Public Goods, Private Interests, and Representation

John E. Jackson; David C. King


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We estimate a model of House members' roll call voting decisions embodying some hypotheses about representation, including estimates of the influence of district opinion on broad collective issues relative to personal economic interests, of the effect of electoral security on constituency responsiveness, and of the difference in constituency and party voting among Republicans and Democrats. This model is estimated with votes taken during deliberations on the 1978 Tax Reform Act, important because it was a significant change from the tax reforms passed in the late 1960s and 1970s, marked the first appearance of the Kemp-Roth proposed tax cut, and represented a concerted effort by Republicans to make tax policy a broad national issue. Findings indicate that constituent preferences for redistribution are important influences on representatives' decisions and that Republicans exhibited a greater degree of party voting than the Democrats while the Democrats better represented their constituent's preferences.

Nearing the end of the 34-hour marathon session that closed out the 95th Congress, the House let down its decorum. One young lawmaker donned comic glasses for a vote while just off the floor another played his saxophone. With the November elections less than three weeks away, representatives were eager to head home, but one prospective roll call stood in the way—a final vote on the Revenue Act of 1978. In a political environment where Proposition 13 was a recent and much ballyhooed revelation, this bill, granting substantial cuts in personal and capital gains taxes, was immensely popular. Debates were heated because the bill radically reversed two decades of changes making the federal income tax more progressive. Unusual as the setting may seem, 15 October 1978 was not atypical. Congress faces a befuddling array of expectations, conflicts, and constraints every day of every session.

Legislative scholars "explain Congress" with many heuristic schemes. We have learned about congressional campaigns (Fenno 1978; Jacobson 1983), norms and socialization (Asher 1973), committees (Fenno 1973; Hall 1987), roll call voting (Jackson 1974; Kingdon 1981), and constituency service (Cain, Ferejohn, and Fiorina 1987). The congressional subfield is eclectic, but two questions transcend specialties: Does Congress "represent" pursuant to collective interests or special interests? and Whose interests are they?" At a minimum, any assessment of representation must tackle the nexus between aggregate demands and the actions of "representatives," but it should also allow for the individualistic and stochastic world of comic glasses and saxophones.

We present evidence that votes of members of the U.S. House of Representatives reflect the mean preferences of their constituents, which in turn reflect the distribution of "public goods" preferences.
within the district. Further, the influence of constituency preferences is lower among representatives from more competitive and better-educated districts. We also find less response to personal and constituent considerations among representatives voting the "party line," who in this case were Republican.

Our analysis is not aimed solely at congressional scholars. A discussion about individual preferences for public goods distinguishes our use of this term from the sometimes ambiguous notions of the public interest or the common good. Further, we make several methodological advances. Whether a district elects a Republican or a Democrat reflects preferences both for a candidate and for certain policies. In other words, a lawmaker's party label and voting behavior are jointly determined outcomes in any representation model. Accordingly, our hypotheses are tested employing multivariate logistic equations. We also develop, using national survey data, a statistically consistent and more efficient method for measuring constituency preferences and for estimating representation than those used previously.

At its heart, though, we present a congressional voting model that lets us see how faithfully lawmakers represent constituent interests as the electoral competitiveness and the political sophistication of the district change. Past empirical examinations of representation take a different approach. A lawmaker's vote, we are told, is a weighted function of, for example, personal preferences of the representative + party affiliation + preferences of constituents. Unfortunately, many of the most intriguing theories of political philosophers cannot be tested within this additive structure. Is representation, for example, enhanced by having a politically sophisticated electorate? Such a question is properly modeled when the weight lawmakers give constituency preferences (e.g., how much influence constituents have over their lawmakers) varies with sophistication. In rough form, then, we hold that a lawmaker's vote is some function of personal preferences of the representative + demands of the party + (preferences of constituents \times factors related to constituent influence). Factors related to constituent influence may include, among other things, the safeness of the seat, the electorate's sophistication, the homogeneity of the district, and the member's seniority.

We detail what is and is not implied by the concept of a "public good." We take issue with a well-known theme in the congressional literature—that lawmakers respond primarily to the narrowly defined and often selfish demands of their constituents. We detail why votes shaping the 1978 Revenue Reform Act are particularly timely and appropriate vehicles for testing theories of representation and develop a formal model of representation. We confront and resolve the methodological challenges brought on by estimating the public goods preferences among constituents in all 435 congressional districts. Finally, we report our empirical results and outline some of the implications of our findings.

Public Goods Preferences, Private Interests, and Redistribution

Our analysis of representation focuses on the concept of a public good and the distribution of people's preferences for public goods. The formal definition of a public good is a good that is available for, and consumed by, all individuals. Its consumption by any one person does not diminish its consumption by others. People cannot (easily) be excluded from sharing in its consumption and at times have no other choice (see Musgrave and Musgrave 1980, chap. 3).
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Public goods preferences—such as what the income distribution ought to be, what cleaner air is worth, and how much national defense is desirable—are a vital part of people’s political attitudes. (For evidence that individuals have measurable preferences for public goods, see Jackson 1983 on environmental quality and Hawthorne and Jackson 1987 on income redistribution.) Several facts have been taken in measuring and talking about demands for public goods, and closely related but not identical notions include preferences for unitaristic policies (Wilson and Banfield 1964, 1971), symbolic politics (Sears, Hensler, and Speer 1979; Sears et al. 1980), and sociotropic attitudes (Meehl 1977; Kinder and Kiewiet 1981). Our concern is how much these preferences for collective outcomes, as distinct from private interests, are related to legislative decisions.

Public Goods and Private Interests

In the process of providing public goods, government programs also create private benefits and costs for specific individuals. Imagine workers for a major defense contractor. Weapons procurement contracts that provide the public good of national defense also affect their livelihood and are immensely important private concerns. Air quality emission regulations also produce private benefits and costs. As a consequence of cleaner air, some individual’s property values will rise, firms who make emission controls will see increased profits, and frequent drivers and public utility consumers will have higher costs. Or, with income redistribution, any change in the tax code lowers and raises taxes for selected individuals. Similar types of private interests are associated with all government actions to provide public goods.

An important issue in the public opinion and decision-making literature has revolved around a presumed conflict between private interests and the public interest or the public good. Often implicit in these discussions is the implication that collective behavior and decisions either promote the public interest or reflect the triumph of private interests. We agree that such tension exists, but for our purposes it is not the relevant distinction. We distinguish among three different terms and concentrate our analysis on two of these. The first is the concept of a public, or collective, good and the accompanying distribution of individual preferences about the proper amount of that good. Second is the normative discussion about the public interest or the public good, which usually debates public decisions according to some singularly defined objective and outcome, such as larger defense expenditures, cleaner air, or a more progressive income distribution. Lastly, there are the private, or particularistic, interests created by any governmental activity. Our concern is with the first and the third of these terms. Do congressional decisions, as reflected in the votes of individual representatives on specific roll calls, respond to and thereby reflect the distribution of preferences about public goods? Or do they primarily reflect the particularistic interests of constituents associated with each decision? Our normative argument is that the distribution of collective goods preferences should influence the behavior of political institutions, in this case, Congress. If we find evidence consistent with this argument, we leave it to others to judge whether that distribution and the congressional response lead to outcomes that agree with the reader’s definition of the public good.

