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The Effects of AMA Contributions in the United States Senate: An Analysis of Roll Call Votes, 1979--1992.

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THE EFFECTS OF AMA CONTRIBUTIONS IN THE U. S. SENATE: AN ANALYSIS OF ROLL CALL VOTES 1979-1992

A Dissertation

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ABSTRACT

Based on the economic theory of regulation, our model portrays U.S. senators as utility-maximizing agents and the American Medical Association (AMA) as a rational contributor. We use contributions from the AMA's political arm, the American Political Action Committee (AMPAC), and roll call votes in the U.S. Senate from 1979-1992 to test for AMPAC contributions effects, to test the hypothesis that the AMA "rewards" senators for their voting behavior, and to determine the role of issue specificity. We use pooled, cross-sectional data in a simultaneous Probit-Tobit-Generalized Least Squares framework and extend the traditional analyses by examining alternative timing specifications, election year and nonelection year samples, and Senate committee members and nonmembers. We obtain estimates of the standard errors by using bootstrap procedures which does not rely on asymptotic assumptions.

We find no strong evidence that the AMA is successful in capturing legislation nor any evidence that the AMA rewards (or punishes) voting behavior. There is weak evidence that senators respond to future AMA contributions when voting on bills especially important to the AMA. We also find weak evidence that (future) key votes explain AMA contributions. Tests show that the underlying process generating AMA contributions is different for election years and nonelection years, and for Senate committee members and nonmembers.

INTRODUCTION

The American Medical Association (AMA) is often viewed as one of the most powerful interest groups in Washington, both in the popular and academic literature.[1] The political arm of the AMA, the American Medical Political Action Committee (AMPAC), is the health industry's largest political committee. Table 1.1 indicates the AMA's contributions to congressional candidates over the 1977-1992 period. The AMA continues to be a major political contributor. In 1991-92, the AMA contributed over $2.8 million in real dollars to congressional candidates. The AMA was the third overall largest PAC contributor in 1988, second to the National Association of Realtors and the Teamsters Union. If contributions do influence policy, then the AMA's reputation may be well founded. On the other hand, if AMA contributions do not affect roll call votes, is the power of the AMA being overestimated and is the AMA contributing in a rational manner?

The economic theory of regulation models political interest groups as competing for favorable legislation by contributing time and money to candidates in hopes of being rewarded when the legislator votes on bills of interest to the group (Stigler, 1971; Peltzman, 1976; Becker, 1983). Interest groups contribute to "buy" favorable legislation, which legislators supply to remain in office (i.e., get re-elected). The market for legislation is competitive, with various interest groups and constituencies

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[1] Sorauf (1988) describes AMPAC as "formidable" (page 73) and "affluent" (page 119). Sabato (1984) calls AMPAC a "pacesetter" and "successful" (page 6). Keiser and Jones (1986) conclude "the AMA is indeed a potent political force" (page 766).

Table 1
AMA Contributions to Congressional Candidates
(in Real Dollars, base year 1982)

Year	Republican	Democrat	Total
1977-78	$ 1,813,810	$ 798,128	$2,611,938
1979-80	1,387,511	464,833	1,852,344
1981-82	1,444,387	586,146	2,030,532
1983-84	1,442,980	768,025	2,211,004
1985-86	2,170,443	1,167,843	3,338,285
1987-88	1,374,924	1,289,785	2,664,709
1989-90	924,627	898,048	1,822,675
1991-92	1,538,098	1,284,972	2,823,070

pressuring Congress for favorable legislation. It is the interaction of these demand and supply forces that is realized when bills are voted into law.

This self-interest model of simultaneous economic and political concerns raises several questions: What effect, if any, do campaign contributions have on legislative outcomes? Are interest groups successful in capturing regulation? Are votes on certain types of legislation affected differently by interest groups? Do legislators punish groups who contribute to their opponents by voting against bills supported by the interest group? What determines contributing behavior? What is the proper specification for the timing of votes and contributions?

This study serves several purposes. Our primary goals are to determine the effects of AMA contributions and membership on roll call votes in the Senate and to test the hypothesis that the AMA contributes to senators based on their voting records, an assumption often made but seldom tested. We also want to determine if issue specificity plays a role in how successful the AMA is in capturing legislation. With these goals in mind, we analyze pooled, cross-sectional data and extend the traditional analyses by examining alternative specifications based on the timing of votes and contributions, and by examining election year versus nonelection year data. Lastly, we consider the importance of senate committees in affecting our conclusions about the effects of AMA contributions on roll call votes.

We base this study on previous models of roll call votes. However, the value-added of our study to the existing models of PAC influence is based on the following points.

The methodology used in this study avoids the potential bias present in other studies. Simultaneous Probit-Tobit-generalized stage least squares estimation techniques are used to examine Senate votes, AMA contributions, and constituency voting, respectively. Bootstrapping is used to estimate standard errors. The bootstrap method identifies potential bias in estimators and provides more reliable finite sample standard errors.[2] Bootstrapping represents an improvement in testing hypotheses over that used in previous studies of interest group behavior.

A measure of opposition strength is incorporated where possible. Theory suggests that the AMA's success in capturing votes depends inversely on the strength of opposition. Contributions from interest groups who oppose the AMA stance on a vote are included to avoid understating AMA influence. We include contributions from interest groups who support the AMA stance to avoid overstating the AMA's impact on votes.

We use a sample of forty-two roll call votes; previous studies use substantially fewer votes. The AMA identifies most votes used in this study in its *Compendium of Statements*, and, by using this as our source, we avoid researcher bias in issue identification. In addition to estimating individual vote equations, we use several vote indices in order to capture a broader range of issues. The use of vote indices assumes the AMA considers the overall voting record (on bills of interest to the AMA) of a senator rather than a single vote in making contribution decisions.

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[2] Freedman and Peters (1984).

We create a full vote index using the total sample of votes. The votes differ in their degree of effect on the AMA membership. Therefore, votes are separated into two categories; narrow if the issue affects AMA membership economically or practically, and broad if the issue is of a broad social nature and the AMA has announced a stance. We then use the narrow vote index and the broad vote index separately in the contributions equation.

Previous studies have not examined the issue of grudge-bearing, although the possibility of its existence in determining congressional behavior has been noted.[3] We test the hypothesis that a senator "punishes" the AMA for contributing substantially to her opponent by voting against the AMA stance.

The data permit us to test three alternative hypotheses concerning the timing of contributions; the AMA rewards senators for voting pro-AMA in the past congressional session, the AMA rewards pro-voting behavior in the current session, or the AMA contributes to buy future votes. By estimating and comparing these alternative models, we hope to determine the effects of AMA contributions on votes (and of votes on contributions) over different time periods.

The demand for campaign funds changes during campaign cycles. A senator facing an upcoming election increases her demand for funds and the underlying structure of the model of votes and contributions may change. The data are structured in a way to test the hypothesis of structural changes across election cycles.

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[3] Kau, Keenan, and Rubin (1982) recommend examination of this issue though they do not incorporate grudge-bearing specifically in their model.

In the next section, we describe the American Medical Political Action Committee and campaign contributions.

American Medical Political Action Committee

Officially organized in 1848, the AMA began considering the formation of a political action committee in 1958. A 1925 federal law[4] forbids corporations from making contributions to or expenditures on behalf of candidates for federal office, although it did not prohibit unincorporated committees from doing the same. Committees could accept donations from corporations for political education purposes and voluntary gifts from individuals for use in elections. After observing the political force of labor through the AFL-CIO, the council and board of the AMA approved the formation of the American Medical Political Action Committee (AMPAC) in May of 1961. It was initially created as a non-profit, voluntary, bipartisan, unincorporated committee, whose stated purpose was to build a strong bipartisan, conservative coalition in Congress. Support came from state and local medical societies, as direct membership dues to the AMA could not be used for contributions. Individual donations of $99 or less were also accepted.

During this study's observation period, PAC contributions are limited to $5,000 per candidate per year, although levels of "soft money", independent expenditures, and other services (such as research and campaign strategies) are unlimited by law. "Soft money" is any contribution not regulated by federal election laws, such as money donated to state and local party organizations, or to the national parties but specifically

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[4] The Corrupt Practices Act of 1925.

earmarked for their local affiliates. The use of "soft money" may only be used to support state and/or local activities or activities jointly supporting state/local and federal candidates. Independent expenditures are funds spent independently by a PAC to support or oppose a candidate by name, but cannot be made in conjunction with or in coordination with the campaign or staff of any candidate.

A Congressional Review Committee, consisting of the AMPAC chairman and two to three other directors, decides which candidates AMPAC will support (or oppose). Recommendations are then made to the AMPAC board for final action. AMPAC claims to have influenced House and Senate elections[5], although affecting legislation per se has never been a stated goal of AMPAC.

Previous Research and Literature Review

Roll call votes and contributions have been modeled as both single and multiple equations, with some studies using a single vote or several vote outcomes and some using a vote index of "correct" votes. Single equation estimation assumes one-way causality and treats the error terms from the vote and contribution equations as independent. If votes and contributions are jointly determined, the errors may not be independent, and single equation estimates are biased and inconsistent. Simultaneous equation models take the dependence of random errors and explanatory variables into consideration and produce consistent estimates. Statistical inference from single equation estimation may be misleading, and simultaneous methods are preferred.[6]

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[5] Campion, (1984).

[6] For a discussion of the econometric problems of single equation estimation of a system of equations, see Judge et al., (1988) Chapter 14.

The examination of single votes has been criticized as being dependent on the issue selected, and if that issue does not represent a group's overall interests, then the results could be misleading (Wilhite, 1988). The same argument holds for the selection of a few votes. If PAC influence is significant in determining relatively few vote outcomes, this does not imply overall success in "buying votes". In addition to this potential problem of overstating results, self-selection bias may exist due to the choice of votes analyzed. Researchers may select votes which they believe are most likely to be affected by interest group pressure. A PAC such as AMPAC has multidimensional concerns which may not be captured by the researcher's selection of individual vote outcomes. Using a vote index, preferably consisting of votes identified by the PAC itself, produces results over a series of decisions deemed important to the PAC. Of course, AMPAC could take public positions only on issues over which they have some influence. If so, this study's results would be biased toward showing a strong AMPAC influence. Because our empirical results inicate no such strength, we believe our selection of votes is unbiased.

In the following section, we review previous roll call vote studies. We categorize them according to method of estimation employed and definition of the vote variable (actual roll call vote or vote index). The conclusions about PAC influence vary over these studies.

Single Equation Models

Roll Call Votes

Paul Feldstein (1984) examines the role of contributions by the AMA and state medical political action committees (MEDPACs)[7] in determining one legislative outcome, the Gephardt Amendment, which was a substitute amendment to the Hospital Cost Containment bill of 1979. Most important to health-providers, the amendment eliminated from the bill mandatory revenue limits. Feldstein reports that contributions affect legislation, but the impact is small. AMPAC is not separated from other medical association PACs, so its specific influence can not be identified. Only the vote equation is analyzed; the determinants of contribution behavior are not included in the study.

In another study that examines the role of health PACs, Keith Mueller (1986) analyzes nine health policy votes in the House of Representatives between 1973 and 1980. AMA lobbying strength (as measured by membership in state and local medical societies) is significant in a majority of the votes analyzed, while PAC influence doesn't become significant until 1979. (Contributions are measured as a percentage of total contributions and a contributions equation is not estimated). Mueller concludes ideology is the most important factor determining votes.

Alan Neustadtl (1990) uses votes during the first session of the 99th Congress to examine pro-labor and pro-business influence. Logistic regression of the two models

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[7] In his discussion of groups affected by the President's hospital cost containment proposal, Feldstein states that hospital associations and the AMA are the main lobbyists opposed to the bill. However, it is unclear exactly what PACs are included in "MEDPACs".

(one for labor, one for business) includes "visibility" of the issue as a dependent variable. He finds labor contributions are significantly related to labor vote outcomes, but the influence is small. Business contributions do not significantly affect vote outcomes. Contributions equations are not included in the study.

Vote Index

A study that specifically looks at the influence of AMA contributions is by K. Robert Keiser and Woodrow Jones, Jr. (1986). The Gephardt Amendment vote is the principal dependent variable, and an index of pro-AMA voting on three bills is also analyzed. Ideology and party affiliation are the most important determinants of voting behavior. AMA contributions are not significant in the Gephardt Amendment equation. They are significant in the analysis of the vote index, suggesting that contributions have a larger impact over a series of issues than on a single vote. The authors note the possibility of simultaneity bias and, therefore, assume contributions received in the prior cycle affect current voting behavior. But if contributions are endogenous, then the error terms will correlated with contributions. A valuable contribution of this study is the examination of committee action as well as roll call votes. Keiser and Jones find that AMA contributions have a significant effect on committee decisions. They note that, while party and ideology have similar influences in both domains, committees are smaller and lesser visible arenas of action.

Multiple Equation Models

Roll Call Votes

Henry Chappell (1982) recognizes the econometric problems of a model of simultaneous voting and contributing behavior. He estimates a two equation model, incorporating the dichotomous nature of the vote variable, the non-negativity constraint on contributions, and the possible correlation between the error terms and the explanatory variables. Seven votes from 1974 through 1977 are analyzed, each identified with a particular interest group. Full information maximum likelihood estimates of contributions effects are smaller than single equation estimates. Chappell is unable to conclude that contributions significantly affect vote outcomes, but finds ideology and constituent interests to be significant. Votes are not included as an explanatory variable in the contributions equation. The significant determinants of contributions are incumbency (a positive effect), election margin (a negative effect), and ideology.

Thomas Stratmann (1991) recognizes the need to incorporate (1) the endogeneity of PAC contributions in the vote equation, (2) the censored nature of the contributions variable, and (3) the dichotomous nature of the vote variable. He uses the method of full information maximum likelihood to estimate simultaneous Probit-Tobit equations of farm votes and contributions from the farm sector. PAC contributions are significant in eight out of ten votes. He shows that relatively small amounts of contributions can have important effects on vote outcomes. Stratmann argues that legislative attempts to reduce PAC influence on congressional voting behavior would have to include sizable

reductions in the maximum allowable contribution in order to achieve its goals. Voting behavior is not included in the contributions equation.

James Kau, Donald Keenan, and Paul Rubin (1982) model the behavior of congressmen, contributors, and voters in a three-equation system. Eight bills in 1979 are identified with corresponding interest groups. (The Gephardt Amendment is included). The predicted values of votes, contributions, and election margin estimated from a first stage are used in the second stage of estimation. Business and labor PAC contributions are significant in six out of eight votes, while contributions from the health industry are significant in only one of four votes, the significant impact being on the Gephardt Amendment.

Kau et al. include voting behavior (a vote index of conservative votes) in the contributions equation, along with party, the loser's total contributions (contributions received by the Congressman's opponent in the last election), a dummy variable equal to one if the congressman was in a primary, and a measure of seniority. The vote index significantly impacts contributions, suggesting that the simultaneous model is appropriate.

Vote Index

Allen Wilhite and John Theilmann (1987) and Allen Wilhite (1988) find that organized labor contributions influence labor legislation in some voting cycles, but in others. Instead of using individual vote outcomes as the dependent variable, they construct a pro-union voting probability based on the AFL-CIO's Committee on Political Education (COPE) ranking system, thereby avoiding potential researcher bias.

In 1980 and 1982, labor contributions significantly affect the probability of voting pro-union, but not in 1984. Contributions are significantly affected by the probability of voting pro-labor, supporting the hypothesis that the tendency to vote pro-labor and labor PAC contributions are simultaneously determined.

Gregory Saltzman (1987) uses COPE scores as a dependent variable in a two-stage least squares estimation of pro-labor congressional votes and labor PAC contributions. In recognizing the problem of double truncation of the COPE variable, Saltzman employs a two-limit Tobit analysis, but in so doing, he cannot control for the simultaneity bias. Labor PAC contributions have a significant, but small, impact on COPE scores. He argues that the overall impact is substantially greater due to the indirect influence through election outcomes. COPE scores significantly affect contributions, although this effect may be overstated due to the omission of ideology variables.

Frank Davis (1993) finds PAC influence on votes affecting the railroad industry and the airline industry. Individual roll call votes are not directly analyzed, rather a "roll call support index" is created for each industry, ranging from -3 to 3. (Three votes of interest for each PAC are used). Two-stage least squares estimation is used, with "contribution scores" calculated from the first stage included in the second-stage vote equation as an instrumental variable. The vote index based on only 3 votes may not capture the general interests of the PACs. Votes are not included in the contributions equations, although key committee membership is. The estimated first stage contributions equations are not reported.

In reviewing the various methodologies presented above, we find that single equation models tend to overstate the significance of PAC influence, while the simultaneous models produce mixed results. The two studies that use multiple equations and individual votes (Chappell and Stratmann) produce opposite results, perhaps due to self-selection bias. Studies using the best design, multiple equation and vote index, also produce mixed results. Overall, the results from these studies raise serious doubts about the ability of interest groups to influence roll call votes. Our study examines AMPAC's influence on roll call votes in the U. S. Senate for the 1979-1992 period.

CHAPTER 1

TRADITIONAL MODEL OF SENATE ROLL CALL VOTES AND AMA CONTRIBUTIONS

1.1 Introduction

The traditional models used in roll call vote analyses assume congressmen respond to last period's contributions. Contributions are a function of current votes. Assuming that voting behavior is instantly observable, but contribution reporting is lagged, this specification is appropriate. We assume this model specification in this chapter.

We propose a three-equation model in which senators vote on bills of interest to the American Medical Association (AMA), the American Medical Political Action Committee (AMPAC) contributes to senators, and constituents elect candidates to the Senate. The direction of causality between Senators' votes and AMA contributions is unclear a priori. Senators may vote in response to contributions while the AMA contributes to particular senators based on their voting performance. The same concept applies to roll call votes and constituency support. As is common in roll call vote analyses, we assume that senators respond to contributions received in the previous period, i.e., senators "reward" contributors, that the AMA contributes contemporaneously to affect vote outcomes, and that constituents vote for senators contemporaneously.

In the next section, we develop the system of equations to be estimated. The equations are essentially reduced-form equations implicitly derived from the underlying structural (demand and supply) equations for votes, contributions, and vote margins.

Many of the control variables included in the system affect both the demand and the supply of the left-hand side variable. We cannot, a priori, hypothesize the direction of effects for these variables in the reduced-form equations. We recognize the restrictions placed on us by using such a model of reduced-form equations, but do not feel that these problems compromise our results.

1.2 Senator Behavior

The vote equation is based on a senator's unobservable, expected utility functions when he votes pro-AMA ($VOTE_i=1$) and when he votes against the AMA stance ($VOTE_i=0$). The utility functions are assumed to be linear. Senator i's expected utilities from voting against the AMA stance and voting pro-AMA and are, respectively,

$$U_{i0}^* = E(U_{i0}) + e_{i0} \text{ and } U_{i1}^* = E(U_{i1}) + e_{i1}.$$

The observed vote is

$$VOTE_i = 1 \text{ if } U_{i1}^* \geq U_{i0}^*$$

$$= 0 \text{ if } U_{i1}^* < U_{i0}^*$$

The probability of senator i voting pro-AMA is

$$\Pr[VOTE_i=1] = \Pr[U_{i1}^* \geq U_{i0}^*]$$

$$= \Pr[(e_{i0} - e_{i1}) \leq (U_{i1}^* - U_{i0}^*)]$$

$$= \Pr[(e_{i0} - e_{i1}) \leq \mathbf{X}^v{}_i'\beta^v]$$

$$= F(\mathbf{X}^v{}_i'\beta^v).$$

$$\Pr[VOTE_i=0] = 1 - F(\mathbf{X}^v{}_i'\beta^v)$$

where $\mathbf{X}^{v}_{i}$ is a matrix of factors determining the difference between the expected utilities of voting pro-AMA and against the AMA. β^{v} is the vector of corresponding (unknown) parameters.

Assuming that the errors e_{i0} and e_{i1} are bivariate normal, $F(\mathbf{X}^{v}_{i}{}'\beta^{v})$ is the cumulative distribution function for a standard normal random variable and Probit is used for estimation.

The vote equation to be estimated is

$$\text{VOTE} = \begin{cases} 1 \text{ with Prob } P_i = F(\mathbf{X}^{v}{}'\beta^{v}) \\ 0 \text{ with Prob } 1\text{-}P_i \end{cases} \qquad (1.1)$$

The factors assumed to influence the probability of voting pro-AMA ($\mathbf{X}^{v}$) are contributions received in the previous period (AMA$), the percentage of the senator's state doctor population that belongs to the AMA (%AMA), the contributions received from other interest groups in the last period (OTHGRP$), a measure of synergistic effects between the AMA and other interest groups (SYNERGY=AMA$ X OTHGRP$), the AMA's contributions to the senator's opponent last period (AMAOPP$), the margin by which the senator won in the last election (VOTE MARGIN), the political party of the senator (PARTY=1 if Republican, 0 if Democrat), the senator's American for Democratic Action rating (ADA), the total years the senator has been in the Senate (TENURE), the percentage of the senator's state population that is 65 years of age or older (%ELDERLY), the real per capita income of the senator's state (INCOME), and the region of the country that the senator represents (EAST,

SOUTH, MIDWEST). The following section describes the anticipated effects of these variables on voting behavior.

1.2.1 Interest Group Variables

A senator's objective is to get re-elected. Winning an election depends on resources spent on the campaign and the senator's performance in Congress. When voting on a particular bill, a senator considers the trade-off between the costs and the benefits of voting pro-AMA. The costs include losing support from opposing interest groups and possibly losing constituency support. The benefits of voting pro-AMA are contributions provided by the AMA and time and effort spent by AMA members in the candidate's behalf. The marginal gain for voting pro-AMA must at least equal the marginal cost. AMA contributions (AMA$) and the percent of the physician population represented by the AMA (%AMA) are the main interest group variables of concern in this model. We hypothesize that AMA contributions, and the percent AMA physician population, positively influence senators' votes.

The market for legislation is competitive; interest groups compete for political favors. Interest groups who support or oppose particular bills pressure senators to vote in their favor. For each vote equation, we try to identify other interest groups associated with the bill (groups either opposed to the AMA stance or supportive of the AMA stance). OTHGRP$ is the contributions of other interest groups who support or oppose the bill up for vote. We specify whether the group is expected to have a positive effect (if they are in agreement with the AMA) or a negative effect (those opposed the AMA stance). The AMA is likely to be more "successful" when another

interest group joins them in supporting a particular bill, whereas strong opposition from another group lessens the probability of a senator voting pro-AMA. To capture any synergistic effects between the AMA and other interest groups, we include an interactive variable, SYNERGY=AMA$ X OTHGRP$.

Kau, Keenan, and Rubin (1982) suggest the need to consider grudge-bearing on the part of a senator when it comes time to vote on a particular bill. If the AMA contributes substantially to a senator's opponent, does that senator "punish" the AMA by voting against the AMA stance? To examine this issue, we include AMA contributions made to a senator's opponent or contributions made specifically to oppose a senator (AMAOPP$). If grudge-bearing does influence senators' votes, it should have a negative effect.

1.2.2 Control Variables

1.2.2.1 Senator Characteristics

We include the percent of the total vote received by the senator in the last election (VOTE MARGIN) as a measure of the "safety margin" a senator feels when voting on a particular bill of interest to the AMA. With a relatively high electoral margin, the senator may feel safe when voting in compliance with interest groups, independent of constituency preferences. In this case, we expect a positive relationship between VOTE MARGIN and VOTE. Alternatively, a high electoral margin may simply represent a strong correlation between senator and constituency ideology. For these reasons, the sign of VOTE MARGIN is ambiguous.

A senator's propensity to vote pro-AMA depends on her personal characteristics. Ideology is significant explaining legislator behavior in other studies.[1] To capture the effects of ideology, political affiliation and rating by the Americans for Democratic Action (ADA) are included. PARTY equals 1 if the senator is a Republican, 0 if a Democrat. ADA rating (ADA) is based on liberal/conservative voting behavior defined by the Americans for Democratic Action, with higher scores reflecting more liberal voting patterns. We use the party and ADA rating variables to control for a senator's inherent taste for legislation, independent of interest group or constituent pressure. Unlike PARTY, ADA varies significantly over time for an individual senator.

We include the number of years a senator has been in the Senate (TENURE) to capture a senator's feeling of "job security". Tenure may provide a sense of independence in that the senator feels unconstrained by constituency pressure and can safely support AMA interests. It also provides an advantage in attracting campaign funds, thus a lower demand for AMA contributions specifically and less pressure to vote pro-AMA. Because of these conflicting effects, we do not predict the sign of the effect of tenure on votes.

1.2.2.2 Constituent Characteristics

Constituent characteristics may also influence senators' voting. Kau, Keenan, and Rubin (1982) argue that constituent ideology can be used to proxy senator ideology, since candidates with ideologies different from those of their constituencies would not

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[1] Chappell (1982), Mueller (1986), Keenan, Kau, and Rubin (1982), Feldstein and Melnick (1982), Neustadtl (1990), Davis (1993), Peltzman (1984), and Keiser and Jones (1986).

be elected. But, assuming at least partial voter ignorance, and given the possibility of ticket-splitting (voters elect one Democrat and one Republican) the relationship between constituent ideology and senator ideology may not necessarily hold. Therefore, we assume constituents are "demanders" of legislation and a senator's ideology may be different from her constituency's ideology. Since senators want to be reelected, constituent preferences will matter to senators and are included in the vote equation.[2]

Several demographic variables are used to reflect constituents' tastes for legislation. The percent of the state's population that is over sixty-five years of age (%ELDERLY) captures elder citizens' preferences for certain types of health legislation. The sign of its coefficient depends on the particular issue up for vote.

Phelps (1992) hypothesizes that per capita income (INCOME) is related to the demand for certain types of health legislation. People with higher incomes may be more efficient in the production of health. This "health spa effect" may cause high income voters to oppose certain health bills. On the other hand, higher incomes offer the opportunity for more unhealthy lifestyles and these "fast lane effects" may actually create higher demand for certain types of health reform. INCOME is a taste control variable.

