# Special Interest Group Formation in the US: Do Special Interest Groups Mirror the Success of their Spatial Neighbors?

Gregory Randolph
Southern New Hampshire University

and

Michael T. Tasto
Southern New Hampshire University

January 2011

**Abstract:** Special interest groups exert a great deal of influence over political outcomes in the U.S. Thus, understanding the determining factors for the formation of special interest groups is important. The literature, however, has excluded the role of spatial neighbors. This paper employs spatial econometric techniques to discriminately analyze the factors determining the number of special interest groups in a state. While geographic location is not a factor, gross state product, state general expenditures, and union membership relationships between states are crucial in the formation of special interest groups across states.

*Keywords*: Special Interest Groups; Spatial Analysis

*JEL Codes*: D73, P16, C21

*Communications to*: Gregory Randolph, Department of Finance and Economics, Southern New Hampshire University, 2500 North River Road, Manchester, NH 03104.

*E-mail*: grandolph@snhu.edu; *Phone*: (603) 668-2211 x3315

## 1 Introduction

Special interest groups play an extremely important role in the democratic process. They complement the electoral process by providing a means through which citizens and interested parties can communicate with elected officials and influence policy with more frequency and specificity. An abundance of research has examined the benefits and drawbacks of special interest group participation in the political process. Most of the previous literature can be divided into two distinct categories. One primary line of research centers on the collective action problem concerning the configuration of special interest groups while the other examines the operations and influence of special interest groups (Gray and Lowery, 1996).

As first noted by Olson (1965), special interest groups may be difficult to mobilize as the benefits of interest group activity often benefits members as well as non-members. Once a special interest group successfully overcomes the mobilization costs and organizes, it is likely that the special interest group will stay active. Additionally, Olson (1982) suggests that the number of special interest groups rises as time passes as long as the economic and political environments remain relatively stable over time. The second primary category of research concerning special interest groups provides an extensive analysis of the incentives facing special interest groups and politicians (Malbin, 1984; Mueller and Murrell, 1986; Hall and Wayman, 1990; Mitchell and Munger, 1991). If a special interest group can provide resources such as campaign funds and votes, politicians are willing to consider policies and offer resources that are beneficial to special interest groups. Therefore, special interest groups are likely to be attracted to states with a greater availability of resources.

While these studies offer a great deal of insight into the formation and function of special interest groups, it is important to examine the causes of growth and change of special interest group populations in order to understand the behavior and policy influence of special interest groups. Gray and Lowery (1996) develop a population ecology approach to estimate state special interest group populations in the U.S. in order to address this issue. Their study uses a unique data set consisting of the number of special interest groups by state in different time periods. Using this model, the authors identify the total economic activity within a state, the amount of total state government expenditures, and the overall stability of the political environment as the primary factors that impact the formation and sustainability of state special interest groups over time. Additionally, a subsequent analysis by Boehmke (2002) finds that the availability of the voter initiative process provides an additional avenue of influence and tends to increase the number of state special interest groups.

Previous studies, however, have excluded spatial relationships between states as a possible explanatory factor in the formation of interest groups. Once a special interest group successfully mobilizes and attains some success in one state, the group could seek to expand in other states that share similar characteristics. Additionally, individuals in these states could view the success of the special interest group and attempt to replicate their accomplishment. For example, consider a special interest group that overcomes mobilization costs and successfully forms in Florida. Since Florida shares a border with Georgia, the special interest group may face lower mobilization costs in that neighboring state. It is also possible that a special interest group may choose to mobilize in other states that have share similar economic characteristics rather than simply a geographic border. For example, once a special interest group in Florida forms, individuals in a state with a similar gross state product (such as Illinois) may be more likely to attempt to form a similar special interest group and attempt to achieve the success that the special interest group in Florida has attained.

A great deal of research in the social sciences has focused on spatial relationships in recent years. The exclusion of a significant spatial relationship in regression analysis can lead to biased estimates. The primary motivation behind these studies involves the common observation that close units tend to exhibit more similar traits than distant units (Huckfeldt, 1986, Vasquez, 1995, Berry and Berry, 1990). Darmofal (2006) notes that political science data are particularly prone to display spatial relationships as they involve the measurement of variables that occur at a specific location. When spatial autocorrelation is present, neighboring observations tend to exhibit similar traits. It is important to note that this spatial relationship may be caused by physical proximity to other observations or by other characteristics that are similar between observations.

The consideration of spatial relationships seems particularly important when examining the formation and continuation of special interest groups over time. This study examines several possible spatially dependent relationships between states in the U.S. The traditional definition of spatial dependence involves examining the geographic location of observations. In addition to geography, this paper also examines spatial relationships with gross state product, state general expenditures, and the number of union members in the state as additional spatially dependent relationships. The findings in this study suggest that some spatial relationships are, in fact, important explanatory factors in the formation of interest groups in states over time. This is the first paper to explicitly consider the impact of spatial relationships on special interest groups.