Preferences for Income Redistribution

Society’s income distribution is a classic public good (see Thurow 1971). Redistribution preferences cannot be characterized simply as either altruism or selfish-interest but represent people’s views of
which changes in the income distribution are socially desirable. Individuals' redistribution preferences are related to their present and likely future income, as expected. However, there is far more to these preferences than just one's place in the income distribution. Other factors, such as age, race, region, and local economic characteristics enter into these preferences (see Hawthorne and Jackson 1987). People, even with the same income, disagree substantially on what changes are socially desirable. Support for redistribution is higher among blacks, residents in the East and Midwest, and people living in counties with high unemployment and high per capita income. Opposition to redistribution increases with age, education, and the proportion black within a person's county. The net result of these associations is considerable diversity of views as to how—or whether—the income distribution in our society ought to be changed, even among people with the same income.

Redistribution preferences play an important and central role in shaping individual positions on a range of specific tax policies, as should be expected of any public goods preference (see Hawthorne and Jackson 1987). Evaluations of capital gains exemptions, mortgage and gas tax deductions, and other similar proposals were strongly related to redistribution preferences as well as to whether the person was likely to benefit directly from the proposal. For example, homeowners who itemized deductions were more likely to favor the mortgage tax deduction than either nonhomeowners or homeowners who did not itemize deductions. However, among all three groups, support for keeping this deduction was strongly and negatively related to redistribution preferences. We interpret those results to mean that people evaluate tax reform with respect to its public goods (redistribution) implications as well as with respect to their own benefits. The question here is whether Congress does the same. If representatives promote only the private interests and neglect the public goods preferences of their constituents, congressional decisions will not fully represent the public's collective interests.

Representation in Congress

There exists a theoretical ideal point for governmental programs that reflects every individual's preferences for public and private goods. But actually defining society's collective preferences and assessing whether congressional decisions reflect these preferences is an impossible task. (See Chamberlin and Courant 1983 for an excellent theoretical analysis of this problem.) More often, congressional scholars examine dyadic-level relationships (between subpopulation constituencies and their single, elected representative) and ask whether constituency preferences are "represented" by lawmakers.

The lack of dyadic relationships does not preclude institutional representation. After all, conservatives in liberal districts may have their views advocated by conservatives from other districts (see Weisberg 1978 and note that we substitute institutional representation for his collective representation). Similarly, the presence of dyadic representation does not ensure institutional representation. Gerrymandered districts or representation of a biased set of preferences may preclude this result. However, the existence of dyadic representation increases the likelihood of institutional representation, which then depends upon the influence constituents have and the mix of preferences lawmakers reflect. For us, the critical question then becomes what public goods and private goods mix of preferences is reflected in Congress.

Qualitative studies of Congress offer some of the strongest evidence of constituency interests' influence on legislative
decisions. Much of this literature emphasizes the importance of private rather than public interests. Mayhew (1974) argues that the electoral process induces lawmakers to legislate in issue areas that hand out “particularistic” benefits. Instead of reflecting national or collective goals, congressional outputs tend to mirror narrow, district-driven interests (on related issues, see Arnold 1979, Fiorina 1977, Lowi 1979, Shepsle and Weingast 1984). This district self-interest bias is enhanced to the extent that representatives respond to organized interest groups (Kingdon 1981, chap. 5) and to the extent that groups fail to mobilize around collective goals (Olson 1965). In short, Congress is often seen as much more likely to represent constituent preferences in self-interest areas (e.g., pork barrel) than collective goods issue areas (e.g., environmental protection, minority rights, etc.). Arthur Maass (1983) rejects this dominant caricature of Congress by detailing how legislative-executive interactions expand a program’s “breadth of view”; but it is clear that the literature’s image of Congress emphasizes the institution’s adeptness at handing out private goods in order to increase the chance of reelection.

We contend that public goods representation is more likely than the dominant literature suggests. When evaluating various public actions, constituents consider both the likelihood of achieving some desired public objective and the action’s impact on their personal situation, coming to a weighing of their utility for public goods and for private consumption. Lawmakers do not untangle their constituents’ utility calculus, so representation of their voters’ preferences produces attention to public goods. Only if there is some institutionally induced bias, as suggested by Mayhew, by Fiorina, and by Olson, will we see the pursuit of private interests and not find representation based on constituency preferences in the broader sense.

The emphasis on an institutionally induced bias for particularistic interests overlooks important evidence about how legislators relate to their constituents. When representatives talk about preferences in their districts, they often speak in general terms about broad issue areas. A district may be “hawkish,” full of “tree huggers,” “profarm,” “anti-big business,” and so on. Such generalities give lawmakers very strong cues about constituency preferences, which they may choose to follow when shaping legislation and voting in committees or on the floor. (Sears and his associates [Sears, Hensler, and Speer 1979; Sears et al. 1980] contend the public thinks about political issues in broad symbolic ways, which would lead to this process.) Furthermore, Fenno (1978) and Kingdon (1981, chap. 2) argue that representatives vote in ways they can “explain” in future campaigns. These explanations are likely to focus on the general topics that constitute constituents’ frames of reference. The question then becomes whether these orientations evolve around public or private interests. If these general orientations center on broadly defined public goods, such as redistribution, environmental quality, or national defense, the incentives created by the explaining process will evoke attention to public goods concerns.

Revenue Act of 1978

What better way to observe the roles of collective and private interests than in efforts to change the tax code? The potential for self-interested behavior is evident, as individuals and groups fight for favorable rates and loopholes. Tax policy also taps into the distribution—and redistribution—of income within society. In 1978 over 10% of the GNP was devoted to income redistribution between private individuals. That is a monumental economic effort driven not merely by special inter-
est demands but also by some agreement, and debate, about what the income distribution in society ought to look like. Tax policy also entails a choice among conflicting public objectives, which itself constitutes a collective decision.

The 1978 tax bill is a decade old and has been eclipsed by newer legislation, but our analysis of how pocketbook interests and redistribution preferences are represented is particularly timely. After a decade of big budget deficits, proposals to increase taxes are likely in the 1990s. What preferences will be reflected? Individuals' images of a socially desirable income distribution? Individuals' expectations of how tax policies can stimulate economic growth? Private concerns over after-tax income? Or some mixture of all three demands?