To control for any possible regional differences in tastes, dummy variables for South, East, and Midwest are included. West is the omitted region of comparison.

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[2] This assumption is consistent with senators not engaging in complete shirking.

1.3 AMA Behavior

No specific underlying "utility" function is specified for the AMA. Developing a theory of a group utility function is beyond the scope of this study. Olsen (1971) suggests the purpose of an organization such as a PAC is "the furtherance of the interests of (its) members". Furthermore, a group utility function does not logically follow from the maximization of individual members' utility functions, since purely individual interests are better advanced individually. Those in control of an organization may shirk and use their power to maximize their own welfare, which may or may not coincide with group interests. Max Weber (1947) proposes that a group may exist for the purpose of "serving only the ends of the leadership". Our analysis allows for this possibility. The AMA's revealed preferences are taken from the AMA's *Compendium of Statements*, whenever possible.[3] The "revealed preference" is assumed to reflect the AMA's interests, whether it be the group's common interests or the leadership's interests, and is consistent with maximizing behavior.

We use Tobit analysis because the AMA contributes to some senators but not to others. Even when contributions are zero, there may still be some underlying, latent willingness to contribute but we do not observe this willingness, and the data are said to be censored. Applying least squares procedures to either a subsample of observations where contributions are positive, or to the full set of observations leads to inconsistent and biased estimators.[4]

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[3] Votes dealing with issues mentioned in the *Compendium* are used, as are any votes on issues clearly of concern to the AMA.

[4] See Judge et al, (1988) Chapter 19.

To develop the Tobit framework, we assume that the AMA perceives each senator as having some threshold contribution level before she will vote as the AMA desires. This "supply price" may be different across senators. The AMA attempts to distribute its (limited) funds efficiently, and contributes to senators having the lowest "supply price" first. At some point, the contribution level will reach the AMA's "reservation price", the maximum amount the AMA is willing to contribute to a particular senator.[5] If the AMA's "reservation" level of contributions is less than the perceived supply price, the AMA will not contribute to this senator. Although the AMA might be willing to contribute some amount to this senator, we do not observe this willingness.[6] Consider the following variables.

$AMA\$_i^*$ = contributions the AMA is willing to contribute to senator i

$AMA\$_i$ = the AMA's actual (observed) contributions to senator i

$AMA\$_i^0$ = senator i's (perceived) supply price for voting pro-AMA

If $AMA\$_i^* \geq AMA\$_i^0$ then $AMA\$_i = AMA\$_i^*$ [7]

If $AMA\$_i^* < AMA\$_i^0$ then $AMA\$_i = 0$

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[5] The AMA's "reservation" price would be that level of contributions at which the marginal gains just equal the marginal costs of making that contribution. Given that funds available to the AMA for contribution are limited, it would not make sense for the AMA to contribute $10,000 to Senator X in order to buy his vote if it could contribute $5,000 each to Senators Y and Z in order to buy two votes.

[6] The constrained optimization assumption is not empirically modeled in this Tobit framework due to the difficulties created by using a casual structural model to justify what is essentially a reduced-form empirical equation.

[7] Rational behavior would imply that the AMA adjusts the maximum amount they would be willing to contribute to a particular senator until it just equals $AMA\$_i^0$ since it would not contribute more than necessary to obtain votes. In that case, the formulation would be: If $AMA\$_i^* = AMA\$_i^0$, then $AMA\$_i = AMA\$_i^*$.

The equation of interest is

$$AMA\$ = \mathbf{X}'\beta^c + e$$

where $\mathbf{X}$ is a matrix of determinants of contributions and β_c is the vector of corresponding unknown parameters. The equation to be estimated is

$$AMA\$_i = \begin{cases} AMA\$ = \mathbf{X}'\beta^c + e \text{ if } AMA\$ \geq AMA_i^0 \\ 0 \text{ otherwise} \end{cases} \quad (1.2)$$

The factors assumed to affect the level of contributions are the percentage of times the senator votes pro-AMA (VOTE INDEX), PARTY, whether the senator is facing an upcoming election (CAMPGN), whether the senator was an incumbent in the last election (INCUMBENT), the contributions received by the senator's opponent (TOTALOPP$), ADA, SOUTH, EAST, MIDWEST, and if the senator serves on one of the following Senate committees; Budget, Finance, Foreign Relations, Governmental Affairs, and Small Business (BUDGET, FINANCE, FOREIGN RELATIONS, GOV'T AFFAIRS, and SMALL BUSINESS).

1.3.1 Vote Index

The vote index, (VOTE INDEX), is included in the contributions equation instead of the individual vote variable VOTE. VOTE INDEX is the ratio of pro-AMA votes to total votes during a voting cycle.[8] To allow for different effects based on issue specificity, we estimate the contributions equation using three measures of the vote index; the full sample of forty-two votes for the full vote index and a narrow vote

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8 $\text{VOTE INDEX} = \sum_{j=1}^{N} \frac{\text{VOTE}_j}{N}$ where N is the total number of votes.

index and a broad vote index, each consisting of twenty-one votes. For example, we code H J Res 631 (1982) and S 655 (1986) as narrow: H J Res 631 bars the use of Federal Trade Commission funds to investigate or make rules relating to the medical profession and S 655 reduces the limits on political action committee contributions. Examples of broad votes are HR 4616 and S 1630 (1990); HR 4616 withholds federal highway funds from states whose minimum drinking ages are under twenty-one and S 1630 (passage of the Clean Air Act Reauthorization) provides for the attainment and maintenance of health ambient air quality standards.

1.3.2 Control Variables

1.3.2.1 Senator Characteristics

In each of the contribution cycles studied, AMPAC has contributed more to Republican senators than Democratic senators. If the AMA opposes increased government regulation, and Democrats are generally viewed as pro-government involvement, we expect a positive relationship between AMA$ and PARTY (PARTY = 1 if Republican, 0 if Democrat).

AMA contributions are affected by the senator's demand for campaign funds. A senator's demand for contributions is greater when facing an upcoming election. Therefore, we expect a positive relationship between AMA$ and CAMPGN, a dummy variable equal to 1 if the senator is facing an upcoming election. Interest groups prefer to contribute to the frontrunner in order to insure access after the election.[9] Since

[9] Access may then be translated into influence on votes. This matter will be discussed in detail later.

incumbents traditionally are re-elected, we would expect a positive relationship between AMA$ and the incumbent variable (INCUMBENT =1 if the senator is an incumbent). It could be, however, that incumbents require less overall contributions. If so, incumbents may demand less contributions from the AMA. Therefore, we do not predict the direction of effect for INCUMBENT a priori.

Incumbents seek more contributions in close elections and interest groups are willing to supply funds to sympathetic candidates in such elections. We hypothesize that AMA contributions are positively related to the total campaign contributions received by a candidate's opponent during an election cycle (TOTALOPP$), which is used as a proxy for the closeness of a race.

ADA is included as an explanatory variable to capture senator ideology. More conservative senators, as reflected by a lower ADA score, have ideologies more compatible with those of the AMA, and might receive more support, an assumption supported by AMPAC's declared goal of creating a conservative coalition in Congress. We include the previously defined regional dummies to capture regional differences in the demand for campaign funds.

Bills brought to a vote on the Senate floor must have passed through committee. Committee assignments should be an important factor in determining targets for AMA contributions.[10] Five Senate committees control most bills concerning the health industry. Assignment to the Budget, the Finance, Foreign Relations, Governmental

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[10] Committees have power over whether a bill is reported to the full Senate for a vote, and over the content of the bill. We address the issue of committee importance in Chapter 4.

Affairs, and the Small Business Committees are controlled for through the dummy variables BUDGET, FINANCE, FOREIGN RELATIONS, GOV'T AFFAIRS, and SMALL BUSINESS.

1.3.2.2 Constituency Characteristics

Previous studies of interest group effects include certain constituency characteristics in the contributions equation, arguing a PAC will not "waste" dollars on senators with constituencies firmly opposed to the interest group. For example, labor union PACs potentially find it unprofitable to contribute to senators from states that are highly anti-union. The marginal dollar spent on these senators has little or no effect. But given the diversity of bills in this study, there is no one constituency group that would consistently oppose the AMA. In addition, the specification of AMA$ above incorporates this marginal decision-making.

This model assumes AMA contributions are independent of any constituency variables. While the AMA might assume rational ignorance on the part of voters, this is not necessary for the validity of the above assumption. Constituency voting may be influenced by total campaign spending, but not by AMA spending. Hence, the AMA may not consider voter behavior important when choosing its optimal level of contributions.[11]

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[11] The relationship between AMA contributions, as "seed money", and total contributions received is not addressed here.

1.4 Constituency Behavior

Development of a comprehensive model of constituent voting is beyond the scope of this paper. Instead, we present a simple model of consistent voting which takes the following form:

$$\text{VOTE MARGIN}_i = \mathbf{X}_i^{p\prime}\beta^p + e_i^p \qquad (1.3)$$

$$= a + d_1\text{VOTE INDEX}_i + d_2\text{LAGGED VOTE MARGIN}_i + d_3\text{TOTALOPP\$}_i + d_4\text{INCUMBENT}_i + d_5\%\text{WHITE}_i + d_6\%\ \text{ELDERLY}_i + d_7\text{INCOME}_i + e_i$$

Total voter ignorance is not assumed; we assume voters observe (and care about) the way their senators vote on particular bills. Thus, a senator's record affects the probability of re-election. The sign of the VOTE INDEX coefficient is not predicted, as voters may support some bills included in the vote index and oppose others.

Voters are assumed to be consistent, in that, if all else remains the same, the way they voted in the last election is the way they vote in the current election. We use the margin received by the winner in the election prior to the last one (LAGGED VOTE MARGIN) to capture the consistency of voting behavior.

Jacobson (1980) finds a negative relationship between a candidate's total campaign spending and the margin by which he wins an election. While this may seem a peculiar result, higher campaign spending may capture the effects of a close race, and facing a strong opponent at the polls reduces the winner's electoral margin. Instead of using total campaign receipts of the winner, we use the opponent's campaign

receipts(TOTALOPP$) to measure the closeness of a race. TOTALOPP$ is expected to reduce VOTE MARGIN, a result which is consistent with Jacobson's analysis.[12]

Voters typically re-elect incumbents running for office. Incumbents use constituent mailings to enhance their image and they have a comparative advantage in raising campaign dollars. Given the complexity of the political election process, voters cannot incorporate all the available information on candidates in their decision-making process. Carmines and Kuklinski (1990) argue that voters use heuristics, or short-cuts, to gather and use political information. Political signals play a significant role in citizen decision-making, and reputation serves as a signal. Incumbency creates reputation; the longer a senator serves, the clearer her positions become to the public. INCUMBENCY is included to reflect voters' somewhat heuristic decision-making process.

We use constituency characteristics to control for voters' preferences in elections. %ELDERLY, and INCOME were defined earlier and are used to reflect voters' tastes in elections. The percentage of the state population that is white is also included (%WHITE).

1.5 Model Estimation

Given the joint determination of VOTE, AMA$, and VOTE MARGIN, two-stage estimation techniques are used. The three equations derived in the previous section are denoted as

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[12] Using a fixed effects model, Levitt (1984) finds campaign spending has a much smaller effect on electoral votes than found in Jacobson's cross-sectional model.

$$VOTE_i = f_1[\mathbf{X}_i^{v\prime}\beta^v + e^v] \quad (1.4)$$

$$AMA\$_i = f_2[\mathbf{X}_i^{c\prime}\beta^c + e^c] \quad (1.5)$$

$$VOTE\ MARGIN_i = f_3[\mathbf{X}_i^{p\prime}\beta^p + e^p] \quad (1.6)$$

AMA$ and VOTE MARGIN appear as explanatory variables in the VOTE equation. VOTE appears in the AMA$ and the VOTE MARGIN equations.[13] The design matrix in each equation is correlated to the error term of that equation and single equation estimation is not appropriate. Therefore, we estimate the equations using two-stage techniques. In the first stage, instrumental variables are created which are correlated with the design matrix but not with the error term. The instrumental variables are the predicted (endogenous) variables, estimated by using all exogenous and lagged endogenous explanatory variables in the system. The instrumental variables replace the right-hand side endogenous variables in the second stage with their predicted values.

If $\mathbf{X}$ is the matrix of variables including all of the unique elements of $\mathbf{X}_i^v$, $\mathbf{X}_i^c$, and $\mathbf{X}_i^p$, that is, all exogenous and lagged endogenous variables included in the system, the reduced form equations to be estimated in the first stage are

$$VOTE_i = f[\mathbf{X}\pi_1 + v_1]$$
$$AMA\$_i = g[\mathbf{X}\pi_2 + v_2]$$
$$VOTE\ MARGIN_i = h[\mathbf{X}\pi_3 + v_3]$$

In the first stage of estimation, the vote equations are estimated by Probit, the contributions equation by Tobit, and the vote margin equation by ordinary least squares.

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[13] VOTE appears in the equations through the vote index variable, VOTE INDEX.

In the second stage, the predicted values obtained in the first stage replace the right-hand side endogenous variables.[14]

The covariance matrix of the system of equations is a complex function of all of the error terms in the first-stage and second-stage equations (the e's and v's). Bootstrapping is a resampling procedure that permits estimation of standard errors using the observed residuals. Freedman and Peters (1984) show that the conventional estimates of standard errors using two-stage estimation can underestimate the actual standard errors.[15] Bootstrapping produces more reliable estimates of the standard errors for hypothesis testing, without relying on asymptotic assumptions.[16] One thousand pseudo-data sets[17] containing seven hundred observations each are formed by randomly sampling (with replacement) from the original data set. The equations are estimated using the pseudo-data sets. The bootstrap standard error is the standard deviation of the sample of estimated coefficients from this bootstrap procedure. We are concerned with hypothesis testing for the significance of explanatory variables and believe using bootstrap standard errors is superior to using conventional standard errors. Bootstrap estimates of coefficient bias, standard deviation of bias, and bias t-statistics are fully reported in Appendix D.

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[14] In addition to estimating the individual vote equations, we estimate the vote indices using the same design matrix used for the individual vote equations. Generalized least square estimation is used for the vote indices equations.

[15] Freedman and Peters (1984) provide a review of the literature on bootstrap results.

[16] Freedman and Peters (1984) note that asymptotics are less reliable the more covariances there are to estimate.

[17] The bootstrap procedure was also performed using five hundred pseudo-data sets for comparison.

1.6 Data

All data are from 1978 through 1992. Contributions and Senate voting are in corresponding two year cycles. All monetary values are adjusted to real terms. See Appendix A for variable descriptive statistics.

We obtain data on campaign contributions from the Federal Election Commission's *Reports on Financial Activity* and *Committee Index of Candidates Supported/Opposed*. The former provides data on total contributions received by senators and their opponents, while the latter reports AMPAC contributions.

Each year, the AMA issues a *Compendium of Statements* to the Congress and the administrative agencies, through its Department of Federal Legislation. These statements on legislative and regulatory issues are used to identify bills of interest to the AMA. Additional bills having a clear impact on the AMA or its members are included, even if they are excluded from the Compendium. We identify forty-two bills that the AMA clearly supports or opposes.[18] Roll call votes obtained from the Congressional Quarterly's *Congressional Roll Call* are set equal to one if the vote is consistent with the AMA's position, and set to zero otherwise. Missing values are replaced by predicted values. Each vote equation, therefore, has one hundred observations. For each bill possible, we identify other interest groups as either opposing or supporting the AMA. Contributions from these other groups are used. See Appendix F for a list of the PACs associated with these interest groups.

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[18] Several votes that were identified as being important to the AMA lacked sufficient variation. These votes could not be used in the study.

Data on senators' characteristics and electoral margins are obtained from the *Congressional Quarterly Almanac*, the Congressional Quarterly's *Congressional Roll Call*, and from the Census Bureau. The Census Bureau's *Statistical Abstract* provides data on constituency characteristics and physician populations.

1.7 Results

The primary focus of this study is to determine what, if any, effect AMPAC contributions have on Senate roll call votes. We are also interested in any effects that voting behavior has on AMPAC contributions. The results from the individual vote equations are presented first, followed by the vote indices equations. Next, the contributions equations results are presented. Lastly, results from the vote margin equation are reported. Lists of the dependent and independent variables for the appropriate equations are presented where necessary.

1.7.1 Vote Equation Results

Dependent Variable

VOTE = 1 if pro-AMA vote, 0 if against the AMA's stance

Independent Variables

Interest Group Variables

AMA$ = contributions from AMPAC
%AMA = percent of the state's doctor population that are AMA members
OTHGRP$ = contributions from an interest group other than AMPAC
SYNERGY = interaction term between AMA$ and OTHGRP$
AMAOPP$ = contributions from AMPAC to the senator's opponent in the last election

Control Variables (Senator Characteristics and Constituency Characteristics)

VOTE MARGIN = electoral margin received by the senator in the last election

PARTY = 1 if Republican, 0 if Democrat
ADA = Americans for Democratic Action rating (liberal to conservative rating)
TENURE = number of years that the senator has been in the U.S. Senate
%ELDERLY = percent of the state's population that is over 65 years old
INCOME = state's real per capita income
EAST, SOUTH, MIDWEST = regional dummies

1.7.1.1 Individual Vote Equations

Table 1.1 is a summary of the forty-two individual vote equations. The full regression results for each equation are provided in Appendix C. The hypothesized direction of effect is in parentheses. Variables whose signs are predicted a priori are tested using a one-tailed test, while those whose sign is not predicted are tested using a two-tailed test. A discussion of the major results follows.

1.7.1.1.1 Interest Group Variables

Of the forty-two votes analyzed, AMA$ is significant in only two. The two votes on which contributions have effects are a motion to kill an amendment to the fiscal 1988 budget (1987 S Con Res 49) and a motion to invoke cloture, thus limiting debate on a bill to amend the Federal Aviation Act of 1958 (1990 S 341). It should be noted that a preferred amendment may be introduced later to substitute for the one killed on the floor, and it is difficult to ascertain why a motion to invoke cloture is made at a particular time. It could be made in hopes of passing the bill or killing the bill at that time. Given the uncertain purpose of these votes, the codings, and therefore results, are questionable. The overall results provide little evidence that the AMA is successful in capturing individual votes of interest. %AMA is significant and positive

Table 1.1
Individual Vote Equations (Pro-AMA Vote=1)
Summary of Probit Analysis of 42 Votes
Times Significant[a]

	Significant	Significant Positive	Significant Negative
Interest Group Variables			
AMA$ (+)	2	2	0
%AMA (+)	3	3	0
OTHGRP$ (?)	1	1	0
SYNERGY (?)	0	0	0
AMAOPP$ (-)	0	0	0
Control Variables			
VOTE MARGIN (?)	1	1	0
PARTY (?)	9	4	5
ADA (?)	23	11	12
TENURE (?)	5	4	1
%ELDERLY (?)	2	2	0
INCOME (?)	12	7	5
EAST (?)	4	3	1
SOUTH (?)	6	3	3
MIDWEST (?)	2	0	2
CONSTANT	10	3	7

[a] Significant at the .05 level

in only three of the votes. Mueller (1986) argues lobbying strength is more important than contributions in determining some votes. The significance of %AMA is consistent with that argument. But, as with contributions, the number of votes affected is small given the total number of votes studied.

The other interest group variable (OTHGRP$) is significant in only one vote equation. The vote was on an amendment to eliminate the five-month waiting period for disability insurance benefits for persons with diseases that two doctors determined would lead to death within 12 months, a bill that the AMA opposed. While the AMA's position is clearly stated in the *Compendium*, the insurance companies' position is not clear. A one-tailed test of significance shows insurance PAC money has a negative effect on this particular vote, but to accept this result, one would have to assume insurance PACs support the bill. A two-tailed test fails to show significance.

No synergistic effects between the AMA and other interest groups are detected in any of the votes. There is also no evidence that grudge-bearing is occurring. AMA contributions made to a senator's opponent do not effect her roll call vote.

1.7.1.1.2 Control Variables

Ideology, as measured by ADA rating and PARTY, seems to be the most important determinant of voting behavior, a result found by numerous other studies. Given the perception that Democrats favor government intervention and are "pro-choice", the signs on ADA and PARTY are as expected. The signs on ADA and PARTY are vote specific and for votes where they both appear as significant, they are of opposite sign, except for HR 2622 in 1991.

There is very little evidence that AMPAC contributions affect individual votes. Individual votes may not capture the multidimensional concerns of the AMA. Therefore, in the following section, we examine vote indices to determine if the AMA is successful in affecting votes over a range of issues.

1.7.1.2 Vote Indices Equations Results

The forty-two votes are used to create the full vote index. The votes are then separated according to specificity to the AMA. The narrow vote index contains twenty-one votes which directly affect AMA members or AMPAC. The broad vote index contains twenty-one votes which have broader social impact. The results reported in Table 1.2 are based on these different samples of votes. The data have been corrected for heteroskedasticity.[19] The equations are estimated by generalized least squares. The predicted direction of effect is below the variable name. Since other interest groups were identified vote by vote in the individual vote equations, the variables OTHGRP$ and SYNERGY cannot be aggregated for use in the indices equations. The t-statistics are absolute values.

1.7.1.2.1 Full Vote Index

1.7.1.2.1.1 Interest Group Variables

Again, there is no evidence that the AMA is successful in capturing votes. None of the interest group variables of interest (AMA$, %AMA, and AMAOPP$) significantly affect the full vote index. We find no evidence to support the hypothesis

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[19] All data are transformed by P, where and var(VOTE INDEX) = [VOTE INDEX(1-VOTE INDEX)]/N.

Table 1.2
Vote Indices Equations
GLS Estimates and t-statistics

	Full Vote Index	Narrow Vote Index	Broad Vote Index
Interest Group Variables			
AMA$	.0000012	.000001	-.000000121
(+)	(.979)	(.600)	(.076)
%AMA	.0104	.237*	-.0775
(+)	(.120)	(1.993)	(.690)
AMAOPP$	.00000003	-.0000006	.0000007
(-)	(.035)	(.498)	(.570)
Control Variables			
VOTE MARGIN	.08511	.207	-.0183
(?)	(.931)	(1.646)	(.154)
PARTY	-.04248	.0319	-.0442
(?)	(1.519)	(.829)	(1.216)
ADA	-.000162	-.00056	.00092
(?)	(.357)	(.899)	(1.550)
TENURE	.003385*	.0025	.00295
(?)	(2.67)	(1.435)	(1.790)
%ELDERLY	1.071*	1.899*	.7618
(?)	(2.392)	(3.082)	(1.308)
INCOME	.0000107*	.0000046	.0000199*
(?)	(2.408)	(.744)	(3.440)
EAST	-.00289	-.0426	.0146
(?)	(.091)	(.978)	(.355)
SOUTH	-.0366	-.1065*	.0283
(?)	(1.14)	(2.423)	(.681)
MIDWEST	-.03998	-.1317*	.0210
(?)	(1.204)	(2.882)	(.486)
CONSTANT	1.3828	-.2913	1.8137
	(6.761)	(1.035)	(6.819)
F-Value	7.310*	8.587*	7.050*

* Significant at the .05 level

that the AMA affects votes, either through its contributions or its membership size. There is also no evidence that senators punish the AMA by voting against its stance. The grudge-bearing variable, AMAOPP$ is statistically insignificant.

1.7.1.2.1.2 Control Variables

Ideology is insignificant in determining the vote indices, though it is significant in a majority of the individual vote equation. Given that the signs on PARTY and ADA on individual votes are almost equally split and that the full vote index contains both liberal and conservative, this result is not surprising. TENURE is significant and positive, supporting the hypothesis that longer tenure provides the senator with a sense of security when voting pro-AMA.[20] %ELDERLY and INCOME are significant and positive, indicating that the preferences of the elderly and higher income constituencies are important to senators.

1.7.1.2.2 Narrow and Broad Vote Indices

One reason for the insignificance of the AMA interest group variables in the full vote index equation may be a heterogeneity problem in aggregating votes. To further test for effects on different types of votes, we divide the sample of votes into subsamples. Of the forty-two votes used in the study, twenty-one are defined as being of narrow interest to the AMA and twenty-one as being of broad interest. The narrow vote index contains key votes which are "weighted" more heavily by the AMA than

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[20] Recall that votes are coded 1 if voted in favor of the AMA stance and 0 otherwise. The results for TENURE are not to be interpreted as interaction terms, since the AMA variables are not significant. Rather, they indicate increased independence from constituency pressures when voting pro-AMA.

votes in the broad index. The broad index contains votes of a more social nature and do not necessarily directly impact AMA membership.[21] We hypothesize that AMA influence is greater on votes of narrow interest, since these votes are more important to the AMA. The second and third columns of results in Table 1.2 show the results for the narrow vote index and the broad vote index.

1.7.1.2.2.1 Interest Group Variables

Even after segregating votes into two categories, there is no evidence that AMA contributions affect voting behavior. Vote buying is not occurring even for bills for which the AMA has strong preferences. To test even further for effects, the full sample of was divided into two time periods, 1978-1985 and 1986-1992.[22] All three vote indices were analyzed. Chow tests (Chow, 1983) failed to reveal any structural shifts in the model.[23]

%AMA is significant in determining the narrow vote index and has the predicted sign, though it is insignificant in determining the broad (or full) index. State AMA membership is important to the senator on votes important to the AMA, while overall

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[21] If senators do respond to AMA variables, one would expect to find a larger effect on the narrow index since these votes matter more to the AMA and are, in general, less visible than the votes included in the broad index.

[22] We divide the sample into two equal time periods to allow for any omitted factors that could cause differences in the periods. If significant differences were found, we could then further investigate by separating the sample at different time periods. Since no difference was found, we assume no underlying structural changes across time.

[23] The Chow test statistics are .763, .927, and .415 for the full, narrow, broad indices, respectively. The critical value is 1.75.

monetary contributions are not. AMA's influence being greater on votes of narrow interest is consistent with interest group theory.

