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# Are legislators ideologues or the agents of constituents?

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**Abstract**

Legislatures often make important economic decisions. A decade ago economists viewed each legislator as the agent, if not of the median voter, of some pivotal voter in a party constituency. Therefore, the voting decision of a legislator could readily be predicted if one could measure the preferences of the relevant pivotal voter. Models where interests on specific issues can be simply linked to votes on the same issues are questionable, however, since votes will be traded across issues. Political parties are one important vehicle for organizing such trades. A simple empirical test for the United States Senate, however, clearly rejects the notion that the representative is the agent of the median voter or a local party constituency, even if vote trades are allowed. Thus, there is ample opportunity for politicians, even under reelection constraints, to either voice their own ideology or that of idiosyncratic support coalitions. The relevant theory and empirical evidence is summarized, and some validating tests for European parliaments are suggested.

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## 1. Agents or ideologues?

Important economic decisions, including fiscal policy, are made by legislatures, particularly national parliaments. In many parliaments, the final decisions take the

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form of recorded votes, termed roll calls. Complex and diverse economic interests must be aggregated in the legislative process. What can the roll call record tell us about this process? What is the appropriate theoretical framework for asking empirical questions?

Most of the work of the past two decades can be grouped in terms of two theoretical perspectives. The first will be termed 'economic' or 'principal–agent'. It recognizes that legislatures typically (Israel's Knesset being an exception) serve geographically based constituencies. As a representative or *deputé*, the agent must serve the interests of a principal. (Shirking aside, see below.) Who, among thousands of voters, is the principal? The natural candidate was the median voter. The upshot, empirically, was to regress (typically via probit or logit) the Yea–Nay voting decision on aggregated characteristics (e.g., median income) of the constituency. This type of work was popular for about a decade, prominent examples being Kau and Rubin (1979), Kau et al. (1982), Kalt (1981), and Kalt and Zupan (1984). More sophisticated versions of the 'economic' approach either recognized that legislators were influenced by political parties and campaign contributors; as a result, the median voter model might not be the appropriate model for the principal (Peltzman, 1984). Moreover, the voting decisions of legislators would be influenced not just by the characteristics of their principals but by the institutional structure of the legislative process (Gilligan et al., 1989).

The second approach will be termed 'political' or 'ideological'. It recognizes, in the most simple version, that politicians are commonly described as being located on a left–right continuum or, in the United States, a liberal–conservative continuum. The ideological approach is basically atheoretical as to where the ideology comes from. Ideology might be a dash of the principal's preferences, a sprinkle of party discipline, and a pinch of the legislator's personal ideology. Although finding the sources of ideology is an important quest, empirically, the vote can just be regressed on a measure of ideology.

An important contrast between the economic and political approaches is that the economic approach tends to emphasize the specificity of votes on particular issues whereas the political approach sees all votes as reflecting the common force of ideology. For example, Kalt and Zupan (1984), in their study of United States Senate roll call votes on the surface mining of coal, included variables aimed at measuring each state's costs and benefits from mining. In the specific, economic, view, very different alignments of legislators might be expected as different issues get voted on. Coalitions would be ephemeral, and voting patterns unstable. In contrast, the political approach recognizes that votes on issues are linked through coalition behavior in the form of party coalitions, vote trades, logrolls, and so on. Ferejohn (1986), for example, discusses how, in 1964 in the United States House of Representatives, a deal was struck between rural interests seeking higher agricultural subsides and urban interests seeking food consumption subsidies (food stamps) for the poor. In this type of situation, it would not be appropriate to put just agricultural variables on the right-hand side of the agricultural subsidy votes

and just poverty variables on the right-hand side of the food stamp votes. If fact, in the ideological model, neither type of variable would be very important since coalitions will be stable and simple left–right patterns of voting will occur on nearly every issue.

Political parties are, as argued recently by Cox and McCubbins (1993), important organizations that maintain the stability of coalitions. But the continuum of ideology, as we shall see, does a far better job of describing the data than does party alone. Moderate [1] Democrats provided the necessary votes for the Reagan tax and budget measures in 1981; moderate Republicans are now torpedoing some of the provisions of the 'Contract with America'. One might counter that the need for an 'ideological' measure is just a peculiar feature of the American constitution, which, by not providing for dissolution and endogenous elections, robs parties of a powerful weapon for disciplining legislators. Clearly, however, this institutional difference is but one element of the incentive structure which binds a legislator to his party rather than to the principals in his geographic constituency or to his personal preferences. In the French Fourth Republic, for example, only the Communists failed to show important within-party variation in roll call voting behavior (MacRae, 1966).

