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3 Congress and Railroad Regulation: 1874 to 1887

Keith T. Poole and Howard Rosenthal

3.1 Introduction

The Congress of the United States has been deeply involved in the economy from the early days of the Republic. Tariffs, internal improvements, and the banking system are obvious examples. The major thesis of this paper is that the coalitions that battled over these and most noneconomic issues as well are in large part based on relatively long-term "indirect" preferences that follow a simple structure. Specifically, members of Congress can be arrayed along a liberal-conservative or left-right continuum. These positions "explain" how they vote on a wide variety of issues. To some extent the indirect preferences are better described by adding a second dimension in addition to the fundamental left-right breakdown. This dimension picks up the race issue before the Civil War and after the Great Depression (Poole and Rosenthal 1991a). In the intervening period the dimension is closely related to urban-rural distinctions (Poole and Rosenthal 1993a). How coalitions organize members of Congress within this low dimensional structure is primarily linked to the divisions between the major political parties of the time, but sectional interests also play a role. Coalition formation must also respond to the internal differentiation of

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the parties into, loosely, "moderate" and "extremist" wings. This internal differentiation is captured by the dimensional representation of preferences.

To illustrate our thesis we will examine in detail Senate and House voting on railroad regulation from the first recorded roll call vote on railroad regulation in 1874 until the passage of the Interstate Commerce Act (ICA) in 1887. Essential to moving farm and many other products to distant markets, railroads were central to the economy of the late nineteenth century. If only because majority rule permits redistribution, it was inevitable that such an important sector would receive political attention.[1] In the 1870s the users of rail services began to seek help from Congress as well as state legislatures.[2] The bottom line was how rail freight pricing would be controlled.

Regulation could use a variety of instruments. One possibility was direct legislation of rail rates, as in the 1874 Iowa law (Miller 1971, 114). Another was the establishment of a commission to set maximum rates, as in the unsuccessful McCrary bill of 1874 (Haney 1968, 2:255, 283–85). Finally, Congress could proscribe various practices that would affect pricing, including the pooling of revenues (successful pools eliminate any incentive for price competition on a route) and rebates (a form of price discrimination). Most famously, Congress's institution of a short-haul pricing constraint (which made it illegal to charge more for a short haul than for a longer haul that traversed the same route) reduced price discrimination between pairs of cities on a given line. Whatever the policies adopted, enforcement was also an issue. Shippers could be given standing to pursue the railroads in the courts, or an "independent" regulatory commission, likely to be favorable to the railroads, could be created to decide disputes. When finally enacted, the ICA included a short-haul pricing constraint (SHPC) and banned pools and rebates but left enforcement to the Interstate Commerce Commission.

Because there are so many potential instruments of economic policy and such diverse interests in a nation, it is possible that we might see many different alignments on railroad regulation votes. The congressional districts that, say, benefited from having a no-rebate clause might be different than those made better off by a SHPC. And both of these might differ from those that were better off with court enforcement rather than a commission. That is, rather than seeing votes line up on party lines or liberal-conservative lines, we might see legislators voting according to district interests.

We in fact will show that the earlier votes on railroad legislation do not fit into a pattern consistent with long-term preferences. This is not to say that voting in terms of district interests will be apparent. Legislators may have difficulty in perceiving how a bill will affect their districts or, more important, those individuals in the districts who are relevant to the legislators. They may

1. Regardless of whether railroads were "indispensable" in the sense of Fogel (1964), the fact that railroads actually carried the goods would make railroads politically salient.

2. On railroad regulation by state legislatures, see Kanazawa and Noll, chap. 1 of this volume.

also trade votes on provisions of railroad regulation for votes on other issues such as free coinage of silver or the gold standard. After such trades take place, it may be difficult to discern voting on district interests if one only looks at isolated roll call votes. Further blurring occurs as a coalition is built around a bill that represents a negotiated compromise that stipulates a specific combination of policy instruments.

There are advantages to building the coalition along lines that follow a standard liberal-conservative split, or, more generally (see below), a split in the low-dimensional space. Voting that splits along conventional lines is useful for signaling to constituents. Constituents may find it difficult to evaluate the potential impact of the bill. When a legislator votes with his usual allies, he signals "I am likely to have voted the right way because people who usually voted the way I do also voted like me." This incentive not to break conventional voting patterns helps to blur, in roll call votes on specific economic policy provisions, the expression of constituency interests, since the constituency interest must be relatively strong for the legislator to deviate from his usual voting alignments.