1.7.1.2.2.2 Control Variables

Senators consider constituency preferences and do not shirk completely. The elderly population and higher income population appear to have preferences compatible with the AMA and their preferences are taken into consideration by senators. This is consistent with elderly and higher income constituents being more politically active and vocal so that senators not only know their positions, but respond to them.

1.7.2 Contributions Equation Results

Dependent Variable

AMA$ = contributions from AMPAC

Independent Variables

VOTE INDEX = ratio of pro-AMA votes to total votes

Control Variables

PARTY= 1 if Republican, 0 if Democrat
CAMPGN = 1 if senator is facing an upcoming election, 0 otherwise
INCUMBENCY = 1 if senator is an incumbent, 0 otherwise
TOTALOPP$ = total campaign receipts of the senator's opponent
ADA = Americans for Democratic Action rating (liberal to conservative rating)
EAST, SOUTH, MIDWEST = regional dummies
BUDGET = 1 if on the Budget Committee, 0 otherwise
FINANCE = 1 if on Finance Committee, 0 otherwise
FOREIGN RELATIONS = 1 if on Foreign Relations Committee, 0 otherwise
GOV'T AFFAIRS = 1 if on Governmental Affairs Committee, 0 otherwise
SMALL BUSINESS = 1 if on Small Business Committee, 0 otherwise

Another purpose of this study is to identify determinants of AMA contributions. We are particularly interested in the effects that senators' voting behavior have on

AMA contributions. Table 1.3 is a comparison of single equation and simultaneous equation Tobit estimations of AMA contributions. The two-stage results show both the t-statistic from two-stage estimation and the t-statistic using the bootstrap standard errors.[24] The equation is estimated three times. The first two columns of results are from using the full vote index as an explanatory variable, the third and fourth columns from using the narrow index, and the last two columns from using the broad index.

1.7.2.1 Vote Indices

None of the vote indices significantly affect contribution behavior. Results from the previous section show no evidence that the AMA is successful in buying votes, and results from the contributions equations suggest vote-buying is not even a motive of the AMA. This is consistent with the hypothesis that the AMA's motive for contributing is to gain access or goodwill,[25] not to reward or punish senators for voting behavior.

Political scientists contend that access is an important motivation for campaign contributions and that access is a necessary, though not sufficient, condition for influence.[26] PAC money itself carries no message to congressmen. Access or some other form of communication is needed to translate money into influence. Investments

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[24] The bootstrap standard error is calculated as the standard deviation of the sample of five hundred estimates obtained from Tobit estimation of the five hundred "pseudo-datasets". See Hill, Cartwright and Arbaugh (1994) page 11.

[25] Sabato (1984, pp. 128-132) lists four types of PAC contributions; "reward money", "punish money", "present needs" money, and "future needs" or "goodwill" money.

[26] Langbein (1986), Grenzke (1989), Gopoian (1984), Malbin (1984), Sabato (1984), Sorauf (1988).

Table 1.3
Tobit Results of AMA Contributions
Single Equation and Simultaneous Equation Estimates and t-Statistics[a]

	Full Vote Index		Narrow Vote Index		Broad Vote Index	
	Single Eqn	Two-Stage	Single Eqn	Two-Stage	Single Eqn	Two-Stage
VOTE INDEX	-655.967 (.1856)	-2685.93 (.792) (.736)[b]	-345.45 (.135)	74.88 (.0292) (.0913)	1492.14 (.547)	-251.50 (.091) (.347)
Control Variables						
PARTY	4987.1 (2.13)	5678.18 (2.409) (2.105)	5020.29 (2.139)	5555.58 (2.354) (2.034)	5010.85 (2.143)	5571.26 (2.369) (2.054)
CAMPGN	12524.54 (5.758)	12697.16 (5.835) (3.75)	12511.83 (5.761)	12529.30 (5.801) (3.697)	12432.68 (5.745)	12543.63 (5.808) (3.715)
INCUMBENCY	-4952.47 (2.652)	-4821.74 (2.619) (2.346)	-4973.49 (2.667)	-5069.22 (2.732) (2.492)	-5121.99 (2.786)	-5048.56 (2.773) (2.44)
TOTALOPPS	0.00172 (3.0957	0.00177 (3.198) (1.78)	0.0017 (3.091)	0.00173 (3.129) (1.731)	0.001688 (3.051)	0.00174 (3.146) (1.755)
ADA	-15.337 (.4144)	-8.273 (.222) (.271)	-15.52 (.42)	-12.83 (.349) (.387)	-17.965 (.483)	-12.160 (.325) (.323)
EAST	-808.207 (.296)	-1002.46 (.3669) (.228)	-826.03 (.3025)	-1192.68 (.439) (.3308)	-904.689 (.331)	-1166.59 (.427) (.2272)

(table con't)

	Full Vote Index		Narrow Vote Index		Broad Vote Index	
	Single Eqn	Two-Stage	Single Eqn	Two-Stage	Single Eqn	Two-Stage
Control Variables (continued)						
SOUTH	3199.77 (1.322)	3443.46 (1.421) (1.31)	3195.83 (1.32)	3234.71 (1.343) (1.223)	3096.53 (1.278)	3265.58 (1.344) (1.25)
MIDWEST	2516.67 (.993)	2845.31 (1.132) (.929)	2507.8 (.99)	2765.68 (1.103) (.899)	2426.13 (.957)	2781.84 (1.106) (.917)
BUDGET	75.603 (.0344)	313.27 (.1439) (.035)	87.35 (.0398)	323.60 (.149) (.0397)	168.83 (.0768)	314.17 (.144) (.022)
FINANCE	4434.58 (2.017)	4480.35 (2.055) (1.806)	4445.52 (2.023)	4570.47 (2.099) (1.758)	4518.4 (2.055)	4556.94 (2.09) (1.84)
FOREIGN RELATIONS	-3392.01 (1.325)	-3975.77 (1.550) (1.425)	-3391.97 (1.325)	-3933.35 (1.535) (1.42)	-3405.65 (1.33)	-3930.90 (1.535) (1.42)
GOV'T AFFAIRS	-2836.05 (1.0668)	-2894.40 (1.093) (1.343)	-2837.15 (1.0675)	-2920.43 (1.104) (1.338)	-2871.15 (1.08)	-2910.10 (1.099) (1.32)
SMALL BUSINESS	3358.98 (1.485)	3311.08 (1.474) (1.558)	3364.32 (1.485)	3259.07 (1.447) (1.519)	3330.8 (1.474)	3260.49 (1.45) (1.532)
CONSTANT	-63811.4 (3.616)	-60392.88 (6.101) (12.05)[a]	-64808.88 (3.998)	-66687.73 (4.123) (12.915)	-68933.733 (3.976)	-66071.12 (3.915) (12.77)

[a] Significance is not denoted due to the reporting of both the t-statistics from standard analysis and from bootstrapping.

[b] t-statistic using Bootstrap standard error

made by PACs open doors so that the PACs have a chance to tell their story. In an empirical analysis of contributions and a direct measure of access, Langbein (1986)finds that PAC contributions buy access time at a decreasing rate. The results found here dispute the vote-buying motive and are consistent with access-buying. While access and vote-buying are not the same, the relationship between contributions, access, and influence has not been established and warrants further research.

1.7.2.2 Control Variables

Some variables are significant and have their predicted signs. Senators facing an upcoming election receive more contributions, perhaps due to increased solicitation or because the AMA wants sympathetic senators re-elected. Republicans receive more money from the AMA than Democrats, a finding consistent with the AMA's desire for a conservative coalition. The insignificance of the ADA variable, in conjunction with the significance of PARTY indicates that the AMA considers party affiliation a better indication of ideology and contributes accordingly. The negative sign on the incumbency coefficient is consistent with the argument that incumbents are more efficient in raising overall contributions and therefore demand less funds specifically from the AMA. The higher the level of campaign funds a senator's opponent has, the higher are AMA contributions, perhaps because of the senator's greater demand for political contributions.

Membership on the Senate Finance Committee is important in determining contribution levels, but assignment to the other committees does not appear to affect contributions. This suggests that Finance Committee activity is important to the AMA

relative to floor action. Chapter 4 of this study further investigates the relationship between contributions and committee action.

Variables that emerge as significant determinants of AMA contributing behavior do not vary in terms of their significance across indices.[27] This, again, supports the theory that the AMA is contributing for reasons other than buying votes, whether the votes are of narrow concern or of broad concern.

1.7.3 Vote Margin Equation Results

The primary concerns of this study are the effects of AMA contributions on Senate roll call votes and the effects of votes on contributions. In order to complete the model and obtain unbiased estimates in the other equations, we include the vote margin equation in the system of equations to allow for the endogeneity of constituent voting behavior. The dependent and independent variables are listed below.

Dependent Variable

VOTE MARGIN = electoral margin received by the senator in the last election

Independent Variables

VOTE INDEX = ratio of pro-AMA votes to total votes

Control Variables

LAGGED VOTE MARGIN = lagged electoral margin received by the senator
TOTALOPP$ = total campaign receipts of the senator's opponent
INCUMBENCY = 1 if senator is an incumbent, 0 otherwise
%WHITE = percent of the state population that is white
%ELDERLY = percent of the state population over 65 years old
INCOME = state's per capita income

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[27] The reported Tobit estimates are estimates of the marginal effects on the latent variable (the underlying willingness to contribute), and indicate the direction of effect on the observed variable (actual AMA contributions).

Table 1.4 presents the results from single equation and simultaneous estimation techniques. The t-statistics from two-stage least squares and from bootstrapping are reported. Data are corrected for heteroskedasticity.

1.7.3.1 Standard Analysis Results

The following conclusions are based on the two-stage least squares t-statistics. The voting behavior of senators is not significant in determining election outcomes (at least over the votes studied). This result is consistent with the rationally ignorant voter hypothesis.

Higher opponent's receipts are an indication of a close race and the results are consistent with Jacobson's result. Jacobson finds a significant negative relationship between a candidate's campaign spending and her electoral margin. He concludes that higher campaign spending indicates a tight race. We use the opponent's total campaign receipts instead of the senator's total receipts, but the conclusion is the same as Jacobson's.

Incumbency leads to higher electoral margins. Voters behave consistently; they tend to vote the way they have in the past. Higher white populations and higher income populations lead to closer electoral outcomes.

1.7.3.2 Bootstrap Results

The t-statistics using the bootstrap standard errors produce somewhat different conclusions. None of the variables included in the equation explain constituency voting when the bootstrap t-statistics are used for hypothesis testing. The bootstrap estimates of the standard errors are larger than the two-stage estimates, indicating that the least

Table 1.4
Least Squares Results of VOTE MARGIN Equation
Single Equation and Two-Stage Least Squares Estimates and t-Statistics[a]

	Single Equation OLS	Two-Stage Least Squares
VOTE INDEX	.00213 (1.164)	-.000829 (.475) (.094)[b]
Control Variables		
TOTALOPP$	-2.36E-9 (7.866)	-2.33E-9 (7.762) (1.466)
INCUMBENCY	.003565 (3.43)	.00373 (3.597) (.8125)
LAGGED VOTE MARGIN	.079255 (19.415)	.079921 (19.4) (1.557)
%WHITE	-.03435 (10.538)	-.0348 (10.747) (1.192)
%ELDERLY	-.01656 (.817)	-.0127 (.629) (.116)
INCOME	-.000001 (4.951)	-.00000099 (4.817) (.90)
CONSTANT	.561 (55.976)	.5648 (58.106) (12.68)

[a] Significance is not denoted due to the reporting of both the t-statistics from standard analysis and from bootstrapping.

[b] t-Statistic using Bootstrap standard error.

squares modeling of this equation may not be the correct specification. However, constructing a comprehensive model of voter behavior is not the purpose of this study.

1.8 Conclusions

The capture theory of legislation holds that interest groups contribute money in order to affect legislation in their favor. This chapter looks specifically at contributions made by the American Medical Political Action Committee and U.S. Senate roll call votes on bills of interest to the AMA, with traditional assumptions about the timing of the responses. There is no evidence that the AMA is successful in capturing regulation by affecting roll call votes. Even votes on issues of differing specificity do not respond to AMA contributions.

When we separate votes according to specificity into narrow and broad categories, the percent of physicians in a state who are members of the AMA positively affects the narrow vote index. This is consistent with Mueller's (1986) findings. While PAC "influence" has never been clearly defined, our findings suggest that AMA membership (and the potential lobbying efforts it represents) is more important in determining roll call votes than AMA contributions.

We do not propose that the results found for the AMA apply to other interest groups since the purpose of interest groups may vary from industry to industry. But when we compare our results to those of previous studies using multiple equation models, our individual roll call vote results are consistent with others' findings. Chappell (1982), Stratmann (1991), and Kau et al. (1982) find little evidence that

contributions significantly affect votes. The studies using vote indices find more significant contributions effects, but none of those studies look at the AMA specifically.

We find no evidence that senators' voting behavior influences AMA contributions. Ideology, election cycle, incumbency, and campaign spending by a senator's opponent are significant determinants of AMA contributions. Senate Finance Committee members receive significantly higher AMA contributions.

The simultaneous model used in this chapter represents a more comprehensive model of senator and interest group behavior, yet we find no evidence of AMA influence through contributions. The lack of significant findings is rather surprising. The AMA spends millions of dollars every campaign cycle and we assume that the AMA is rational in its contributing behavior. The assumptions we make concerning model specification may be driving the results. For example, we assume lagged contributions affect current voting, but we do not consider the effects of current contributions. We assume the underlying relationship between votes and contributions is the same for senators facing an upcoming election and those who are not. We make the same assumption for Senate committee members and non-members. In the next three chapters, we relax these assumptions in hopes of revealing the role of AMA contributions in the Senate.

CHAPTER 2

THE TIMING OF VOTES AND CONTRIBUTIONS: IN SEARCH OF THE CONTRACT BETWEEN SENATORS AND THE AMERICAN MEDICAL POLITICAL ACTION COMMITTEE

2.1 Introduction

The current debate over campaign reform is based on the popular belief that PACs exert influence in the political arena either by affecting election outcomes or by affecting the roll call votes by congressmen. In the search for the effects of PAC contributions on legislation, theoretical models that use roll call vote analyses traditionally assume congressmen reward PACs by voting favorably on bills of interest to the PACs. Empirically, current roll call votes are regressed on lagged contributions. While it may be a plausible assumption, the hypothesis of this timing scheme being the correct model needs to be tested, not simply assumed.

Contributions data typically used are reported by the Federal Elections Commission in two-year contribution cycles. Congressional Quarterly reports the specific day that individual votes occur. Because of these data inconsistencies, it is impossible to determine the precise timing of contributions and key votes. Perhaps this explains why traditional models use lagged contributions to explain current voting behavior. But if congressmen are concerned with current (or future) contributions, the model used to explain voting contributing behavior should be designed accordingly. It is possible to model the exchange of votes and contributions based on different timing mechanisms. Several alternative models of congressional voting behavior and PAC contribution behavior are possible; PACs may reward past voting behavior, contribute

contemporaneously in exchange for votes, similar to the exchange of goods and money in private markets, or "invest" in future voting behavior. Assuming that the nature of the contract between PACs and congressmen is symmetric and known to both parties, congressmen vote in expectation of future contributions, respond to contributions in the current voting cycle, or "pay-off" past contribution behavior. To develop a comprehensive model of PAC influence, these alternative possibilities must be addressed.

In this chapter, we develop a more comprehensive model of legislator and PAC behavior by allowing for these possibilities. Thus far, the results from research have been inconclusive concerning the effects of contributions on votes. Chapter 1 of this study uses the traditional timing of votes and contributions and finds no evidence that the AMA is successful in capturing legislation through vote-buying. In this chapter, we attempt to identify the relationship between senators' roll call votes on bills of interest to the AMA and contributions by the American Medical Political Action Committee (AMPAC) by analyzing models of alternative timing mechanisms. The alternative models are used to test the main hypothesis of this study; that AMA contributions affect legislative outcomes. Detailed development of the equations, general model, and estimation techniques are presented in Chapter 1.

2.2 Previous Studies' Treatment of the Timing of the Contract

Existing studies assume a particular timing of contributions and voting; most often, they assume that contributions received in the period prior to voting in Congress influence roll call votes and that contributions are made based on the current voting behavior. Several studies use this ad hoc model specification. Chappell (1982), Kau,

Keenan, and Ruben (1982), Feldstein (1984), Keiser and Jones (1986), Wilhite (1988), Stratmann (1991), and Davis (1993) all adopt this specification, and obtain mixed results. Langbein (1986) uses the same timing scheme in modeling contributions and access, as opposed to contributions and votes.

Other studies use different timing specifications to analyze the relationship between votes and contributions. Wilhite and Theilmann (1987) use a weighted average of AFL-CIO ratings to create a 1980 rank and a 1982 rank of favorable voting behavior. Assuming that the AFL-CIO ratings are from the same two-year cycle as contributions, the 1980 rank is based on votes in 1979-80 and the 1982 rank is based on 1981-82 votes.[1] Contributions are from these same periods, so a model of contemporaneous contributing/voting is estimated. Under this specification, PAC money significantly affects voting behavior and votes significantly affect contributions.

Mueller (1986) presents a unique model of the timing of contributions and votes. He uses contributions from 1972 to explain votes in 1973, 1974, 1975, and 1978, constituting various lagged-effects. Contributions from 1982 are used to explain votes in 1979 and 1980, suggesting a future money effect on votes. No explanation is given why the vote equations were modeled in this manner. He reports that contributions are not significant in explaining votes until 1979.

Three studies specifically address the issue of the timing of contributions and votes. Saltzman (1987) uses a lagged-effects model to test the appropriateness of the

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[1] We state the assumption here, though it is never explicitly made in the study.

simultaneous model.[2] Contributions received in 1979-80 were used to predict COPE[3] scores in 1981-82, and COPE scores from 1977-78 were used to predict contributions in 1979-80. Saltzman concludes from ordinary least squares results that the simultaneous (i.e., contemporaneous) model is as appropriate as the lagged-effects model since the R^2's are virtually the same. There are at least two problems with this conclusion. First, ordinary least squares procedures are inappropriate for the contributions equation because the dependent variable is censored.[4] Second, given the simultaneous nature of the equations, the R^2's have questionable relevance. Despite these limitations, Saltzman does recognize the importance of alternative model specifications.

Grenzke (1989) includes both previous and current contribution variables in her vote indices equations. Only incumbent behavior is studied. She finds that the level of either contributions variable does not effect voting behavior and that changes in the contributions variables do not influence changes in voting behavior.

Stratmann (1995) specifically tests the effects of lagged and current contributions on votes by looking at votes taken at the end of the years 1981 and 1985. The 1981 vote equation includes both contributions received in 1981 and those received in 1979-

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[2] Quotation marks are added since Saltzman refers to only the contemporaneous model as "simultaneous", meaning "occurring at the same time". But the lagged-effects model exists in a simultaneous framework, too, since the errors are correlated with explanatory variables.

[3] AFL-CIO Committee on Political Education.

[4] For a discussion of the properties of the least squares estimator in the censored regression model, see Judge et al. (1988) Chapter 19.

80. (An analogous procedure was used to estimate the 1985 votes). A three-equation model is estimated. In nine out of ten votes analyzed, current contributions have a larger impact on legislator's votes than previous period contributions. Stratmann concludes that legislators are less compelled to pay off (with votes) contributions that helped them get elected than for contributions that will help them get re-elected in the future, and that contributions from several cycles need to be considered in any campaign reform debate.

The mixed results from these studies raise important questions concerning the specification and interpretation of vote and contributions equations. Do contributions have significant distributed lag effects? Do they have significant future effects? Over how many periods do contributions have potential effects? The next section systematically explores the timing mechanism between roll call votes in the Senate and AMPAC contributions.

2.3 Models

In the theoretical model of the market for legislation, senators supply legislation and interest groups and constituents demand legislation. Interest groups contribute to "buy" favorable legislation, and legislators attempt to remain in office (i.e., get re-elected) by weighing the costs and benefits of voting in a particular manner.

A two-equation model of senator voting behavior and AMPAC contribution behavior from 1979 through 1992 is presented. The direction of causality cannot be assumed. Factors influencing the tendency of a senator to vote pro-AMA may also cause AMPAC to contribute more to that senator. Votes and contributions are both

endogenous in the system of equations and are correlated with the error terms of the equation in which they appear as explanatory variables. We use two-stage generalized least squares and Tobit estimations, respectively, to estimate the vote indices and contributions equations. Instrumental variables estimated using all exogenous variables in the system in the first stage replace the endogenous right-hand side variables in the second stage. We estimate four alternative models with different timing schemes to further examine the relationship between roll call votes and AMPAC contributions. Variable names and definitions are the same as in Chapter 1.

2.3.1 Vote Index Equation

As described in Chapter 1, senators vote on bills of interest to the AMA based on the expected utility from voting pro-AMA (VOTE=1) versus voting against the AMAs stance (VOTE=0).[5] The expected utility functions are assumed to be linear and the corresponding probabilities of voting pro-AMA and against the AMA are

$$\Pr[VOTE=1] = F(\mathbf{X}^{v}\beta^{v}) \text{ and}$$

$$\Pr[VOTE=0] = 1-F(\mathbf{X}^{v}\beta^{v}).$$

Assuming that the errors are bivariate normal, $F(\mathbf{X}^{v}\beta^{v})$ is the cumulative distributions function for a standard normal random variable. The single vote equation is

$$VOTE = \begin{cases} 1 \text{ with Prob } P = F(\mathbf{X}^{v}\beta^{v}) \\ 0 \text{ with Prob } 1-P \end{cases} \qquad (2.1)$$

[5] Some subscripts used in the first chapter are not used here unless required for clarification.

This single vote equation is estimated using Probit analysis in Chapter 1. While the analysis of single votes is worthwhile, the corresponding results apply only to those individual votes. The AMA may have narrow policy concerns, but to more fully capture the impact of the AMA over a range issues, a vote index is created from the individual votes.[6] As discussed previously, VOTE INDEX is the ratio of pro-AMA votes to total votes during a voting cycle. We also separate votes based on specificity: a narrow vote index and a broad vote index are created as in Chapter 1. The equation to be estimated is

$$\text{VOTE INDEX} = \mathbf{X}^{v}\beta^{v} + e^{v} \qquad (2.2)$$

VOTE INDEX is a continuous variable between 0 and 1 and is estimated using generalized least squares. The factors assumed to explain VOTE INDEX include the interest group variables: AMA$ (contributions received from AMPAC), %AMA (the percentage of senator's state doctor population that belongs to the AMA), and AMAOPP$ (AMPAC contributions to the senator's opponent); individual senator's characteristics, including VOTE MARGIN (the margin by which the senator won in the last election), PARTY (the political party of the senator, PARTY=1 if Republican, 0 if Democrat), ADA (the senator's ADA rating), and TENURE (how many years the senator has been in the Senate); and constituency characteristics %ELDERLY (the percentage of the senator's state population that is 65 over years of age), INCOME (real

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[6] This study is concerned with AMPAC's overall influence on legislative agendas. Evidence of influence on specific votes is not indicative of influence on senators' voting patterns in general over issues of concern to AMPAC. Therefore, the vote index is used instead of single votes.

per capita income of the senator's state), and EAST, SOUTH, MIDWEST (the region of the country the senator represents). The justification for inclusion of these particular variables is the same as in Chapter 1.

2.3.2 Contributions Equation

While we do not specify a "utility function" for the AMA, we assume the group contributes money to senators rationally. By examining the AMA's *Compendium of Statements*, it is possible to infer AMA preferences over certain issues. This "revealed preference" is assumed to represent the AMA's interests, whether it be the group's common interests or the leadership's interests.

The equation of interest is

$$AMA\$^* = \mathbf{X}^c \cdot \beta^c + e^c$$

and is fully derived in Chapter 1. The equation to be estimated is

$$AMA\$_i = \begin{cases} AMA\$ = \mathbf{X}\cdot\beta^c + e \text{ if } AMA\$ \geq AMA_i^0 \\ 0 \text{ otherwise} \end{cases} \qquad (2.3)$$

Given this formulation, the contributions equation is estimated using the Tobit procedure. The factors assumed to affect the level of contributions are the VOTE INDEX and control variables. The control variables are PARTY, CAMPGN (whether the senator is facing an upcoming election), INCUMBENCY (the senator's incumbency status), TOTALOPP$ (contributions received by the senator's opponent), ADA, regional dummy variables (EAST, SOUTH, MIDWEST), and Senate committee membership

dummies (BUGET. FINANCE. FOREIGN RELATIONS. GOV'T AFFAIRS. SMALL BUSINESS)

2.3.3 Estimation of Models

The vote indices and contributions equations are estimated in a simultaneous framework to allow for correlation between endogenous explanatory variables and the error terms. We create instruments using all exogenous variables in the system to replace the endogenous right-hand side variables. The statistical software package SAS is used to estimate the vote indices equations and the contributions equations using GLS and Tobit techniques. respectively.

The first model is based on the usual assumptions about the timing of the contract between senators and contributors: that is. senators vote in response to last period contributions and AMPAC contributes contemporaneously. The next three models are designed to allow for symmetry of the contract between senators and the AMA. In the second model. senators vote in anticipation of being paid-off in the next cycle and AMPAC contributes in order to reward past voting behavior. The third model assumes senators and AMPAC exchange money and votes contemporaneously. Both agents observe the behavior of the other and respond in the same period. The fourth model assumes senators respond in the current period by voting to pay-off past contributions and AMPAC invests in future votes.

These models can be written as:

Model #1: $VOTE\ INDEX_t=f(AMA\$_{t-1}, ...)$

$AMA\$_t=g(VOTE\ INDEX_t,.....)$ Lagged-Current

Model #2: VOTE INDEX$_t$=f(AMA\$$_{t+1}$,.....)

AMA\$$_t$=g(VOTE INDEX$_{t-1}$,.....) Future-Lagged

Model #3: VOTE INDEX$_t$=f(AMA\$$_t$, ...)

AMA\$$_t$=g(VOTE INDEX$_t$, ...) Current-Current

Model #4: VOTE INDEX$_t$=f(AMA\$$_{t-1}$ .....)