In 1978 lawmakers made several clear-cut choices in making the tax code less progressive. Republicans, as a party, made a conscious attempt to recast tax policy from a debate about income distribution to one over economic growth. Their proposals were aimed at stimulating new investment through changes in marginal rates and additional incentives. They wanted to reverse the increases in capital gains taxes passed in 1969 and 1976 and reduce marginal rates at the top end rather than at the low end, as had been the practice through the 1970s. The most radical proposal, sponsored by Representative Kemp (R-NY) and Senator Roth (R-DE), would have cut rates by 33% across the board. The efforts to defeat these Republican proposals offered legislators clear choices regarding both the national income distribution and the economic interests of their constituents. Finally, we examine the 1978 bill for a very practical reason: the necessary data to measure constituent preferences are available.

A reading of the Congressional Record leads us to expect that three of the House floor votes on 10 August 1978 shaping the 1978 tax bill may be interpreted as clearly "for" or "against" further redistribution of income or "for" economic growth:

1. Vote on the Rule. The motion was to order the previous question (ending debate) on the adoption of rule H Res 1306. The rule was adopted 284–130 with the Republicans voting as a nearly unanimous bloc, 136–8. While some Democrats were upset that the rule did not provide for a vote on a Social Security amendment, most debate surrounded the provision for a vote to recommit the bill with instructions to amend, as per Kemp-Roth, to cut individual taxes by one-third. As such, the vote on the rule became a first test of a representative's position on this radical tax plan, and a nay vote might be seen as prorredistribution.

2. Index Capital Gains. The vote was on a committee amendment (sponsored by Texas Republican Bill Archer) to index capital gains taxes for inflation. The amendment was adopted 248–167 with the Republicans voting as a bloc, 142–1. Opposition was lead by Illinois Democrat Dan Rostenkowski, who argued that indexation would make the tax code more regressive because it amounted to a selective tax break for a wealthy minority. Archer described indexing as a progrowth hedge against inflation, and several supporters indicated that the code was already "too progressive."

3. Corman Progressive. The vote was on California Democrat Jim Corman's amendment to alter the planned tax cut to benefit taxpayers earning less than 15 thousand dollars. The tax cut would be paid for by taxpayers earning over 50 thousand dollars, thereby making the tax code more progressive. The amendment was rejected 193–225, and again, the Republicans voted as a bloc,
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8–134. Debate quickly centered on just how progressive the tax code ought to be, and a yea vote might be interpreted as prorredistribution.

Several other votes were taken, but, as debates recounted in the Congressional Record indicate, they were more concerned with procedural issues than income redistribution. First (362–49) and final (337–38) passage votes were bandwagon affairs because representatives did not want to be seen fighting (as contrasted with shaping) tax reform in the days of Proposition 13. However, nay votes here should reflect very strong opposition to the regressive plan contained in the 1978 act. The closest thing to a direct vote on Kemp-Roth was a proposal to recommit the bill to Ways and Means with instructions to add Kemp-Roth language. (We refer to this vote as "Kemp."). Rejection (177–240) reflected opposition by more than a few members who, as a matter of institutionalized discipline, would never vote to send a bill back to Ways and Means with instructions. Lastly, the House approved (268–135) a motion to instruct conferees to concur with a Senate amendment to reduce individual taxes by 5% annually in 1980–83 but only if federal outlays did not increase by more than 1% annually. This last condition made the vote largely symbolic, and some members balked at interfering with the conferees.

If we could (1) measure preferences for the public good of income redistribution within any congressional district, (2) develop a measure for districts’ interest in the progrowth platform being advocated by the Republicans, and (3) find a proxy for the self-interest that a district may have for any particular tax code provision, we could learn something about the relative strengths of public goods and private interest pressures in forming this legislation.

A Formal Model of Representation

Representatives’ voting decisions weigh institutional, personal, and constituent demands. Much of the voting decision literature assesses when, why, and to what extent one set of “pressures” predominates. For example, when are constituent interests (either public or private) weighed more heavily than congressional demands (such as party and committee obligations) or personal interests (such as those stemming from a member’s seniority, ideology, or group identity)? Quantitative voting studies are designed to assess these weights, though the task has proved difficult. The voting decision is more complicated than a simple linear sum of relevant demands. Pressures interact, and our voting model must reflect verbal descriptions of these interactions.

Our formal model of the verbal hypotheses about legislators’ decisions is nonlinear because some of the most interesting questions address the circumstances that strengthen the representation link between constituents and lawmakers. The model relates a representative’s vote \( V_i \) to three components: institutional and personal factors \( \beta_1 \), constituency preferences \( \beta_2 \), and constituency influence \( \beta_3 \). The subscript in the last term indicates that we expect constituency influence to vary among legislators. In explicit form, this model is

\[
V_i = X_{i,1}\beta_1 + X_{i,2}\beta_2 + u_i.
\]

In the next sections we describe the detailed specification.

Institutional and Personal Factors

Members’ individual characteristics often guide their voting. These characteristics include both institutionally relevant factors, such as party affiliation and seniority, and proxies for personal pref-
erences, such as race or age. The existence of party voting is well documented (see Collie 1983, 475–91 for a review of the literature). In this study, party is particularly important because the Republicans made tax policy and economic growth salient issues on which to campaign in future elections. The leadership worked hard, and with great success, to get members to vote as a bloc.

Seniority is a second institutional factor that may influence some voting decisions. More senior members may be unlikely to vote for proposals that violate House norms by, for instance, threatening committee autonomy and power. For example, on the initial vote on whether to adopt the rule, more senior members may vote affirmatively in support of the Rules Committee rather than because of their position on redistribution.

By all accounts, members’ own policy preferences influence their voting decisions. How members think about society’s income distribution will color their approach to issues that alter that distribution. Although we will not be able to measure a representative’s preferences directly, we use race and age as proxies for these interests.2 Hawthorne and Jackson (1987) show that these characteristics are highly correlated with redistribution preferences. Race may have an additional association with members’ voting decisions because of the presence and importance of the congressional black caucus.

This individual part of the model is

\[ X_{i1} = B_0 + B_1 \text{GOP}_i + B_2 \text{terms}_i \\
+ B_3 \text{nonwhite}_i + B_4 \text{age}_i \\
= B_0 + B_1 G_i + B_2 T_i + B_3 N_i \\
+ B_4 a_i. \]

Constituency Preferences

Constituent positions are divided into three categories: their public goods preferences, their stake in the Republican’s progrowth platform, and their narrow economic self-interest. Income redistribution is a classic public good and is central to any debate about tax policy. Redistribution preferences also capture the idea that constituents communicate general cues rather than specific demands to legislators. If representation is taking place, variations in redistribution preferences will be associated with differences in the probability of a representative voting for the Republican proposals.

The Republican strategy shifted the objectives of tax policy from income redistribution to promoting economic growth through individual investment incentives. This strategy should appeal most to people in growing areas. We proxy this appeal by the district’s growth in personal income between 1969 and 1979, defined as the ratio of these variables.

