Bimodal Issues, the Median Voter Model, Legislator's Ideology, and Abortion

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The median voter model is widely used in the public choice literature to explain legislator's behavior. According to the model, if voter preferences are unimodal, a vote-maximizing legislator should mirror the position of the median voter. However, the median voter model has not been tested on bimodal issues. This paper fills this critical void by empirically testing the applicability of the median voter model on an issue which clearly meets the criteria for being bimodal: abortion. Using a variety of attitudinal measures from large sample public opinion polls and constituency demographics, this study finds that Senate voting on the 1994 Freedom of Abortion Access bill was highly related to the senator's personal characteristics—especially ideology—and not to constituent opinion or demographics. (JEL D72)

I. Introduction

The median voter model is widely used in the public choice literature to explain how legislators select their positions or vote on various issues. According to the median voter model, if voter preferences are unimodal and can be represented along a single dimension, then in a representative democracy, a vote-maximizing politician should mirror the position or preferences of the median voter [Downs, 1957].

However, in a representative democracy, the applicability of the median voter model is likely to vary according to the issue in question. Public choice theorists generally agree that the median voter model is not applicable to issues where voter preferences are bimodal [Holcombe, 1989].

A bimodal issue has several features:

1) Public opinion on the issue is highly salient, intense, and contentious.
2) Opinions on a bimodal issue tend to stem from passionate ethical, moral, or religious beliefs.
3) A bimodal issue is dichotomous: either one favors or opposes the issue.
4) There is virtually no room for compromise on a bimodal issue. Consequently, the policy options on the issue tend to be mutually exclusive and, in many cases, extreme.
5) Regardless of the position a representative takes on a bimodal issue, either proponents or opponents will be alienated.
6) The more intense opinion is on a bimodal issue, the less likely a representative will vote in accordance with the preferences of the median voter.

One public policy issue that satisfies the above characteristics of a bimodal issue is abortion. Abortion is a highly salient issue. Proponents and opponents have intense,

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inflexible, and uncompromising opinions about abortion based on strong moral beliefs or civil liberties. The abortion issue is dichotomous: either a pregnant woman is allowed to have an abortion or not; there is no compromise or middle position. This would suggest (from the aforementioned points 5 and 6) a representative's vote on abortion is more likely to be cast in accordance with the representative's own preferences rather than the median voter model.

On May 12, 1994, the U.S. Senate passed (69-30) the Freedom of Abortion Access bill that made it a federal crime to block access to abortion clinics or to use force or the threat of force to harm, interfere, or intimidate abortion providers, clinic staffs, or their patients. Protesters found guilty would be subject to both criminal and civil penalties, with the penalties increasing with each successive offense. Proponents argued that federal legislation was necessary to protect a woman's legal right to an abortion.

Opponents denounced the bill as an unconstitutional attempt to suppress anti-abortion demonstrators. While it may seem as if the abortion access legislation represents a constitutional debate on the scope of the first amendment's guarantee of freedom of speech, the Senate debate focused solely on the question of whether a woman should have the legal right to the abortion option [*Congressional Record*, May 12, 1994, S 5595-S 5606]. The analysis presented in this paper utilizes only the vote for final passage of the Freedom of Abortion Access bill. The choice of an abortion vote makes little difference. The vote on the final passage of the Abortion Access bill was virtually identical to the vote on four amendments which were offered prior to the final vote.[1]

The purpose of this paper is to empirically examine the Senate vote on abortion access. Two hypotheses will be tested. If abortion is a bimodal issue, then the median voter model will not be applicable in explaining the Senate vote, and a senator's ideology will be the primary determinant explaining the vote.

The Senate vote on abortion access legislation is particularly appropriate for testing these two hypotheses for several reasons. First, the legislation is a direct vote on the legality of abortion and does not involve any external issues such as government abortion funding or vote trading. Second, public opinion on the issue of abortion became more intense and focused with the election in 1992 of an ardent pro-choice president who, in the first 18 months in office, overturned virtually all anti-choice legislation that had occurred during the previous 12 years.

