Evaluating the Median Voter Model's Explanatory Power

Evaluating the Median Voter Model's Explanatory Power[#]

David Stadelmann
(University of Fribourg, CREMA)

Marco Portmann
(University of Fribourg)

Reiner Eichenberger
(University of Fribourg, CREMA)

July 11, 2011

Abstract

We match individual senators' voting behavior on legislative proposals with 24 real referenda decisions on exactly the same issues with identical wording. This setting allows us to evaluate the median voter model's quality with revealed constituents' preferences. Results indicate a limited explanatory power of the median voter model: It explains 17.6 percentage points more than random voting and a senator's probability to accept a proposal in parliament increases on average by 8.4 percentage points when the district median voter accepts the proposal.

Key words: Median Voter Model, Political Representation, Constituents' Preferences.
JEL Classification: D7, H7.

This article has fewer than 2000 words including tables and references and is written for "Economics Letters".

---

1   Introduction

The median voter model is a widely used framework to analyze political representation. In spite of its theoretical robustness and elegance in political economy models, empirical evidence shows that legislators deviate significantly from the median voter (see, e.g., Bender and Lott 1996; Gerber and Lewis 2004). A major problem of empirical studies is to elicit constituents' preferences concerning legislative proposals and confront them with real legislative decisions by politicians.

We use unique quasi-experimental data which allow us to identify whether legislators' decisions correspond to revealed preferences of their district's median voter. We evaluate the explanatory power of the median voter model by confronting Swiss referenda results with senators' roll call votes in parliament on the very same issues and with exactly the same wording. This setting not only permits us to estimate congruence between politicians and median voters but also the impact of district median preferences on senators' decisions. Empirical results indicate that the median voter model explains on average 17.6 percentage points more than random voting. The median's preferences has an impact on senators but the probability that they accept legislative proposals only increases by approximately 8.4 percentage points when the district median accepts instead of rejects the same proposal.

The remainder of this paper presents our data in Section 2, assesses the explanatory power of the median voter model in Section 3, and offers conclusions in Section 4.

2   Matching senators' roll call votes with median preferences

Congruence between politicians and median voters is usually approximated by "ideology scores" (e.g. Kenny and Lotfinia 2005 use ADA scores). Our empirical approach to elicit median voter preferences is closely related to a sparse literature focusing on referenda (e.g. Gerber and Lewis 2004).

Switzerland offers a quasi-experimental setting to analyze and evaluate the median voter model's explanatory power. Swiss legislators vote on laws and law changes. Accepted legislative proposals do not directly turn into law. Citizens may demand a popular referendum on parliamentary decisions before laws are enacted and they may also propose

constitutional amendments by demanding an initiative.[1] Referenda permit constituents to judge different policies and rank these against the status quo (see Schneider et al. 1981).

The Swiss Senate (upper house of parliament; "Ständerat" in German) has 46 members who are elected by majority voting.[2] The Senate's sessions are recorded by a camera which allows us to identify individual voting behavior in 859 cases for 24 different roll call votes from 2007 to 2010 which were subsequently also presented to constituents in referenda.[3] Thus, constituents reveal their preferences on the same legislative proposals with identical wording as senators. This setting permits us to analyze congruence between the senators and their constituents decision by decision in all 26 electoral districts and avoids difficulties related to reducing multiple policy dimensions to a single ideology scale.

Congruence is measured by dichotomous measure and occurs if senators voted like the majority of their constituents. As constituents only reveal their preferences after senators have voted, senators need to anticipate their constituency's preferences which results in a unique measure for congruence (see Garret 1999).

3 The quality of the median voter model

3.1 Baseline results

Table 1 evaluates congruence between senators and their constituents.

In 67.6% of all matched referenda and legislative decisions, senators vote in line with their district median voters' preferences as shown in column (1), Panel (a). If senators tossed a coin they would match the median of their district in 50% of all cases, irrespective of the median voter's preferences. Observed congruence between senators and the median voter's preferences is 17.6 percentage points above the 50% "random voting" benchmark. The t-value in parenthesis indicates that differences to the benchmark are statistically significant.