AMA\$$_{t-1}$=g(VOTE INDEX$_t$ .....) Lagged-Future

The model labels above will be used in the discussion to follow. The first term in the label refers to the timing of contributions relative to votes. The second term refers to the timing of votes relative to contributions.

2.4 Results

2.4.1 Vote Indices Equations Results

2.4.1.1 Full Vote Index

Table 2.1 presents the results of the full vote index equations using the different timing schemes. The data are corrected for heteroskedasticity as in Chapter 1. The predicted direction of effect is given below each variable name. We report root mean squared errors (RMSE)[7] and F-values.

2.4.1.1.1 Interest Group Variables

We are primarily interested in the impact AMA contributions and AMA membership has on roll call voting behavior. We use one-tailed tests of significance since the effects are hypothesized to be positive. None of the models examined

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[7] $RMSE=\sqrt{MSE}$ where $MSE=\frac{SSE}{n-p}$. SSE is the model sum of squared errors, n is the number of observations and p is the number of parameter estimates.

Table 2.1
Full Vote Index Equation
GLS Estimates and t-Statistics

	Model 1 Lagged-Current	Model 2 Future-Lagged	Model 3 Current-Current	Model 4 Lagged-Future
Interest Group Variables				
AMA$	.0000012	.000000613	-.000002932	.000000814
(+)	(.979)	(.679)	(2.466)	(1.008)
%AMA	.0104	.1139	.0674	.010
(+)	(.120)	(1.165)	(.7083)	(.116)
AMAOPP$	.00000003	.00000013	-.000000633	.000000553
(-)	(.035)	(.148)	(.6479)	(.541)
Control Variables				
VOTE MARGIN	.08511	.0306	.113	.0948
(?)	(.931)	(.306)	(1.1226)	(1.033)
PARTY	-.04248	-.0947*	-.0175	-.0399
(?)	(1.519)	(3.236)	(.5793)	(1.444)
ADA	-.000162	.000502	.000077	-.000129
(?)	(.357)	(1.027)	(.1544)	(.286)
TENURE	.003385*	.0026	.0023	.0036*
(?)	(2.67)	(1.912)	(1.6768)	(2.765)
%ELDERLY	1.071*	.147	1.305*	1.092*
(?)	(2.392)	(.291)	(2.6494)	(2.435)
INCOME	.0000107*	.0000028	.0000136*	.0000105*
(?)	(2.408)	(.556)	(2.7736)	(2.365)
EAST	-.00289	.0202	-.0142	-.0014
(?)	(.091)	(.571)	(.0142)	(.045)
SOUTH	-.0366	-.0065	-.0280	-.0378
(?)	(1.14)	(.186)	(.028)	(1.178)
MIDWEST	-.03998	-.0328	-.0498	-.0402
(?)	(1.204)	(.895)	(.0498)	(1.21)
CONSTANT	1.3828	2.020	1.467	1.391
	(6.761)	(9.357)	(6.508)	(6.788)
RMSE	1.4277	1.4086	1.42083	1.42766
F-Value	7.310	5.316	7.909	7.287

* Significant at the .05 level

provide evidence of vote-buying. The choice of model specification does not alter this result.[8] In the first, second, and fourth models, AMA$ is positive as hypothesized, but insignificant. %AMA is positive across all models but is also not statistically significant.

2.4.1.1.2 Control Variables

The variables that significantly affect votes are fairly consistent across the first, third, and fourth model; TENURE, %ELDERLY and INCOME positively influence pro-AMA voting. Overall, these models tend to produce similar parameter estimates for the interest group and control variables.

Estimates from the second model (Future-Lagged) differ substantially from those of the other models. It would be nice if there were a statistical test to determine the correct model. Unfortunately, no such test exists. We report the root mean squared error (RMSE) as a measure of the variability of the estimates. The RMSE for the first, third, and fourth models are similar, as are the parameter estimates.

2.4.1.2 Narrow Vote Index

The results for the narrow vote index equation are given in Table 2.2. Recall that twenty-one votes of narrow specificity are used in the formation of the index. These key votes are more important to the AMA and, if contributions have an effect, we expect to find it for these votes.

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[8] Using a two-tailed test, the third model shows a significant negative effect. This is inconsistent with rational interest group behavior and we reject the specification of the relationship between AMA contributions and voting behavior in that model.

Table 2.2
Narrow Vote Index Equation
GLS Estimates and t-Statistics

	Model 1 Lagged-Current	Model 2 Future-Lagged	Model 3 Current-Current	Model 4 Lagged-Future
Interest Group Variables				
AMA$	0.000001	0.000002	-0.000002	0.0000006
(+)	(0.600)	(1.591)	(1.594)	(0.574)
%AMA	0.237*	0.369*	0.283*	0.237*
(+)	(1.993)	(2.676)	(2.316)	(1.997)
AMAOPP$	-0.0000006	-0.0000006	-0.000001	-0.0000002
(-)	(0.498)	(0.515)	(0.908)	(0.15)
Control Variables				
VOTE MARGIN	0.207	0.15	0.232	0.218
(?)	(1.646)	(1.063)	(1.841)	(1.725)
PARTY	0.0319	-0.0499	0.045	0.027
(?)	(0.829)	(1.21)	(1.158)	(0.712)
ADA	-0.00056	0.0002	-0.0006	-0.0006
(?)	(0.899)	(0.316)	(0.925)	(0.992)
TENURE	0.0025	0.001	0.002	0.0026
(?)	(1.435)	(0.656)	(0.904)	(1.47)
%ELDERLY	1.899*	0.907	2.106*	1.937*
(?)	(3.082)	(1.272)	(3.361)	(3.138)
INCOME	0.0000046	-0.000003	0.000007	0.000005
(?)	(0.744)	(0.432)	(1.125)	(0.756)
EAST	-0.0426	-0.003	-0.051	-0.0412
(?)	(0.978)	(0.067)	(1.174)	(0.943)
SOUTH	-0.1065*	-0.094	-0.103*	-0.11*
(?)	(2.423)	(1.909)	(2.344)	(2.497)
MIDWEST	-0.1317*	-0.137*	-0.14*	-0.133*
(?)	(2.882)	(2.656)	(3.055)	(2.902)
CONSTANT	-0.2913	0.362	-0.217	-0.277
	(1.035)	(1.189)	(0.761)	(0.982)
RMSE	1.96441	1.9859	1.96132	1.96448
F-Value	8.587	4.923	8.781	8.569

* Significant at the .05 level

2.4.1.2.1 Interest Group Variables

As predicted by interest group theory, the AMA contributions and membership variables have a stronger influence on narrow roll call votes than on broad votes. The AMA contributions variable is positive in all the equations except in the third model (Current-Current), and is marginally significant (at the .10 level) in the second model (Future-Lagged). The latter finding suggests that contributions affect narrow votes when the senator responds to funds to be received in the next period. The % AMA variable is positive and significant across all models, suggesting that state AMA membership or direct potential votes are more important than monetary contributions in explaining narrow roll call votes.

2.4.1.2.2 Control Variables

Demographic and regional variables (%ELDERLY, SOUTH, and MIDWEST) are significant and have the same sign across models, except for in the second model. TENURE and INCOME, significant in explaining the full vote index, are not important in the narrow vote index equation. As with the full vote index, the first, third, and fourth models produce similar parameter estimates and root mean squared errors.

2.4.1.3 Broad Vote Index

Table 2.3 reports parameter estimates for the broad vote equation. Recall that the broad vote index contains votes on issues of a more diffuse social nature and represent the broad ideological concerns of the AMA.

Table 2.3
Broad Vote Index Equation
GLS Estimates and t-Statistics

	Model 1 Lagged-Current	Model 2 Future-Lagged	Model 3 Current-Current	Model 4 Lagged-Future
Interest Group Variables				
AMA$	-0.000000121	0.000000046	-0.000003	0.0000009
(+)	(0.076)	(0.038)	(2.263)	(0.873)
%AMA	-0.0775	0.017	-0.0156	-0.0767
(+)	(0.690)	(0.130)	(0.136)	(0.683)
AMAOPP$	0.0000007	0.000001	-0.00000005	0.0000012
(-)	(0.570)	(0.805)	(0.041)	(0.938)
Control Variables				
VOTE MARGIN	-0.0183	-0.0582	0.0062	-0.0128
(?)	(0.154)	(0.433)	(0.052)	(0.107)
PARTY	-0.0442	-0.0607	-0.0168	-0.041
(?)	(1.216)	(1.549)	(0.460)	(1.140)
ADA	0.00092	0.0011	0.001	0.001
(?)	(1.550)	(1.752)	(1.803)	(1.702)
TENURE	0.00295	0.0028	0.0019	0.0033
(?)	(1.790)	(1.500)	(1.141)	(1.950)
%ELDERLY	0.7618	0.1295	1.00	0.7752
(?)	(1.308)	(0.191)	(1.691)	(1.330)
INCOME	0.0000199*	0.000012	0.000023*	0.00002*
(?)	(3.440)	(1.685)	(3.847)	(3.377)
EAST	0.0146	0.0223	0.0037	0.0175
(?)	(0.355)	(0.471)	(0.089)	(0.424)
SOUTH	0.0283	0.0636	0.0367	0.026
(?)	(0.681)	(1.365)	(0.889)	(0.622)
MIDWEST	0.0210	0.0347	0.0099	0.02
(?)	(0.486)	(0.708)	(0.228)	(0.464)
CONSTANT	1.8137	2.276	1.895	1.815
	(6.819)	(7.87)	(7.06)	(6.81)
RMSE	1.85697	1.88676	1.8501	1.85596
F-Value	7.050	4.018	7.487	7.079

* Significant at the .05 level

2.4.1.3.1 Interest Group Variables

None of the interest group variables (AMA$, % AMA, and AMAOPP$) significantly affect voting behavior on broad issues. Interest group theory predicts that interest groups are less successful in influencing votes with diffuse benefits, votes which face higher opposition, and votes with higher visibility. The costs to the interest group to influence these types of votes outweighs the benefits to the group. These characteristics describe the votes used in the construction of the broad vote index.

2.4.1.3.2 Control Variables

INCOME is significant in explaining the broad vote index in the first, third, and fourth models. No other variables are important in explaining voting on these broad votes. We believe these results are due to the nature of the votes. Higher visibility compels the senator to respond more to constituency pressure. More opposition (and support) groups are associated with these votes. Since we do not include measures of visibility or opposition (or support) and since the votes are aggregated over a range of issues, the lack of significant findings is not surprising.

As in the full and narrow vote indices equations, the estimates and root mean squared error from the second model differ from the other three models. III. B. AMA

2.4.2 Contributions Equations Results

In this section, we present the results of the Tobit estimation of AMA contributions. The contributions equation is estimated three times; the full vote index, the narrow vote, and the broad vote index are each used as the explanatory variable of major concern.

Due to model specification, the first and third models have the same results. The reported results indicate the direction of effects on the observed dependent variable. The t-statistics from the two-stage estimation are reported, as well as the t-statistics calculated using Bootstrap standard errors.[9] Predicted directions of effects are below the parameter estimates.

2.4.2.1 Using Full Vote Index

Table 2.4 presents the results for the contributions equation using the full vote index as a right-hand side variable. We are primarily concerned with the effects of the voting behavior on contributions.

2.4.2.1.1 Full Vote Index

The full vote index is positive and marginally significant (at the .10 level) in explaining AMA contributions in the fourth model (Lagged-Future). In the other models, roll call voting behavior does not significantly affect AMA contributions. As we discussed in Chapter 1, there may be other motives for contributing money, such as ensuring access once a senator is elected. But we see some evidence here that the AMA may be paying senators for future votes.

2.4.2.1.2 Control Variables

CAMPGN is the only variable significant across all models. Whether a senator is facing an upcoming election appears to affect AMA contributions. This raises the

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[9] The Bootstrap method of estimating standard errors is described fully in Chapter 1. The same techniques used there are used in this chapter.

Table 2.4
AMA Contributions Equation
Full Vote Index as Explanatory Variable
2-Stage Tobit Estimates and t-Statistics

	Models 1 & 3 Lagged-Current & Current-Current	Model 2 Future-Lagged	Model 4 Lagged-Future
VOTE INDEX	-2685.93	225.43	3906.30
(+)	(.792)	(0.048)	(1.601)
	(.736)[a]	(.061)	(1.341)
Control Variables			
PARTY	5678.18	3661.80	1295.35
(+)	(2.409)	(1.067)	(.753)
	(2.105)	(1.253)	(.447)
CAMPGN	12697.16	19231.12	21074.82
(+)	(5.835)	(5.313)	(15.443)
	(3.75)	(3.658)	(3.799)
INCUMBENCY	-4821.74	-4034.003	-1377.04
(?)	(2.619)	(1.667)	(.994)
	(2.346)	(1.603)	(.543)
TOTALOPP$	0.0017	0.0019	.00044
(+)	(3.198)	(2.77)	(1.068)
	(1.78)	(1.726)	(.401)
ADA	-8.273	-58.27	-100.67
(?)	(.222)	(1.08)	(3.698)
	(.271)	(1.218)	(2.109)
EAST	-1002.46	-1027.8358	-3240.8172
(?)	(.3669)	(.2923)	(1.634)
	(.228)	(.341)	(1.066)
SOUTH	3443.46	1169.11935	681.146231
(?)	(1.421)	(.3693)	(.3805)
	(1.31)	(.384)	(.222)
MIDWEST	2845.31	3554.81897	-1381.7643
(?)	(1.132)	(1.121)	(.7503)
	(.929)	(1.103)	(.428)

(table con't)

	Models 1 & 3 Lagged-Current & Current-Current	Model 2 Future-Lagged	Model 4 Lagged-Future
Control Variables (continued)			
BUDGET	313.27	-517.881	135.4408
(+)	(.1439)	(.1879)	(.0839)
	(.035)	(.228)	(.058)
FINANCE	4480.35	5193.0001	2012.557661
(+)	(2.055)	(1.9094)	(1.232)
	(1.806)	(1.942)	(.753)
FOREIGN RELATIONS	-3975.77	-5803.0359	-843.49886
(+)	(1.550)	(1.8020)	(.4667)
	(1.425)	(2.121)	(.312)
GOV'T AFFAIRS	-2894.40	-1933.9381	-2379.8108
(+)	(1.093)	(.5848)	(1.275)
	(1.343)	(.800)	(.991)
SMALL BUSINESS	3311.08	4363.69368	370.4739
(+)	(1.474)	(1.5478)	(.9132)
	(1.558)	(1.759)	(.149)
CONSTANT	-60392.88	-52721.854	-83294.52
	(6.101)	(2.008)	(7.067)
	(2.849)	(8.367)	(13.912)
Log Likelihood Value	-2875.029685	-2268.85973	-2981.330539

[a] t-statistic calculated from the bootstrap standard error. 1000 pseudo-data sets each containing 700 observations are created from the original data set.

question, does the underlying structure of contributing behavior differ in election and nonelection years? We examine this issue in the next chapter.

The significance of many of the other control variables is sensitive to the timing scheme employed. PARTY, INCUMBENCY, TOTALOPP$, ADA, FINANCE, and SMALL BUSINESS are significant in some models but not in others. These variables are not of primary interest and an analysis of their sensitivity to timing specification is beyond the scope of this paper.

We report the value of the log likelihood function for each model simply for comparison across models. Intuitively, parameter estimates that achieve a large likelihood function are more likely to be the true parameters than for estimates which produce a smaller likelihood function.[10]

2.4.2.2 Using Narrow Vote Index

Interest group theory predicts that the AMA cares more about senators' voting behavior on key issues. According to Gopoian (1984), interest groups motivated by narrow policy concerns select a set of key votes to use as a litmus test of loyalty and allocate contributions based on the voting record on those votes. If the AMA rewards senators for favorable voting, we expect the rewards to be greater for favorable voting on bills which are more important to the AMA. Table 2.5 presents results using the narrow vote index as an explanatory variable.

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[10] Maximum likelihood estimation chooses values of the (unknown) parameters that maximize the probability of obtaining the sample actually observed. See Judge et al. (1982) Chapter 6, for further discussion.

Table 2.5
AMA Contributions Equation
Narrow Vote Index as Explanatory Variable
2-Stage Tobit Estimates and t-Statistics

	Models 1 & 3 Lagged-Current & Current-Current	Model 2 Future-Lagged	Model 4 Lagged-Future
VOTE INDEX	74.88	1773.99	3613.13
(+)	(.0292)	(.533)	(1.795)
	(.0913)[a]	(.598)	(1.291)
Control Variables			
PARTY	5555.58	3521.62	1108.66
(+)	(2.354)	(1.025)	(.574)
	(2.034)	(1.209)	(.383)
CAMPGN	12529.30	19197.14	21151.71
(+)	(5.801)	(5.306)	(13.373)
	(3.697)	(3.518)	(3.768)
INCUMBENCY	-5069.22	-4280.49	-1476.05
(?)	(2.732)	(1.759)	(.980)
	(2.492)	(1.646)	(.580)
TOTALOPP$	0.00173	0.00181	.0004
(+)	(3.129)	(2.657)	(.975)
	(1.731)	(1.616)	(.365)
ADA	-12.83	-59.99	-98.86
(?)	(.349)	(1.123)	(3.170)
	(.387)	(1.281)	(2.092)
EAST	-1192.68	-1035.41	-3305.77
(?)	(.439)	(.295)	(1.472)
	(.3308)	(.343)	(1.095)
SOUTH	3234.71	1166.19	634.69
(?)	(1.343)	(.369)	(.344)
	(1.223)	(.386)	(.208)
MIDWEST	2765.68	3647.67	-1390.05
(?)	(1.103)	(1.149)	(.706)
	(.899)	(1.145)	(.430)

(table con't)

	Models 1 & 3 Lagged-Current & Current-Current	Model 2 Future-Lagged	Model 4 Lagged-Future
Control Variables (continued)			
BUDGET	323.60	-544.93	133.07
(+)	(.149)	(.198)	(.077)
	(.0397)	(.238)	(.058)
FINANCE	4570.47	5253.64	1951.48
(+)	(2.09)	(1.964)	(1.090)
	(1.758)	(1.978)	(.754)
FOREIGN RELATIONS	-3933.35	-5757.81	-799.10
(+)	(1.535)	(1.789)	(.402)
	(1.42)	(2.128)	(.294)
GOV'T AFFAIRS	-2920.43	-1817.17	-2103.55
(+)	(1.104)	(.550)	(1.044)
	(1.338)	(.751)	(.868)
SMALL BUSINESS	3259.07	4299.54	240.12
(+)	(1.447)	(1.525)	(.137)
	(1.519)	(1.741)	(.097)
CONSTANT	-66687.73	-55059.89	-79543.96
	(4.123)	(2.245)	(6.233)
	(12.915)	(9.184)	(14.188)
Log Likelihood Value	-2875.344903	-2268.73	-2980.82866

[a] t-statistic calculated from the bootstrap standard error. 1000 pseudo-data sets each containing 700 observations are created from the original data set.

2.4.2.2.1 Narrow Vote Index

The narrow vote index is positive and marginally significant at the .10 level in the fourth model. Consistent with interest group theory, it appears the AMA cares about the narrow votes and contributes in hopes of capturing favorable legislation in the next period. The other models show no evidence that roll call voting behavior, even on narrow votes, influences AMPAC contributions. The choice of model determines whether votes are influential or not.

2.4.2.2.2 Control Variables

CAMPGN is significant across all models. PARTY, INCUMBENCY, ADA, FINANCE, FOREIGN RELATIONS, and SMALL BUSINESS are significant in explaining AMA contributions in some models, but their significance depends on the model specification.

2.4.2.3 Using Broad Vote Index

The results for the contributions equation using the broad vote index as an explanatory variables are presented in Table 2.6. Theory predicts that votes on broad social issues should have less of an effect on AMA contributions.

2.4.2.3.1 Broad Vote Index

Table 2.6 shows no evidence that voting behavior on broad issues significantly affects AMA contributions. The results are, again, consistent with interest theory. The AMA has weaker preferences for votes with diffuse benefits and does not reward (or punish) based on these votes. The AMA states their position on a variety of broad issues, but evidence suggests that the votes do not affect contributing decisions.

Table 2.6
AMA Contributions Equation
Broad Vote Index as Explanatory Variable
2-Stage Tobit Estimates and t-Statistics

	Models 1 & 3 Lagged-Current & Current-Current	Model 2 Future-Lagged	Model 4 Lagged-Future
VOTE INDEX	-251.50	-546.79	-772.37
(+)	(.091)	(.151)	(.359)
	(.347)[a]	(.220)	(.302)
Control Variables			
PARTY	5571.26	3692.37	1858.92
(+)	(2.369)	(1.075)	(.980)
	(2.054)	(1.103)	(.550)
CAMPGN	12543.63	19229.83	21064.55
(+)	(5.808)	(5.315)	(13.373)
	(3.715)	(3.425)	(3.485)
INCUMBENCY	-5048.56	-4010.43	-870.89
(?)	(2.773)	(1.674)	(.589)
	(2.44)	(1.615)	(.348)
TOTALOPP$	0.00174	0.0019	.00049
(+)	(3.146)	(2.79)	(1.190)
	(1.755)	(4.208)	(.959)
ADA	-12.160	-56.7	-85.04
(?)	(.325)	(1.049)	(2.706)
	(.323)	(1.162)	(1.591)
EAST	-1166.59	-998.16	-3226.65
(?)	(.427)	(.284)	(1.438)
	(.2272)	(.416)	(1.317)
SOUTH	3265.58	1217.05	870.18
(?)	(1.344)	(.384)	(.473)
	(1.25)	(.469)	(.336)
MIDWEST	2781.84	3584.23	-1445.36
(?)	(1.106)	(1.130)	(.733)
	(.917)	(1.389)	(.593)

(table con't)

	Models 1 & 3 Lagged-Current & Current-Current	Model 2 Future-Lagged	Model 4 Lagged-Future
Control Variables (continued)			
BUDGET	314.17	-557.11	206.16
(+)	(.144)	(.202)	(.120)
	(.022)	(.327)	(.118)
FINANCE	4556.94	5165.04	1764.00
(+)	(2.09)	(1.898)	(.988)
	(1.84)	(2.634)	(.881)
FOREIGN RELATIONS	-3930.90	-5834.46	-913.57
(+)	(1.535)	(1.811)	(.460)
	(1.437)	(3.352)	(.505)
GOV'T AFFAIRS	-2910.10	-1952.18	-2292.73
(+)	(1.099)	(.591)	(1.137)
	(1.32)	(1.012)	(1.125)
SMALL BUSINESS	3260.49	4356.02	-78.56
(+)	(1.450)	(1.545)	(.044)
	(1.532)	(2.128)	(.039)
CONSTANT	-66071.12	-51077.49	-76236.15
	(3.915)	(1.977)	(5.779)
	(12.77)	(5.322)	(10.326)
Log Likelihood Value	-2875.341182	-2268.836575	-2982.37656

[a] t-statistic calculated from the bootstrap standard error. 1000 pseudo-data sets each containing 700 observations are created from the original data set.

2.4.2.3.2 Control Variables

CAMPGN is positive and significantly affects AMA contributions. INCUMBENCY, TOTALOPP$, FINANCE, FOREIGN RELATIONS, AND SMALL BUSINESS are important determinants of contributions in some models and not in others.

2.5 Conclusions

The ad hoc modeling of votes and contributions in previous roll call vote analyses raises questions concerning the timing of the contract between senators and the AMA. Does the timing of the exchange of votes and contributions matter? Do contributions received in different periods have dissimilar effects on votes? Does the AMA consider past, current, or future voting behavior when it makes its contributing decisions? We examine four alternative models of voting and contributing behavior based on different timing schemes. We allow for lead, lag, and current effects of AMA contributions on votes and of senators' voting behavior on contributions.

As predicted by interest group therapy, AMA contributions and membership have a stronger influence on narrow roll call votes than broad votes. There is (weak) evidence that contributions affect narrow votes when the senator responds to funds received in future. The results suggest that senators are forward-looking in their voting behavior.

AMA membership is positive and significant in explaining narrow votes. This result is insensitive to model specification. AMA membership represents potential

lobbying force or direct potential votes, and appears to be more important in explaining senators' voting behavior on narrow roll call votes than monetary contributions.

We find (weak) evidence that future voting behavior affects AMA contributions. The full vote index and narrow vote index are marginally significant in explaining contributions when contributions are modeled as a function of future votes. The broad vote index is not important in explaining contributions in any of the models. Consistent with theory, the narrow vote matters to the AMA relatively more than the broad votes.

Interest groups have parochial policy concerns and broad ideological concerns.[11] This categorization of concerns parallels our narrow and broad vote indices. We find marginal evidence that the AMA is an interest group with predominantly parochial concerns, although it may outwardly express its broad ideological concerns to Congress and the public.

In summary, we find only weak evidence that AMA contributions affect Senate roll call votes, even when we use different timing mechanisms to model the exchange of votes and contributions. As in Chapter 1, we are a bit surprised at the lack of strong significant findings, given the amount of money the AMA contributes to senators. Marginally significant findings suggest that senators and the AMA are forward-looking in their behavior. Other studies that examine the timing of contributions and votes only use lagged and current contributions, so this finding is unique in the literature.

The results on some of the control variables in the contributions equations lead us to question whether we have properly modeled the relationship between votes and

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[11] Gopoian (1984)

contributions. The variable CAMPGN (whether a senator is facing an upcoming election) is positive and statistically significant in all models. The result is insensitive to the choice of vote index as explanatory variable (full, narrow, or broad). But by using a dummy variable to measure the effects of an upcoming election, we assume that the underlying structures of voting and contributing behavior are the same for election years and nonelection years. In the next chapter, we drop that assumption and investigate whether the relationship between votes and contributions differs with the election cycle.

Some Senate committees are significant in determining AMA contributions. We expect this result since committee members have power over the content of bills and over whether a bill ever reaches the full Senate. Since we find only weak evidence of AMA influence, we question whether the roll call vote on the floor of the Senate is the appropriate variable to analyze. We continue our search for significant AMA influence on legislation in Chapter 4 by considering the importance of committee membership.