II. The Empirical Median Voter Model of Abortion Voting

The median voter model takes the following functional form:

$$P_i = f(X_c, I_c), \tag{1}$$

[1] The correlation between the vote for final passage and the four amendments range between .75 and .95.

where: P_i is the probability that a senator from state i votes yes on a particular issue; X_c is a vector of constituent (c) interests who have a stake in the outcome of the legislation; and I_c is a measure of the constituents' ideological preferences.[2]

The dependent variable in (1) equals 1 if senator i votes pro-choice (i.e., in favor of abortion access legislation) and 0 if the senator votes the anti-abortion position (i.e., against abortion access legislation).

This paper uses four measures of constituent interest in (1). The first is the percentage of women 16 years or older who are employed in a white-collar occupation (professional, technical, managerial, administrative, and sales) in each state. White-collar women have been found to be supportive of legal abortion presumably because they have a higher opportunity cost of a child or a greater discount of a future unplanned birth relative to other women [Medoff, 1989].

A second interest group constituency is each state's percentage of women 16 years or older who are single. Single women are more likely to be supportive of legal abortion because they have higher explicit and implicit costs of childbearing and childrearing than married women [Jones, 1983].

Another group likely to be supportive of legal abortion are blacks. Blacks are more likely to have an abortion than whites, and they may perceive abortion as a civil rights issue [Medoff, 1989]. The black variable is the percentage of each state's population 18 years or older who are black.

Two advocacy groups that are actively and fervently anti-abortion are the Catholic and Fundamentalist Christian Churches. The measure of their anti-abortion strength used in this paper is the percentage of each state's population that is a member of the Roman Catholic or a Fundamentalist Christian Church [Jones, 1983].[3]

Five measures of a state's constituent ideology are used one at a time in (1). The General Election Exit Poll [1992] surveyed 15,490 voters on November 3, 1992. Voters of each state were asked their position on abortion, and how they would characterize their political ideology. Three of the measures of political ideology are: (1) the percentage of voters who classify themselves as liberal; (2) the difference between the percentage of voters who classify themselves as liberal, and those who classify themselves as conservative; and (3) the percentage of voters who favor permitting a woman to have an abortion in most or all cases.

The final two ideology measures were designed to represent a state's political and a state's abortion ideology each along a continuum. A state's political ideology index was derived by computing a mean political ideology score. Liberalism was arbitrarily assigned the value of 3, moderate the value 2, and conservative the value 1. Each political philosophy value was weighted by the General Election Exit Poll's [1992] proportion of voters who adhere to that philosophy.

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[2]It is a convention in the literature for constituents' ideological preferences (I_c) to appear in equation (1) even though it is a constituent interest. Consequently, all references to constituent interests in the text include constituency ideology.

[3]All economic variables used in this paper were obtained from the *U.S. Bureau of the Census* [1990]. Heatwole [1978] was used to identify 'Bible Belt' denominations that profess a belief in the literal interpretation of the Bible and are ardently fundamentalist. Church membership was calculated from Quinn et al. [1992].

A state's mean score was computed by adding up all the weighted values. A state with a mean index score at or near 3 is a state where the political ideology of the average voter is characterized as liberal, whereas a state with a mean index score at or near 1 is a state where the political ideology of the average voter is characterized as conservative.

A state abortion ideology index was computed by arbitrarily assigning values—the value 4 to the belief abortion should be legal in all cases, the value 3 to the belief abortion should be legal in most cases, the value 2 to the belief abortion should be illegal in most cases, and the value 1 to the belief abortion should be illegal in all cases—and weighing each abortion ideology value by the proportion of voters in each state with that value.

A state's mean score was calculated by adding all weighted values. A state with a mean index score at or near the value 4 is a state where the average voter is highly supportive of legal abortion, whereas a value at or near 1 is a state where the average voter would like to see abortion illegal in all cases. For both the state political ideology index and the state abortion ideology index, the higher the mean score, the more liberal the state's voters are politically and in terms of abortion beliefs.