20 electoral districts have two senators while six small electoral districts are represented by only one senator. In columns (2) and (3) we split the sample into districts with two and one senator respectively. There is no significant difference between the two cases. Districts

---

[1] A referendum is mandatory for constitutional amendments. 50'000 signatures (~1% of eligible voters) are required for a facultative referendum on laws and law changes. Initiatives for constitutional amendments require 100'000 signatures.

[2] An exception is the Canton of Jura where the two senators are elected by proportional voting. All results remain robust when excluding Jura.

[3] Senators may be absent or abstain from voting (sickness, professional voyage, professional bias, etc.) and in few cases the camera position does not allow identification.

with two senators match their constituents' preferences in 67.6% of the analyzed decisions while districts with one senator match in 67.8%.

Table 1: Explanatory power of the median voter model: Senators and their constituents

	Full sample of matches (1)	Districts with two senators (2)	Districts with one senator (3)
Panel (a): all referenda decisions			
Senators matches majority of constituents	0.6764 (11.042)	0.6761 (10.2377)	0.678 (4.1198)
Observations (referenda)	859 (24)	741 (24)	118 (24)
Panel (b): excluding close referenda decisions			
Senators matches majority of constituents	0.7303 (13.6881)	0.7252 (12.3853)	0.7634 (5.9459)
Observations (referenda)	697 (24)	604 (24)	93 (23)

Notes: The table presents the probability of a match between senators' decisions in parliament and the majority of constituents in referenda (# of matches divided by total # of decisions). Panel (b) excludes referenda where 45 to 55% of constituents voted "yes". The t-value in parenthesis tests whether the mean of the matches is significantly different to 50 percent.
Sources: Swiss Federal Statistical Office for referenda data; Swiss Official Bulletin video footage for individual senators' voting records.

Senators may unintentionally diverge from the median voter because they have difficulties to identify the constituent's majority for close referenda decisions. In Panel (b) of Table 1 we exclude observations where 45.0 to 55.0% of constituents voted "yes", i.e. we grant senators a substantial error margin of 10 percentage points. Senators tend to match more closely the median voter's preferences when constituents' decisions are clear. Congruence increases to between 72.5 and 76.3% in these cases (columns 1 to 3). Thus, observed congruence is slightly higher than in Panel (a).

3.2 Influence of median preferences on senators

To evaluate the influence of the median voter's preferences on senators' decisions we estimate the change in the likelihood that senators agree to a proposal given that their respective district median voter agrees too in a logistic model. The dependent variable is *Senator Votes YES* on a legislative proposal which is explained by the variable *District Votes YES* in the referendum on the same proposal. Table 2 reports the results with robust standard errors clustered for districts in parenthesis.

Table 2: Effects of district median voter's preferences on senators

	Full sample of referenda	Districts with two senators	Districts with one senator	Close Decision Interaction
	(1)	(2)	(3)	(4)
District Votes YES	0.8131***	0.8294***	0.6574	1.0269***
	(0.2257)	(0.2311)	(0.7983)	(0.2268)
Close Decision				0.6457**
				(0.3051)
District Votes YES * Close Decision				-0.9826**
				(0.3910)
Mandatory Referendum	1.1106***	1.1811***	0.7647	1.0747***
	(0.3346)	(0.3799)	(0.6730)	(0.3621)
Initiative	-3.3605***	-3.3257***	-3.6179***	-3.2796***
	(0.4766)	(0.5197)	(1.1363)	(0.4827)
(Intercept)	1.6282***	1.6088***	1.7744**	1.4669***
	(0.3069)	(0.3309)	(0.8428)	(0.3462)
Discrete change: District Votes YES	0.0840**	0.0864**	0.0642	0.1111**
	(0.0333)	(0.0358)	(0.0933)	(0.0416)
R2	0.621	0.6173	0.646	0.6244
Brier	0.1123	0.1139	0.1019	0.1117
n. Obs.	859	741	118	859

Notes: Dependent variable is the probability that "Senator Votes YES" in parliament. The discrete change represents the change of the predicted probability that a senator votes "yes" when the variable "District Votes YES" changes from "no" (0) to "yes" (1) and all other variables are evaluated at the median value. Discrete effects for interaction terms and their significance are calculated according to Ai and Norton (2003). *** < 1%, ** 1 to 5%, * 5 to 10% significance level.
Sources: Swiss Federal Statistical Office for referenda data; Swiss Official Bulletin video footage for individual senators' voting records.