Private interests are defined by how individual incomes will be altered by proposed tax changes. In this case, the Republican proposals to cut the taxes of higher-income people and to reintroduce the capital gains deduction provide clear indicators of self-interest. We represent these interests at the district level by percentage of the population earning over 25 thousand dollars. If self-interest is a strong factor in dyadic representation, the higher this proportion, the more likely representatives are to vote for the Republican proposals and against Corman. (The proportion with incomes below 5 thousand dollars is a second self-interest measure but is so highly correlated with the over-25-thousand-dollar variable that only one is necessary.) If this concept of self-interest relates to expected as well as current income, the income growth variable may be a second self-interest measure. These constituency preference hypotheses are shown symbolically as

\[ X_{i2} = C_1 \% \text{inc} > 25_i \\
+ C_2 (\text{inc 1979/inc 1969})_i \]
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\[ + C_3 r e d i s t r i b u t i o n_i \]
\[ = C_1 I_i + C_2 A I_i + C_3 R_i. \quad (1) \]

Constituency Influence

The third part of the model represents the expectations about how constituency influence varies among representatives. The verbal descriptions relate these variables to the safeness of the member's seat, to whether the member is standing for re-election, and the sophistication of the electorate.

Fenno argues that large electoral margins leave representatives less constrained by constituent preferences, making it easier for them to evolve (or devolve) from a "constituent representative" into a "Washington representative" (1978, chap. 7). This statement implies that safeness is negatively associated with preference congruence. Kingdon, however, suggests that constituents reward responsive representatives with large reelection margins (Kingdon 1981, 67). He implies that safeness is positively associated with constituent representative preference congruence. These are not competing hypotheses. Kingdon is proposing the additional hypothesis that responsiveness, or congruence, may lead to the presence of a safe seat. These hypotheses need to be modeled by a separate equation explaining safeness.³

Safeness is measured by the member's plurality in the November 1978 election. Although this election follows the decision on the tax act, the roll calls all took place late enough for members to know whether there was a challenger and how strong the challenger would be. We could, alternatively, have used 1976 election returns, but we believe the 1978 numbers are a more realistic reflection of that fall's race. We expect that any simultaneity effects between votes on the tax act and the 1978 election results will be minor. For those with no challenger, the margin was set to 1.00. We also included a lame duck variable for members not running for reelection.

The level of political sophistication in a district may serve as a constraint on member actions and color how Washington behavior is "explained" at home (Fenno 1978, chap. 5; Kingdon 1981, chap. 2). The underlying proposition here is that constituent preferences (be they for public or private goods) are more faithfully represented in districts comprised of a politically sophisticated electorate. Political sophistication is measured by the mean years of schooling within the district. This choice can be justified on pragmatic and conceptual grounds. Pragmatically, years of schooling information is readily available for each congressional district. Conceptually, recent studies have shown that education has a strong association with other, more direct, measures of sophistication. (For an excellent discussion and evaluation of these measures, see Zaller 1986. He concludes that political information, or knowledge, is the best measure but that education performs well, is the second best measure, is highly correlated with information, and contains less measurement error.)

These hypotheses are combined into the following model of constituency influence:

\[ \beta_{2,i} = 1 + A_{1 \text{safe}_i} + A_{2 \text{lame duck}_i} \]
\[ + A_{3 \text{education}_i} \]
\[ = 1 + A_{1 S_i} + A_{2 L_i} + A_{3 E_i}. \quad (2) \]

In the actual estimation of the model, we define safeness and sophistication relative to the average electoral margin (72%) and education level (12.2 years) among districts. We do this by subtracting these amounts from \( S \) and \( E \) in equation 2. This specification means that the coefficients denoted by \( C \) in equation 1 now indicate the constraint of constituency interests on a representative from this "average" district.
The Statistical Equation

These three separate parts are combined to form a single expression describing a member's roll call decisions,

\[ V = B_0 + B_1G + B_2T + B_3N \]
\[ + B_4ag + (C_1I + C_2AI + C_3R) \]
\[ \times (1 + A_1S + A_2L + A_3E). \] (3)

In the first part of the model, each \( B \) indicates the expected change in support for an amendment or bill associated with a given characteristic. The coefficients denoted by \( C \) indicate the expected change in representatives' positions associated with a change in the relevant characteristics for districts with average safeness and sophistication. For example, \( C_3 \) indicates, for an average district, the association between redistribution demands and legislators' votes. Lastly, the coefficients denoted by \( A \) indicate how constituency influence varies with electoral margins and education levels. For example, we expect \( A_1 \) to be negative, indicating that constituency influence decreases with the safeness of the seat, and \( A_3 \) to be positive, reflecting that more sophisticated districts impose greater constraint on the actions of members. This last expression models constituency influence, necessitating the nonlinear, multiplicative form.

Methodology for Measuring Interests and Estimating Representation

Before discussing our results, it is critical to appreciate how difficult we as a discipline have found the problem of estimating constituent preferences, though not for lack of trying. Part of this difficulty has been conceptual, with researchers having different (and at times only implicit) definitions of constituent preferences or of what would constitute representation. However, a major hurdle has been methodological. Some significant efforts have been flawed so as to bias estimates, usually toward the inference of little representation of any sort. Others have relied on such tenuous proxies for constituency interests that conclusions about representation were highly speculative and unconvincing. This research improves on previous methodological efforts while simultaneously offering insights about the process of representation.

There are three methodological concerns in estimating equation 3. We will not dwell on these but summarize them and refer to various appendices and related papers. The first and most important concern is the measurement of constituency redistribution demands. Miller and Stokes (1963) estimated mean constituent opinion within congressional districts by sampling residents and averaging their responses to selected questions. This approach has a number of conceptual and methodological limitations that greatly restrict our ability to measure representation. (See Achen 1978 and Jackson 1989 for discussions of these limitations.) This approach is prohibitively expensive and will still only assess mean constituency opinion and representation with error.

Our procedure combines information from a survey assessing redistribution attitudes with district information to estimate mean constituency redistribution preferences. This method is described in detail and compared to other methods in Jackson 1989. The assessment of individual attitudes is done with data from a survey of attitudes towards tax policy conducted by the Roper organization in May 1978. This survey includes a specific question about using taxes to redistribute income. (See Hawthorne and Jackson 1987 for an extended discussion of these attitudes and of the analysis of the Roper data.) The individual preference model estimated with the responses to the question in the Roper study is \( \bar{R}_i = \chi_i b \). Based
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on this model of individual preferences, we estimate the mean district preference for district \( j \) by \( \hat{X}_j = \hat{X}_j \beta \), where \( \hat{X}_j \) indicates the district means for the variables used in the model of individual preferences. The data on mean district characteristics, \( \hat{X}_j \), were obtained from census files aggregating the data from the 1980 census into congressional districts for the districts in effect in 1978.