## 2 Data

This paper employs data from 1990, 1997, 1998, and 1999 for states in the U.S. Sources and brief explanations for all data can be found in the appendix. In order to explore the factors that influence interest group populations, this study examines the number of registered interest group organizations by U.S. state. The data for the dependent variable were constructed by Gray and Lowery (1996). This data set allows for an examination of the growth and change of special interest group populations over time. Descriptive statistics for the variables are presented in table 1.

[Table 1 about here]

Following Gray and Lowery's (1996) study of the population ecology of interest organizations, we include several independent variables that help to explain special interest group populations. Gross state product and gross state product squared are included as an indicator of total state economic activity. Gray and Lowery (1996) suggest that special interest groups vary according to total state economic activity. Boehmke (2002) finds that states with higher gross state product have more active special interest groups, although the marginal effect on special interest groups declines as GSP increases. Additionally, state general expenditures as a percentage of GSP is included as a measure of the proportion of the economic activity controlled by the government that is potentially available to special interest organizations. A number of studies suggest that a higher proportion of government expenditures may attract additional groups as politicians have more resources for special interest groups to acquire (Mueller and Murrel, 1986; Mitchell and Munger, 1991).

Several political variables are included to account for the political landscape of individual states. Olson (1982) and Gray and Lowery (1996) predict that the number of special interest groups are more likely to grow as the political climate is stable over time. Divided branch government is included by incorporating a dummy variable that takes the value of one if the governor is the opposite political party of a unified legislature. Another dummy variable is used to account for the availability of the voter initiative process in states. States in which the voter initiative process is available receive a value of one while states that lack the voter initiative process are the excluded group.[1] Boehmke (2002) finds that states in which the voter initiative process is available have significantly higher numbers of special interest groups, presumably because the voter initiative process affords special interest groups an additional avenue of influence over the state legislature.

Political ideology plays an important role in the outcome of legislation as legislators generally respond rationally to constituent ideology (Nelson and Silberberg, 1987; Tollison, 1988). A measure developed by Berry, Ringquist, Fording, and Hanson (1998) is used to examine the role of ideology in special interest group populations as state government ideology differs across states.[2] According to Tollison (1988), there are a number of economic incentives that influence the behavior of the state legislature, which may in turn impact special interest group activity within a given state. In order to help account for these incentives, an index developed by Squire (1992) and expanded by King (2000) is included in order to measure legislative professionalism.[3]

In order to assess the impact of institutional quality on the population of special interest groups, the state institutional score constructed by Karabegovic and McMahon (2005) is included as an independent variable.[4] Sobel (2008) finds that states with lower institutional scores (i.e. states with weaker institutions) have significantly higher numbers of special interest groups. Several other variables are included to account for other important differences between states. State population and the state population of citizens over the age of 65 are included as larger states and states with a greater number of older citizens may be more likely to have higher special interest group activity. The number of individuals that belong to unions is also included as union workers may be more likely to be represented by a special interest group.

## 3 Empirical Model

Until now, the analysis of special interest groups has excluded spatial econometric techniques that might establish a possible spatial relationship in the formation of special interest groups (Gray and Lowery, 1996; Boehmke, 2002). Previous research tests various models attempting to find the factors that determine the number of special interest groups using ordinary least squares (OLS). The OLS model enforces the assumptions of no spatial interdependence (spatial lag) or spatial correlation (spatial error). Under these assumptions, we have the following model to estimate:

$$Y = XB + u \tag{1}$$

where $Y$ is an $nT$ x 1 dependent variable vector, measuring the number of special interest groups in a state. The number of states is $n$ and the number of years is $T$. The matrix $X$ is an $nT$ x $k$ matrix of exogenous variables defined in the previous section.

The OLS estimates of (1) provide a benchmark for the spatial model that follows and a comparison to the standing results from the literature. The next step in our empirical model tests whether there is a relevant spatial component, unaccounted for in (1).

Spatial interdependence enters the empirical model in the conditional mean of each state's reaction function. Edmiston and Turnbull (2007) derive these reaction functions

$$y_{it} = \lambda \sum_{j \neq i} W_{ij} y_{jt} + XB + u \tag{2}$$

where, $W$, is a spatial weight matrix defining each state's neighbors. In matrix form, the reaction functions are $Y_i = f(Y_j, X)$. Allowing for spatial interdependence and correlation in (1) yields

$$\underset{nT\,x\,1}{Y_i} = \lambda \underset{nT\,x\,nT}{W} \underset{nT\,x\,1}{Y_j} + \underset{nT\,x\,k}{XB} + \underset{nT\,x\,1}{u}; \qquad \underset{nT\,x\,1}{u} = \rho \underset{nT\,x\,nT}{W} \underset{nT\,x\,1}{u} + \underset{nT\,x\,1}{\varepsilon}, \tag{3}$$

where $\varepsilon$ is a vector of innovations assumed to be i.i.d. The known weighting matrix, *W*, has zeros across the diagonals and the row sums are standardized to equal one. The coefficient of spatial interdependence, $\lambda$, measures the interdependence between the numbers of special interest groups among states. Likewise, $\rho$ is the coefficient of spatial correlation, which measures the correlation between unobserved or unmeasured characteristics. Rearrange (3) to find:

$$Y = XB(I - \lambda W)^{-1} + u(I - \lambda W)^{-1}; \qquad u = (I - \rho W)^{-1}\varepsilon, \tag{4}$$

which is our estimating equation.