The probability that a senator agrees to a legislative proposal increases when the district median voter agrees. The variable *District Votes YES* is significant and positive in specification (1). If the district majority agrees in the referendum the probability that the senator agrees increases by 8.4 percentage points as indicated in the row below the coefficients.[4] The logistic model controls for the type of referendum. Constitutional changes demanded by parliament often pass with large majorities while initiatives usually do not receive parliamentary support. This is reflected by the coefficients for the type of referendum.[5]

In column (2) and (3) we focus on the subset of districts with two and one senators respectively. The influence of the median voter's preferences in districts with two senators is almost identical to its influence found in specification (1). For districts with one senator we find a slightly smaller but not significant influence of the district median which is not surprising due to the relatively small number of observations. Median preferences affect politicians in districts with one senator only marginally.

---

[4] All other variables are evaluated at their median when calculating discrete effects.
[5] Facultative referenda form the reference group.

Finally, we analyze whether the influence of median preferences decreases in close decisions. We identify close decisions with a dummy equaling one if constituents agreed with between 45 to 55% to the referendum. This dummy for close decisions is interacted with the variable *District Votes YES*. If the district median votes "yes" the probability that the senator votes "yes" increases significantly. In clear decisions, i.e. variable *Close Decision* equals zero, the discrete effect of the median voter's influence is 11.1 percentage points. The influence of the median voter on senators' positions vanishes in close decisions as indicated by the negative and significant interaction term which has almost the same absolute size as the baseline effect. In close referenda the discrete effect of *District Votes YES* is only 0.4 percentage points and insignificant. Thus, the median voter only influences senators' positions if subsequent referenda can be expected to be clear cut.

4   Conclusions

Citizens regularly reveal their preferences for legislative proposals in popular referenda in Switzerland. Swiss senators vote on exactly the same legislative proposals with the same wording that constituents vote on in referenda. By matching senators' roll call votes and district referenda results, we pursue a unique way to identify whether senators represent the median voter of their districts and to assess the explanatory power of the median voter model.

Despite the theoretical appeal and robustness of the median voter model, empirical results show that senators diverge significantly from constituents' preferences. The median voter model explains approximately 17.6 percentage points more than a random voting model of politicians flipping a coin when senators decide whether to vote with or against the majority of their constituents. The district median voter's preferences have limited influence on senators' legislative decisions. The probability that senators agree increases by 8.4 percentage points on average if the median voter agrees to same legislative proposals.

Bibliography

Ai, C., Norton, E. C. (2003), 'Interaction terms in logit and probit models', *Economics Letters* **80**(1), 123-129.

Bender, B., Lott, John R, J. (1996), 'Legislator Voting and Shirking: A Critical Review of the Literature', *Public Choice* **87**(1-2), 67-100.

Garrett, T. A. (1999), 'A Test of Shirking under Legislative and Citizen Vote: The Case of State Lottery Adoption', *Journal of Law and Economics* **42**(1), 189-208.

Gerber, E. R., Lewis, J. B. (2004), 'Beyond the Median: Voter Preferences, District Heterogeneity, and Political Representation', *Journal of Political Economy* **112**(6), 1364-1383.

Kenny, L., Lotfinia, B. (2005), 'Evidence on the importance of spatial voting models in presidential nominations and elections', *Public Choice* **123**(3), 439-462.

Schneider, F.; Pommerehne, W. W. & Frey, B. S. (1981), Politico-economic interdependence in a direct democracy: The case of Switzerland, *in* Hibbs, Fassbender, ed., 'Contemporary Political Economy, Studies on the Interdependence of Politics and Economics', North Holland, Amsterdam.