CHAPTER 3

TESTS FOR STRUCTURAL CHANGE BETWEEN ELECTION AND NONELECTION YEARS

3.1 Introduction

Whether or not a senator is facing an election affects her demand for campaign contributions. We expect the demand for funds to increase during re-election campaigns, especially in close races. Most studies of roll call votes and PAC contributions do not differentiate between those congressmen facing an upcoming election and those who are not. If favorable voting attracts PAC money, and senators vote differently in elections years, then this needs to be controlled for in the vote equation. Similarly, if PACs respond to the increase in demand for funds and contribute differently during election years, this, too, should be incorporated into the equation explaining contributions.

Only one study we reviewed includes a variable to capture different behavior due to the election cycle. Kau, Keenan, and Ruben (1982) include a dummy variable in the contributions equation, equal to 1 if the winner was in a primary. This variable is highly significant in predicting contributions in four out of six cases. Our survey revealed no other study that examines the effects that election and nonelection years have on either voting behavior or contributing behavior.

In the previous chapters, we find little evidence of significant contributions effects on roll call votes. In this chapter, we extend our search for significant effects by looking for a more appropriate model of the relationship between senators and the American Medical Association (AMA). We test for structural change in the models of voting by senators on bills of interest to the AMA and in the contributing behavior of

the American Medical Political Action Committee (AMPAC) across election cycles. We estimate all models, allowing for different underlying structures, to examine the simultaneous effects of votes on contributions and contributions on votes. The data are the same as in previous chapters, and the derivation of the equations and explanation of estimation techniques are provided in Chapter 1.

The analyses in Chapter 1 and 2 include the variable CAMPGN in vote and contributions equations. Recall that CAMPGN is a dummy variable equal to 1 if the senator is facing an upcoming election in either the current period or the next period, thereby causing an increase in demand for campaign funds. This variable was highly significant in all equations. The dummy variable specification assumes that the underlying structural equations (for both votes and contributions) are the same for election and nonelection years. In the following section, we test whether this assumption is valid.

3.2 Estimation and Tests

To test the null hypothesis of no structural change, we divide the data into election and nonelection year observations. We perform Chow tests (Chow, 1983) on the vote equations and perform Likelihood Ratio tests on the contributions equations. Both of these tests rely on estimation of a restricted model (no structural difference between election and nonelection years) and an unrestricted model (estimation of the model for observations only in an election year and then for observations only in nonelection years). For a review of dependent and independent variables in the vote indices equations, see below.

Dependent Variable

VOTE INDEX= ratio of pro-AMA votes to total votes

Independent Variables

Interest Group Variables

AMA$ = contributions from AMPAC
%AMA = percent of the state's doctor population that are AMA members
OTHGRP$ = contributions from an interest group other than AMPAC
SYNERGY = interaction term between AMA$ and OTHGRP$
AMAOPP$ = contributions from AMPAC to the senator's opponent in the last election

Control Variables (Senator Characteristics and Constituency Characteristics)

VOTE MARGIN = electoral margin received by the senator in the last election
PARTY = 1 if Republican, 0 if Democrat
ADA = Americans for Democratic Action rating (liberal to conservative rating)
TENURE = number of years that the senator has been in the U.S. Senate
%ELDERLY = percent of the state's population that is over 65 years old
INCOME = state's real per capita income
EAST, SOUTH, MIDWEST = regional dummies

Equations for the full, narrow, and broad vote indices are estimated using generalized least squares. (We use the same categorization of votes as in previous chapters). We use the resulting sums of the squared errors to calculate the test statistic which has an F-distribution. The test determines if the underlying structure of voting behavior is different in election years and nonelection years.

The calculated test statistic is

$u=[SSE_r-SSE_u)/K]/(SSE_u)/T-K$[1]

SSE is a measure of the unexplained variation in the dependent variable (vote index). $SSE_r \geq SSE_u$ because, in the restricted model, the parameter estimates may only take on certain values. The test statistic u is large if SSE_r and SSE_u are sufficiently different, and the null hypothesis of no structural difference between election years and nonelection years is rejected.

The AMA contributions equations are specified in previous chapters. For a review of the dependent and independent variables, see below.

Dependent Variable

AMA$ = contributions from AMPAC

Independent Variables

VOTE INDEX = ratio of pro-AMA votes to total votes

Control Variables

PARTY= 1 if Republican, 0 if Democrat
CAMPGN = 1 if senator is facing an upcoming election, 0 otherwise
INCUMBENCY = 1 if senator is an incumbent, 0 otherwise
TOTALOPP$ = total campaign receipts of the senator's opponent
ADA = Americans for Democratic Action rating (liberal to conservative rating)
EAST, SOUTH, MIDWEST = regional dummies
BUDGET = 1 if on the Budget Committee, 0 otherwise
FINANCE = 1 if on Finance Committee, 0 otherwise
FOREIGN RELATIONS = 1 if on Foreign Relations Committee, 0 otherwise
GOV'T AFFAIRS = 1 if on Governmental Affairs Committee, 0 otherwise
SMALL BUSINESS = 1 if on Small Business Committee, 0 otherwise

[1] T=number of observations=700 and K=number of explanatory variables=11. SSE_r is the sum of squared errors from the restricted model (all observations) and SSE_u is the sum of the sum of squared errors from the unrestricted model (nonelection and election).

Tobit estimation is used for the three contributions equations and are estimated via maximization of the log likelihood. (Each equation includes one of the vote indices as an explanatory variable.) The values of the likelihood functions are then used to compute the log likelihood test statistic which is distributed as a chi-square random variable. The Likelihood Ratio test statistic is $LR= 2(\ln L_u - \ln L_r)$.[2]

The null hypothesis of no structural difference restricts the set of values the parameter estimates can take. This restricts the possible values for the maximum value of the likelihood function. If the values of the likelihood functions are close, then the estimates from the restricted and unrestricted models are close, the test statistic (LR) is small, and we do not reject the null hypothesis.[3]

In Chapter 2, we examined four models of different timing schemes between votes and contributions. We found weak evidence of forward-looking behavior for both senators and the AMA. We examine those four models here. The models are defined as follows:

Model #1:	$\text{VOTE INDEX}_t = f(\text{AMA\$}_{t-1}, \ldots..)$	
	$\text{AMA\$}_t = g(\text{VOTE INDEX}_t, \ldots..)$	Lagged-Current
Model #2:	$\text{VOTE INDEX}_t = f(\text{AMA\$}_{t+1}, \ldots..)$	
	$\text{AMA\$}_t = g(\text{VOTE INDEX}_{t-1}, \ldots..)$	Future-Lagged
Model #3:	$\text{VOTE INDEX}_t = f(\text{AMA\$}_t, \ldots..)$	
	$\text{AMA\$}_t = g(\text{VOTE INDEX}_t, \ldots..)$	Current-Current

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[2] $\ln L_u$ is the sum of the values of the likelihood functions for nonelection and election year samples and $\ln L_r$ is the value of the likelihood function using pooled observations.

[3] See Judge et al. (1988), Chapter 3.

Model #4: $VOTE\ INDEX_t = f(AMA\$_{t-1} \ldots..)$

$AMA\$_{t-1} = g(VOTE\ INDEX_t \ldots..)$ Lagged-Future

3.3 Results

Table 3.1 shows the results from the Chow tests for the vote equations and the Likelihood Ratio tests for the contributions equations, as well as the critical values for the chi-square and F-distributions.

3.3.1 Vote Equations Results

Models 1 and 4 show no evidence of a structural change in senators' voting behavior between election and nonelection years. Models 2 and 3 indicate differences in voting behavior for the full vote index and Model 2 also shows differences for the broad vote index. These findings are consistent with the arguments that broad roll call votes on major social issues are highly visible and that senators have to be more responsive to constituents' preferences on these issues.

In contrast, none of the models find evidence of structural change in voting behavior on narrow votes indices. This result is consistent with the interest group theory assumption of rationally ignorant voters. Voters tend to be unaware of narrow interest group votes so senators are not pressured to vote differently in election years. Our results indicate that senators are consistent in their voting behavior on issues that are important to the AMA.

3.3.2 Contributions Equations Results

The null hypothesis of no structural change for the contributions equations is soundly rejected in all models. This is intuitively appealing; one would expect the

Table 3.1
Tests for Structural Change Between Election and Nonelection Years

Chow Test of Vote Equations $u=[(SSE_r-SSE_u)/K]/(SSE_u)/T-K$		Likelihood Ratio Test of Contributions Eqn. $LR= 2(\ln L_u-\ln L_r)$
Model 1: Using Lagged Contributions[a]		Model 1 and 3: Using Current Votes[b]
Full Vote Index	u=1.5000815	Using Full Vote Index LR=300.43*
Narrow Vote	u=1.200863	Using Narrow Vote Index LR=298.69*
Broad Vote Index	u=1.18957	Using Broad Vote Index LR=293.68*
Model 2: Using Future Contributions		Model 2: Using Lagged Votes
Full Vote Index	u=2.04133*	Using Full Vote Index LR=244.21*
Narrow Vote Index	u=1.6303	Using Narrow Vote Index LR=243.76*
Broad Vote Index	u=1.81367*	Using Broad Vote Index LR=244.27*
Model 3: Using Current Contributions		
Full Vote Index	u=1.88542*	
Narrow Vote Index	u=1.35003	
Broad Vote Index	u=1.516875	
Model 4: Using Lagged Contributions		Model 4: Using Future Votes
Full Vote Index	u=1.17473	Using Full Vote Index LR=132.98*
Narrow Vote Index	u=.9493	Using Narrow Vote Index LR=133.57*
Broad Vote Index	u=1.0391	Using Broad Vote Index LR=132.97*
$F_c \approx 1.80$[c]		$X^2_c=19.6751$[c]

* The null hypothesis of no structural change is rejected with a 95% confidence interval.

[a] The labeling reflects the timing of the endogenous explanatory variable.

[b] Recall that the specification of contributions in Model 1 and 3 are the same.

[c] Critical values with $\alpha=.05$.

underlying structures of the supply and demand functions for contributions during election years to be different from those in nonelection years.

Evidence from Table 3.1 shows that estimating the contributions equations by pooling election and nonelection years is not appropriate. To better explore contributing behavior, we examine the election year and nonelection year results in the following section. We compare the parameter estimates from the unrestricted models and test for significant differences.

3.3.2.1 Comparison of Parameter Estimates for Contributions Equations

In this section, we report the regression results for AMA contributions equations in both election and nonelection years. Again, we use Tobit estimations to obtain parameter estimates. To test whether the parameter estimates from the two models are significantly different, we use a dummy variable model to allow the slope parameters to change. Maintaining the Tobit framework, the equation we estimate is

$$\text{AMA\$} = \begin{cases} \text{AMA\$}^* \text{ if AMA\$}^* \geq \text{AMA\$}^0 \\ 0 \text{ otherwise} \end{cases}$$

where now,

$$\text{AMA\$}^* = \alpha + \sum_{k=1}^{K} (X_k' \beta_k + X_k \text{CAMPGN} \delta_k) + e \qquad (3.1)$$

CAMPGN is a dummy variable equal to one if the senator is facing an upcoming election and zero otherwise. For a nonelection year, the parameter estimate for the k^{th} explanatory variable is β_k. In an election year, the parameter estimate is $\beta_k + \delta_k$. The

statistical significance of δ_k determines whether the parameter estimates from election and nonelection years are significantly different.

3.3.2.1.1 Full Vote Index

Tables 3.2 gives the results from the Tobit estimation of AMA contributions in both election and nonelection years with the full vote index as an explanatory variable. The first row for each variable is for nonelection years and the second row is for election years. The t-statistic for significant difference is provided. Asterisks denote statistical significance (at the .05 level) within the equation.

Table 3.2 shows no evidence that voting on the full range of votes affects contributions. This result holds for both election and nonelection years. In Chapter 2, we found (weak) evidence that future votes affect contributions (Model 4). When we estimate the two subsamples, election and nonelection years, this result disappears, suggesting that the results found in Chapter 2 are due to pooling election and nonelection year observations.

The significance of the control variables varies according to model specification and the sample used. TOTALOPP$ maintains significance across both samples for Models 1 (and 3) and 2, and during nonelection years for Model 4. Similarly, PARTY is significant for both samples in Model 1 (and 3), in election years for Model 2, and in nonelection years in Model 4.

The significance of committee membership is sensitive to the sample and model specification. Being on the Finance Committee is important during election years in

Table 3.2
Tobit Estimation of AMA Contributions Equations
Comparison of Election/Nonelection Year Results
Full Vote Index as Explanatory Variable

	Models 1 & 3 Current Votes	Model 2 Lagged Votes	Model 4 Future Votes
VOTE INDEX			
Nonelection	-4824.95	1312.798	4571.922
Election	3243.55	-796.964	-455.64
	(3.919)*	(.884)	(1.241)
Control Variables			
PARTY			
Nonelection	2627.09*	-1169.9098	4146.807*
Election	6235.38*	7673.483*	-302.153
	(2.916)*	(4.774)*	(4.445)*
INCUMBENCY			
Nonelection	-2559.62*	-592.1479	3060.999*
Election	-3296.80	-2350.30	-827.116
	(1.564)	(.309)	(2.826)*
TOTALOPPS			
Nonelection	.000705*	0.000759*	.00099*
Election	.00217*	.002689*	-.000055
	(.604)	(.141)	(2.047)*
ADA			
Nonelection	28.282	-25.85	-63.707*
Election	-81.267	-68.861	-14.165
	(.173)	(2.074)*	(.420)
EAST			
Nonelection	-792.62	367.336	-4089.43
Election	-1352.70	-1857.0617	289.504
	(.171)	(.101)	(.093)
SOUTH			
Nonelection	2536.13*	1048.86	1321.40
Election	1703.403	231.43	2109.74
	(.517)	(.955)	(.770)

(table con't)

	Models 1 & 3 Current Votes	Model 2 Lagged Votes	Model 4 Future Votes
Control Variables			
MIDWEST			
Nonelection	266.41	745.718	-174.20
Election	4815.96	4448.93	1620.88
	(1.697)*	(.981)	(2.257)*
BUDGET			
Nonelection	281.203	-643.846	19.001
Election	-178.122	-665.044	324.898
	(.318)	(.600)	(.420)
FINANCE			
Nonelection	293.88	216.714	928.19
Election	5576.35*	4953.98	1021.92
	(1.196)	(.807)	(.173)
FOREIGN RELATIONS			
Nonelection	288.216	-134.6909	-2722.90
Election	-9657.42	-9909.1	-171.0
	(1.693)*	(1.230)	(2.065)*
GOV'T AFFAIRS			
Nonelection	-3494.91	-4132.96	-635.335
Election	-3494.91	-3236.722	394.37
	(.582)	(1.061)	(.096)
SMALL BUSINESS			
Nonelection	1806.92*	3368.229*	1422.02
Election	1026.21	2571.777	1283.59
	(.716)	(1.151)	(.239)
CONSTANT			
Nonelection	-45402.72*	-48435.907*	-50455.708
Election	928.30	5440.05	-32296.08*

* Significant at the .05 level.

the first model and membership on the Small Business Committee is important in nonelection years in the first (and third) and second models.

Based on the t-statistics of difference between parameter estimates, we find that the estimates for the full vote index, using current votes, are statistically different from each other. The parameter estimates are the marginal change in the AMA's willingness to contribute, given a one percent change in the vote index. The AMA willingness to contribute, based on voting behavior, significantly increases during elections. Of the control variables that have significantly different estimates, only PARTY and TOTALOPP$ are statistically significant in the equation.

3.3.2.1.2 Narrow Vote Index

Table 3.3 shows the results from using the narrow vote index in the contributions equations in election and nonelection years.

The results presented in Table 3.3 are similar to those in Table 3.2. Again, there is no evidence that votes affect AMA contributions, even when the votes are of greater importance to the AMA. In Chapter 2, we found future voting behavior on narrow votes (weakly) affects contributions. The result does not hold when the data separated into election and nonelection years. This suggests the result in Chapter 2 is due to pooling of the data.

The control variables that are significant in explaining contributions when the narrow vote index is used are essentially the same as when the full index is used. PARTY, INCUMBENCY, TOTALOPP$, ADA, FINANCE, AND SMALL BUSINESS impact contributions, but their significance is dependent on election cycle and timing

Table 3.3
Tobit Estimation of AMA Contributions Equations
Comparison of Election/Nonelection Year Results
Narrow Vote Index as Explanatory Variable

	Models 1 & 3 Current Votes	Model 2 Lagged Votes	Model 4 Future Votes
VOTE INDEX			
Nonelection	-3182.19	-631.503	1745.63
Election	3372.012	-1430.49	608.39
	(2.940)*	(1.124)	(1.009)
Control Variables			
PARTY			
Nonelection	2605.93*	-122.84	4184.79*
Election	6042.74*	7839.11	-258.82
	(3.721)*	(4.948)*	(4.576)*
INCUMBENCY			
Nonelection	-2476.15*	-374.36	3269.37*
Election	-3428.27	-2203.32	-929.01
	(1.812)	(.358)	(2.848)*
TOTALOPPS			
Nonelection	.000774*	.000783*	.001*
Election	.002191*	.00272	-.00009
	(.470)	(.203)	(2.082)*
ADA			
Nonelection	21.48	-24.842	-52.02*
Election	-77.94	-68.979	-15.61
	(.370)	(2.098)*	(.610)
EAST			
Nonelection	-1048.26	-350.724	-4018.25
Election	-1170.04	-1939.62	130.15
	(.318)	(.116)	(.114)
SOUTH			
Nonelection	2269.38*	1128.91	1455.37
Election	1825.69	155.724	2055.49
	(1.080)	(.986)	(.844)

(table con't)

	Models 1 & 3 Current Votes	Model 2 Lagged Votes	Model 4 Future Votes
Control Variables			
MIDWEST			
Nonelection	289.22	775.557	-155.04
Election	5036.63	4307.84	1586.69
	(1.774)*	(.961)	(2.242)*
BUDGET			
Nonelection	84.744	-597.79	-32.97
Election	-363.13	-524.267	230.89
	(.737)	(.763)	(.485)
FINANCE			
Nonelection	523.121	286.55	701.62
Election	5428.884*	4828.61	937.29
	(.987)	(.748)	(.196)
FOREIGN RELATIONS			
Nonelection	258.35	-54.31	-2710.90
Election	-9729.04	-9919.28	-183.54
	(1.639)	(1.221)	(2.004)*
GOV'T AFFAIRS			
Nonelection	-3675.25	-3976.621	-722.50
Election	-4044.88	-3324.47	338.02
	(.617)	(1.025)	(.127)
SMALL BUSINESS			
Nonelection	1986.095*	3345.70*	1124.23
Election	842.033	2666.64	1135.63
	(.737)	(1.156)	(.125)
Constant			
Nonelection	-50625.34*	-45153.236*	-43435.28*
Election	2570.68	5476.109	-33577.39*

* Significant at the .05 level.

specification. The parameter estimates that are significantly different for election and nonelection years are basically the same ones as when the full vote index is used. The AMA willingness to contribute, based on voting behavior, increases during election years relative to nonelection years.

3.3.2.1.3 Broad Vote Index

Table 3.4 shows the regression results for AMA contributions in election and nonelection years when the broad vote index is used as a regressor.

Table 3.4 shows no evidence that votes influence AMA contributions. When the data are separated into election and nonelection year, the major determinants of contributing behavior are the same whether voting is on narrow issues or broad issues. The magnitude of the effects of these determinants, however, varies between election and nonelection years. The overall results of the AMA contributions equations are essentially insensitive to vote specificity when modeled according to the election cycle.

The vote index parameter estimates are significantly different from each other, as they were with the full and narrow vote indices (for the first, third, and fourth models). The underlying willingness to contribute in response to voting behavior is higher during election years, perhaps due to the increase in demand for funds during those years. Parameter estimates for PARTY, INCUMBENCY, ADA, and FOREIGN RELATIONS differ significantly between election and nonelection years. In order to capture the different marginal effects on the AMA's willingness to contribute, we cannot pool the data across all years.

Table 3.4
Tobit Estimation of AMA Contributions Equations
Comparison of Election/Nonelection Year Results
Broad Vote Index as Explanatory Variable

	Models 1 & 3 Current Votes	Model 2 Lagged Votes	Model 4 Future Votes
VOTE INDEX			
Nonelection	-981.72	562.67	167.24
Election	2959.94	2620.30	-278.54
	(2.337)*	(.387)	(1.839)*
Control Variables			
PARTY			
Nonelection	2467.72*	-1232.64	4500.40*
Election	6266.83*	7609.12*	-275.54
	(3.879)*	(5.030)*	(4.350)*
INCUMBENCY			
Nonelection	-2948.54*	-476.45	3533.62*
Election	-3117.28	-2535.82	-851.28
	(2.038)*	(.472)	(2.851)*
TOTALOPPS			
Nonelection	.0007*	.00076*	.00104*
Election	.0021*	.00259*	-.000057
	(.687)	(.175)	(.311)
ADA			
Nonelection	23.79	-25.75	-54.07
Election	-84.17	-78.13	-14.0
	(.652)	(2.239)*	(.258)
EAST			
Nonelection	-930.63	-384.06	-4020.17
Election	-1398.19	-1817.01	261.61
	(.389)	(.084)	(.213)
SOUTH			
Nonelection	2299.72*	1085.56	1561.86
Election	1663.77	82.71	2111.88
	(1.207)	(1.145)	(.593)

(table con't)

	Models 1 & 3 Current Votes	Model 2 Lagged Votes	Model 4 Future Votes
Control Variables			
MIDWEST			
Nonelection	205.01	711.36	-180.44
Election	4669.01	4590.41	1636.22
	(1.999)*	(1.072)	(2.180)*
BUDGET			
Nonelection	159.51	-614.94	-38.19
Election	-46.50	-252.36	287.45
	(.539)	(.719)	(.472)
FINANCE			
Nonelection	742.13	241.08	577.43
Election	5666.85*	5223.35	1012.67
	(.818)	(.862)	(.285)
FOREIGN RELATIONS			
Nonelection	419.57	-92.94	-2712.31
Election	-9879.30	-9683.11	-170.37
	(1.666)*	(.618)	(2.070)*
GOV'T AFFAIRS			
Nonelection	-3442.53	-4063.19	-854.06
Election	-4244.23	-3102.69	416.81
	(.603)	(1.098)	(.195)
SMALL BUSINESS			
Nonelection	2001.18*	333.07*	977.42
Election	1142.17	2566.45	1257.71
	(.745)	(1.190)	(.154)
CONSTANT			
Nonelection	-53466.44*	-47038.44*	-42896.46*
Election	949.72	-3346.56	-32621.73*

* Significant at .05 level.

3.4 *Conclusions*

A senator's demand for campaign contributions increases when facing an upcoming re-election campaign. In examining the relationship between senators and contributors, empirical models should allow for this increased demand for funds during election years. Other studies of roll call votes have pooled election and nonelection year observations, but we suspect this is not the proper specification.

Tests of structural change show relatively stable voting behavior across election and nonelection years, especially on issues of narrow concern to the AMA, but the underlying structure of contributing behavior is not. Simply including a dummy variable in contribution equations to capture the effect of election years is not appropriate.

We estimate separate equations for AMA contributions using election and nonelection year samples and find no evidence that voting behavior affects AMA contributions. In Chapter 2, we used pooled data and found weak evidence that future voting on narrow issues affects contributions. We do not find that result here. The overall results are fairly insensitive to vote specificity. The major determinants of contributions are relatively stable when the three vote indices are used as explanatory variables (full, narrow, and broad). Their estimated effects on the AMA's (underlying) willingness to contribute, however, vary across nonelection and election samples. Since our estimated equations are reduced form equations, the results are consistent with changes in the underlying supply and demand functions for contributions in election years.

Our primary goal in this study is to discover the role of AMA contributions in the Senate. While we find no evidence that AMA contributions affect votes or that the AMA rewards senators for favorable voting, there is strong evidence that the underlying process generating contributing behavior is not the same in all years. We conclude that empirical studies of the relationship between votes and PAC contributions should allow for structural change. In the search for better models of PAC behavior and influence, differences in the underlying structural model should be modeled appropriately.

CHAPTER 4

THE IMPORTANCE OF COMMITTEE MEMBERSHIP

4.1 Introduction

Some researchers criticize roll call vote analyses for not taking into consideration the complex process a bill goes through before reaching the floor of the Senate. They argue that the final floor vote is merely a formality and is not the proper variable to examine to find evidence of PAC influence.[1] Statistical models of roll call votes may underestimate the influence of campaign contributions on legislative outcomes because they omit an important element of the legislative process, committee action.

Previous chapters find little or no evidence that contributions from the American Medical Association (AMA) affect Senate roll call votes. In this chapter, we continue our investigation into the role of AMA contributions in the U. S. Senate by looking at the importance of Senate committee membership. No one committee has jurisdiction over health policy in the Senate, so we choose five committees for analysis. We select committees based on the amount of American Medical Political Action Committee (AMPAC) contributions received by its members, and because many bills of concern to the AMA are referred to these committees.

The committees considered are the Senate Budget, Finance, Foreign Relations, Government Affairs, and Small Business Committees. In Chapter 1, we found evidence that membership on the Finance Committee positively affects AMA contributions. In

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[1] Andrew J. Seltzer (1995) and R. Douglas Arnold (1990) both argue the importance of committee action relative to floor action.

Chapter 2, we discovered that membership on the Finance and Small Business Committees significantly affects contributions (in models where current votes are used to explain contributions). If membership on certain committees influences the level of contributions received, do these contributions, in turn, influence senators' voting behavior? In this chapter, we examine the voting behavior of members of the committees mentioned above in a continued search for AMPAC effects on legislation.