One form of a dimensional alignment is a vote strictly along party lines. In the period of our study, party discipline in Congress was very effective. The party leadership often had sufficient leverage to induce a legislator to vote against constituent interests on at least some issues.

Whether a party-line vote appears on an issue reflects incentives presented by majority rule. In a house where the two parties are nearly evenly balanced, a few defections will be very costly to the (slim) majority party, and party-line votes may prevail. If, in contrast, one party has a substantial majority, some position-taking defections can be permitted. Votes will continue to be low-dimensional—the signaling incentive remains—but both parties can show internal splits on the issue.

In section 3.3, we analyze the developments that culminated in the passage of the ICA. We show the prevalence of dimensional voting, particularly in the years immediately prior to passage. As a counterpoint that emphasizes the solidity of coalitions with respect to the economic aspects of railroad regulation, we show how, in 1884, the Republicans nearly succeeded in killing a House bill, not by tinkering with instruments of economic policy but by introducing an amendment on racial discrimination. This section also contrasts party-line voting in the Senate with cross-party voting in the House. Section 3.4 shows that, at least in terms of variables used in an earlier study by Gilligan, Marshall, and Weingast (1989), constituency interest measures add little to our dimensional representation of roll call voting. Section 3.5 analyzes abstention with the dimensional framework. We show that, ceteris paribus, nonvoters locate near a line of indifference that represents the split on the vote. The finding is relevant to understanding the functioning of coalitions, for coalitions may find it cheaper to influence the turnout of these marginal voters than to buy or persuade supporters of the opposite side. Indeed, as section 3.3 dis-

cusses, changing turnout was critical to Republican success in the Senate in 1886. Before reaching the substantive analysis, however, we clarify, in section 3.2, the concept of dimensional split and summarize our methodology for measuring the "indirect" preferences.

3.2 A Spatial Model of Congressional Voting

We measure the long-term, or "indirect," preferences by estimating a probabilistic version of a standard Hotelling-type spatial model of voting in which all substantive issues are projections into the dimensions of the voting space. Each legislator is represented by an ideal point in the space, and each roll call is represented by two points—one corresponding to voting yea, the other to voting nay. Each legislator votes, error aside, for the outcome closest to his ideal point.[3]

A quick understanding of what we have done is available from inspecting figure 3.1. The left panel shows the votes in the House in January 1885 on the O'Neill (R-PA) amendment to kill the SHPC. In the figure, the ideal point of each member voting or paired is represented by a token, where *r* denotes a Republican, *d* a Democrat, *J* a Readjuster, and *I* an Independent.[4] This ideal point is estimated not just on the basis of the O'Neill vote but from the congressman's entire voting record during all the years he was a member of Congress. The results presented in this study, as shown in Poole and Rosenthal 1993a, appendix, would be largely unaffected by excluding railroad votes from the calculation of ideal points. Inspection of the ideal points shows that the two major parties represent distinct clusters on the horizontal dimension but that there is substantial differentiation *intra*party. Representatives from the big cities tend to be found at the bottom of the vertical dimension, those from farm states at the top (Poole and Rosenthal 1993a).

Also shown in figure 3.1 (left panel) is the cutting line that represents the "dimensional split" on the issue. Representatives above the cutting line are predicted to be supportive of a SHPC, those below opposed. In our probabilistic model, legislators far from the cutting line are virtually sure bets to obey the prediction, while those very close to the line come close to flipping fair coins when they vote. Not surprisingly, some representatives are misclassified by the model, as shown in the "errors" (right) panel of the figure. The twenty-eight tokens representing errors are concentrated near the cutting line, as expected from the model.

3. Here we attempt to present the basic intuition of the methodology. Readers interested in a detailed technical development may consult Poole and Rosenthal 1991a. Other applications to economic issues are contained in Poole and Rosenthal 1991b, 1993a, 1993b.

4. The roll call voting data in this study are taken from the standard Interuniversity Consortium for Political and Social Research tapes. We have generally found the ICPSR's written summaries of roll call votes for this period to be highly accurate. In contrast, the recording of pairs and announced votes, which had to be done from reading textual material in the *Congressional Record*, appears to be less accurate. The party codes are taken from Martis (1989).