The interdependence effect, $\lambda$, is the primary interest in this paper. If there is a significant interdependence effect this would imply that the number of special interest groups in one state is dependent upon the number of special interest groups in another state. This reaction by special interest groups could be viewed as a group of people observing the success of a formed special interest group in one state and then reacting to this success by forming a registered special interest group in their own state. Thus, the success by a neighboring states' special interest group might have an effect to increase the number of special interest groups in other states. Which state's special interest groups identify themselves with, or who their neighbors are – is unclear, that is the role of the spatial weight matrix.

Defining states as neighbors in (2) and (3) requires the use of a spatial weighting matrix. This weight matrix conveniently allows alternative interpretations in defining which states are neighbors. One way to define neighbors is in terms of geographic distance, while another way to determine neighbors is whether a state shares a similar economic characteristic.

This paper tests four alternative weight matrix specifications. The three alternative economic measures are gross state product (GSP), general expenditures (Gen Exp), and the amount of union workers in a state (UNION). The geographical measure of distance is based on contiguity, where a state's neighbors are those that share a physical border. Following the Case, Hines, and Rosen (1993)[5] method for constructing the weight matrix, the elements of *W* are defined as:

$$
\begin{aligned}
&w_{ii} = 0 \text{ and} \\
&w_{ij} = 1 / |\overline{\text{dmeasure}}_i - \overline{\text{dmeasure}}_j| / S_i ; \qquad (5) \\
&S_i = \sum 1 / |\overline{\text{dmeasure}}_i - \overline{\text{dmeasure}}_j|
\end{aligned}
$$

where $\overline{\text{dmeasure}}$ is the sample period mean.

The rationale for testing alternative weight matrix specifications lies within the problem of defining one's neighbors, because it might not be perfectly clear how special interest groups in one state actually identify their neighbors. The task in determining neighbors is a common issue in spatial models, and is an empirical question. We look to theory to help provide rationales for why the number of special interest groups in one state might be interdependent with the number of special interest groups in another; in this case and many others, theory does not provide a strong argument for how this interdependence may occur. If the a priori defined neighbors were misspecified, then we would not expect to find the number of special interest groups among states interdependent, because the test for interdependence incorrectly assumes which states are neighbors of one another. Therefore, testing to determine whether the number of special interest groups in one state is interdependent with another state is essentially a joint test of whether these neighbors are interdependent and whether the neighbors are correctly specified. Researchers cannot test whether the weight matrix specification is the correct specification, and this is why we test alternatives.

The first weight matrix specification we test is geographical contiguity. This is a conceptually less challenging specification in identifying neighbors. The contiguity weight matrix specification is a very common measure (Case, Hines, and Rosen, 1993; Boarnet and Glazer, 2002; Conway and Rork, 2004; Fletcher and Murray, 2006; Rork and Wagner, 2008; and Edmiston and Turnbull, 2007). Under this specification, special interest groups in Florida identify themselves with two neighbors, Georgia and Alabama; while special interest groups in Georgia identify with four neighbors: Florida, Alabama, Tennessee, and South Carolina.

The first economic variable that we use for an alternative weight matrix specification is gross state product (GSP). Perhaps special interest groups associate themselves with special interest groups in other states that have a similar economic base or size of their economy. For example, the average GSP for Massachusetts is $217.356 billion and the average GSP for North Carolina is $218.679 billion, which makes them close neighbors of one another. However, New Hampshire’s average GSP is only $34.9 billion indicating that New Hampshire and Massachusetts are not close neighbors under this economic specification. However, special interest groups may identify their neighbors in other ways as well.

Another economic variable that we try is related to the size of the state’s government. We use the state government’s general expenditures as a possible way in which special interest groups identify their neighbors. In our sample, South Carolina and Kentucky have a very similar average size of government; South Carolina’s average general expenditures is $14.812 billion while Kentucky’s average general expenditures is $14.799 billion – this implies they are very close neighbors. On the other hand, New York and South Dakota are not as New York’s average general expenditures is $97.242 billion while South Dakota’s average general expenditures is $2.402 billion, suggesting they are not close neighbors.

Our final alternative weight matrix specification allows for the possibility that special interest groups identify their neighbors by the amount of union membership in a state. Perhaps special interest groups identify themselves with other states that have similar labor market characteristics. This would imply that states with a similar amount of union membership view one another as neighbors. In our sample, Wyoming and South Dakota are close neighbors because their average number of union workers is 22,000; as well are Massachusetts and Wisconsin with an average number of union workers 463,000 and 465,000, respectively.