Identifying districts with the most and least favorable redistribution preferences provides some intuitive feel for this measure. The highest levels of support were among districts experiencing severe economic distress, such as black central city districts and areas with declining manufacturing industries. The least supportive districts were in Hawaii, Southern California, and the Rocky Mountain West. Almost as a rule, constituents in southern districts were less amenable to more income redistribution than their counterparts in the north. Nationally, the mean opinion in a district varied from about 44% to 78% in favor of income redistribution, and the average district mean opinion indicated about 57% approval.

This model-based method is preferred to the sampling-based method used by Miller and Stokes because it has smaller measurement errors, resembles the instrumental variables method for overcoming errors in explanatory variables, and permits the inclusion of all congressional districts in the representation model. Each of these advantages will provide less-biased and more-precise estimates of the influence of constituency redistribution preferences (see Jackson 1989 for further discussion).

The second methodological concern is that conventional logit or probit analysis will not capture the endogenous connection between representatives' party labels and their votes. It is well known that voters express policy preferences in the selection of a Republican or Democrat, meaning that a member's party is not an exogenous factor in any representation model. Still, despite Fiorina's (1975) gentle prodding, scholars have continued treating party as a given. We solve this problem by treating a district's party choice and a lawmaker's vote as part of a hierarchical two-equation system, with the implicit first equation predicting party affiliation. The choices of party (Republican or Democrat) and the lawmaker's vote (yes or no) are both binary, so either probit or logit methods are preferred to a linear model, such as two-stage least squares.

Our choice of estimation procedure for these two jointly determined dichotomies is based on the multivariate logistic model discussed by Nerlove and Press (1973) and Franklin and Jackson (1986). Denote the model of party affiliation as \( P = Z \Gamma \) and the vote model given in equation 3, exclusive of party, as \( V = \chi \beta \). (This general form includes, but ignores, the nonlinear aspects of the model.) We then denote by \( Q \) the joint interaction between party affiliation and vote decisions. \( Q \) measures how much more likely Republicans are to vote for regressive changes than against them and how much more likely Democrats are to vote against the changes, given identical personal, institutional, and constituency characteristics. The party and vote variables are combined to yield a nominal scale with four outcomes—Democrat and no, Republican and no, Democrat and yes, and Republican and yes. (All votes are polarized so that a yes vote favors the Republican plan and a no vote favors the proredistribution alternative.)

The statistical model is based upon estimating the probability a given representative falls into each category. The model's specification is such that the log of the ratio of these probabilities is linear in \( P, V, \) and \( Q \). The log-odds model is specified to test the proposition that there is more party voting among Republicans, meaning they are less responsive than Demo-
crats to the personal, institutional, and constituency factors in equation 3. This specification introduces a parameter, denoted as \( \alpha \), that measures the weight given to \( V \) by Republicans. With this specification, the log of the odds that a Democrat votes yes is \( V - Q \), while the log of the odds of a Republican voting yes is \( \alpha \times V + Q \).

The coefficients in equation 3 now assess how the log-odds measures change as personal, institutional, and constituency factors change. Since \( Q \) assesses the relationship between party affiliation and vote, if no association exists, controlling for \( V \), \( Q \) will be zero. Positive values for \( Q \) indicate that even controlling for \( V \), the log-odds of a Democrat voting yes are smaller than those of a similar Republican. Lastly, if \( \alpha \) is one, variations in personal, institutional, and constituency factors, as expressed in \( V \), have the same effect on the log-odds of a Republican voting yes as on a Democrat's. However, if \( \alpha \) is much less than one, these variations have much less association with Republican votes. At the extreme, if \( \alpha \) is zero, these associations are totally absent, and all Republican voting is simply party affiliation, as reflected in \( Q \).

The third methodological consideration is the nonlinearity introduced in equation 3 by the hypotheses about variations in constituency influence. These specifications are incorporated into the statistical procedure so that we get direct estimates of all the coefficients denoted by \( A \), \( B \), and \( C \) in equation 3 as well as for \( Q \) and \( \alpha \) in the log-odds model.\(^5\) (Appendix A presents a more formal description of the model.)

**Estimated Representation Model**

Our results confirm that constituent demands—for public goods as well as for private goods—are important, though their influence varies far differently than was expected. The relationship between representatives' votes and constituent demands varied with the safeness and sophistication of the district on all votes but the Kemp recommittal motion.\(^6\) But more often than not, less electoral safety and more political sophistication decreased the influence attributed to constituents. We will discuss these results in a moment. First, we want to explain how to read the tables, since our estimating procedures may be unfamiliar to some.

The entries in the tables reflect the expected change in the probability of voting for the Republican proposals associated with a change in each explanatory variable. The change in each explanatory variable corresponds to the range about the mean that includes one-quarter of the House members. For example, the mean proportion favoring using taxes to redistribute income is 56.7%, and one-quarter of the districts have proportions in the range 56.7% ± 2.4%. The table entries report the differences in the vote probabilities of a representative from a district where 59.1% of the residents favor redistribution with those of a representative from a district where 54.3% favor redistribution, everything else being equal.\(^7\) The probabilities are calculated around the point \( P = .5 \) to maintain symmetry and comparability across votes. (The full statistical results are given in Appendix B.) Results are given first for the personal and institutional factors, then for the constituency variables and for the variations in their influence, and lastly for the partisan differences.

**Personal and Institutional Influences**

In a representative's voting calculus, the first set of influences described relate to personal preferences, associated with race and age, and to institutional pressures, defined here by seniority. Table 1 shows the expected voting change associated with a change in each of these variables. Keep in mind that we have chosen as
a representative range for these comparisons deviates about the sample means that include one-quarter of all members or districts. Seniority effects were only evident on the votes involving committee autonomy. A seniority increase of 2.4 terms is associated with an increase of .09 in the probability of voting for the report and decreases of .12 and .06 in the probability of instructing the conferees and of recommitting the bill, respectively. On all the other votes, which concerned only substantive matters, the expected probability change for this increase in seniority is .03 or less.8

Race was strongly related to voting. The expected difference in the votes of blacks and whites representing similar districts ranged from .08 for opposing accepting the report to .44 on indexing of capital gains, with most differences about .3. Nonwhite representatives always favored a more progressive redistribution of income than would be indicated by constituency preferences alone. A representative’s age was related to voting, but not strongly so. Older members voted for regressive proposals more than younger members, as expected, except for instructing the conferees. However, these effects for a six-year age difference only exceeded .03 on two votes and .05 only for accepting the report. These results suggest that personal preferences related to race but not to age played a role in representative’s voting.