In summary, the median voter model argues that representative voting responds to constituent interests. It is theorized that abortion is a bimodal issue and, consequently, the less likely a representative will respond to the interests of the constituency and the more likely the representative's vote is guided by his or her own preferences. In order to test the hypotheses about the explanatory power of the median voter model, this paper utilizes a model of senatorial voting on abortion entirely determined by constituency demand and constituency opinion measures.

The median voter model predicts that the greater the percentage of white-collar women, single women, black population, or the more liberal a state's political (or abortion) ideology, the more likely a senator is to vote in favor of abortion. The greater the percentage of a state's population who are Roman Catholic or Fundamentalist Christian, the more likely a senator is to vote against abortion.

III. Empirical Results

Equation (1) was estimated using logit analysis because the dependent variable—the probability of voting pro-choice—is binary.[4] The empirical results appear in Table 1. The empirical results offer no support for the median voter model. No matter which political ideology measure is used in (1), none of the constituency variables are statistically significantly different from 0.[5]

In order to determine whether the findings were sensitive to model specification, the authors re-estimated (1) as follows: 1) including the labor force participation of women; 2) replacing the white-collar women variable with the labor force participation variable; 3) replacing the percentage of the population who are black with the percentage of the

[4]Since the data in this study are individual as opposed to grouped, maximum likelihood logit estimates are less sensitive to heteroscedasticity than are ordinary least squares logit estimates [Pindyck and Rubinfeld, 1991]. Accordingly, all logit equations are estimated by maximum likelihood.

[5]Additionally, all the likelihood ratio index scores are .12. This indicates that the models have a low degree of explanatory power (on the use of the likelihood ratio index as a measure of goodness of fit for logit models [Greene, 1993]).

TABLE 1

Median Voter Model and Logit Estimates of Senate Vote on Abortion

Independent Variables	Dependent Variable Probability of Voting Pro-Choice				
	(1)	(2)	(3)	(4)	(5)
Constant	-4.1788	-3.6547	-4.3141	-3.8394	-4.0271
	(-.72)	(-.61)	(-.76)	(-.58)	(-.71)
Percent White	-.0027	-.0067	.0005	.0019	.0151
Collar Women	(-.03)	(-.09)	(.01)	(.02)	(.20)
Percent Single	.1294	.1268	.1302	.1301	.1394
Women	(1.28)	(1.24)	(1.25)	(1.28)	(1.35)
Percent Black	-.0498	-.0495	-.0492	-.0487	-.0542
Population	(-1.18)	(-1.20)	(-1.18)	(-1.19)	(-1.27)
Percent Catholic	.0018	.0012	.0016	.0022	-.0025
Religion	(.06)	(.041)	(.05)	(.07)	(-.08)
Percent Fundamental	-.0351	-.0318	-.0364	-.0378	-.0411
Religion	(-1.35)	(-1.15)	(-1.39)	(-1.38)	(-1.58)
Percent Liberal	.0035				
Voters	(.08)				
Percent Liberal-		.0081			
Conservative Voters		(.30)			
Percent Voters Who			-.0008		
Favor Legal Abortion			(-.03)		
State Liberal				-.3299	
Ideology Index				(-.12)	
State Abortion					-.5634
Ideology Index					(-.47)
Likelihood Ratio Index	.12	.12	.12	.12	.12

Note: t-statistics in parentheses.

female population who are black (aged 16-54, 16-64, 16+). In every case, none of these alternative specifications provide any support for the median voter model.

Additionally, the statistical insignificance of the independent variables is not due to multicollinearity. Using the Farrar-Glauber test for multicollinearity, the null hypothesis

of orthogonality between all the independent variables could not be rejected. Also, none of the independent variables in Table 1 became statistically significant when the model was re-estimated omitting one independent variable at a time.