To conclude this section, we emphasize that the main topic of interest in this paper is the spatial interdependence effect ($\lambda$). Allowing for spatial correlation, ($\rho$), in the empirical model is important, because excluding this parameter, when $\rho \neq 0$, leads to invalid test statistics for the parameter estimates, including spatial interdependence; thus, spatial correlation is essentially a nuisance parameter. The methodology used here employs 2SLS (two-staged least squares) and GS2SLS–GMM (generalized two-staged least squares – generalized method of moments) estimation. Differences between these models have important consequences for statistical inference. If there is no spatial interdependence in the conditional mean or spatial correlation in the error structure, OLS is the best linear unbiased estimator. In the case where spatial correlation does exist, the OLS estimates will be unbiased but not efficient. The GMM correction for the error structure is efficient when there is spatial correlation. If spatial interdependence is significant, this implies the OLS estimates from (1) are biased.

## 4 Results

Our findings in the ordinary least squares regression are consistent with those found in Gray and Lowery, which we performed as a consistency check. The spatial analysis for special interest groups is the key contribution of this paper. Four separate measures of spatial relationships are examined. Our results find that alternative spatial relationships are in fact important in the determination of special interest groups.

Our first examination of spatial interdependence involves an examination of contiguity among states in the U.S. We find that special interest groups are not influenced by geographic neighbors as the coefficient on $\lambda$ in table 2 is not significant. Somewhat surprisingly, it seems that interest groups do not necessarily look to migrate to their geographic neighboring states.

[Table 2 about here]

However, it does appear that a spatial relationship exists between states with similar gross state product. Our results in table 3 show that special interest groups will increase by 2.9 groups for every 10 groups that a neighbor has when the spatial relationship is defined by gross state product. This implies that special interest groups may look to other states with similar gross state product as the state in which they start a new organization.

[Table 3 about here]

The spatial effect is also very strong, again at the 1% confidence level, when using state general expenditures to define neighbors. The magnitude of the effect in table 4 is slightly smaller at 2.2 groups per 10 groups in the neighboring state, compared to the 2.9 groups with GSP; nonetheless, this is another economic spatial relationship that is confirmed to be positive and significant, compared to the common geographic measure that was insignificant. This means that special interest groups also look to neighboring states with similar state general expenditures to form new groups.

[Table 4 about here]

The final measure that we test for a spatial relationship is the number of union workers in a state. Table 5 reports the interdependence effect of special interest groups and neighboring states with similar numbers of union workers to be positive and significant at the 1% confidence level. The magnitude of the interdependence is close to the previous two tests, a $\lambda$ of .18 or 1.8 groups per 10 groups in the neighboring states. The result here indicates that special interest groups also look to other states that have similar labor market characteristics, in terms of their union membership. Combining this evidence with the other three spatial measures reveals that the formation of special interest groups does depend on the success of spatially neighboring states, and these neighbors are defined in terms of similar economic characteristics, rather than geography. Table 6 reports a summary of the interdependence effects between special interest groups and the different measures of neighbors.

[Table 5 about here]

After finding significant spatial effects in the GS2SLS-GMM regressions, this leads to the conclusion that the original estimates in the OLS regression are biased. Thus the focus of the discussion for the independent variables will look at only the GS2SLS-GMM results from tables 2, 3, 4, and 5.

[Table 6 about here]

Our analysis concurs with the results from Boehmke (2002) – indicating that states with more economic activity, measured by gross state product, are more likely to have special interest groups form and thrive where more economic and political resources available. This effect is positive and significant near the 10% level for three of the four spatial models. The evidence is inconclusive regarding the marginal effect of GSP, using the variable GSP squared. Interestingly, however, the amount of spending as a portion of GSP suggests the opposite. The variable GE/GSP is negative and highly significant at 1% across all four spatial models. This means that as states increase their proportion of spending – less special interest groups will form.

Some have suggested that a stable political environment will foster more special interest groups, to test this determinant we use the variable divided government. Our results for this effect, however, are insignificant. Another political variable we use is the availability of the voter initiative process available at the state level. Our a priori expectation is confirmed by the positive and highly significant results above the 1% confidence level for all four spatial models. This suggests that the voter initiative process can be a helpful tool for special interest groups, which increases the likelihood of a group forming in a state where this is available. The remaining political variables we include such as the ideology of a state and the legislative professionalism are insignificant in our sample.

We include population as a demographic variable, which will control for different sized states; this variable is insignificant and does not appear to affect the number of special interest groups in a state. On the contrary, the amount of population greater than 65 years of age does have an impact on the number of special interest groups. This determinant is positive and highly significant above the 1% confidence level across all four spatial models. This may not be surprising, as senior citizens are much more engaged in the political landscape and have enormous lobbying groups.

The final two independent variables we include in the analysis controls for the effects that unions and institutions may have on determining the number of special interest groups in a state. Our union variable is negative and significant at the 1% confidence level across all four spatial models. This seems contrary to our hypothesis that a state with more union membership would appear to be better organized and thus more adept to lobbying the government for their own special interests – thereby increasing the number of special interest groups in a state. Our institution variable is negative and nearly significant at the 5% level for the four spatial models, which has a more intuitive explanation. In fact, our estimates are consistent with Sobel (2008) where he also finds that states with lower institutional scores in place have more special interest groups. Without having institutions in place to adequately handle the bargaining and lobbying of government officials, it seems plausible that special interest groups appear more frequently, because it is easier for a special interest group to influence the political process.