There are many sources from which bills originate. In addition to congressmen, interest groups, citizen groups, bar associations, chambers of commerce, and individuals have the right to petition and transmit their proposals to members of Congress.[2] The senator who has agreed to sponsor a bill usually introduces it by presenting it to a clerk at the Presiding Officer's desk, without commenting on it on the floor of the Senate.[3] The Presiding Officer's desk then sends a copy of the bill to the chairman of the committee to which it is referred. The committee reviews the bill, discusses reports from subcommittees, and sometimes makes amendments. (Amendments are changes to the bill as introduced and are subject to rejection or acceptance by the full Senate.) Committee members vote whether the committee will report favorably or "table" the bill. (By tabling a bill, the committee effectively kills the bill.) If the committee reports favorably, it may report the bill with or without amendments, or, if extensive

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[2] The following discussion pertains to the Senate, although the procedure in the House of Representatives is very similar.

[3] A more formal procedure may be used, in which the senator rises and introduces the bill on the floor, but more commonly it is presented to the Presiding Officer's desk.

amendments have been approved, report a "clean bill". A committee seldom adversely reports a bill, since tabling a bill effectively prevents action on it.

Committee action is public record, but is less visible, and is conducted in a smaller arena of activity than the Senate floor. While the full Senate does not necessarily abide by the recommendations of the referring committee when voting, the committee has power over whether a bill goes to the full Senate for a vote and over the content of the bill. Therefore, we expect that PACs direct their efforts to committee members in order to influence legislation.

To test for PAC influence in committees, Keiser and Jones (1986) examine committee action under the assumption that contributions are likely to exert more influence on committee votes than floor votes. The dependent variable is support for President Carter's 1979 hospital cost containment proposal, a bill that the AMA vehemently opposed. In addition to analyzing House floor votes, Keiser and Jones examined votes in the Ways and Means Committee and the Energy and Commerce Committee. AMA contributions had the hypothesized sign in both committees, but were significant only in the Energy and Commerce Committee. Keiser and Jones concluded that the Energy and Commerce Committee was the legislative forum in which the AMA was most able to exert influence.

We would like to use the models presented in previous chapters to examine committee roll call votes. Applying the simultaneous models developed in Chapters 1-3 might reveal AMA influence at the committee level even though it is not found at the Senate floor level. Unfortunately, the required data are not available. We face several

sample sizes, we cannot use multivariate analysis of committee members individual roll call votes.[4] Pooling the individual votes creates a sufficiently large data set, but to obtain unbiased parameter estimates, we must assume the parameters are equal across equations. Likelihood ratio tests reveal that pooling cross-sectional data on individual votes to create a large sample is inappropriate due the inequality of parameter estimates across vote equations.[5]

Because of these data limitations, multivariate analysis cannot be used to examine committee decisions. Several qualitative methods can be used to determine the influence of AMPAC on such decisions. Chow tests of structural differences indicate whether committee members vote differently from non-members. Correlation coefficients show whether vote indices and AMPAC contributions are related (using only committee members). Finally, contingency tables and associated nonparametric tests identify the independence or association between votes (of committee members) and AMPAC contributions.

4.2 Tests for Structural Differences and Measure of Correlation

We divide the full sample of vote indices into subsamples of committee members and non-members and estimate the vote indices equations using two-stage general least squares.[6] We test the full, narrow, and broad vote indices equations for structural

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[4] The maximum sample size for a roll call vote for committee members is twenty.

[5] We estimated the votes of committee members and non-members separately and use the unrestricted and restricted log likelihood values to compute the likelihood ratio test statistic. All calculated t-statistics soundly reject the null hypothesis of equal coefficients across vote equations.

[6] The equation specification is the same as in the vote indices equations in Chapter 1.

change using Chow tests.[7] The test determines if the underlying structure of voting behavior is different for committee members and non-members. A list of the dependent and independent variables in the vote indices equations follows.

Dependent Variable

VOTE INDEX = ratio of pro-AMA votes to total votes

Independent Variables

Interest Group Variables

AMA$ = contributions from AMPAC
%AMA = percent of the state's doctor population that are AMA members
OTHGRP$ = contributions from an interest group other than AMPAC
SYNERGY = interaction term between AMA$ and OTHGRP$
AMAOPP$ = contributions from AMPAC to the senator's opponent in the last election

Control Variables (Senator Characteristics and Constituency Characteristics)

VOTE MARGIN = electoral margin received by the senator in the last election
PARTY = 1 if Republican, 0 if Democrat
ADA = Americans for Democratic Action rating (liberal to conservative rating)
TENURE = number of years that the senator has been in the U.S. Senate
%ELDERLY = percent of the state's population that is over 65 years old
INCOME = state's real per capita income
EAST, SOUTH, MIDWEST = regional dummies

The calculated test statistic for the Chow test is

$$u=[SSE_r-SSE_u)/K]/(SSE_u)/T-K^8$$

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[7] The categorization of votes according to specificity is defined in previous chapters.

[8] SSE_r is the sum of squared errors from the restricted model (which includes both committee members and non-members), SSE_u is the sum of squared errors from the

SSE is a measure of the unexplained variation in the dependent variable (vote index). $SSE_r \geq SSE_u$ because, in the restricted model, the parameter estimates may only take on certain values. If SSE_r and SSE_u are sufficiently different, then the test statistic u is large and we reject the null hypothesis of no structural difference between members and non-members. Table 4.1 presents the results of the Chow tests.
Appendix E contains the full regression results.

Table 4.1 shows that the structures of all three vote indices equations differ for committee members and non-members of the Finance Committee. The structures for the full and narrow vote indices significantly differ for the Small Business Committee. The structures of the full vote index equations are different in the Foreign Relations Committee. The results do not indicate whether contributions cause differences in voting behavior, but they provide evidence that the underlying processes generating voting behavior are different for members of some committees.

Combining these results with the findings in Chapters 1 and 2, the Finance and Small Business Committees are "important" in the sense that the AMA contributes relatively more to members of these committees, and the voting behavior of these committee members is structurally different from non-members. The results are not evidence of a causal relationship between votes and contributions, but they do suggest the need for further investigation. To further explore the relationship between votes and

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unrestricted model (the sum of the sum of squared errors from the regressions for members and non-members). K is the number of explanatory variables, the T is the number of observations.

Table 4.1
Tests for Structural Change
Vote Indices Equations
Senate Committee Members Versus Non-Members

Chow Test of Vote Equations $u=[(SSE_r-SSE_u)/K]/(SSE_u)/T-K$		
Budget Committee	Full Vote Index	u=1.16
	Narrow Vote	u=.905
	Broad Vote Index	u=1.34
Finance Committee	Full Vote Index	u=2.28*
	Narrow Vote Index	u=1.91*
	Broad Vote Index	u=1.85*
Foreign Relations Committee	Full Vote Index	u=1.95*
	Narrow Vote Index	u=.954
	Broad Vote Index	u=1.45
Governmental Affairs Committee	Full Vote Index	u=.574
	Narrow Vote Index	u=.662
	Broad Vote Index	u=.775
Small Business Committee	Full Vote Index	u=2.92*
	Narrow Vote	u=2.89*
	Broad Vote Index	u=1.42
$F_{.05}\approx 1.80$		

* Significant at the .05 level.

contributions, we examine correlation coefficients for the vote indices and AMPAC contributions next.

The correlation coefficient between votes and contributions depends on their covariance[9] (which measures linear association), and their variances. Correlation is defined as

$$\rho_{vote,contribution} = \frac{cov(vote,contributions)}{\sqrt{var(vote)}\ \sqrt{var(contributions)}}$$

The correlation coefficient is a number that falls between -1 and 1. If votes and contributions are independent, then $\rho_{vote,contributions}$ equals zero. The absolute value of $\rho_{vote,contributions}$ will be higher the more votes and contributions are linearly related.

Table 4.2 shows the correlation coefficients the full, narrow, and broad indices and AMA contributions for members of the five Senate committees. Allowing lagged, current, and future contributions to have different correlations with votes, we report the correlation coefficients for votes and contributions received in the period prior to the vote, contributions received in the same period, and contributions received in the next period. P-values for the null hypothesis of zero correlation are in parentheses.

The significant finding in Table 4.2 is the correlation between the full vote index and AMPAC contributions in the Foreign Relations Committee. All other correlation coefficients are not significantly different from zero. These results provide very little evidence that votes and AMPAC contributions are related and are consistent with the

[9] The more votes and contributions jointly vary from their means, the higher their covariance will be.

Table 4.2
Correlation Between Vote Indices and AMPAC Contributions for
Senate Committee Members
Correlation Coefficients and P-Values

	Lagged Contributions	Current Contributions	Future Contributions
Budget Committee			
Full Vote Index	.0803	-.0376	-.0937
	(.3238)	(.6430)	(.2834)
Narrow Vote Index	.0665	-.0843	.0421
	(.4128)	(.2988)	(.6302)
Broad Vote Index	-.0055	0658	-.1111
	(.9459)	(.7220)	(.2026)
Finance Committee			
Full Vote Index	-.0026	.0759	-.0272
	(.9756)	(.3743)	(.7693)
Narrow Vote Index	.0298	.0620	.1343
	(.7273)	(.4683)	(.1454)
Broad Vote Index	.0310	.0611	-.1528
	(.7173)	(.4749)	(.1972)
Foreign Relations Committee			
Full Vote Index	.2297**	-.1215	-.1467
	(.0106)	(.1806)	(.1372)
Narrow Vote Index	.0398	-.0374	.1413
	(.6618)	(.6705)	(.1524)
Broad Vote Index	-.0225	-.0076	-.2342
	(.8052)	(.9337)	(.167)
Gov't Affairs Committee			
Full Vote Index	.0739	-.0423	-.1167
	(.4517)	(.6668)	(.2652)
Narrow Vote Index	-.1245	.0752	-.0214
	(.2034)	(.4434)	(.8389)
Broad Vote Index	-.0094	.1101	-.1336
	(.9241)	(.2610)	(.2019)
Small Business Committee			
Full Vote Index	-.0942	-.0018	.0092
	(.3041)	(.9841)	(.9266)
Narrow Vote Index	-.1012	-.0631	.0515
	(.2695)	(.4915)	(.6069)
Broad Vote Index	-.1142	.0573	-.0472
	(.2124)	(.5322)	(.6376)

** Significant at the .01 level.

findings in Chapters 1-3. In those chapters, there is very little evidence that AMPAC contributions buy favorable legislation and that voting behavior affects contributions.

The Chow tests show structural differences in voting between some committee members and non-members, but the correlation coefficients fail to show significant association between votes and contributions except in the Foreign Relations Committee. In the next section, we use nonparametric procedures to examine the relationship between votes and AMA contributions without making inferences about the variables' means or variances.

4.3 Nonparametric Tests

Up to this point in this study, we assume the observations come from certain parametric families of distributions. The values of the parameters are not known, but appropriate multivariate techniques provide parameter estimates. We then make statistical inferences about the significance of the parameter estimates.

In this section, we make no assumptions about the particular distributions from which the observations come. The observations are classified according to two categories, vote and contributions. A senator votes either 0 (against the AMA stance) or 1 (pro-AMA) and receives either zero AMPAC contributions or positive AMPAC contributions. This categorization produces a two-way contingency table to test the hypothesis that the two categories are independent. We also calculate a nonparametric measure of correlation using the data in the table.

4.3.1 Independence

The null hypothesis that votes and contributions are independent is in the statistical sense; that is, if we randomly select a senator from the population, the probability that she votes a particular way *and* receives positive contributions is equal to the probability that she votes a particular way *times* the probability she receives positive contributions.[10]

Development of the test statistic is as follows: The contingency table contains R rows and C columns. For $i=1,...,R$ and $j=1,...,C$, $\hat{E}_{ij}$ denotes the maximum likelihood estimate of the expected number of observations that is classified in the i^{th} row and j^{th} column of the table, given that the null hypothesis is true.[11] Then

$$\hat{E}_{ij} = (N_{i+}N_{+j})/n$$

where N_{i+} is the total number of observations in row i, N_{+j} is the total number of observations in column j, and n is the total number of observations in the table.

The test statistic, Q, is calculated as

$$Q = \sum_{i=1}^{R} \sum_{j=1}^{C} \frac{(N_{ij} - \hat{E}_{ij})^2}{\hat{E}_{ij}}$$

where N_{ij} is the number of observations in the cell located in row i and column j. Q

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[10] An intuitive explanation might be: If the null hypothesis of independence is rejected, then knowing one variable (contributions) can "tell us something" about the other variable (vote).

[11] To show that $\hat{E}_{ij}$ is the M.L.E. of the expected number of observations in cell ij, let p_{ij}=probability of being in cell ij. $E(N_{ij})=np_{ij}$. When H_o is true, $p_{ij}=p_{i+}p_{+j}$. (p_{i+} is the probability of being in row i and p_{+j} is the probability of being column j). Let $\hat{p}_{i+}$ and $\hat{p}_{+j}$ denote M.L.E.'s of p_{i+} and p_{+j}. Then $\hat{E}_{ij} = n\hat{p}_{i+}\hat{p}_{+j}$. Since $\hat{p}_{i+}=N_{i+}/n$ and $\hat{p}_{+j}=N_{+j}/n$, it follows that $\hat{E}_{ij} = n[(N_{i+}/n)(N_{+j}/n)]=(N_{i+}N_{+j})/n$.

follows a χ^2 distribution with (R-1)(C-1) degrees of freedom. If the actual number of observations in a cell sufficiently differs from the expected number of observations, Q is large and we reject the null hypothesis of independence.

4.3.2 Degree of Association

The value of the Q statistic presented above provides a measure of the degree of association between votes and contributions. If there is no association between votes and contributions, then the observed frequency in each cell is very close to the expected frequency since the expected frequency is calculated under the null hypothesis of independence. The higher the degree of association, the larger the difference between observed and expected frequencies will be. The contingency coefficient, C, measures the degree of association between votes and contributions. C equals zero when there is no association between votes and contributions and approaches one as the association increases. (The contingency coefficient is significantly different from zero only when the null hypothesis of independence is rejected.) The contingency coefficient is calculated as $C = \sqrt{\frac{Q}{n+Q}}$.

4.3.3 Contingency Tables

Table 4.3 shows the contingency tables for the five Senate committees. Contributions are AMPAC contributions received in the period prior to the vote.[12]

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[12] We also examine votes and current contributions, and votes and future contributions using contingency tables. No evidence of dependence is found in any of the committees.

The table includes row and column totals, as well as table totals. We report the test statistics Q and C, which are defined above, for each committee. Recall that the contingency coefficient is significantly different from zero only when the Q statistic is statistically significant.

Table 4.3 shows dependency between votes and contributions for the Budget Committee. We cannot infer a functional form of the relationship between votes and contributions, but the test statistic provides evidence of a significant relationship. The contingency coefficient for the Budget Committee is significantly different from zero, but does not suggest a strong degree of association between votes and contributions. The null hypothesis of independence between roll call votes and AMA contributions cannot be rejected in the other committees.

The results are, again, consistent with the results in Chapters 1-3: there is little evidence of a relationship between votes and contributions. However, these results differ from those in Table 4.2. In Table 4.2, there is no evidence of a relationship between votes and contributions in the Budget Committee. Only the correlation coefficient for the full vote index in the Foreign Relations Committee is significant. In Table 4.3, there is evidence of a significant relationship between votes and contributions in the Budget Committee, but no evidence of a significant relationship in the Foreign Relations Committee.

The correlation coefficient ($\rho_{vote,contributions}$), and the contingency coefficient (C), do not assume a causal relationship between votes and contributions. However, the correlation coefficient depends on the degree of covariation between votes and

Table 4.3
Contingency Tables for Selected Senate Committees
Tests of Independence and Association Between Votes and AMPAC Contributions

BUDGET	Contributions =0	Contributions >0	
Vote=0	341	126	c_1=467
Vote=1	284	161	c_2=445
Q=8.941** C=.0985**	r_1=625	r_2=287	n=912
FINANCE	Contributions =0	Contributions >0	
Vote=0	284	118	c_1=402
Vote=1	285	128	c_2=413
Q=.260 C=.035	r_1=569	r_2=246	n=815
FOREIGN RELATIONS	Contributions =0	Contributions >0	
Vote=0	257	102	c_1=359
Vote=1	261	122	c_2=383
Q=1.04 C=.037	r_1=518	r_2=224	n=742
GOV'T AFFAIRS	Contributions =0	Contributions >0	
Vote=0	196	86	c_1=282
Vote=1	217	96	c_2=313
Q=1.101 C=.043	r_1=413	r_2=182	n=595
SMALL BUSINESS	Contributions =0	Contributions >0	
Vote=0	254	121	c_1=375
Vote=1	263	98	c_2=361
Q=2.307 C=.056	r_1=517	r_2=219	n=736

** Significant at the .01 level.

contributions, while the contingency coefficient does not consider variation in the variables from their means. Regardless of these differences, there still is little evidence that votes and AMPAC contributions are related.

4.4 Conclusions

Previous chapters of this study fail to find strong evidence that AMPAC contributions affect senators roll call votes or that voting behavior affects AMA contributions. In this chapter, we extend our investigation by analyzing the relationship between votes and AMPAC contributions for the members of five Senate committees (the Budget, Finance, Foreign Relations, Governmental Affairs, and Small Business Committees). We would like to examine the votes at the committee level since committee action is less visible and plays an important role in formulating legislation. Unfortunately, the data are not available. Therefore, we continue to use Senate floor roll call votes and AMPAC contributions, but move away from analyzing formal econometric models.

Chow tests confirm that the underlying structures of the processes generating all three categories of votes (full, narrow, and broad) differ for Finance and Small Business Committee members and non-members. The process generating the full vote index also differs across members and non-members of the Foreign Relations Committee. The results are consistent with results found in previous chapters, where membership on the Finance and Small Business Committees significantly affects AMPAC contributions.

Correlation coefficients, which are measures of association between votes and contributions, show a significant relationship between roll call votes and contributions in the Foreign Relations Committee. There is no evidence of such a relationship in the other committees studied. Nonparametric tests derived from contingency tables show that votes and contributions are dependent (statistically) in the Budget Committee, though the degree of association is relatively low. The correlation coefficients and nonparametric test statistics of independence do not infer casual effects of AMA contributions on votes (or votes on contributions), but they indicate that a relationship exists between these variables in certain Senate committees.

According to interest group theory, PACs have more influence at the committee level than in the full Senate. Our Chow tests show that the underlying structure of roll call voting on votes important to the AMA differs for some committee members, although we find no direct evidence of AMPAC influence. We believe that roll call votes are not the appropriate variables to examine when looking for AMA contributions effects. When the data on committee votes are available, we hope to identify significant AMPAC influence by applying the procedures used in this study to committee-level data.

SUMMARY AND CONCLUSIONS

Proponents of campaign reform assert PACs use their influence in Washington to affect legislation. To reduce interest group power, they advocate lowering the caps on campaign contributions. To determine the effects of such reform, knowledge of the relationship between interest group contributions and legislators is needed. Estimates of the effects of contributions on legislative outcomes are inconclusive. It is unclear whether PACs affect legislation and, if so, by what magnitude.

Our model portrays senators as utility-maximizing agents and the American Medical Association (AMA), through its political action committee, the American Political Action Committee (AMPAC), as a rational contributor. Contributions and roll call votes in the Senate from 1978-1992 are analyzed to test the "capture" theory. Our primary goals are to identify AMPAC contributions effects, to test the hypothesis that the AMA "rewards" senators for their voting behavior, and to determine the role of issue specificity. We use pooled, cross-sectional data in a simultaneous framework and extend the traditional analyses by examining alternative timing specifications, election year and nonelection year samples, and senate committee members and non-members.

We find little evidence to support the theory that AMPAC contributions affect roll call votes. Models of individual votes and three vote indices fail to show that AMA contributions significantly influence roll call votes or that senators' voting behavior significantly influences contributions. A measure of lobbying support or potential direct votes does, however, affect votes of narrow concern to the AMA. The percentage of a state's physician population that belongs to the AMA has a significant

positive effect on pro-AMA votes of narrow specificity, indicating that AMA membership is more important than contributions in affecting senators' voting behavior.

If AMA contributions do not influence roll call votes, the question arises, what do contributions "buy"? Roll call votes may not be the proper variable to measure influence in the political arena. Access, as measured by the time spent with legislators, may be the channel through which money is transformed into influence. While measurement of access is problematic, it should be considered for future research.

Our analysis of the importance of committee membership indicates that the underlying structures of the processes generating votes differ for the Senate Finance, Foreign Relations, and Small Business Committee members. Although nonparametric tests fail to show significant association between roll call votes and AMA contributions, theory suggests that PAC influence is greater at the committee level, where decisions are less visible. Again, we conclude that roll call votes on the floor of the Senate may not be the proper variable to analyze.

We explore whether the lack of influence of AMA contributions on roll call votes can be attributed to specification error. We specify and test alternative timing schemes, and we test for structural changes in voting and contribution behavior over the election cycle.

We find that the specification of the timing of the contract between senators and the AMA affects conclusions about determinants of vote outcomes and contributions. We estimate models of lead, lag, and current effects, and, while there is no strong evidence that contributions affect votes, there is weak evidence that senators respond

to future AMA contributions when voting on issues of narrow concern to the AMA, and that (future) votes on key issues are important in explaining AMA contributions. We conclude that choosing a particular timing scheme affects results and that researchers should carefully consider the theoretical basis of the empirical specification.

Analyzing pooled data over all years (election and nonelection) does not appear to be the proper specification. Test results show that the underlying structural processes of voting and contributing behavior are different in election years and in nonelection years. While not a surprising result since the supply and demand forces in these years are conceivably different, most studies do not address this issue. But, again, we find no evidence of AMA influence on votes in either election or nonelection years.

Several issues of concern warrant further discussion. Measuring the strength of opposition to particular bills is problematic. It is difficult to identify opposing (or supporting) groups. Contributions received from these groups may not fully capture the strength of opposition through the dissemination of information to the public and lobbying efforts.

Evidence of logrolling in voting behavior has been shown to be important. (Stratmann, 1992 and 1995). Our model does not include logrolling in the vote equations. In the presence of logrolling, simple roll call vote analysis may be misleading. However, the use of AMA-specific issues in the narrow vote index is less susceptible to this problem since we do not expect logrolling over a set a narrow concerns.

Future research should analyze alternative dependent variables to determine the role of AMA contributions and its translation into influence. We infer from our results that AMA contributions do not directly impact roll call votes. But roll call votes may not capture the indirect influence of AMA contributions through either access or committee action. The relationship between contributions and access, and the translation of access into influence, has not been thoroughly investigated.

We hope to analyze votes at the committee level if such data become available. We can then test the hypothesis that AMA contributions have a greater effect on committee action, where important legislative decisions are made and the lower visibility of such action may afford legislators greater freedom in responding to PAC interests.

While our results concerning the role of AMA contributions in the U. S. Senate may not hold for PACs in general, they do raise questions over the nature of campaign reform. If campaign contributions do not directly influence roll call votes, what impact will campaign reform have? At least eighteen bills relating to political action committees and campaign finance reform have been introduced in the 104th Congress.[13] If changing vote outcomes through the reduction of interest group power is desired, proponents of current campaign reform might do well to consider the effects, or lack of effects, their legislation would have. A better understanding of the motives and effects of PACs on policy is needed before reform can have desired effects.

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[13] HR 2566, S 1219, S 116, HR 1427, HR 1837, HR 2566, S 1389, S 1528, HJ Res 171, HR 296, HR 732, HR 738, HR 1427, HR 1692, HR 1865, HR 2141, HR 2830, and HR 3209.

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APPENDIX A: DESCRIPTIVE STATISTICS

Variable	Minimum	Maximum	Mean	Standard Deviation
VOTE INDEX	0	1.0000000	0.5264195	0.2250942
NARROW VOTE INDEX	0	1.0000000	0.3909048	0.3217711
BROAD VOTE INDEX	0	1.0000000	0.6095952	0.3140899
LAGGED AMA$	0	122000.85	2368.97	8144.14
CURRENT AMA$	0	131685.22	2244.67	8848.35
FUTURE AMA$	0	201021.13	2717.89	12596.09
%AMA	0.134	0.9830426	0.5831667	0.1382322
AMAOPP$	0	186222.63	1178.98	8883.89
PARTY	0	1.0000000	0.4871429	0.5001921
CAMPGN	0	1.0000000	0.3371429	0.4730722
INCUMBENCY	0	1.0000000	0.6285714	0.4835322
TENURE	0	50.000000	9.1614286	7.9964905
TOTALOPP$	0	10756873.18	1219078.06	1219078.06
ADA	0	100.00000	45.4542857	31.8683706
VOTE MARGIN	0.43	1.0000000	0.5992071	0.0971467
LAGGED VOTE MARGIN	0.434	1.0000000	0.5948186	0.1015055
%WHITE	0.334	0.9900000	0.8659303	0.1153535
%ELDERLY	0.02	0.1830000	0.1117257	0.0223706
INCOME	3759.70	115446.82	8719.80	2202.54
BUDGET	0	1.0000000	0.2200000	0.4145425
FINANCE	0	1.0000000	0.1985714	0.3992098
FOREIGN RELATIONS	0	1.0000000	0.1757143	0.3808490
GOV'T AFFAIRS	0	1.0000000	0.1514286	0.3587224
SMALL BUSINESS	0	1.0000000	0.1728571	0.3783941

N = 700.