As was discussed in the previous section, the explanatory power of the median voter model will be poor when analyzing highly salient bimodal issues such as abortion because whether a representative votes "for" or "against" the issue, a significant portion of the electorate will be alienated. Since the political gain from voting in accordance with the median voter is low on bimodal issues, a representative is more likely to follow his or her own ideology when voting on such issues.

This does not mean that representatives are "shirking" (i.e., casting a vote inconsistent with his or her constituent interests [Kalt and Zupan, 1984]). It merely means that on bimodal issues, the difference between the political gains from representing one portion of the electorate and the political losses from not representing the other portion of the electorate are small. Therefore, it is hypothesized that for a bimodal issue like the abortion access vote, a senator's ideology will be more important than constituency interests.

In order to test the above hypothesis, senator ideology variables were added to (1). Two types of ideology measures were included. The first, a senator's personal ideology, originates from the senator's personal characteristics.[6] The personal ideology variables are: 1) age (Older senators are more likely to vote against abortion due to generational differences); 2) marital status (Dummy variable is equal to 1 if the senator is married. Married couples have smaller demand for abortions); 3) religious affiliation (Three dummy variables each equal to 1 if the senator is Jewish, Catholic, and Baptist or Mormon—measure of religious convictions or ideals); and 4) gender (Dummy variable equal to 1 if the senator is a female. Abortion is considered to be a woman's rights issue).[7]

The second ideology measure is a senator's political ideology. Typically, social scientists have measured a senator's political ideology by using interest group ratings [Jackson and Kingdon, 1992]. This study uses the ratings of the Americans for Democratic Action (ADA) [1994] to measure a senator's political liberalism.[8] This rating is the percentage of a senator's votes which were in accordance with the liberal interest group's position on various issues.[9]

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[6]All the personal data on senators were obtained from Barone and Ujifusa [1993].

[7]The justification for the inclusion of these senator characteristic variables is given by Gohmann and Ohsfeldt [1990].

[8]Jackson and Kingdon [1992] argue that interest group ratings overestimate the impact of ideology. Snyder [1992] indicates that rather than overestimating the impact of ideology, the S-shaped distribution of interest group rating scores actually causes them to underestimate the impact of ideology. Following Snyder [1992], this study also used the Poole and Rosenthal [1991] measure of ideology. For the latest year available (1989), their "dominant" dimension correlated with the 1989 ADA measure at -.95. Thus, choice of an indicator makes little difference.

[9]The authors have made two changes in the liberalism scores reported by the Americans for Democratic Action. Since the 1993 ADA ratings incorporate a vote similar to the dependent variable, this vote is eliminated from the version of the 1993 ADA ratings used in this study. Additionally, to avoid penalizing members for failure to vote, the ADA scores were recalculated as the percentage of times the senator voted in the direction supported by the ADA on the votes on which the particular senator voted. The votes were taken from 1993 and were supplied by the Americans for Democratic Action.

The empirical results are shown in Table 2. As hypothesized, the empirical results show little support for the median voter model on the bimodal issue of abortion. None of the constituency interest variables are statistically significantly different from 0.

Moreover, two of the senator ideology variables were statistically significant: affiliation with a Fundamentalist Christian religion and political ideology. Senators who are affiliated with ardently anti-abortion fundamentalist denominations follow their personal religious beliefs by voting against abortion. The more liberal a senator's political ideology, the more likely the senator is to support abortion.[10] These results support the hypothesis that, on a bimodal issue like abortion, representatives are more likely to vote in accordance with their personal preferences rather than the preferences of the median voter.[11]

It might be argued that the senator political ideology measure used is not a pure measure since the ADA variable may incorporate elements of the senator's personal ideology. In order to take this possibility into account, the authors follow the two-stage procedure suggested by Kau and Rubin [1979] to obtain a pure measure of a senator's political ideology. In the first stage, senator ADA ratings are regressed on all the senator's personal ideology variables to purge the effect of these variables from the political ideology measure. In the second stage, the residual from the first stage regression replaces the ADA variable, and the model in Table 2 is re-estimated.