## 5 Conclusion

Understanding how special interest groups form in the U.S. is an important issue. This paper provides evidence that the literature is missing an important element of the equation in determining why special interest groups form where they do. Until now, the spatial aspect of special interest group formation has been overlooked. This paper employs a GS2SLS-GMM estimation technique to discretely analyze the spatial interdependence of special interest groups. The findings are surprising and overwhelmingly robust. The results indicate that geographic relationships do not play a significant role in the formation of special interest groups. This means that special interest groups in one state do not look to the success of their geographically neighboring states. On the other hand, the economic variables defining neighbors do show a strong interdependence in special interest group formation. The three alternative specifications of neighbors show a consistent positive and significant effect, indicating that special interest groups look at the success of one of their economically similar neighbors and then react by forming a special interest group in their own state. The magnitude of this reaction by special interest groups varies from 18-29% and is highly significant across the specifications.

The new model of special interest group formation presented in this paper highlights the importance of including spatial analysis. Excluding this aspect can have serious consequences on statistical inference. Understanding how special interest groups form has important implications for state governments, since they can now anticipate similar special interest groups forming in their own state once a group has obtained success in a economically similar state. This finding is particularly important, since special interest groups have clearly demonstrated their ability to affect policy outcomes at the state level. In addition, the results presented here provide evidence that a successful special interest group in one state can expand by focusing their efforts in states that have similar economic characteristics, rather than a geographic border. A line of future research that would be interesting and useful to this literature could focus on case studies of specific special interest groups, possibly following them from formation over a period of time, and observing their natural expansion in multiple states in the U.S.

## References

Berry, Frances Stokes, and William D. Berry. 1990. State Lottery Adoptions as Policy Innovations: An Event History Analysis. *American Political Science Review* 84 (2): 395-415.

Berry, William D., Evan J. Ringquist, Richard C. Fording, and Russell L. Hanson. 1998. Measuring Citizen and Government Ideology in the American States, 1960 – 93. *American Journal of Political Science* 42 (1), 327–348.

Berry, William D., Evan J. Ringquist, Richard C. Fording, and Russell L. Hanson. *State Citizen and Government Ideology* [Online], (cited June 1, 2010). Available from: <http://www.uky.edu/~rford/stateideology.htm>.

Boarnet, M. G., and Glazer, A. 2002. Federal Grants and Yardstick Competition. *Journal of Urban Economics* 52: 53-64.

Boehmke, Frederick J. 2002. The Effect of Direct Democracy on the Size and Diversity of State Interest Group Populations. *The Journal of Politics* 64: 827-844.

Case, A. C., Hines, J. R. J., and Rosen, H. S. 1993. Budget Spillovers and Fiscal Policy Interdependence. *Journal of Public Economics* 52: 285-307.

Conway, K. S., and Rork, J. C. 2004. Diagnosis Murder: The Death of State Death Taxes. *Economic Inquiry* 42(4): 537-559.

Darmofal, David. 2006. Spatial Econometrics and Political Science. Working Paper. University of South Carolina.

Edmiston, K. D., and Turnbull, G. K. 2007. Local Government Competition for Economic Development. Working Paper. AYSPS. Georgia State University.

Fletcher, J. M., and Murray, M. N. 2006. Competition over the Tax Base in the State Sales Tax. *Public Finance Review* 34(3): 258-281.

Gray, Virginia and David Lowery. 1996. *The Population Ecology of Interest Representation*. Ann Arbor: The University of Michigan Press.

Hall, Richard D. and Frank W. Wayman. 1990. Buying Time: Moneyed Interests and the Mobilization of Bias in Congressional Committees. *American Political Science Review* 84: 797–820.

Huckfeldt, Robert. 1986. *Politics in Context: Assimilation and Conflict in Urban Neighborhoods*. New York: Agathon Press.

Karabegovic, A., McMahon, F., 2005. *Economic Freedom of North America: Annual Report*. The Frasier Institute, Vancouver.

King, James D. 2000. Changes in Professionalism in U.S. State Legislatures. *Legislative Studies Quarterly* 25: 327–343.

Malbin, Michael J. 1984. *Money and Politics in the United States*. Chatham, NJ: Chatham House.

Matsusaka, John G. 2004. *For the Many or the Few: The Initiative, Public Policy, and American Democracy.* Chicago. University of Chicago Press.

Mitchell, William C. and Michael Munger. 1991. Economic Models of Interest Groups: An Introductory Survey. *American Journal of Political* Science 35 (May): 512–546.

Mueller, Dennis G. and Peter Murrell. 1986. Interest Groups and the Size of Government. *Public Choice* 48 (2): 125–145.

Nelson, Douglas and Eugene Silberberg. 1987. Ideology and Legislator Shirking. *Economic Inquiry*. 25 (1): 15–25.

Olson, Mancur Jr. 1965. *The Logic of Collective Action*. Cambridge: Harvard University Press.