Constituent Preferences

The proportion earning over 25 thousand dollars had virtually no association with representatives’ votes on the tax reform act and was frequently negatively associated with votes. (Table 1 also gives the relations between the constituency variables and the probability of voting for the Republican measures.) Only on the two votes for passage, the most lopsided of all the votes, were the associations large and positive. On the vote on the Corman substitute, by far the most important of the votes, the association with voting for Corman was positive, though not significant. Thus, our most straightforward measure of self-interest was not systematically related to voting. Several other measures related to the income distribution were tried, such as percentage
earning over 50 thousand dollars and over 15 thousand dollars, percentage earning less than 5 thousand dollars, and median income. All gave essentially the same results but with slightly poorer fits.

One explanation for the positive relationship between incomes over 25 thousand dollars and key votes might be that representatives from a few liberal, wealthy districts voted for redistribution. We made two attempts to ascertain if this was the case, both of which suggest not. The percentage with incomes over 25 thousand dollars was included in quadratic form to see if opposition to Corman increased over most of the range and then dropped in the upper levels. The result was just the opposite. Next, we reestimated the equation with the twenty wealthiest districts excluded. The estimated coefficient on percentage earning over 25 thousand dollars was virtually unchanged. The conclusion we reach is either that the income distribution variable is not a good measure of individual economic interests or that these interests are not particularly powerful explanations for representatives' decisions. We find the former conclusion surprising, given the nature of the issues being voted on, and the latter surprising too, given the prevalent views about legislative behavior.

The associations between income change and redistribution preferences and representatives' votes were consistently large and in the expected directions. The relation between income change and legislator's voting was particularly strong on the key votes on the report, capital gains indexing, and Corman and on the final vote. A 13.4% difference in income growth between 1969 and 1979 predicts a .12 higher probability of voting against Corman, a .08 higher probability of voting for the report, and a .05 higher probability of voting for capital gains indexing. We interpret these results as indicating both possible public and private interests. People with rising incomes may be less likely to favor income redistribution for self-interested reasons. At the same time, people in areas with increasing income may believe that stimulating economic growth is a more important public objective than income redistribution and accept the Republicans' argument that tax cuts are needed to stimulate that growth.

Increases in the proportion of the district that favors using taxes to redistribute income predict a significantly higher probability of that representative's voting against the Republican proposals. This relationship is largest on the Corman vote, where a shift of 4.8% favoring redistribution predicts a .13 higher probability of voting for Corman. The importance of redistribution preferences is indicated by the result that the differences in the probability of voting for redistribution measures associated with the 4.8% difference in public support were above .06 on all votes.

Variations in the Influence of Constituent Preferences

Safeness and sophistication were strongly related to how much district income change and redistribution demands constrained legislators' voting decisions but in precisely the opposite manner from what we hypothesized. Greater constituency education led to smaller associations between the constituency variables and legislator's voting behavior. On some of the important votes the differences were substantial. Larger electoral margins are associated with less constraint on all votes but the one for final passage. Table 2 shows the expected differences in the probability of a Democrat voting for the tax reforms for three different safeness and education levels for the same difference in redistribution preferences used in Table 1. An electoral margin of 72% and an education level of 12.2 years correspond to average safeness and
Public Goods, Private Interests

Table 2. Relations with Safeness and Sophistication

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<tr>
<th></th>
<th>Electoral Margin (%) of Vote</th>
<th>Education (Years of Schooling)</th>
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<td></td>
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<td>-.07</td>
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<tr>
<td>Corman</td>
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<td>-.04</td>
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<td></td>
<td>-.13</td>
<td>-.01</td>
</tr>
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<td></td>
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<td>-.00</td>
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<td>Kemp*</td>
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<td>-.13</td>
</tr>
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<td></td>
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<td>-.03</td>
</tr>
<tr>
<td>Passage</td>
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<td>-.05</td>
</tr>
<tr>
<td>Conferees</td>
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<td>-.11</td>
</tr>
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<td>Final Vote</td>
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<td>-.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-.05</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>.00</td>
</tr>
</tbody>
</table>

Note: Entries are change in probability of voting for Republican proposal for the same 4.8% change in redistribution preferences used in Table 1.
*Not applicable, as safeness and sophistication hypotheses are not significant.

sophistication levels and are the values used in constructing Table 1.

The Corman vote illustrates the interpretation of Table 2. With average electoral margins and education levels, a change of 4.8% in the proportion of the district that favored more income redistribution was associated with a .13 higher probability of voting for the Corman substitute (see Table 1). In competitive districts, where the electoral margin is only 50%, this expected probability difference is reduced to .08, while in districts with margins of 94% the expected difference is .19. In highly educated districts, with average schooling levels of 14 years, the expected difference is only .03 while in districts with an average 10.4 years of schooling, the expected difference grows to .23. (There are no entries for the vote on the Kemp recomittal motion, as these variations were statistically insignificant.) On all critical votes, higher electoral margins and lower education levels were associated with larger relationships between income change and redistribution preferences and the probability of voting for the Republican tax proposals. These results are statistically significant and contrary to expectations.

Some literature suggests that our result on safeness may not be so contrary. Powell (1982) also found a negative relation between safeness and representation. If more electorally competitive districts are more heterogeneous (defined as having a larger variance in redistribution preferences and a larger number of groups concerned about different issues), mean district opinion may appear less constraining if representatives follow nonmedian strategies in creating reelection constituencies from among various subgroups (Fiorina 1974). Another explanation for the contrary outcome of the safeness hypothesis is suggested in Kingdon’s discussion that greater attention to constituency preferences may lead to a safer seat. If this relationship is stronger than the rate at which representatives with safer seats deviate from constituency preferences, we are left with the observed positive association. (This is the classic simultaneous equation bias, only in this case it appears in models of the coefficients, which is far harder to rectify.) We have no obvious interpretation of the negative association between education and constituency constraint but do conclude there is no support for the sophistication hypothesis. We think safeness and sophistication are still very plausible hypotheses.
that warrant additional testing, and equation 3 offers the framework for such tests.

Partisan Differences

The differences in the voting patterns of Republicans and Democrats were larger than those associated with any other factor in the study. Republican and Democratic voting behavior can differ in two ways. One is the direct partisan effect, which predicts that a Republican's probability of voting for the tax reform proposals is greater than a Democrat's, everything else being equal. This partisan effect is represented by the extremely large interaction term in the model. The differences attributable to this interaction term are shown in the seventh column of Table 1, which show the differences in the probability that otherwise identical Republicans and Democrats would vote for each proposal (or against Corman). These differences were constructed so the effects of all other variables and constant terms sum to zero, leaving only the differences attributable to the partisan term. The magnitudes of these partisan differences is startling. The smallest partisan difference is .7, and all others are over .8! The clear implication here is that it would take considerable constituency influences or personal influences to induce a Republican to vote against the tax reforms or to get a Democrat to vote for them.