APPENDIX B: DESCRIPTION OF SENATE VOTES 1979-1992

(S)=AMA support
(O)=AMA opposition
(In Comp)=Issue specifically mentioned in AMA Compendium of Statements

1979 96th Congress First Session

S 440. Alcohol Abuse Prevention and Rehabilitation Act. Huddleston, D-Ky., motion to table (kill) the Thurmond, R-SC., amendment to require that a health warning label be placed on all bottles of beverages containing 24% alcohol. Motion rejected 21-68: R 7-31: D 14-37. May 7, 1979. The Thurmond amendment was adopted subsequently by voice. (O) (In Comp)

1980 96th Congress Second Session

HR 3236. Disability Insurance. Bayh, D-Ind., amendment to eliminate the five-month waiting period for disability insurance benefits for persons who had diseases that two doctors had determined would lead to death within 12 months. Adopted 70-23: R 25-12: D 45-11. Jan. 30, 1980. (O) (In Comp)

1981 97th Congress First Session

S Con Res 19. Fiscal 1982 Budget Targets. Thurmond, R-SC., amendment to add $300 million in budget authority and $150 million in outlays for veterans' programs in fiscal 1982 and make offsetting cuts in health programs. Rejected 36-55: R 24-24, D 12-31. May 8, 1981. (O)

S 1377. Budget Reconciliation. Roth, R-Del., amendment to delete a provision in order to retain Medicare as the primary payer of health insurance benefits for federal employees who are also covered by the Federal Employee Health Benefits programs. Adopted 51-47: R 15-38: D 36-9. June 25, 1981. (S)

1982 97th Congress Second Session

HR 4961. Budget Reconciliation Tax Increases/Spending Cuts. Passage of the bill to increase taxes $99 billion for fiscal years 1983-85 and to cut welfare, Medicare and Medicaid spending $17 billion for the same three years, in compliance with reconciliation instructions in the fiscal 1983 budget resolution (S Con Res 92). Passed 50-47: R 49-3: D 1-44. in the session which began July 22, 1982. (O) (In Comp)

S J Res 58. Balanced Budget/Tax Limitation Amendment. Passage of the joint resolution to propose an amendment to the Constitution to require a balanced budget at the beginning of each fiscal year unless a three-fifths majority of Congress agreed to

deficit spending. The amendment could be waived during the time of a declared war. Passed 69-31; R 47-7; D 22-24. Aug. 4, 1982. A two-thirds majority of those present and voting (67 in this case) of both houses is required for passage of a joint resolution proposing an amendment to the constitution. A yea was a vote supporting the president's position. (S) (In Comp)

H J Res 631. Continuing Appropriations. Fiscal 1983/Federal Trade Commission. Rudman, R-NH., motion to table (kill) the McClure, R-Idaho, amendment to bar the use of funds by the FTC to investigate or make rules relating to the medical or other professions that were licensed and regulated by the states. Motion agreed to 59-37; R 31-21; D 28-16. In the session which began Dec. 6, 1982. A yea was a vote supporting the president's position. (O) (In Comp)

1983 98th Congress First Session

HR 1900. Social Security Act Amendments. Passage of the bill to overhaul the Social Security system, to revamp the way the federal government reimburses hospital for Medicare, to extend the federal supplemental unemployment, benefit program for six months and to increase Supplemental Security Income benefits. Passed 88-9; R 47-6; D 41-3. March 23, 1983. (O) (In Comp)

S Con Res 27. First Budget Resolution, Fiscal 1984. Dole, R-Kan., amendment to provide $1.8 billion in fiscal 1983-85 for health care assistance for the unemployed. Adopted 90-9; R 45-9; D 45-0. May 5, 1983. (S) (In Comp)

S J Res 3. Human Life Federalism Amendment. Passage of the joint resolution to propose an amendment to the Constitution that would overturn the 1973 Supreme Court decision, Roe V. Wade, which made abortion legal. Rejected 49-50; R 34-19; D 15-31. June 28, 1983. A two-thirds majority of those present and voting (67 in this case) of both houses is required for passage of a joint resolution proposing an amendment to the Constitution. A yea was a vote supporting the president's position. (O) (In Comp)

1984 98th Congress Second Session

HR 2163. Deficit Reduction. Dole, R-Kan., motion to table (kill) the Kennedy, D-Mass., amendment to the GOP-leadership deficit plan eliminating the increases in part B, covering out-of-pocket patient costs, in Medicare premiums and deductible. Motion agreed to 58-36; R 48-3; D 10-33. May 9, 1984 (S) (In Comp)

HR 4616. Motor Vehicle Safety/Minimum Drinking Age. Lautenberg, D-NJ., amendment to withhold a percentage of highway funds from states whose minimum drinking ages are under 21 and to provide incentives for other actions aimed at reducing drunk driving. Adopted 81-16; R 45-10; D 36-6. June 26, 1984. A yea was a vote supporting the president's position. (S) (In Comp)

1985 99th Congress First Session

S 484. Saccharin Study and Labeling Act. Metzenbaum, D-Ohio, amendment to require special labeling of diet soft drinks containing aspartame, an artificial sweetener, to indicate how much of the additive they contain. Rejected 27-68; R 4-46; D 23-22. May 7, 1985. (S) (In Comp)

S 43. Line-Item Veto. Quayle, R-Ind., motion to invoke cloture (thus limiting debate) on the Quayle motion to proceed to the consideration of the bill to give the president power to veto individual spending items by requiring that appropriations bills be split by paragraph or section into separate bills before being sent to the White House. Motion rejected 57-42; R 45-7; D 12-35. July 18, 1985. A three-fifths majority vote (60) of the total Senate is required to invoke cloture. A yea was a vote supporting the president's position. (S) (In Comp)

S 1078. Federal Trade Commission Act Amendments. Kasten, R-Wis., motion to table (kill) the McClure, R-Idaho, amendment to prohibit the FTC from using its jurisdiction over unfair or deceptive acts or practices to overrule state laws regarding the licensing, qualifications and permissible duties or tasks of professional such as lawyers, doctors and dentists. Motion agreed to 71-26; R 30-21; D 41-5. July 25, 1985 (O) (In Comp)

S 1730. Omnibus Budget Reconciliation, Fiscal 1986. Durenberger, R-Minn., motion to table (kill) the Bumpers, D-Ark., amendment to provide Medicare coverage for "reasonable and medically necessary" liver transplants performed on individuals aged 18 and over. Motion agreed to 51-47; R 45-7; D 6-40. Nov. 14, 1985. (O) (In Comp)

Bowen Nomination. Confirmation of President Reagan's nomination of Otis R. Bowen of Indiana to be secretary of The Department of Health and Human Services. Confirmed 93-2; R 49-1; D 44-1. Dec. 12, 1985. A yea was a vote supporting the president's position. (S) (In Comp)

1986 99th Congress Second Session

S Con Res 120. Budget Resolution, Fiscal 1987. D'Amato, R-NY, amendment to reduce fiscal 1987 budget authority and outlays for furniture and furnishings of the federal government by $100 million and to increase fiscal 1987 budget authority and outlays for health programs by $100 million to provide increased spending for drug prevention and rehabilitation programs. Adopted 82-12; R 46-4; D 36-8. May 1, 1986. (S)

S 655. Campaign Finance/PAC Spending. Boren, D-Okla., amendment to reduce limits on political action committee (PAC) contributions to congressional campaigns, to increase limits on individuals contributions, and to require broadcasters to provide equal time to subjects of negative advertising by PACs. Adopted 69-30; R 26-27; D 43-3. Aug. 12, 1986 (O) (In Comp)

1987 100th Congress First Session

S 677. FTC Reauthorization/Insurance. Metzenbaum, D-Ohio, amendment to require the FTC to study the sale of health insurance to the elderly and increases in property and casualty insurance rates to small business owners and others. Adopted 80-18; R 29-15; D 51-3. April 8, 1987. (O)

S Con Res 49. Fiscal 1988 Budget Resolution/Medicare-Medicaid. Chiles, D-Fla., motion to table (kill) the Chafee, R-RI, perfecting amendment, to increase fiscal 1988 finding for the Medicare and Medicaid programs by $1 billion each, and to provide for a $2 billion increase in unspecified revenues. Motion agreed to 69-29; R 20-2; D 49-4. May 6, 1987. (O)

S 1420. Omnibus Trade Bill/Advanced Civilian Technology Agency. Hollings, D-SC., motion to table (kill) the Glenn, D-Ohio, amendment to reorganize the Department of Commerce and the Office of the US Trade Representative and to create an independent Advanced Civilian Technology Agency to provide funding for high-risk technology development not being undertaken by the government. Motion agreed to 73-21; R 43-3; D 30-18. July 14, 1987. (O)

HR 2470. Catastrophic Health Insurance/Passage. Passage of the bill to expand the Medicare program to protect beneficiaries from catastrophic health-care costs and to otherwise expand the Medicare and federal-state Medicaid programs. Passed 86-11; R 36-10; D 50-1. Oct. 27, 1987. A yea was a vote supporting the president's position.(O) (In Comp)

1988 100th Congress Second Session

S 2. Campaign Finance/Cloture. Byrd, D-W.Va., motion to invoke cloture (thus limiting debate) on the bill to overhaul federal campaign-finance law. S 2 would limit campaign spending and the role of political action committees in Senate elections. Motion rejected 53-41; R 3-39; D 50-2. Feb. 26, 1988. A three-fifths majority vote (60) of the total Senate is required to invoke cloture. (O) (In Comp)

S Con Res 113. Fiscal 1989 Budget Resolution/Health Care. Chiles, D-Fla., motion to table (kill) the Weicker, R-Conn., amendment to transfer $50 million from the science function to health functions and to increase spending for childhood immunizations, geriatric training for nurses and other health programs. Motion agreed to 57-38; R 27-19; D 30-19. April 14, 1988. (O)

S 1220. AIDS Research and Education/Passage. Passage of the bill to authorize approximately $645 million for AIDS information, education and treatment programs and unspecified sums for research, for fiscal year 19088. Passed 87-4; R 39-4; D 48-0. April 28, 1988. (S) (In Comp)

HR 2470. Catastrophic Health Insurance/Conference Report. Adoption of the conference report on the bill (thus clearing the measure for the president) to cap the amounts for which Medicare beneficiaries will be financially liable for Medicare-covered services and to make other changes in the program. Adopted 86-11; R 34-11; D 52-0. June 8, 1988. (O) (In Comp)

HR 4783. Fiscal 1989 Labor, Health and Human Services, Education Appropriations/Contraceptives for Minors. Chiles, D-Fla., motion to table (kill) the Helms, R-NC, amendment to an Appropriations Committee amendment. The Helms amendment would have cut off all funds to the Department of Health and Human Services after Jan. 1, 1989, unless the secretary published regulations prohibiting minors (unmarried children under 18) from obtaining contraceptives without written permission from their parent or guardian. Motion agreed to 54-34; R 14-25; D 40-9. July 25, 1988. (S) (In Comp)

1990 101st Congress Second Session

S 1630. Clean Air Act Reauthorization/Passage. Passage of the bill to provide for attainment and maintenance of health ambient air quality standards, to limit the maximum allowable concentration of so-called criteria pollutants (ozone, lead, sulfur dioxide, particulates, nitrogen dioxide and carbon monoxide) and to require emissions reductions in motor vehicles; to limit emissions of airborne toxins; to require major utilities to reduce emissions of oxides of sulfur and nitrogen, precursors of acid rain; and to establish a system of federal permits and enforcement. Passed 89-11; R 39-6; D 50-5. April 3, 1990. A yea was a vote supporting the president's position. (S) (In Comp)

HR 4404. Fiscal 1990 Supplemental Appropriation/Domestic Redistribution. Kasten, R-Wis., motion to table (kill) the Byrd, D-W.Va., amendment to reduce aid to Panama by $120 million and use the fund for American Indian health facilities, Energy Department environmental restoration and waste-management projects, agriculture disaster assistance programs, and food programs for women and infants. Motion agreed to 51-48; R 43-2; D 8-46. April 26, 1990. (O) (In Comp)

S 2240. AIDS Emergency Relief/Passage. Passage of the bill to authorize $300 million annually in fiscal 1991 and 1992 and such sums as necessary for fiscal 1993-95 for emergency grants to metropolitan areas reporting more than 2,000 cases of AIDS and the same amounts in grant to states to develop or improve comprehensive care for people infected with HIV, the infection that causes AIDS. Passed 95-4; R 40-4; D 55-0. May 16, 1990. (S) (In Comp)

S 341. Air Travel Rights for the Blind/Cloture. Mitchell, D-Maine, motion to invoke cloture (thus limiting debate) on the bill to amend the Federal Aviation Act of 1958 to prohibit discrimination against blind people in air travel. Rejected 56-44; R 6-39; D 50-

5. June 12, 1990. A three-fifths majority vote (60) of the total Senate is required to invoke cloture. (S) (In Comp)

S 110. Title X Family Planning Amendments/Counseling. Chafee, R-RI., amendment to the Jeffords, R-Vt., amendment to the committee amendment, to specify that pregnant women receiving family planning services at federally funded facilities, upon request, be advised of all their legal and medical options, including abortion. Adopted 62-36: R 16-27; D 46-9. Sept. 25, 1990. (S) (In Comp)

1991 102nd Congress First Session

S 323. Title X Pregnancy Counseling/Parental Consent. Mitchell, D-Maine, amendment to require entities that receive Title X finding to obtain consent from a parent, grandparent, adult sibling, aunt or uncle for a minor to have an abortion. If the consent if not forthcoming, the attending physician could give parents or guardians 48 hours' notice before the abortion. The amendment also contains court or clergy bypass provisions. Adopted 54-45: R 9-34; D 45-11. July 16, 1990. (O) (In Comp)

HR 2622. Fiscal 1992 treasury-Postal Appropriation/AIDS. Helms, R-NC., amendment to provide for a $10,000 fine and a prison term of not less than 10 years for health-care providers who knowingly have the AIDS virus and perform invasive medical procedures without notifying the patient. Adopted 81-18; R 36-7; D 45-11. July 18, 1991. (O) (In Comp)

HR 2707. Fiscal 1992 Labor, HHS and Education Appropriations/Conference Report. Adoption of the conference report (thus clearing the measure for the president) to provide $204,919,763,000 in new budget authority for the Departments of Labor, Health and Human Services, and Education and related agencies, $176,796,071,000 in fiscal 1992, $27,848,692,000 in fiscal 1993, and $275,000,000 in fiscal 1994. The administration requested $200,6111,414,000. The measure would block enforcement of the administration rule, known as the 'gag rule', barring abortion counseling in federally funded family planning clinics. Adopted 73-24; R 21-21; D 52-3. Nov. 7, 1991. A nay was a vote supporting the president's position. (S) (In Comp)

1992 102nd Congress Second Session

HR 4210. 1992 Tax Bill/Prescription Drug Costs. Bentsen, D-Texas, motion to table (kill) the Pryor, D-Ark., amendment to contain the cost of prescription drugs by denying certain tax breaks to drug companies that raise prices above the rate of inflation as reflected in the Consumer Price Index. Motion agreed to 61-36; R 41-2; D 20-34. March 11, 1992. (S)

HR 2507. National Institutes of Health Reauthorization/Passage. Passage of the bill to reauthorize and amend the programs of NIH, including $2.2 billion for the National

Cancer Institute and $1.5 billion for the Heart, Lung and Blood Institute. The bill would lift the ban on fetal tissue transplant research, including fetal tissue obtained from induced abortions. Passed 87- 10; R 33-9; D 54-1. April 2, 1992. A nay was a vote supporting the president's position. (S) (In Comp)

S 3. Campaign Finance/Conference Report. Adoption of the conference report to limit spending (H Rept 102-487) in congressional campaigns by providing incentives to candidates to agree to voluntary spending limits, restricting money that candidates can accept from political action committees and restricting "soft money" raised and spent by state parties in federal elections. Adopted (thus cleared for the president) 58-42; R 3-40; D 55-2. April 30, 1992. A nay was a vote supporting the president's position. (O) (In Comp)

88 S 3. Campaign Finance/Veto Override. Passage, over President Bush's May 9 veto, of the bill to limit spending in congressional campaigns by providing incentives to candidates to agree to voluntary spending limits, restricting money that candidates can accept from political action committees (PACs) and restricting "soft money" raised and spent by state parties in federal elections. Rejected 57-42; R 3-40; D 54-2. May 13, 1992. A two-thirds majority of those present and voting (66 in this case) of both houses is required to override a veto. A nay was a vote supporting the president's position. (O) (In Comp)

HR 11. Tax Bill/Tobacco Advertising. Ford, D-Ky., motion to table (kill) the Harkin, D-Iowa, amendment to reduce the tax deductibility on advertising for tobacco products from 100 percent to 80 percent with the revenue generated going to anti-smoking campaigns. Motion agreed to 56-38; R 28-14; D 28-24. Sept. 24, 1992. (O) (In Comp)

S 323. Family Planning Amendments/Veto Override. Passage, over President Bush's Sept 25 veto, of the bill to reauthorize Title X of the Public Health Service Act for five years through fiscal 1997. The bill overturned the administration's "gag rule" and thus allowed abortion counseling at federally funded clinics. Passed (thus cleared for House action) 73-26; R 20-23; D 53-3. Oct. 1, 1992. A two-thirds majority of those present and voting (66 in this case) was required to override a veto. A nay was a note in support of the president's position. (S) (In Comp)

APPENDIX C: INDIVIDUAL VOTE EQUATION RESULTS

Table C.1
Vote Equation Results
Probit Estimates and t-Statistics
1979-1982

	S 440	HR 3236	S Con Res 19	S 1377	HR 4961	S J Res 58	H J Res 631
AMAS	-.001143	.0000119	.0000405	-.0000231	.0000763	.0000366	.0000192
	(-.0352)	(.3391)	(.8374)	(-.388)	(1.052)	(.3426)	(.3658)
%AMA	3.1669	-1.9208	-2.389	-1.397	-.9984	6.928	6.755
	(1.5647)	(-1.0588)	(-1.325)	(-.823)	(-.4254)	(1.81)	(2.752)
AMAOPPS	.00675	-.0000316	.0000133	.0001123	.0002503	.0001476	-.0001141
	(.084)	(-.4194)	(.1379)	(1.245)	(1.841)	(1.051)	(-.9227)
OTHGRPS	-	-.0000946	-.000704	-	-	-	-
		(-1.7217)	(-1.15)				
SYNERGY	-	1.93E-8	3.654E-7	-	-	-	-
		(1.845)	(.8523)				
VOTE	2.1666	.9725	-.8923	2.755	.5645	-.0407	-1.297
MARGIN	(.9741)	(.6527)	(-.6435)	(1.699)	(.2402)	(-.0168)	(-.7822)
PARTY	.2065	-.4168	-.304	-.3552	-2.988	.6898	-.691
	(.5581)	(-1.117)	(-.7997)	(-.9187)	(-5.014)	(1.115)	(-1.286)
ADA	-.01047	-.02578	.0221	.0312	.0225	-.071	-.0254
	(-1.2354)	(-2.866)	(2.637)	(3.527)	(1.689)	(-3.787)	(-2.373)
TENURE	.0538	.0294	.0304	-.014	.0379	.021	-.02
	(2.094)	(1.7)	(1.4949)	(-.6452)	(1.127)	(.5832)	(-.871)
%ELDERLY	-9.4473	7.281	5.446	-3.17	10.932	-8.007	-25.05
	(-1.0467)	(.789)	(.667)	(-.3338)	(.8449)	(-.534)	(-1.95)
INCOME	-.000615	.0002282	-.0000976	.0006699	.0002165	-.000205	-.001197
	(-2.492)	(1.056)	(-.5138)	(2.257)	(.8225)	(-.6351)	(-2.711)
EAST	.7177	.0998	-.4692	.031	-.6807	-.4599	-1.663
	(1.361)	(.1829)	(-.9038)	(.058)	(-.8997)	(-.6708)	(-2.23)
SOUTH	-.19151	.4096	-.4266	1.12	.5607	.5141	-1.644
	(-.3443)	(.8057)	(-.9005)	(2.025)	(.7127)	(.5478)	(-2.409)
MIDWEST	.365	.4369	-.2212	.1834	.4209	-.3155	-1.706
	(.6318)	(.7825)	(-.4285)	(.3366)	(.5139)	(-.3747)	(-2.708)
CONSTANT	2.6937	-1.7978	1.441	-5.45	-1.89	2.073	8.39
	(.8908)	(-.6897)	(.716)	(-2.044)	(-.665)	(.5466)	(2.198)

Table C.2
Vote Equation Results
Probit Estimates and t-Statistics
1983-1984

	HR 1900	S Con Res 27[a]	S J Res 3	HR 2163	HR 4616
AMA$	.0000302 (.3323)	.0000058 (.0376)	.0000256 (.4131)	.0000298 (.3578)	.0001102 (1.494)
%AMA	2.492 (.9067)	42.413 (1.54)	4.745 (1.62)	1.058 (.434)	7.915 (2.067)
AMAOPP$	-.001542 (-.0011)	-.000489 (-.874)	.0000584 (.5237)	-.0001198 (-.63)	.00376 (.0016)
OTHGRP$	-	-	-.00456 (-.126)	-	-
SYNERGY	-	-	-2.569 (-.028)	-	-
VOTE MARGIN	3.603 (.8356)	-15.002 (-1.182)	.6117 (.2332)	-3.746 (-1.304)	4.575 (1.551)
PARTY	-2.558 (-1.844)	-18.01 (-1.721)	1.017 (1.569)	1.893 (2.913)	1.063 (1.704)
ADA	-.0793 (-2.388)	.2099 (1.93)	.0474 (4.006)	-.0354 (-3.01)	.022 (2.067)
TENURE	-.1414 (-1.396)	-.1379 (-1.221)	.0482 (1.768)	.0676 (1.989)	-.0186 (-.744)
%ELDERLY	-18.608 (-.7357)	-258.68 (-1.739)	-6.831 (-.599)	-11.71 (-.78)	2.051 (.1795)
INCOME	-.0004 (-1.482)	-.0017 (-1.35)	.000479 (2.609)	.0005326 (2.26)	.0003247 (1.878)
EAST	-5.782 (-.0013)	16.712 (1.78)	2.026 (1.885)	-.5282 (-.6815)	1.948 (2.436)
SOUTH	-.3891 (-.4606)	-1.223 (-.5326)	-.0316 (-.0467)	.5432 (.5742)	1.324 (2.08)
MIDWEST	-.9297 (-.7055)	-2.054 (-.542)	-1.547 (-1.909)	-.306 (-.336)	.4349 (.4811)
CONSTANT	5.47 (.8882)	20.174 (1.065)	-10.266 (-2.54)	-1.649 (-.4385)	-12.064 (-2.852)

[a] Due to the relative lack of variation in the dependent variable, results are questionable. Vote passed 90-9.

Table C.3
Vote Equation Results
Probit Estimates and t-Statistics
1985-1986

	S 484	S 43	S 1078	S 1730	Bowen Nom.[a]	S Con Res 120	S 655
AMAS	-.000104	.0000098	.0000122	-.000019	.002116	.0000355	.000058
	(-.954)	(.4485)	(.781)	(-.432)	(.00005)	(.4074)	(1.359)
%AMA	-1.7055	.5315	1.31	1.646	183.42	-1.475	1.173
	(-.948)	(.3287)	(.788)	(.875)	(.0005)	(-.677)	(.672)
AMAOPPS	.00014	-.000001	-.0000042	.0000022	.00375	.0002277	.000011
	(1.359)	(-.3145)	(-.1143)	(.048)	(.0003)	(.888)	(.423)
OTHGRPS	-	-	-	-	-	-	-
SYNERGY	-	-	-	-	-	-	-
VOTE MARGIN	1.1623	2.337	1.21	.5527	379.49	-1.099	-4.004
	(.483)	(1.079)	(.611)	(.229)	(.0008)	(-.403)	(-1.683)
PARTY	-.429	.04297	.2076	-1.843	-4.24	.438	.8858
	(-.7494)	(.0768)	(.406)	(-3.45)	(.00004)	(.632)	(1.681)
ADA	.02512	-.0503	-.0188	.032	-.249	.0034	-.016
	(2.566)	(-3.868)	(-2.153)	(2.915)	(-.0002)	(.323)	(-1.832)
TENURE	.0655	.0082	-.0405	-.087	-.713	-.0121	.0343
	(2.553)	(.3475)	(-1.552)	(-2.59)	(-.0004)	(-.443)	(1.384)
%ELDERLY	24.572	.775	-8.671	-1.474	641.55	44.9	-12.644
	(1.92)	(.0668)	(-.824)	(-.118)	(.0002)	(2.09)	(-1.1)
INCOME	.485	-.000171	-.0001633	.000027	.02109	.0001321	-.0000424
	(2.44)	(-1.023)	(-1.141)	(.148)	(.0008)	(.523)	(-.285)
EAST	-.3568	1.251	.468	.0558	44.2	-8.322	-.054
	(-.5747)	(2.028)	(.833)	(.0816)	(.0005)	(-.0003)	(-.09)
SOUTH	-.0402	-1.277	-.1682	.017	-23.23	-8.034	-.674
	(-.051)	(-1.697)	(-.31)	(.022)	(-.0005)	(-.0003)	(-1.182)
MIDWEST	.595	.1146	-.63	-.984	-36.73	-9.224	.063
	(.844)	(.175)	(-.986)	(-1.239)	(-.0005)	(-.0003)	(.10)
CONSTANT	-9.528	2.653	1.449	-.848	-511.36	4.442	2.698
	(-2.748)	(.9181)	(.546)	(-.259)	(-.001)	(.0001)	(.955)

[a] Due to the relative lack of variation in the dependent variable, results are questionable. Vote passed 93-2.