Olson, Mancur Jr. 1982. *The Rise and Decline of Nations*. New Haven, CT: Yale University Press.

Rork, J. C., and Wagner, G. A. 2008. Do regions matter in interjurisdictional competition? Evidence from state taxation. *Economic Letters* 101 (2): 116 – 118.

Sobel, Russell S. 2008. Testing Baumol: Institutional Quality and the Productivity of Entrepreneurship. *Journal of Business Venturing* 23: 641–655.

Squire, Peverill. 1992. “Legislative Professionalism and Membership Diversity in State Legislatures.” *Legislative Studies Quarterly*. XVII: 69–79.

Tollison, Robert D. 1988. Public Choice and Legislation. *Virginia Law Review* 74 (March): 339–71.

Vasquez, John A. 1995. “Why Do Neighbors Fight? Proximity, Interaction, or Territoriality.” *Journal of Peace Research* 32(3): 277-293.

Table 1: Descriptive Statistics

| | Mean | Min | Max |
|---|---|---|---|
| Spec. Interest | 712.60 | 72.00 | 2,969.00 |
| GSP | $ 196,986.70 | $ 11,480.00 | $ 1,502,796.60 |
| GSPSQ | $ 9.38E+10 | $ 1.32E+08 | $ 2.26E+12 |
| GE/GSP | 0.12 | 0.07 | 0.18 |
| Divided Gov. | 0.59 | 0 | 1 |
| Voter Init. | 0.45 | 0 | 1 |
| Ideology | 45.55 | 2.50 | 97.92 |
| LP | 0.26 | 0.06 | 0.09 |
| Pop | 5,469.75 | 454.00 | 33,145.00 |
| Pop65 | 693.95 | 47.00 | 3,648.00 |
| Union | 349.13 | 19.00 | 2,624.00 |
| State Inst. | 6.71 | 5.1 | 8.3 |
| D1997 | 0.25 | 0 | 1 |
| D1998 | 0.25 | 0 | 1 |
| D1999 | 0.25 | 0 | 1 |

$'s in 1,000's

Table 2: Special Interest Groups with Contiguity for Weight Matrix

| | OLS | OLS | GS2SLS-GMM | GS2SLS-GMM |
|---|---|---|---|---|
| | Coef. | t | Coef. | t |
| constant | 1423.91 | 2.92 | 1440.51 | 3.12 |
| GSP | 1.30E-03 | 2.82 | 1.36E-03 | 3.03 |
| GSPSQ | -5.00E-10 | -2.54 | -5.33E-10 | -2.80 |
| GE/GSP | -3982.89 | -3.04 | -4073.32 | -3.28 |
| Divided Gov. | 55.57 | 1.62 | 52.98 | 1.61 |
| Voter Init. | 114.46 | 3.12 | 122.53 | 3.18 |
| Ideology | 0.62 | 0.87 | 0.60 | 0.87 |
| LP | -135.13 | -0.46 | -114.92 | -0.40 |
| Pop | 0.00 | -0.16 | 0.00 | -0.11 |
| Pop65 | 0.52 | 4.71 | 0.50 | 4.71 |
| Union | -0.33 | -3.16 | -0.35 | -3.44 |
| State Inst. | -112.86 | -2.20 | -119.98 | -2.41 |
| D1997 | -17.06 | -0.29 | -32.16 | -0.51 |
| D1998 | -11.07 | -0.18 | -31.16 | -0.47 |
| D1999 | -9.39 | -0.14 | -24.92 | -0.36 |
| Lambda | | | 0.07 | 0.62 |
| Rho | | | 0.02 | |
| # of obs | 192 | | 192 | |
| R Sqr | 0.79 | | | |

Table 3: Special Interest Groups with GSP for Weight Matrix

| | GS2SLS-GMM Coef. | GS2SLS-GMM t |
|---|---|---|
| constant | 1108.53 | 2.22 |
| GSP | 1.17E-04 | 0.16 |
| GSPSQ | 1.26E-10 | 0.36 |
| GE/GSP | -3265.73 | -2.48 |
| Divided Gov. | 52.34 | 1.49 |
| Voter Init. | 127.01 | 3.40 |
| Ideology | 0.70 | 0.95 |
| LP | 123.18 | 0.40 |
| Pop | 0.03 | 1.40 |
| Pop65 | 0.36 | 2.96 |
| Union | -0.47 | -4.16 |
| State Inst. | -100.01 | -1.94 |
| D1997 | 6.00 | 0.09 |
| D1998 | 12.08 | 0.17 |
| D1999 | 22.87 | 0.31 |
| Lambda | 0.29 | 2.40 |
| Rho | 0.06 | |
| # of obs | 192 | |