The second Republican-Democratic difference is our hypothesis that the efforts to create a cohesive Republican tax bill may have led to smaller associations between voting behavior and constituent and personal factors for Republicans than for Democrats. This hypothesis is assessed by a single coefficient reflecting the weight given to these factors. The coefficients shown in Table 1 under the GOP Factor column measure this aspect of party voting. In all cases, the relationship between constituency and personal factors and Republican votes was much smaller than the relationships for Democrats. On the first three key votes, the Republicans gave about three-quarters as much weight to these factors as Democrats, while on the other, more symbolic votes the differential dropped to just over one-third. These results indicate the Republican party leaders were very effective at building a cohesive party whose members gave less weight to constituency preferences and personal considerations and who voted as a bloc.

Why the Revenue Act Passed.

Our analysis has not answered the question, Why was there tax reform? There was little doubt after Proposition 13 and in a period of high inflation that a tax cut was in the offing. President Carter and congressional leaders of both parties proposed tax cuts. The critical question is, Why did this particular revenue act pass and depart so dramatically from previous reforms? The clues lie in the key votes that shaped the outcome of the reform, and they identify party and constituency as the perpetrators.

Republicans offered a well-defined tax plan to stimulate economic growth through cuts in the marginal tax rate and in capital gains taxes. Republicans voted as a near bloc to support this plan, both to get it on the floor and to kill more progressive Democratic alternatives. The Republicans' cohesive voting is clearly evident in the large GOP coefficients, indicating sizable partisan differences. However, this does not fully explain the outcome, as the Republicans were decidedly a minority party. There were 287 Democrats and 148 Republicans, so even with perfect cohesion the Republicans were still 70 votes short of a majority.

The Republicans needed Democratic votes to fashion a winning coalition. Republican strategists crafted a tax plan that won support from Democrats from districts with rising incomes and with con-
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... constituents opposed to using taxes to redistribute income. The strong relationship between these two variables and lawmakers’ positions on the key votes is evident in Table 1. Analysis of the votes on the critical Corman substitute give a clear picture of the importance of the constituency variables in explaining these defections. (On this vote a bare majority, 225-193, was against more redistribution. A switch of only 16 votes would have enabled Speaker O’Neill to cast the deciding vote, presumably in favor of Corman.)

The equation estimated for the Corman vote predicts 148 Republican and 77 Democratic votes against Corman, enough to defeat his proposal. When we exclude the effects of income change and redistribution preferences from the predictions, there are only 8 predicted Democratic votes against Corman, far short of what the Republicans needed to pass their plan. This pattern was repeated on the report and capital gains votes, giving further indications of the important link between constituency interests and Democratic votes for the Republican proposals.

Republican cohesion broke only when party and constituent demands were forcefully at odds. Though only eight Republicans broke with their party on the Corman vote, all eight came from districts where the constituents strongly favored using taxes to redistribute income. On all the votes, though, there were many more Democratic than Republican defections; and the defections are strongly related to constituent demands. Without constituency interests and their relationship with members’ votes, the Republicans would not have been able to build the winning coalitions needed to shape the tax act as they did.

Conclusions

Imagine 15 October 1978. Bleary-eyed lawmakers were nearing the end of a 34-hour session. Elections loomed large on the horizon. Representatives wanted to head home, but they stayed long enough to rewrite and redirect the U.S. Tax Code. Our study indicates that this redirection was greatly influenced by constituent public goods preferences, mobilized by the Republican party’s electoral strategy.

This legislation was an important collective decision to make the tax code—and presumably the distribution of income—more regressive. Society’s income distribution is pure public good, and constituent redistribution preferences were strongly associated with how representatives voted. Redistribution preferences represent people’s perception of socially desirable changes in the income distribution. We also find, as expected, considerable disagreement about what changes are socially desirable. It is these disagreements over collective issues that we hoped to see, and saw, reflected in the decisions of our political institutions.

This legislation makes a second collective choice, beyond how to redistribute income. The Republicans framed the choice before Congress as one between two desired but competing public objectives—income redistribution and economic growth—not just as one between more or less income redistribution. To the extent that we cannot use tax policy to pursue both objectives simultaneously, we have a collective choice problem. People obviously disagree about the relative importance, as well as about the correct level, for each objective, so we must decide collectively how far to pursue each one. People more concerned about promoting economic growth will likely support the Republican proposals, while those who attach greater importance to a more progressive income distribution will side with the Democrat’s alternatives. If the district income growth variable reflects, at least in part, the relative importance of economic growth to the people in each district, the large associations be-
between votes and both of the public goods variables reflect congressional response to the distribution of preferences over this collective choice.

The notion of "representation within issue areas" is particularly interesting. Constituencies provide representatives with preference information about broad issue areas that the legislator can then translate into positions on specific proposals. For example, legislators need not know the precise percentage of potential voters supporting every suggested change in the U.S. Tax Code; they simply need to know how these voters think about income redistribution (or the importance of stimulating economic investment and growth). On a given proposal involving income redistribution, for example, representatives consider these general preferences, their importance, and how the change will affect individual incomes. They then weigh these considerations and vote accordingly. If elected officials must explain their votes on redistributive or growth issues in future elections, constituents' dispositions on these public objectives become integrated into how representatives approach tax issues. We suggest the same process will hold in other issue areas where constituents' preferences can be identified, for example, pro-environment, probusiness, or anti-defense spending.

Public goods considerations are central to constituent preferences and to legislators' voting decisions. This conclusion has substantial implications for questions about the character of representation. We cannot argue that House decisions in general (or on tax policy specifically) represent the collective will of United States citizens. We do contend that each member's votes strongly reflect mean district preferences for redistribution, preferences for the trade-off between the redistribution and growth objectives, and, to a lesser extent, preferences for personal economic interests. Our dyadic-level analysis has shown that at a minimum, House decisions do reflect the distribution of preferences on public goods existing within the country and are far more than an expression solely of "particularistic" interests. It is certainly conceivable that there is similar preference congruence on public goods issues at the institutional level.

We have not addressed the questions of representation off the House floor or by the Congress as a whole. How important are constituency preferences when lawmakers shape the legislative agenda, write bills, oversee the bureaucracy, or sit on committees? Are there biases in the processes of governance that make it more likely that certain types or sources of preferences will hold sway at different times? Are senators as sensitive to public goods interests as House members? Is tax policy somehow unique? Our finding that critical floor votes shaping tax policy reflect constituent public goods preferences makes research on these additional questions all the more intriguing. Our methodology for estimating constituency preferences and for modeling legislators' decisions provides a base for this research.

Appendix A.

Formal Statistical Model

The statistical model has two non-standard features—the inclusion of the representative's party affiliation as an endogenous variable and the nonlinear structure of the coefficients. The nonlinearities arise from the hypotheses about variations in constituency constraint and about Republican's response to personal and constituency interests.