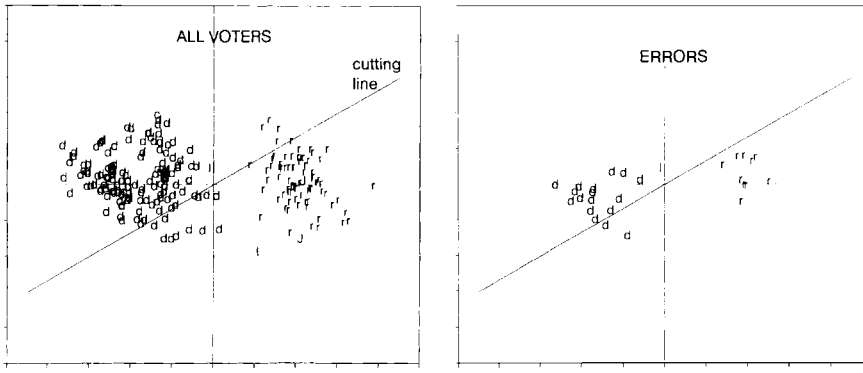

Fig. 3.1 The O'Neill amendment: short-haul pricing constraint (SHPC)
Notes: Vote on the O'Neill (R-PA) amendment on 7 January 1885. The amendment was to eliminate the SHPC. The left panel includes (with some overstriking) one token for each member voting. The token shows the ideal point of the member. The line in the figure is the roll call cutting line. Members below the line are predicted to support the amendment. Those above are predicted to oppose. Prediction errors are shown in the right-hand panel. See the text for further detail.

The cutting line is neither vertical nor horizontal but at an angle, showing that the vote blends both dimensions. Inspection of the figure shows that the cutting line does a substantially better job of classifying than does any cutting line consistent with party-line voting. A pure party split prediction would make twenty-four more errors. More errors would also occur were the cutting line constrained to be either vertical (first-dimension vote) or horizontal (second-dimension vote).

How do we obtain the ideal points for the legislators and the cutting lines for the roll calls? If the world were just one-dimensional and we were interested only in an *ordering* of legislator ideal points and roll call cutting lines, a very simple procedure could be used. Start with some initial ordering of the legislators. Holding this ordering fixed, iterate through the roll calls. On each roll call, place the cutting line between an adjacent pair of legislators and count the classification errors. Pick a placement that minimizes classification errors. With these placements, the legislators and roll calls have been ordered jointly. Now hold the roll calls fixed and iterate over the legislators. Pick a placement for each legislator that minimizes his classification errors. One can then keep going back and forth between roll calls and legislators until no further improvement in classification is possible. While there is no guarantee that this procedure will find an ordering that globally minimizes classification errors, in practice the results are highly robust to the choice of an initial ordering of legislators. Classifications of about 90 percent correct result for the period of this study.

With more than one dimension, the ordering approach is cumbersome. Consequently, we adopt an approach where we seek to maximize the likelihood of

the observed choices for a bell-shaped Euclidean utility function.[5] Like the ordering approach, the algorithm alternates between legislator and roll call phases. In addition, there is a third phase where a single parameter of the utility function is estimated. The algorithm was applied in a simultaneous estimation of all roll call votes from 1789 to 1985 (Poole and Rosenthal 1991a). A legislator's ideal point is represented as a polynomial function of time. The estimation algorithm is named D-NOMINATE, for dynamic nominal three-step estimation. Our preferred model has two dimensions, where legislator positions are allowed to vary linearly over a career.[6] Classifications of this model are about 85 percent correct.

As mentioned above, we have found that, to the extent a spatial model is able to capture voting decisions, at most two dimensions are necessary. Holding the legislator coordinates from the first dimension fixed and applying the unidimensional ordering method outlined above to the roll calls gives classifications that range from 81 percent to 87 percent in the period 1881 to 1900 for the House of Representatives. The second dimension is much less important. Holding those coordinates fixed and applying unidimensional ordering to the roll calls gives classifications for this period in the 63 percent to 76 percent range, barely bettering the marginal percentage voting on the majority side.

Without exception since the Civil War, legislators always cluster by party. This can be seen in the scatter plots of figures 3.2 to 3.4. The *d* and *r* tokens have the same meaning as in figure 3.1, while *s* designates southern Democrats. The northerners, southerners, and westerners of both parties are displayed separately for the 49th Congress in figures 3.2 and 3.3 for the Senate and House respectively, whereas figure 3.4 shows the overall distribution for both chambers in the 99th Congress.[7]

Note that the party clusters were more separated in the 49th Congress, which passed the ICA, then they were a century later. But at both times, there was substantial *intra*party differentiation since roll call votes show consistent pat-

5. The error distribution is that of standard logit models. In one dimension, the ordering of legislators is similar to that produced by the classification approach. Recently, Heckman and Snyder (1992) have shown that, if the error distribution is uniform and utility quadratic, ordinary factor analysis may be applied and that, in one dimension, results correlate highly with those obtained by our procedure.