Table 4: Special Interest Groups with Gen Exp for Weight Matri

| | GS2SLS-GMM | GS2SLS-GMM |
|---|---|---|
| | Coef. | t |
| constant | 1318.22 | 2.86 |
| GSP | 7.51E-04 | 1.61 |
| GSPSQ | 1.49E-11 | 0.06 |
| GE/GSP | -3917.25 | -3.19 |
| Divided Gov. | 57.68 | 1.75 |
| Voter Init. | 107.34 | 3.05 |
| Ideology | 0.72 | 1.04 |
| LP | -148.62 | -0.53 |
| Pop | -0.01 | -0.32 |
| Pop65 | 0.49 | 4.63 |
| Union | -0.29 | -2.80 |
| State Inst. | -107.51 | -2.21 |
| D1997 | -8.81 | -0.16 |
| D1998 | -8.84 | -0.15 |
| D1999 | -4.95 | -0.08 |
| Lambda | 0.22 | 3.34 |
| Rho | -0.01 | |
| # of obs | 192 | |

Table 5: Special Interest Groups with Union for Weight Matrix

| | GS2SLS-GMM Coef. | GS2SLS-GMM t |
|---|---|---|
| constant | 1205.96 | 2.64 |
| GSP | 9.94E-04 | 2.32 |
| GSPSQ | -2.01E-10 | -1.00 |
| GE/GSP | -3410.15 | -2.79 |
| Divided Gov. | 41.12 | 1.27 |
| Voter Init. | 102.31 | 2.93 |
| Ideology | 0.26 | 0.38 |
| LP | -33.40 | -0.12 |
| Pop | -0.01 | -0.46 |
| Pop65 | 0.54 | 5.26 |
| Union | -0.34 | -3.40 |
| State Inst. | -98.11 | -2.05 |
| D1997 | -24.47 | -0.46 |
| D1998 | -22.99 | -0.42 |
| D1999 | -21.87 | -0.38 |
| Lambda | 0.18 | 3.56 |
| Rho | -0.07 | |
| # of obs | 192 | |

Table 6: Summary table of spatial effects

| | Contiguity | GSP | Exp | Union |
|---|---|---|---|---|
| Number of Registered Interest Organizations | 0.07 (0.62) | 0.29 (2.40) | 0.22 (3.34) | 0.18 (3.56) |

## Appendix

**Data sources and variable definitions.**

| Variable | Definition | Source |
|---|---|---|
| NRIO | Number of registered interest organizations | A |
| GSP | Gross State Product | B |
| GSPSQ | Gross State Product Squared | B |
| GE/GSP | General Government Expenditures/Gross State Product | B |
| DivideG | = 1 if control of state legislative chambers is split by parties | C |
| VoterI | = 1 if the voter initiative process is available in the state | D |
| Ideology | = 0 – 100; higher scores indicating a more liberal government. | E |
| LP | = 0 – 1, higher scores indicate a more professional legislature | F |
| POP | State population | B |
| POP65 | State population over 65 | B |
| Union | State union membership (number of individuals) | B |
| State Inst. | = 1-10, with institutional quality increasing as the score rises | G |

Sources:
A: Gray and Lowery (1996)
B: Statistical Abstract of the U.S., U.S. Census Bureau
C: U.S. Census Bureau
D: Initiative and Referendum Institute
E: Berry et al. (2009)
F: King (2000)
G: Karabegovic and McMahon (2005)

**This section is not for publication, but for a referee's reference.**

## 3a Empirical Model

To allow for spatial interdependence and correlation in the conditional mean of (4) we substitute for $u$, where the structural model for *Y,* assuming first–order processes is now:

$$Y = XB(I-\lambda W)^{-1} + \varepsilon(I-\rho W)^{-1}(I-\lambda W)^{-1}. \qquad \text{(i)}$$

The expected value and variance of *Y* is

$$E(Y|X,W) = XB(I-\lambda W)^{-1} \qquad \text{(ii)}$$

$$Var\,Y = \sigma_\varepsilon^2[(I-\lambda W)^{-1}(I-\rho W)^{-1}(I-\rho W')^{-1}(I-\lambda W')^{-1}]. \qquad \text{(iii)}$$

From (3), it is clear that the number of special interest groups in other states, $Y_j$, is endogenous in the model. This is purged using a set of instrumental variables, suggested by Kelejian and Prucha (1998), which approximate the ideal instruments. Since, the dependent variable is a function of the exogenous variables and the beta coefficients are nonzero, multiplying *X* and $X_2$ ($X_2$ is a subset of *X*) by the weight matrix creates transformations of the X's to identify the endogenous spending ($Y_j$) on the right–hand side (RHS). These instruments are valid as long as one of the beta coefficients on the *X*'s are nonzero. They are the *p* linearly independent columns of $H = (X, WX, WX_2)$ and *H* overidentifies endogenenous states' spending ($Y_j$).