The empirical results from using residual ADA ratings appear in Table 3. The previous findings remain robust. None of the constituency variables from the median voter model are statistically significant. Only a senator's political ideology and Fundamentalist Christian beliefs are found to be statistically significant in explaining the senator's vote on abortion. This finding is consistent with the hypothesis that on bimodal issues, like abortion, a representative's vote mirrors personal beliefs.

IV. Conclusion

This paper empirically analyzed the U.S. Senate vote on abortion access legislation. The authors theorized that since abortion is a bimodal issue, the explanatory power of the median voter model would be poor. Furthermore, it is argued that regardless of what position a legislator takes, the electoral gains from voting in accordance with the median voter model are small. Consequently, the legislator will use his or her own ideology, as opposed to constituent interests, as the principle guide to voting on abortion. The empirical results support this hypothesis.

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[10] Furthermore, all the likelihood ratio index scores are approximately .60. This indicates a much greater degree of explanatory power than the findings reported in Table 1.

[11] The authors also included the senator's victory margin in the last election as an independent variable in Table 2. The purpose is to test whether the more electorally secure the senator, the more likely the senator can afford to oppose the median voter and vote their ideology. The victory margin variable was statistically insignificant, and the remaining empirical results were virtually identical to those reported in Table 2. Furthermore, in order to test whether the impact of liberalism varies with the size of a senator's victory margin, this study utilized an interaction term between liberalism and victory margin. The interaction term was statistically insignificant, and the other coefficients were virtually identical to those reported in Table 2.

TABLE 2

Median Voter and Senator Ideology Model and Logit Estimates of Senate Vote on Abortion

Independent Variables	Dependent Variable Probability of Voting Pro-Choice				
	(1)	(2)	(3)	(4)	(5)
Constant	-11.2651	-9.4595	-11.4106	-17.6131	-11.5066
	(-1.10)	(-.91)	(-1.11)	(-1.34)	(-1.12)
Percent White	.0605	.0138	.0604	.0254	.0747
Collar Women	(.45)	(.10)	(.45)	(.19)	(.53)
Percent Single	.1134	.1273	.1176	.1345	.1312
Women	(.63)	(.69)	(.64)	(.73)	(.70)
Percent Black	-.0919	-.1053	-.0939	-.1056	-.1004
Population	(-1.38)	(-1.56)	(1.42)	(-1.55)	(-1.48)
Percent Catholic	-.0336	-.0414	-.0351	-.0420	-.0386
Religion	(-.68)	(-.88)	(-.07)	(-.88)	(-.77)
Percent Fundament-	.0258	.0539	.0260	.0469	.0235
alist Religion	(.68)	(1.25)	(.70)	(1.09)	(.66)
Percent Liberal	-.0047				
Voters	(-.05)				
Percent Liberal-		.0457			
Conservative Voters		(1.07)			
Percent Voters Favor			-.0024		
Legal Abortion			(-.06)		
State Liberal				3.5626	
Ideology Index				(.80)	
Senate Abortion					-.5677
Ideology Index					(-.31)
Senator Age	.0051	.0154	.0023	.0148	.0032
	(.02)	(.28)	(.04)	(.26)	(.06)
Senator Marital	.4993	.5473	.5237	.5764	.5577
Status	(.44)	(.47)	(.48)	(.51)	(.51)
Senator Jewish	17.7026	17.9392	17.6959	17.8647	17.5965
	(.01)	(.01)	(.01)	(.01)	(.01)
Senator Catholic	-1.6123	-1.3877	-1.6046	-1.4318	-1.6493
	(-1.29)	(-1.12)	(-1.31)	(-1.16)	(-1.33)

TABLE 2 (CONT.)