6. Given that the estimates are based on 10,428,617 observed choices, standard tests based on the log-likelihood indicate that additional dimensions and time polynomials are statistically significant. The additional increments to fit in terms of classification, however, are below 1 percent. In addition, the more complicated models have not suggested additional substantive insights. Indeed, the linear model is not a great improvement over a model of constant positions. The stability of positions is a striking result. See Poole and Rosenthal 1991a for further details.

7. Southern states: Virginia, Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North and South Carolina, Texas, Tennessee, Kentucky, and Oklahoma. Northern states: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, Delaware, New Jersey, New York, Pennsylvania, Illinois, Indiana, Michigan, Ohio, Wisconsin, Missouri, Maryland, West Virginia. Western states: Iowa, Kansas, Minnesota, Nebraska, North and South Dakota, Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming, California, Oregon, Washington, Alaska, and Hawaii.

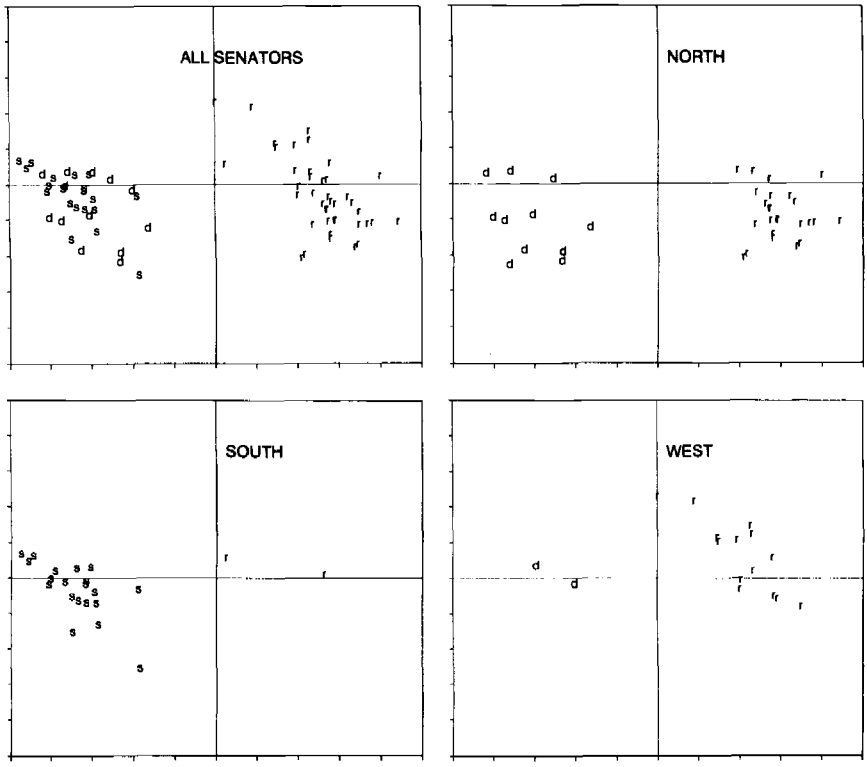

Fig. 3.2 49th Senate, 1885–87
Notes: The tokens represent legislator ideal points. See text for coding of letters and regions.

terns of splitting within parties. Helms votes more frequently with Garn than with Specter. However, when parties collapse (e.g., 1852), a spatial voting model accounts very poorly for the data (Poole and Rosenthal 1991a). Note further that, in both the 49th and 99th Congresses, the patterns for the House and the Senate are quite similar, although the estimations were done independently. This suggests that the major divisions in voting are driven by issues and interests, despite the emphasis others (e.g., Shepsle 1986) have placed on the importance of differences in institutional structure. Although the Senate was not popularly elected in the 1880s and was malapportioned, it differed little in voting structure from the House. Similarly, the presence of closed rules in the House and filibusters in the Senate does not seem to perturb the structure of voting.