The 2SLS estimation only considers the endogeneity of $Y_j$ on the RHS of (3) and the standard errors calculated here assume that $\rho = 0$ (no spatial correlation), meaning $E[u_i u_j']_{\forall i \neq j} = 0$. If $\rho \neq 0$, the 2SLS estimates are consistent but inefficient because $E[u_i u_j']_{\forall i \neq j} = \Omega$, where $\Omega$ is not diagonal:

$$\Omega = \sigma_\varepsilon^2[(I-\rho W)^{-1}(I-\rho W')^{-1}]. \qquad \text{(iv)}$$

If there is spatial correlation in (3), we need a consistent estimate of the unknown spatial correlation parameter ( $\hat{\rho}$ ) and the variance–covariance matrix ( $\hat{\sigma}_{\varepsilon}^{2}$ ) from (iv). Inconsistent estimates of the variance–covariance matrix can yield invalid test statistics for the *B* parameters and the spatial interdependence parameter $\lambda$. Kelejian and Prucha (1998) suggest a generalized method of moments (GMM) estimator to find a consistent estimate of $\hat{\rho}$ and $\hat{\sigma}_{\varepsilon}^{2}$ . This method allows for a general error structure assuming only that ε is i.i.d. The GMM estimator is based on the moment condition E*(H'u)* = 0 and the *p* sample moments that are averaged over *n* and *T*; algebraically this is $\sum_{i=1}^{n}\sum_{t=1}^{T} H'_{ti} u_{ti} / nT$ .

Kelejian and Prucha (1998) suggest estimating the parameters of interest, *B* and $\lambda$, using a three–step procedure. The first step estimates (3) by 2SLS. In the second step, obtain the residuals and estimate the unknown spatial correlation parameter $\rho$ and variance–covariance matrix $\sigma_{\varepsilon}^{2}$ using GMM. The third step, re-estimates (3) by 2SLS, after a GLS type transformation that utilizes the consistent and efficient variance–covariance matrix $\hat{\sigma}_{\varepsilon}^{2}$ that allows for spatial correlation. Therefore, the GS2SLS–GMM estimator used here is

$$\hat{\delta} = [\hat{Z}^{*}(\hat{\rho})'\hat{Z}^{*}(\hat{\rho})]^{-1}\hat{Z}^{*}(\hat{\rho})'Y^{*}(\hat{\rho}), \tag{v}$$

where

$$\hat{\delta} = \begin{pmatrix} \hat{B}' \\ \hat{\lambda} \end{pmatrix}, \quad Z = (X, WY), \quad \hat{Z}^{*}(\hat{\rho}) = P_H Z^{*}(\hat{\rho}), \quad P_H = H(H'H)^{-1}H', \tag{vi}$$
$$Z^{*}(\hat{\rho}) = (Z - \hat{\rho}WZ), \quad Y^{*}(\hat{\rho}) = (Y - \hat{\rho}WY)$$

and $\hat{\rho}$ is a consistent estimator for $\rho$ obtained by GMM. Unfortunately, Kelejian and Prucha (1998) do not provide an analytic expression for the variance–covariance matrix of $\rho$. With this unknown, it is not possible to provide a test statistic for $\rho$ [6].

Typically, researchers assume that the error process in spatial models follows a Cliff and Ord (1981) type first–order process and estimate (i). McGarvey, Walker, and Turnbull (2007), however, remain agnostic about the error structure and allow an even more general error process to occur. This paper is somewhat more restrictive, as it assumes a first-order error process.

**Additional References (not included in the original reference page)**

Cliff, A., and Ord, J. 1981. *Spatial Processes, Models and Applications*. Pion: London.

Kelejian, H. H., and Prucha, I. R. 1998. A Generalized Spatial Two Stage Least Squares Procedure for Estimating a Spatial Autoregressive Model with Autoregressive Disturbances. *Journal of Real Estate Finance and Economics* 17(1): 99-121.

McGarvey, M. G., Walker, M.B., and Turnbull, G. K. 2007. GMM Estimation of Fiscal Policy Interdependence Across States. Working Paper. AYSPS, Georgia State University.

Endnotes

[1] Wyoming is not included as a voter initiative state because it has an extremely high signature requirement at 15%. Illinois is not included as a voter initiative state because it is the only state in which a proposal can only be used to alter the organization of the state legislature. This follows the logic of Matsusaka (2004). The exclusion of Wyoming and Illinois does not significantly alter the results.

[2] Berry et al. (1998) construct an index of state government ideology by examining the division of the state legislature, the party of the governor, the outcomes of congressional elections, roll call for the state congress, and other assumptions about state politicians. This analysis uses the revised 1960-2006 citizen ideology series. It is available through the web site listed in the references. The index ranges from 0 – 100, with higher scores indicating a more liberal government.

[3] Squire (1992) constructs a state index of legislative professionalism based on the length of the legislative session, the salary of legislators, and the staff size. King (2000) updates the index to account for other legislative expenditures.

[4] Karabegovic and McMahon (2005) compose an index that rates states on a scale from one to ten regarding institutional quality. Institutional quality increases as score rises. The index is based on the size of government, discriminatory taxation and government takings, and labor market freedom.

[5] Their preferred model specification uses percent black as an economic distance measure.

[6] The standard errors can be calculated by performing a Monte Carlo simulation or using a bootstrap method, but that is not performed here. Obtaining the standard errors to determine the level of significance on the spatial error parameter is not essential, as it is a nuisance parameter. However, it is important that the analysis allows for possible spatial correlation so that the spatial interdependence estimates remain valid.