How can one measure ideology? An ordinal measure is straightforward. Consider a legislature with $p$ legislators voting on $q$ roll calls indexed by $j$. Find a simultaneous order of the $p + q$ objects. On the $j$th roll call, all legislators to the left of $j$ in the order are assumed to vote one way (either Yea or Nay) and all to the right are assumed to vote the *opposite* way. [2] Those who do not vote as assumed are counted as classification errors. As a measure of ideology, find the order which minimizes classification error. There is no fast algorithm available which guarantees finding a global minimum. But an alternating algorithm, described in detail in Poole and Rosenthal (1996, ch. 2) works extremely well in practice.

An important empirical question is whether ideology can be described by a one-dimensional concept. In addition to left–right, we may need to characterize a legislator on a lay–clerical dimension. In part because classification methods are not practical in more than one dimension, we developed NOMINATE, an interval scaling procedure that estimates an ideal point for each legislator in multi-dimensional space. Roll calls are characterized by two points in the space, one for the Yea outcome, the other for the Nay. Legislators are characterized by utility functions which are additive in a spatial component and an error component. The spatial components are all exponential in Euclidean distance and differ only in the location of the bliss point. The errors satisfy the assumptions of the logit model.

[1] In American political language, moderate denotes centrist positions in distinction to some continental usage where it denotes right-wing positions.

[2] Abstentions are excluded from the analysis.

Detailed expositions of NOMINATE are available in Poole and Rosenthal (1985b, Poole and Rosenthal (1991a). Briefer expositions can be found in Poole and Rosenthal (1985a, Poole and Rosenthal (1987, Poole and Rosenthal (1991b, Poole and Rosenthal (1993a, Poole and Rosenthal (1993b, Poole and Rosenthal (1994). Applications can be found in Cox and McCubbins (1993), Kiewiet and McCubbins (1991), Myagkov and Kiewiet (1995) and Rothenberg (1994). Recently, Heckman and Snyder (1992) have developed a method that is similar in spirit to NOMINATE but based on quadratic utility and uniform error distributions. The results of the two procedures correlate very highly (see Poole and Rosenthal, 1996, chapter 3), particularly in one dimension.

Before proceeding, let us briefly summarize the two approaches. The economic approach leads to empirical models of the form

$$\text{Prob}(\text{Yea Vote}) = f(X_1, X_2, X_3, X_4)$$

where $X_1$ represents a set of variables (e.g., median income) that measure general characteristics of a constituency, $X_2$ a set of measures of issue-specific characteristics (e.g., the value of railroad capital), $X_3$ political party, frequently included because it dramatically improves, much more than any economic variable, the fit of the model, and $X_4$ some control measure of ideology. The ideological measure is most often the rating published by an 'ideological' interest group, such as the Americans for Democratic Action. These ratings are just weighted sums of roll call vote decisions. Alternatively, as Kalt and Zupan (1984) did in constructing a measure of environmental ideology, one could just put together one's own weighted sum of votes on roll calls on which an interest group had taken a position. In examining 29 interest groups issuing ratings in 1979 and 80, we (Poole and Rosenthal, 1996, ch. 8) found that the ratings were all very highly correlated with the NOMINATE scores (bliss points) for this period. In other words, issue-specific interest groups like the League of Conservation Voters or the United Auto Workers aren't all that issue-specific but just fit into the liberal–conservative mold. Indeed, Poole and Romer (1993) show that results are unchanged in the Kalt and Zupan (1984) model when their issue-specific, pro-environmental index is replaced by the NOMINATE score.

In contrast to the economic approach, the ideological approach is just

$$\text{Prob}(\text{Yea Vote}) = g(\text{Ideology}).$$

Of course, the two approaches can be nested for testing purposes.