Senator Baptist or Mormon	-2.1757 (-1.72)*	-2.0832 (-1.68)*	-2.2041 (1.62)*	-2.1251 (-1.71)*	-2.3253 (-1.73)*
Senator Female	21.5820 (.01)	22.1789 (.01)	21.6059 (.01)	22.0880 (.01)	21.6380 (.01)
Senator ADA Rating	.0963 (3.98)***	.0993 (4.07)***	.0962 (3.99)**	.0974 (4.09)***	.0964 (3.97)***
Likelihood Ratio Index	.61	.62	.61	.61	.61

Note: t-statistics in parentheses (statistically significant at the *.10 level, **.05 level, and ***.01 level).

TABLE 3

Median Voter and Senator Residual Ideology Model and Logit Estimates of Senate Vote on Abortion

Independent Variables	Dependent Variable Probability of Voting Pro-Choice				
	(1)	(2)	(3)	(4)	(5)
Constant	-9.8076 (-.97)	-7.9562 (-.77)	-9.9538 (-.98)	-16.1390 (-1.24)	-10.0467 (-.99)
Percent White Collar Women	.0606 (.45)	.0138 (.10)	.0604 (.46)	.0254 (.19)	.0748 (.54)
Percent Single Women	.1134 (.63)	.1274 (.69)	.1176 (.65)	.1346 (.73)	.1313 (.71)
Percent Black Population	-.0920 (-1.39)	-.1054 (-1.57)	-.0940 (-1.43)	-.1056 (-1.56)	-.1005 (-1.48)
Percent Catholic Religion	-.0337 (-.68)	-.0414 (-.89)	-.0351 (-.70)	-.0420 (-.88)	-.0387 (-.77)
Percent Fundamentalist Religion	.0259 (.68)	.0539 (1.26)	.0260 (.70)	.0469 (1.10)	.0236 (.66)
Percent Liberal Voters	-.0047 (-.06)				

TABLE 3 (CONT.)

Percent Liberal-Conservative Voters		.0458 (1.08)			
Percent Voters Favor Legal Abortion			-.0025 (-.06)		
State Liberal Ideology Index				3.5627 (.81)	
Senate Abortion Ideology Index					-.5677 (-.31)
Senator Age	.0470 (.89)	.0624 (1.81)	.0477 (.91)	.0608 (1.13)	.0488 (.93)
Senator Marital Status	.8840 (.78)	.9441 (.82)	.9083 (.83)	.9655 (.85)	.9430 (.85)
Senator Jewish	21.5388 (.01)	21.8960 (.01)	21.5304 (.01)	21.7446 (.01)	21.4390 (.01)
Senator Catholic	.0282 (.02)	.3043 (.25)	.0352 (.03)	.2275 (.19)	-.0061 (-.01)
Senator Baptist or Mormon	-4.0819 (-2.71)***	-4.0493 (-2.75)***	-4.1094 (-2.58)***	-4.0530 (-2.75)***	-4.2346 (-2.66)***
Senator Female	22.2637 (.01)	22.8820 (.01)	22.2873 (.01)	22.7775 (.01)	22.3208 (.01)
Senator Residual ADA Rating	.0963 (3.98)***	.0994 (4.07)***	.0963 (3.99)***	.0974 (4.09)***	.0965 (3.97)***
Likelihood Ratio Index	.61	.62	.61	.61	.61

Note: t-statistics in parentheses (statistically significant at the *.10 level, **.05 level, and ***.01 level).

While the median voter model was not successful in this instance, an obituary is premature.[12] The median voter model needs to be tested under a wide variety of circumstances. For example, future research needs to examine the median voter model on highly salient, unimodal issues and on less salient issues of varying degrees of opinion polarity. By demonstrating that issue salience and the distribution of public opinion are critically important in affecting the political incentives for legislators, the results of this study move the research agenda on the median voter model toward an important re-orientation on the role of public opinion.

[12] In a review of the median voter model, Holcombe [1989] notes that in the last 10 years, a large body of both empirical and theoretical papers contend that the model accurately depicts the decision-making process for many issues in the public sector.

From a policy standpoint, the empirical results suggest that legislators are free to pursue their own view of what the public position on abortion should be [Bernstein, 1989]. This may not be good news for those who view public control of elected officials as a central element of democracy.

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