation and the economy*. Boston: Martinus Nijhoff.
- Mueller, D.C. (1989). *Public choice II*. Cambridge: Cambridge University Press.
- Perkins, G. (1977). Demand for local public goods: Elasticities of demand for own price, cross prices, and income. *National Tax Journal* 30: 411–422.
- Samuelson, P.A. (1954). The pure theory of public expenditure. *Review of Economics and Statistics* 36 (November): 387–389.
- Samuelson, P.A. (1955). A diagrammatic exposition of a theory of public expenditure. *Review of Economics and Statistics* 37 (November): 350–356.
- Samuelson, P.A. (1964). Public goods and subscription TV: Correction of the record. *Journal of Law & Economics* 7 (October): 81–83.
- Weingast, B.R., Shepsle, K.A. and Johnsen, C. (1981). The political economy of benefits and costs: A neoclassical approach to distributive politics. *Journal of Political Economy* 89(4) (August): 642–664.
- Wilde, J.A. (1968). The expenditure effects of grant-in-aid programs. *National Tax Journal* 21(3) (September): 340–348.

## Appendix

### Variable definitions and data sources

Variable	Definition	Source
L	state legislative expenditures in thousands of dollars	A
Y	state median family disposable income in dollars	B,C
N, CPOP	state population in thousands, percent change over previous year	B
G	federal grants by state in dollars	B
F	federal tax liability at median state income in dollars	B
DEN	state population density per square mile of land area	B
AGE	state median age from the previous census	F
NW	percent of state population non-white	B
LOCAL	number of county and municipal governments per square mile of state land area	B
MEMB	upper house plus lower house state legislative membership	D
BILLS	total bills enacted in state legislative session	D
DAYS	calendar days in state legislative session	D
SALARY	annual state legislative salary in dollars	D
BI	dummy variable = 1 if biannual sessions	D
	average effective sales plus income tax rate by state, 1977 used for 1975 and 1965, and 1983 used for 1985	E
	tax revenue from general sales tax and individual income tax by state in dollars	B

#### Sources

A: *State Government Finances in . . .*, U.S. Bureau of the Census;

B: *Statistical Abstract of the U.S.*, U.S. Bureau of the Census;

C: *Economic Report of the President*;

D: *The Book of States*, The Council of State Governments;

E: Feenberg and Rosen (1985);

F: *Census of Population*, U.S. Bureau of the Census.