A major problem in comparing the economic and political models is that ideology can be measured with very high accuracy whereas economic interests are hard to capture. NOMINATE scores are based on hundreds of roll call votes for each legislator. The locations of the ideal points are very stable, especially so in the last half of the twentieth century. In particular, there is no evidence that defeated or retiring legislators 'shirk' by changing their voting patterns in their

final period of service. [3] Consequently, it makes little difference if the roll call on the left-hand side is included in the estimation of the ideal point or if the roll calls used to estimate the ideal points span the left-hand side vote or are restricted to precede it.

In contrast, measuring economic interests is a mess. Consider something relatively simple, the level of the minimum wage. To find if a given citizen is better off by raising the minimum wage, one would have to work out the general equilibrium consequences for wages, hours worked, returns to capital, and so on, at the old minimum and the new minimum. To capture these effects in an empirical model, one will be stuck with the best or worst that government data has to offer.

It turns out that, when constituencies have more than one representative, we can avoid all these measurement issues entirely. We can evaluate median voter type economic models in a way that gives the economic approach its best possible chance. That is our next task.

## 2. Purely economic theories of voting: A failed idea

The median-voter version of the principal–agent model leads to a straightforward test for the United States Senate. Each state's two senators should vote the same way on all roll calls because they have the same constituency. The test is as follows: on every roll call on which both senators from the state vote, pair, or announce, if both are Yea or both are Nay count two successes. [4] If they vote differently, count one success and one error. This error rate is the minimum a purely economic-median voter model could possibly hope to achieve, even if interests could be measured perfectly. The test guarantees at least 50% successes. It does not count as errors some votes that are against constituent interests, such as two Nays when the senators should have both voted Yea.

The results of this test are shown in Fig. 1, for the first 100 Congresses (1789–1988), and Fig. 2 for Congresses 80–100 (1947–1988), as the constituency model. The success rate since the 80th Congress is above 75% only once. On over 1/4 of all roll call votes, a state's two senators disagree.

The pure constituency model cannot be saved by claiming that senators could disagree because one senator sold his vote or logrolled in the state's interest. The two senators should still operate as a team and bundle the pricing of their two votes. The buyers of votes should seek out the cheapest states among the sellers.

[3] Shirking does occur in the form of lower rates of participation. See Poole and Romer (1993) and Poole and Rosenthal (1996, chapter 10).

[4] We are indebted to Charles Brown for suggesting this test at an NBER conference in 1990. Krehbiel (1993) performs a similar test for the 101st Senate only. He refers to his test as a 'match rate'.

Thus pairs of votes from the cheapest states should be bought up to the point where the buyers have enough votes to win on the roll call vote. With the possible exception of the last vote to be bought, one senator from a state should be in a trade if the other senator is in a trade. Even with trading, the constituency model would be expected to be correct for 99 of the 100 senators.

A way out for proponents of economic voting is to hold, as Peltzman (1984) suggests, that each senator represents a state-party constituency rather than the constituency of all the voters in the state. Therefore, we would generously count as errors only discordant votes from two senators of the same party in the state. We refer to this as the 100 party model, as it does not claim, for example, that all Republicans vote together, just that two Republicans from the same state vote together. This model must do better than the constituency model as it can never be in error for a state with a split delegation.

We compare this model with optimal one-dimensional classifications. The classifications were performed separately for each of the 100 Congresses. We also compare it to classifications from the (dynamic) D-NOMINATE model where senator ideal points are constrained to be linear functions of time, measured in the integer Congress number, throughout the career of the senator. The estimation of this model uses all the data for the first 100 Congresses. This model does not always outperform, in terms of classification, the optimal classification model for one dimension. Although there are two dimensions, legislator positions are more

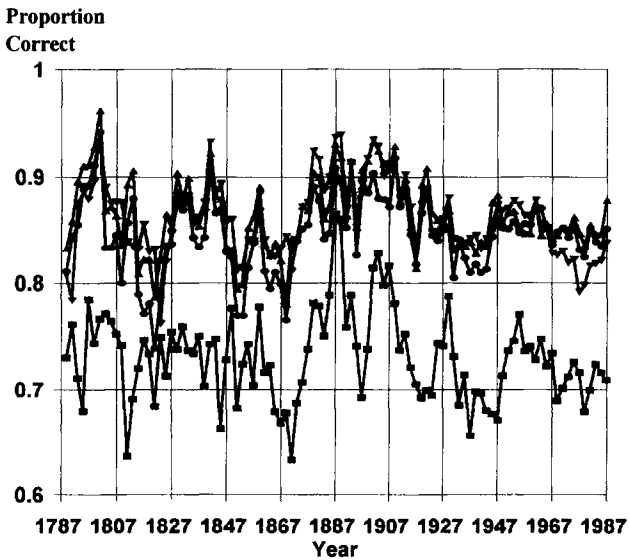


Fig. 1. Classification Success. Model -■- Constituency -▼- 100 Party -●- D-NOMINATE -△- Optimal.