Where malapportionment and selective admission of states mattered is in the relative majorities in the two houses. In the 49th Congress, the Democrats held a large majority in the House, but the Republicans, benefiting from selective granting of statehood only to those thinly populated areas likely to go

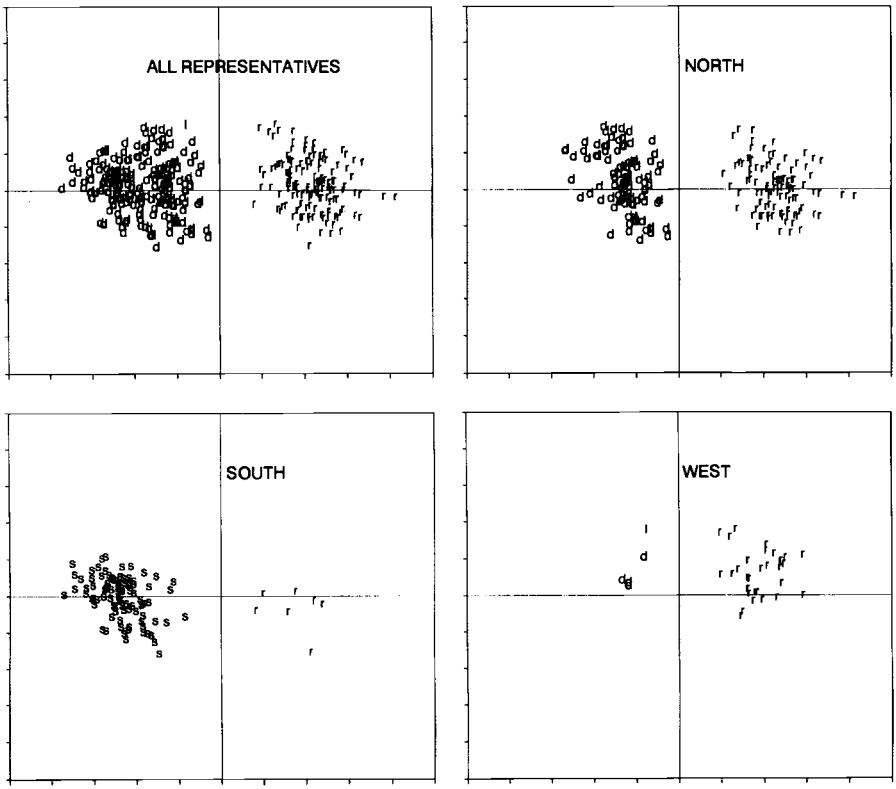

Fig. 3.3 49th House, 1885–87
Notes: The tokens represent legislator ideal points. See text for coding of letters and regions.

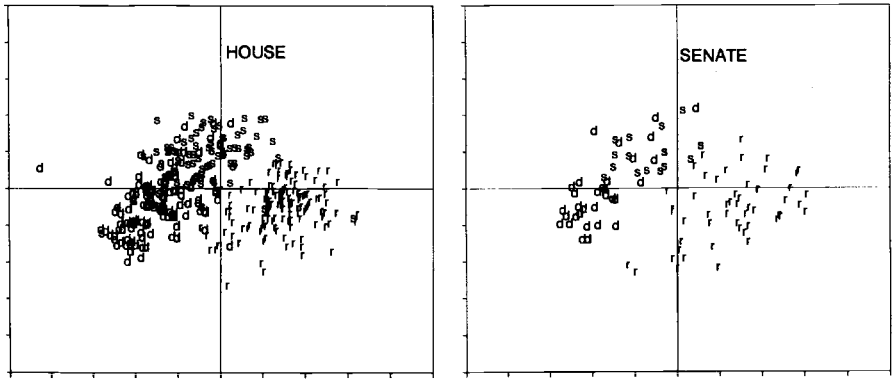

Fig. 3.4 99th Congress, 1985–86
Notes: The tokens represent legislator ideal points. See text for coding of letters and regions.

Republican (Stewart and Weingast 1992), held a narrow majority in the Senate. This difference led, as we discuss in section 3.3, to a major difference in coalition formation, reflected in the slope of the cutting lines within the two-dimensional space.

Some of the differentiation within parties is accounted for by sectional economic interests (Bensel 1984). This is particularly evident in the scatter plot for the 49th House. Northern and southern Democrats are almost perfectly separated. The southerners represented the left wing in American politics at that time. This is easy to understand if we view the main, horizontal dimension as capturing redistributional conflict. Given the disfranchisement of African Americans, the poor South was in conflict with the rich North and West. The handful of southern Republicans also tended to be in the "left" wing of their party. The same pattern recurs, somewhat less strongly, for the Senate.