Table C.4
Vote Equation Results
Probit Estimates and t-Statistics
1987-1988

	S 677	S Con Res 49	S 1420	HR 2470	S 2	S Con Res 113	S 1220[a]	HR 2470	HR 4783
AMAS	.000006	.00007	-.00005	.000022	.000128	-.00004	-.00138	.000024	-.0001
	(.40)	(1.668)	(-.611)	(1.299)	(1.166)	(-.633)	(-.0005)	(1.226)	(-1.694)
%AMA	1.80	2.158	-3.338	1.724	4.308	-.454	112.6	3.827	-2.754
	(.964)	(1.168)	(-1.624)	(.826)	(1.099)	(-.262)	(.0006)	(1.518)	(-1.577)
AMAOPP$	-.00004	-.00284	-.00001	.000009	-.00044	-.00001	-.00084	.000017	.00001
	(-.301)	(-.01)	(-.781)	(.414)	(-.183)	(-.654)	(-.0009)	(.581)	(.322)
OTHGRP$	-	-	-	-	-	-	-	-	-
SYNERGY	-	-	-	-	-	-	-	-	-
VOTE	-1.626	1.628	3.828	4.45	-2.934	1.539	58.31	6.311	-1.57
MARGIN	(-.707)	(.778)	(1.733)	(1.55)	(-.664)	(.766)	(.0009)	(1.892)	(-.2732)
PARTY	.46	1.923	-.321	-.798	2.545	.8464	54.08	1.088	.557
	(.842)	(3.374)	(-.594)	(-987)	(2.401)	(1.537)	(.002)	(1.062)	(1.03)
ADA	-.0145	.0085	.016	-.05	-.0838	.0169	3.019	-.0489	.0397
	(-1.568)	(.955)	(1.83)	(-2.71)	(-2.49)	(2.024)	(.0016)	(-2.89)	(4.05)
TENURE	.025	.0098	-.0269	.0272	-.0039	.0177	-.784	.0118	.0171
	(1.0)	(.378)	(-1.053)	(.877)	(-.075)	(.7667)	(-.0008)	(.29)	(.69)
%ELDERLY	-5.05	9.007	-8.535	8.941	34.42	4.314	-146.4	50.34	17.194
	(-.463)	(.8025)	(-.925)	(.6043)	(1.539)	(.472)	(-.0004)	(2.66)	(1.226)
INCOME	.000222	-.00005	.000056	.000049	.000244	.00012	.00362	.00045	.00027
	(1.244)	(-.333)	(.39)	(.22)	(.7466)	(.791)	(.0004)	(1.677)	(1.334)
EAST	-.596	-.049	-.459	.792	-1.051	1.33	20.34	-.926	-.1258
	(-.858)	(-.074)	(-.778)	(.829)	(-.94)	(2.252)	(.0005)	(-1.024)	(-.175)
SOUTH	-.508	-1.1	.225	-.64	-3.022	-.396	10.71	-1.266	1.804
	(-.887)	(-1.797)	(.384)	(-.893)	(-2.0)	(-.717)	(.0006)	(-1.55)	(2.805)
MIDWEST	-.828	-.631	.579	-.789	-3.458	.0634	63.07	-3.535	.826
	(-1.175)	(-.909)	(.841)	(-.71)	(-1.938)	(.1023)	(.0003)	(-2.666)	(1.16)
CONSTANT	-2.065	-4.49	-1.244	-4.789	-3.052	-4.0	-162.5	-15.99	-4.292
	(-.663)	(-1.518)	(-.46)	(-1.147)	(-.541)	(-1.458)	(-.0008)	(-2.73)	(-1.3)

[a] Due to the relative lack of variation in the dependent variable, results are questionable. Bill passed 87-4.

Table C.5
Vote Equation Results
Probit Estimates and t-Statistics
1989-1990

	S 1630	HR 4404	S 2240[a]	S 341	S 110
AMA$	-.00019 (-1.959)	-.0001967 (-2.12)	-.000404 (-.0002)	.0001709 (1.91)	-.000033 (-1.722)
%AMA	1.392 (.567)	1.344 (.555)	-28.74 (-.0001)	-.436 (-.213)	-.5977 (-.352)
AMAOPP$	.000011 (.3232)	.0000106 (.312)	-.000274 (-.00009)	.0000062 (.33)	.0000034 (.175)
OTHGRP$	.0000265 (.2334)	-	.02798 (.0006)	.0001723 (1.135)	-.0001064 (-1.441)
SYNERGY	-1.53E-8 (-.2096)	-	-.000037 (-.0002)	-2.05E-7 (-1.274)	-4.132E-7 (-.035)
VOTE MARGIN	-3.735 (-1.256)	-3.69 (-1.245)	420.0 (.0002)	2.154 (.797)	-1.552 (-.641)
PARTY	-2.8698 (-3.096)	-2.878 (-3.127)	18.665 (.0001)	-3.786 (-3.544)	.932 (1.256)
ADA	.0192 (1.31)	.0188 (1.30)	.607 (.00008)	-.00035 (-.0316)	.048 (3.833)
TENURE	.0326 (.8765)	.0323 (.8689)	-1.798 (-.0003)	.0092 (.254)	.051 (1.525)
%ELDERLY	-29.85 (-1.8058)	-30.05 (-1.834)	998.4 (.0001)	20.113 (1.289)	1.034 (.075)
INCOME	-.00067 (-2.302)	-.000679 (-2.34)	.01414 (.00008)	-.000471 (-1.737)	.000544 (2.532)
EAST	1.404 (1.464)	1.40 (1.457)	-92.4 (-.0002)	.807 (1.1)	.1814 (.23)
SOUTH	-.0762 (-.0972)	-.075 (-.095)	-10.73 (-.0001)	-1.243 (-1.361)	.406 (.626)
MIDWEST	2.0293 (1.875)	2.01 (1.877)	-36.86 (-.0001)	-.2157 (-.254)	-.249 (-.318)
CONSTANT	-10.156 (-2.092)	10.32 (2.159)	-412.2 (-.0001)	2.286 (.587)	-5.796 (-1.725)

[a] Due to the relative lack of variation in the dependent variable, results are questionable. Vote passed 95-4.

Table C.6
Vote Equation Results
Probit Estimates and t-Statistics
1991-1992

	S 323	HR 2622	HR 2707	HR 4210	HR 2507	S 3	S 3	HR 11	S 323
AMA$	.00011 (1.395)	-.00014 (-1.47)	.0001 (1.146)	.000123 (1.416)	-.00005 (-.573)	.000048 (.483)	.000048 (.483)	.000013 (.16)	.000082 (.874)
%AMA	.9288 (.571)	-3.775 (-1.74)	.4266 (.216)	-.913 (-.564)	2.937 (1.158)	2.262 (.5652)	2.262 (.5652)	.435 (.269)	1.489 (.688)
AMAOPP$	-.00017 (-.407)	.00001 (.108)	-.00012 (-.304)	-.00051 (-.821)	-.00038 (-1.555)	.0076 (.0016)	.0076 (.0016)	-.00001 (-.137)	-.00013 (-.254)
OTHGRP$	-	-	.00002 (.182)	-	.000064 (.415)	-	-	-.00002 (-.183)	-.00008 (-.405)
SYNERGY	-	-	-3.78E-7 (-1.68)	-	-1.24E-9 (-.027)	-	-	7.45E-8 (1.486)	-3.83E-7 (-1.675)
VOTE MARGIN	-2.636 (-1.323)	6.761 (2.76)	5.087 (1.937)	-2.213 (-1.179)	.7616 (.284)	-7.648 (1.442)	-7.648 (1.442)	1.696 (.8652)	.699 (.292)
PARTY	-.645 (-.843)	1.984 (2.326)	-.43 (-.422)	.427 (.577)	.706 (.663)	66.94 (.002)	66.94 (.002)	1.182 (1.507)	-1.282 (-1.24)
ADA	-.05 (-3.61)	.0387 (2.976)	.0489 (2.388)	-.034 (-2.83)	.055 (1.909)	-.052 (-1.84)	-.052 (-1.84)	.0357 (2.869)	.0319 (1.776)
TENURE	.0176 (.625)	-.0042 (-.173)	-.0695 (-1.71)	-.0035 (-.135)	.0376 (1.095)	.1449 (1.984)	.1449 (1.984)	.0196 (.815)	-.0363 (-.948)
%ELDERLY	8.321 (.849)	8.9 (.808)	1.098 (.087)	9.611 (.781)	-2.66 (-.156)	5.667 (.296)	5.667 (.296)	-7.161 (-.5723)	-5.727 (-.418)
INCOME	-.00004 (-.241)	.000056 (.398)	.000535 (2.42)	.000228 (1.59)	.000642 (2.11)	.000119 (.329)	.00012 (.329)	-.00036 (-2.36)	.000708 (2.92)
EAST	-.591 (-.859)	-1.27 (-1.86)	-.26 (-.254)	-.00076 (-.001)	-1.278 (-1.036)	1.191 (.851)	1.191 (.851)	1.269 (1.758)	.652 (.558)
SOUTH	-.669 (-1.09)	-.684 (-.925)	-.191 (-.247)	.264 (.429)	.0759 (.098)	64.83 (.002)	64.83 (.002)	-1.907 (-2.623)	-.542 (-.686)
MIDWEST	-.072 (-.117)	.13 (.206)	-.056 (-.297)	-.153 (-.242)	-.801 (-.733)	-.522 (-.447)	-.522 (-.447)	-.4018 (-.704)	-.369 (-.44)
CONSTANT	2.731 (.9702)	-6.932 (-1.984)	-8.45 (-2.25)	.187 (.064)	-8.532 (-1.88)	-64.45 (-.002)	-64.45 (-.002)	.7793 (.249)	-6.453 (-1.873)

APPENDIX D: BOOTSTRAP RESULTS

Table D.1
Bootstrap Results for AMA Contributions
Nboot=Number of Pseudo-Datasets Used for Estimation
Full Vote Index as Explanatory Variable

Nboot=500				Nboot=1000		
	Bias	SD(Bias)	Bias t-stat	Bias	SD(Bias)	Bias t-stat
FULL VOTE INDEX	-3613.54	172.5838	-20.9379	-3781.3	121.6051	-31.0949
PARTY	-3163.55	108.6385	-29.12	-3110.65	75.24924	-41.338
CAMPGN	941.56	151.0549	6.233	1045.87	106.8992	9.7837
INCUMBENCY	-518.91	90.92434	-5.707	-372.81	64.72645	-5.75978
TOTALOPP$	-.00052	.000044	-11.8712	-.0005	.0000312	-15.946
ADA	-59.7397	1.803735	-33.12	-57.2434	1.279205	-44.7492
EAST	-464.8	122.5817	-3.79176	-534.66	86.59328	-6.17438
SOUTH	-1544.25	116.227	-13.286	-1427.52	80.94451	-17.6358
MIDWEST	-1109.11	124.7806	-8.888	-1057.66	86.83298	-12.1804
BUDGET	-596.895	100.382	-5.946	-621.797	68.34852	-9.09745
FINANCE	-813.11	107.8715	-7.53777	-765.05	76.57613	-9.99071
FOREIGN RELATIONS	-68.72	107.5813	-.63877	-119.02	77.86571	-1.52853
GOV'T AFFAIRS	828.41	93.373	8.872	800.86	69.00374	11.60604
SMALL BUSINESS	-396.73	97.4317	-4.0719	-530.625	71.60883	-7.41005
CONSTANT	48539.19	223.656	217.0261	58335.36	159.7481	365.1708

Table D.2
Bootstrap Results for AMA Contributions
Nboot=Number of Pseudo-Datasets Used for Estimation
Narrow Vote Index as Explanatory Variable

Nboot=500				Nboot=1000		
	Bias	SD(Bias)	Bias t-stat	Bias	SD(Bias)	Bias t-stat
NARROW VOTE INDEX	-620.419	105.995	-5.853	-639.876	76.06037	-8.41274
PARTY	-2685.41	109.454	-24.535	-2623.22	75.82415	-34.5961
CAMPGN	1071.838	150.99	7.099	1172.158	106.989	10.95587
INCUMBENCY	-485.62	90.707	-5.354	-348.92	64.59932	-5.40129
TOTALOPP$	-.00045	.0000439	-10.326	-.00043	.0000312	-13.7309
ADA	-54.0146	1.815	-29.765	-51.5161	1.284315	-40.1118
EAST	-554.68	121.466	-4.567	-630.28	86.00194	-7.32867
SOUTH	-1424.21	116.147	-12.262	-1311.72	81.14468	-16.1652
MIDWEST	-1103.28	124.424	-8.867	-1059	86.69479	-12.2153
BUDGET	-534.709	99.759	-5.360	-554.78	67.78943	-8.18387
FINANCE	-732.38	107.372	-6.821	-685.43	76.36236	-8.97602
FOREIGN RELATIONS	37.57	106.59	.3525	-7.69	77.00779	-.09986
GOV'T AFFAIRS	690.82	94.635	7.30	664.52	69.99417	9.493934
SMALL BUSINESS	-295.12	98.034	-3.010	-427.72	72.19986	-5.92411
CONSTANT	60554.05	226.818	266.972	60274.15	160.0261	376.652

Table D.3
Bootstrap Results for AMA Contributions
Nboot=Number of Pseudo-Datasets Used for Estimation
Broad Vote Index as Explanatory Variable

Nboot=500				Nboot=1000		
	Bias	SD(Bias)	Bias t-stat	Bias	SD(Bias)	Bias t-stat
BROAD VOTE INDEX	-1062.06	125.515	-8.462	-1171.19	86.00636	-13.6175
PARTY	-2725.11	109.629	-24.858	-2668.92	75.64801	-35.2808
CAMPGN	976.35	150.954	6.468	1068.73	106.4568	10.03909
INCUMBENCY	-631.91	91.492	-6.907	-495.61	65.24633	-7.59598
TOTALOPP$	-.00049	.0000438	-11.142	-.0046	.000311	-1.4894
ADA	-53.6675	1.8087	-29.672	-51.0594	1.275656	-40.026
EAST	-560.38	122.362	-4.580	-626.76	86.27958	-7.26429
SOUTH	-1385.13	117.445	-11.794	-1263.35	81.92418	-15.4209
MIDWEST	-1062.87	124.802	-8.516	-1017.55	86.78207	-11.7253
BUDGET	-573.305	101.431	-5.652	-592.552	68.72483	-8.6221
FINANCE	-720.72	107.132	-6.728	-671.92	75.94874	-8.84702
FOREIGN RELATIONS	43.0	106.299	.4045	9.02	76.65835	.117665
GOV'T AFFAIRS	810.45	94.672	8.561	787.38	69.60679	11.31183
SMALL BUSINESS	-352.83	97.347	-3.624	-490.03	71.76694	-6.82807
CONSTANT	59196.34	221.464	267.295	58965.17	157.126	375.2732

Table D.4
Bootstrap Results for VOTE MARGIN Equation
Nboot=Number of Pseudo-Datasets Used in Estimation

Nboot=500				Nboot=1000		
	Bias	SD(Bias)	Bias t-stat	Bias	SD(Bias)	Bias t-stat
VOTE INDEX	.0059	.0004	15.06	.0065	.0003	23.90
TOTALOPP$	-9.9E-9	7.1E-11	-138.89	-9.9E-9	4.98E-11	-198.8
INCUMBENCY	.0139	.0002	67.724	.0138	.0001	93.32
LAGGED VOTE MARGIN	.5366	.0023	233.68	.5350	.0016	327.1
%WHITE	-.0464	.0013	-35.524	-.0463	.0009	-49.30
%ELDERLY	.0846	.0049	17.225	.0835	.0034	24.57
INCOME	9.2E-7	4.92E-8	18.702	9.29E-7	3.4E-8	27.32
CONSTANT	-.2684	.0020	-134.72	-.2677	.0014	-188.6

APPENDIX E: AMA CONTRIBUTION EQUATIONS: SENATE COMMITTEE MEMBERS VERSUS NON-MEMBERS

Table E.1
Vote Indices Equations
Senate Budget Committee Members
GLS Estimates and t-Statistics

	Full Vote Index	Narrow Vote Index	Broad Vote Index
Interest Group Variables			
AMAS (+)	0.000002781 (1.178)	0.000002312 (0.519)	0.000000756 (0.216)
%AMA (+)	-0.030676 (0.183)	0.205589 (0.862)	-0.176541 (0.711)
AMAOPPS (-)	-0.000001443 (1.176)	-0.000001866 (1.066)	-0.000000712 (0.391)
Control Variables			
VOTE MARGIN (?)	0.248608 (0.964)	0.068989 (0.187)	0.421236 (1.099)
PARTY (?)	-0.099437 (1.379)	0.073023 (0.710)	-0.082269 (0.768)
ADA (?)	-0.000298 (0.277)	0.000092022 (0.060)	0.000387 (0.242)
TENURE (?)	0.000323 (0.108)	0.000591 (0.139)	-0.000301 (0.068)
%ELDERLY (?)	0.344049 (0.290)	-0.312969 (0.185)	0.519782 (0.295)
INCOME (?)	-0.000021292* (2.192)	0.000007344 (0.530)	-0.000014299 (0.991)
EAST (?)	0.026608 (0.341)	0.000611 (0.006)	0.007979 (0.069)
SOUTH (?)	-0.017275 (0.244)	0.047851 (0.473)	0.026926 (0.256)
MIDWEST (?)	-0.002214 (0.032)	-0.060671 (0.610)	0.058231 (0.562)
CONSTANT	0.594764 (2.709)	0.162372 (0.519)	0.504326 (1.547)
F-Value	1.235	0.513	0.617

* Significant at the .05 level

Table E.2
Vote Indices Equations
Senate Finance Committee Members
GLS Estimates and t-Statistics

	Full Vote Index	Narrow Vote Index	Broad Vote Index
Interest Group Variables			
AMA$	0.000000610	0.000001456	0.000001210
(+)	(0.315)	(0.589)	(0.442)
%AMA	-0.012341	0.279260	-0.227368
(+)	(0.064)	(1.134)	(0.833)
AMAOPP$	0.000000892	-0.000007603	0.000035273
(-)	(0.049)	(0.324)	(1.357)
Control Variables			
VOTE MARGIN	0.164564	-0.138671	0.256164
(?)	(0.692)	(0.456)	(0.761)
PARTY	-0.002438	-0.122401	0.126293
(?)	(0.035)	(1.376)	(1.281)
ADA	0.000028534	-0.002220	0.002480
(?)	(0.025)	(1.494)	(1.505)
TENURE	0.007459*	0.009353*	0.004614
(?)	(2.047)	(2.008)	(0.894)
%ELDERLY	1.831419	4.210257*	2.335006
(?)	(1.444)	(2.597)	(1.299)
INCOME	-0.000005337	0.000000145	0.000007654
(?)	(0.490)	(0.010)	(0.496)
EAST	0.070566	-0.075312	0.048252
(?)	(1.104)	(0.921)	(0.533)
SOUTH	0.047324	-0.276876*	0.247228*
(?)	(0.554)	(2.536)	(2.043)
MIDWEST	-0.020478	-0.186470	0.024600
(?)	(0.274)	(.948)	(0.232)
CONSTANT	1.219	0.021500	-0.063225
	(0.720)	(0.075)	(0.200)
F-Value	1.219	1.326	1.313

* Significant at the .05 level.

Table E.3
Vote Indices Equations
Senate Foreign Relations Committee Members
GLS Estimates and t-Statistics

	Full Vote Index	Narrow Vote Index	Broad Vote Index
Interest Group Variables			
AMA$	0.000022260*	0.000006230	0.000006080
(+)	(4.260)	(0.651)	(0.703)
%AMA	-0.053287	0.020352	-0.021215
(+)	(0.299)	(0.062)	(0.072)
AMAOPP$	-0.000036738*	-0.000036355*	-0.000034245*
(-)	(3.287)	(1.776)	(1.852)
Control Variables			
VOTE MARGIN	0.476982	0.740243	0.245381
(?)	(1.952)	(1.654)	(0.607)
PARTY	-0.121253*	-0.090391	-0.058326
(?)	(2.340)	(0.952)	(0.680)
ADA	-0.000058781	-0.000974	0.000604
(?)	(0.067)	(0.609)	(0.418)
TENURE	0.007615*	0.004490	0.008142
(?)	(2.855)	(0.919)	(1.845)
%ELDERLY	-0.737786	-0.164097	0.314415
(?)	(0.889)	(0.108)	(0.229)
INCOME	0.000007271	0.000005616	0.000044811*
(?)	(0.956)	(0.403)	(3.563)
EAST	-0.031918	-0.121185	-0.010664
(?)	(0.501)	(1.039)	(0.101)
SOUTH	-0.071233	-0.078929	0.023551
(?)	(0.947)	(0.573)	(0.189)
MIDWEST	-0.027423	-0.109688	0.042052
(?)	(0.336)	(0.733)	(0.311)
CONSTANT	0.293744	0.047851	-0.057073
	(1.533)	(0.136)	(0.180)
F-Value	4.551*	0.747	2.053*

* Significant at the .05 level.

Table E.4
Vote Indices Equations
Senate Governmental Affairs Committee Members
GLS Estimates and t-Statistics

	Full Vote Index	Narrow Vote Index	Broad Vote Index
Interest Group Variables			
AMA$	0.000005584	-0.000012098	-0.000003759
(+)	(0.946)	(1.377)	(0.442)
%AMA	0.107356	0.504618	0.307000
(+)	(0.430)	(1.357)	(0.853)
AMAOPPS	-0.000009925	0.000007585	-0.000017974
(-)	(0.777)	(0.399)	(0.977)
Control Variables			
VOTE MARGIN	-0.087651	0.116270	-0.044906
(?)	(0.328)	(0.292)	(0.117)
PARTY	-0.113052	0.060590	0.011108
(?)	(1.404)	(0.506)	(0.096)
ADA	-0.001356	0.000405	-0.000037185
(?)	(0.964)	(0.194)	(0.018)
TENURE	0.004815	0.002564	-0.005577
(?)	(1.058)	(0.379)	(0.851)
%ELDERLY	-0.210063	0.893325	-0.476788
(?)	(0.194)	(0.555)	(0.306)
INCOME	-0.000013169	-0.000004371	0.000006920
(?)	(1.260)	(0.281)	(0.460)
EAST	0.048708	-0.104190	0.065447
(?)	(0.548)	(0.788)	(0.512)
SOUTH	-0.053566	-0.211622	0.112922
(?)	(0.489)	(1.299)	(0.716)
MIDWEST	-0.081980	-0.250840	-0.050418
(?)	(0.788)	(1.620)	(0.337)
CONSTANT	0.772961	0.073518	0.512445
	(2.569)	(0.164)	(1.183)
F-Value	0.746	0.576	0.452

* Significant at the .05 level.

Table E.5
Vote Indices Equations
Senate Small Business Committee Members
GLS Estimates and t-Statistics

	Full Vote Index	Narrow Vote Index	Broad Vote Index
Interest Group Variables			
AMA$	-0.000002323	-0.000003944	-0.000003152
(+)	(0.828)	(1.018)	(0.817)
%AMA	-0.059660	0.121475	0.147876
(+)	(0.250)	(0.368)	(0.450)
AMAOPP$	-0.000001662	-0.000003221	0.000000819
(-)	(0.439)	(0.616)	(0.157)
Control Variables			
VOTE MARGIN	0.112291	-0.462047	0.136805
(?)	(0.392)	(1.169)	(0.348)
PARTY	0.038305	-0.073294	0.052444
(?)	(0.552)	(0.765)	(0.550)
ADA	0.001306	-0.000846	0.002176
(?)	(1.234)	(0.579)	(1.496)
TENURE	0.001985	0.006992	0.002376
(?)	(0.423)	(1.079)	(0.368)
%ELDERLY	0.349302	0.219809	-0.275049
(?)	(0.267)	(0.122)	(0.153)
INCOME	0.000009007	0.000002442	0.000025710
(?)	(0.836)	(0.164)	(1.735)
EAST	0.025280	0.057396	0.074630
(?)	(0.275)	(0.452)	(0.591)
SOUTH	0.081844	0.040020	0.093250
(?)	(1.008)	(0.357)	(0.835)
MIDWEST	0.053293	0.056847	0.026689
(?)	(0.686)	(0.530)	(0.250)
CONSTANT	0.224627	0.549730	0.042823
	(0.850)	(1.506)	(0.118)
F-Value	0.537	0.379	0.918

* Significant at the .05 level.

APPENDIX F: OTHER INTEREST GROUP POLITICAL ACTION COMMITTEES

PAC	Dates Used in Study
VFW	
Veterans of Foreign Wars PAC	1979-82
INSURANCE,	
Allstate Insurance PAC	1979-80 1987-88
National Association of Independent Insurers PAC	1979-80 1987-88
National Association of Life Underwriters	1979-80 1987-88
Independent Insurance Agents of America	1979-80 1987-88
ANTI-ABORTION ADVOCATES	
National Right To Life PAC	1983-84 1989-92
HUMAN RIGHTS ADVOCATES	
Human Rights Campaign Fund	1987-90
AUTOMOBILE MANUFACTURERS	
American Motors Candidate Assistance Committee	1989-90
Chrysler Corp. Nonpartisan Political Support Comm	1989-90
Ford Motor Co. Civic Action Fund	1989-90
Civil Involvement Program/General Motors	1989-90
AIRLINES	
American Airlines PAC	1989-90
Continental Airlines Employees Good Government	1989-90
Delta Airlines Inc. PAC	1989-90
PAN-AM PAC	1989-90
United Airlines Inc. Good Government Fund	1989-90
US-AIR PAC (aka Allegheny PAC)	1989-90

(continued)

PHARMACEUTICALS	
Cutter Lab Inc. PAC	1991-92
CIBA-GEIGY Employee Good Government Fund	1991-92
Johnson & Johnson Employees Good Government Fund	1991-92
Merck PAC	1991-92
Miles Lab PAC	1991-92
Pfizer PAC	1991-92
Squibb Good Government Fund	1991-92
Upjohn PAC	1991-92
TOBACCO PRODUCERS	
Tobacco Institute PAC	1991-92
U.S. Tobacco Co. Political Involvement Committee	1991-92
Philip Morris PAC	1991-92

VITA

Karen Gutermuth graduated Summa Cum Laude with a B.S in Economics from Louisiana State University in May of 1990. She entered the graduate program in Economics at Vanderbilt University in the Fall of 1990. She returned to Louisiana State University as an LSU Alumni Federation Fellow in the Fall of 1991. Her fields of study include health economics, industrial organization and public policy. As a teaching assistant at LSU, she has taught Introduction to Macroeconomics and Money and Banking and has received two Department of Economics Excellence in Teaching Awards. Besides the working papers from her dissertation, Karen is currently a co-author of two working papers: "Economic Evaluation of the Medicaid Open Formulary" and "A Comparative Analysis of Three Medicaid Drug Cost Containment Policies." Karen is a member of Omicron Delta Epsilon, American Economic Association, Southern Economic Association, and International Health Economics Association.

DOCTORAL EXAMINATION AND DISSERTATION REPORT

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Major Field: Economics

Title of Dissertation: The Effects of AMA Contributions in the U.S. Senate: An Analysis of Roll Call Votes 1979-1992

Approved:

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