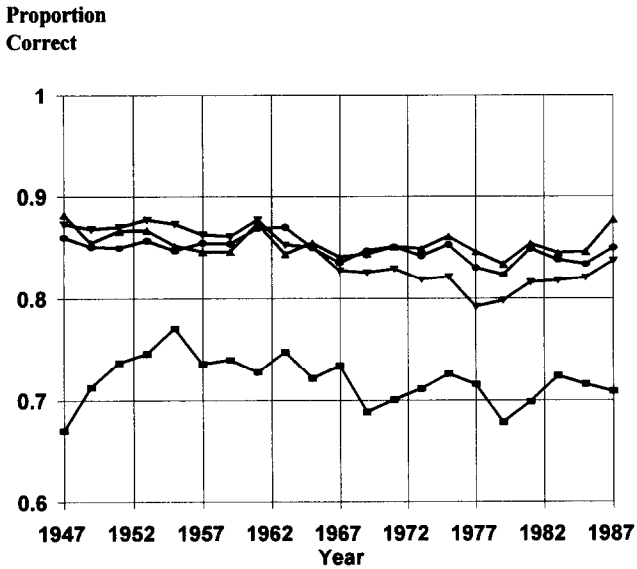


Fig. 2. Classification Success. Post World War II. Model -■- Constituency -▼- 100 Party -●- D-NOMINATE -△- Optimal.

constrained in the dynamic model. Moreover, the estimation is by maximum likelihood not by minimizing classification error. If, as is the case, the space is largely one dimensional, the extra degrees of freedom represented by the second dimension will not always offset the losses in classification ability imposed by maximum likelihood and temporally constrained ideal points. Roll calls with less than 2.5 percent voting for the minority position are excluded as are legislators voting less than 25 times in a Congress. There were 37,281 roll calls for an average of 373 per Congress. The number of states increases from 13 in 1789 to 50 in 1960.

The 100 party model does not better the classifications of either the two-dimensional D-NOMINATE model with linear trend or optimal classification in one dimension. In particular, it classifies worse than the optimal model after 1973 (Congresses 93–100). It is also a very unparsimonious model since it requires 50 (one per state) 'parameters' per roll call, or, for $q$ roll calls, $50q$. In contrast, optimal classification requires one location for each of 100 senators and $q$ midpoints. Since $q + 100 \ll 50q$, the 100 party model is clearly a bad starting point for the analysis of roll call voting.

If economic models must be, on their own, utter failures, they may play an auxiliary role once ideology is taken into account. The marginal relevance of 'economic' factors is nicely shown in work by Loomis (1994). Loomis modified NOMINATE to be a probit rather than logit model. This modification permitted

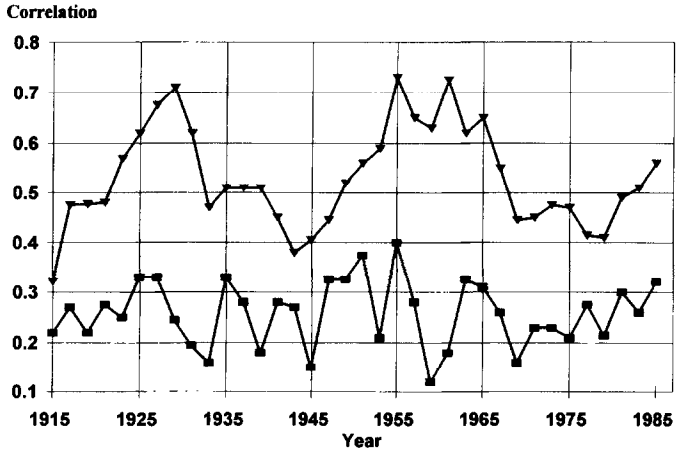


Fig. 3. Senate Correlations. -■- Mixed Party Pairs -▽- Same Party Pairs.

him to view the errors in voting [5] as correlated across senators from the same state and to estimate the degree of correlation. He estimated one correlation, $\rho_S$, that applied to all pairs of senators who belonged to the same political party and another correlation, $\rho_D$, which applied to all senators who belonged to different parties. If the senators are agents of 'median voters', $\rho_S = \rho_D > 0$; if senators are agents of the '100 parties', $\rho_S > \rho_D = 0$; and if elements of both median and party representation are active, $\rho_S > \rho_D > 0$. The results of the estimation are shown in Fig. 3 for the 1915 to 1986 period.