Party is not exogenous in any representation model. It exists in a hierarchical system where constituency demands and characteristics affect the district representative's party, which in turn influences the votes of that member. This hierarchy
is a two-equation system where the first equation models representatives' party affiliations and the second relates roll call votes to party, as shown in equation 3. This is the classical nonrecursive, structural equation model that makes it inappropriate to treat member's party as exogenous (Hanushek and Jackson, chap. 8). We model this system with a $P$ (party) equation and a $V$ (vote) equation, temporarily omitting party from the vote equation.

$$P = Z\Gamma$$

$$V = B_0 + B_2T + B_3N + B_4ag$$

$$+ (C_1I + C_2\Delta I + C_3R)$$

$$\times (1 + A_1S + A_2L + A_3E)$$

A multivariate logistic model represents the relationship between the equations and the observed party affiliation and vote variables. This model accommodates both the dichotomous and endogenous nature of the two measures (Nerlove and Press 1973; Franklin and Jackson 1986). The two dichotomies constitute a single measure with four categories: Democrat and no, Republican and no, Democrat and yes, and Republican and yes. (All votes are polarized so that yes indicates a vote in favor of the Republican proposals, that is, a nay vote on Corman.) The interaction between party affiliation and vote is measured by a constant, $Q$, that increases the odds of being a Democrat and no or a Republican and yes. Lastly, our hypothesis that Republicans gave less weight to the personal and constituency factors in equation 3 is represented by the coefficient $\alpha$ that weights the whole expression for $V$ for Republicans.

The logistic model then specifies the probability of being in each category as

$$\text{ Democrat and no } \quad e^{Q/D}$$

$$\text{ Republican and no } \quad e^{P/D}$$

$$\text{ Democrat and yes } \quad e^{V/D}$$

$$\text{ Republican and yes } \quad e^{(P+\alpha V+Q)/D}$$

where $D = e^Q + e^P + e^V + e^{(P+\alpha V+Q)}$.

This formulation makes party and vote endogenous with $Q$, the interaction between the two outcomes. Consider the predicted log of the odds of a legislator voting yes, given that she or he is a Democrat or a Republican. (In the logistic model these log-odds are linear, making exposition, but not interpretation, easier.) The log-odds of a Democrat voting are

$$\log[Pr[\text{vote } = 1 | \text{Democrat}]/Pr[\text{Vote} = 0 | \text{Democrat}]] = V - Q,$$

and the log-odds for a Republican are

$$\log[Pr[\text{vote } = 1 | \text{Republican}]/Pr[\text{vote} = 0 | \text{Republican}]] = \alpha V + Q.$$

The larger $Q$ is, the less likely Democrats are, and the more likely Republicans are, to vote yes. The smaller $\alpha$ is, the smaller any association between personal and constituency factors and votes is, and the more likely a Republican is, simply to vote yes, for any positive value of $Q$.

Estimation of this model is based on the maximum likelihood function for the observed party and vote outcomes and selects the values of the parameters in the party and vote equations that maximize this function. In other words, we pick the estimates that are most statistically consistent with the observed data. The actual calculations were done with the program Statistical Software Tools (SST) developed by Dubin and Rivers (1987).

The variables used in the party equation, denoted by $Z$, are constant; South, East, and Midwest; education, log (population density), and Gerald Ford's 1976 vote percentage.

Appendix B.

Full Statistical Results

Table B-1 presents the estimated coefficients and their asymptotic standard errors in the models estimating the prob-
Table B-1. Coefficients in Estimated Vote Models

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<tr>
<th>Variable</th>
<th>Report</th>
<th>Capital Gains</th>
<th>Corman</th>
<th>Kemp</th>
<th>Passage</th>
<th>Confer</th>
<th>Final</th>
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<td>.75</td>
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<td>6.16</td>
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<td>(1.06)</td>
<td>(1.12)</td>
<td>(3.65)</td>
<td>(2.58)</td>
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<td>(2.16)</td>
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<td>.36</td>
<td>.39</td>
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<td>.51</td>
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<td>(.12)</td>
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Note: Asymptotic standard errors are in parentheses.

ability of voting for the Republican tax proposed or against the Corman substitute.

Notes

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1. See Polinsky and Rubinfeld 1977, on the relationship between air quality and housing prices.
2. It is commonplace to use interest group ratings, such as those of the Americans for Democratic Action (ADA), to proxy member preferences. Unfortunately, adding such a vote score to our list of explanatory variables is, in effect, regressing votes on votes. We reject that maneuver outright. For a vote score to reflect a member's preferences faithfully, one must assume that every component vote accurately reveals only the member's personal preferences. If, on any component vote, members were responding to a mix of pressures, such as party, constituent, and institutional demands, at odds with their individual preferences, the vote score is an error-filled measure of personal preferences. Worse still, these errors are not white noise but contain systematic biases. Inclusion of a vote score variable with these systematic errors will bias coefficients estimating the independent effects of party and constituents, as well as of ideology. For these reasons, vote scores, including the ever popular ADA and Americans for Constitutional Action ratings, should be expressly avoided in analyses such as this. See Jackson and Kingdon 1989.
3. If both Fenna's and Kingdon's predictions are correct, as we suspect, we have a nonlinear simul-
taneous relationship between representation and safety. Estimation of such a structure is beyond our scope here.

4. The precise question is, “Aside from raising money, the taxing system in our country has come to be used for a number of purposes—to redistribute income, . . . , etc. Here is a list of some different things. Would you tell me for each one whether you think it is something that should be done through raising or lowering taxes or done through other means or not done at all? . . . to reduce the amount of money those who are better off have, and increase the amount of money poor people have?”

5. The nonlinear specifications are incorporated in the maximum likelihood function for the multivariate log-odds model and in the first-order equations used to find the maximum of this function.

6. Statistical tests of the significance of different parts of the model were done comparing the values of the log-likelihood function for different specifications. —2 times these differences are distributed as a chi-squared distribution, with the number of degrees of freedom determined by the number of coefficients being deleted. The first test compared the model with safety and sophistication, equation 3, to one without these terms. On all but the Kemp recommital vote the values of the chi-squared statistic far exceeded any conventional critical value, leading to rejection of the hypothesis that the relationship between roll call votes and the constituency variables did not vary with electoral margin and education. On the Kemp vote, the chi-squared value was 5.94 and the critical value for \( \alpha = .10 \) is 6.25. The second test compared the model with and without the constituency variables. The null hypothesis that the constituency variables had no relationship with votes was rejected in all instances.

7. This expositional format is the simplest way to summarize the statistical results because the coefficients in the logistic model are difficult to interpret directly. These distances are chosen arbitrarily and simply for illustrative purposes.

8. We also examined whether members of the Ways and Means Committee voted differently from other representatives and found that they did not.

9. See n. 3.

References


John E. Jackson is Professor of Political Science and Business Administration and Research Scientist, and David C. King is Graduate Student Research Assistant, Institute for Social Research, University of Michigan, Ann Arbor, MI 48104.