The 'median' model receives only weak support. The correlation of the errors when the senators are from the same state but different parties averages only around 0.2. The 100 party model fares better, as the same party correlation, $\rho_S$, averages around 0.5. Monte Carlo work by Loomis (1994) shows that the $\rho_D$'s, though small in magnitude, still are at least 3 times their standard errors. Consequently, it is clear that, if one controls for ideology, the two senators from the same state do not vote independently. Still, most of what NOMINATE does not explain cannot be explained by common interests of the two senators from the same state, even when they are from the same party.

Taking advantage of the Senate's having two senators from every state, we have presented overwhelming evidence, from 200 years of roll call voting, that simple ideological models account for the data better than simple economic models. The same technique could be applied to many settings outside the United States. For example, both France and Italy have had, at various times in the post-World War II period, multi-member constituencies under proportional repre-

[5] More precisely, he estimated the correlation in the errors in the utility function.

sentation systems. These situations represent additional natural experiments for exploring the influences of geographic representation, political parties, and personal ideologies.

## 3. A role for economic interests?

One might object that the comparisons of the previous section are biased against economic models since the comparisons cover all votes, including procedural votes and votes on 'non-economic' issues. But in a series of studies dealing with railroad regulation (Poole and Rosenthal, 1993, 1994), minimum wage (Poole and Rosenthal, 1991b), and surface mining (Poole and Rosenthal, 1985a; Poole and Romer, 1993) we have found that, when NOMINATE scores are added to the economic models, the NOMINATE score is by far the most influential variable and the economic variables remain at best second fiddles. The same result obtains in our own study of food stamp legislation (Rostan and Rosenthal, 1994) and in our comparison of Peltzman's (1984) approach to studying large sets of roll calls (Poole and Rosenthal, 1985a).

Of course, ideology is a 'reduced form' that incorporates economic interests. In a recent study, Levitt (1994) uses an instrumental variable approach to see how much of ideology (either interest group ratings or NOMINATE) is median voter interests, party interests, or personal ideology, the latter really englobing any influence that is not median voter or party. All are important, but personal ideology predominates. Levitt's finding parallels our finding (Poole and Rosenthal, 1985a) that, after regressing ideology on a broad set of economic variables and then using the residual from this regression as a regressor, the ideological residual is highly significant in logits with economic variables.

If the results previously presented in this paper argue that it may be difficult to see economic interests at work in regression-type analyses of roll call voting, one can nonetheless suggest that economic interests contribute to the framing of economic issues. For example, Romer and Rosenthal (1985) examine Senate voting in 1972 on the minimum size of a firm subject to inspection by the Occupational Safety and Health Administration (OSHA). Although voting on this issue was always strongly liberal–conservative as measured by NOMINATE, a 15 employee limit, passed in June, was changed to a 3 employee limit in October. During the interval, labor unions had almost certainly exerted pressure on pivotal, moderate senators who switched camps. Similarly, Rostan and Rosenthal (1994) show that while food stamp voting fits the spatial model nicely in both 1964 and 1967, the nature of the coalition and the angle of the roll call cutting line in a two-dimensional space shifted. Republican moderates became 'hooked' on food stamps as they faced increasingly large numbers of constituents who were recipients; Southern Democrats defected from the 1964 logroll.

The examples of safety inspections and food stamps argue that economic

interest are not so much absent as that they work in complex ways. The initial approach of economists in the 1970s and 80s was not successful not just because of measurement problems but because the median voter, issue-by-issue approach is a very inadequate model of the political process. The work on ideological models shows that the political process operates in a way that gives a very simple, left–right structure to the data. The next task, formidable but hopefully not impossible, is to show how the expression of economic interests is consistent with the ideological structure of roll call voting.

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