Sectional interests also appear on the second, vertical dimension which, to a large extent, is related to urban-rural conflict and thus helps to capture, particularly in the Senate, the differentiation of the Republican Party into northern and western blocs. There are only a handful of western Democrats, but they too tend to be "high" on the vertical dimension.

Note that, unlike the 1980s, there is a distinct gap between the party clusters in the 49th Congress. Because the scatter plots are developed from our common scaling of data from the first ninety-nine Congresses (1789–1985), distances in the plots for each house of Congress (but not across houses) have a meaningful comparison. The gap echoes the fact that in both houses there were more party-line votes a century ago. That is, the cutting line that splits the legislators into predicted yeas and predicted nays must have frequently fallen into the gap. The separation tells us that these predicted party-line votes must have been virtually errorless; few people bucked the party line. The wide separation produces large relative distances which in turn means estimated voting probabilities are close to zero and one. In contrast, a cutting line that roughly splits the parties in the 99th Congress will probably produce a sizable number of classification errors, since legislators close to the cutting line will be close to indifferent and will be predicted to break ranks with probability close to 0.5. This distinction between the 49th and 99th Congresses suggests that discipline from the national parties may have rivaled local interests as an explanation for roll call voting on railroad regulation.

In the next section, as our main summary measure of fit of the spatial model, we use proportional reduction in error (PRE), which, as shown in the notes to table 3.1, is equal to the ratio of (1) the difference between the minority vote on the roll call and the classification errors of the spatial model, and (2) the minority vote on the roll call. A cutting line placed at the edge of the spatial map is equivalent to predicting that everyone votes with the majority and will always result in classification errors equal to the size of the minority vote, producing a PRE of zero. The PRE measure is independent of the size of the majority (or minority, since abstentions are excluded until section 3.5) and has

Table 3.1 **Interstate Commerce Voting, 1874–87**

Congress	Roll Call[a]	Date	Win[b]	Roll Call Vote			PRE1	PRE2[c]	Topic
				All	Dem.	Rep.			
43	95H	25 Mar 74	R	129-95	6-62	122-31	.58	.67	Order main question
	96H	25 Mar 74	R	92-129	61-6	29-122	.61	.63	Table McCrary bill
	97H	25 Mar 74	R	121-115	5-69	116-44	.57	.63	Pass McCrary bill
45	168H	11 May 78	R	77-106	52-41	24-64	.14	.24	Adjourn debate bill
	191H	28 May 78	D	104-122	40-76	64-44	.19	.31	Consider bill
	266H	11 Dec 78	H	139-104	69-49	68-55	.02	.19	Pass Reagan bill
46	370H	2 Feb 81	H	98-150	58-63	28-83	.03	.27	Consider bill
	417H	1 Mar 81	D	67-144	1-111	65-23	.69	.70	Do not consider bill
47	187H	5 Jun 82	D	121-78	77-10	36-67	.41	.53	Discharge (need 2/3)
48	70H	9 Apr 84	R	102-120	79-63	20-54	.27	.39	Consider Reagan's substitute
	173S	14 May 84	R	23-18	4-18	19-0	.78	.78	ICA (special order)
	199H	16 Dec 84	D	142-98	123-26	16-69	.55	.67	Consider substitute 5-min. rule
	200H	17 Dec 84	R	134-97	48-95 (46-30)[d] (2-65)	84-0	.71	.71	Ban racial discrimination
	201H	17 Dec 84	D	139-84	135-6	1-76	.91	.91	Adjourn
	202H	17 Dec 84	R	149-121	45-120 (44-49) (1-71)	98-0	.70	.78	Table recommit discrimination
	203H	17 Dec 84	D	137-127	134-26	1-97	.80	.81	Substitute for discrimination
	204H	17 Dec 84	D	137-131	136-25	0-101	.85	.85	Substitute for discrimination
	205H	17 Dec 84	R	139-120	76-83	59-35	−.03	.39	Passenger prices
	206H	17 Dec 84	R	141-102	43-101 (41-35) (2-66)	93-0	.71	.77	Ban racial discrimination

207H	18 Dec 84	R	140-108	39-107 (37-41) (2-66)	96-0	.76	.80	Table recommit discrimination
208H	18 Dec 84	D	132-124	130-22	0-98	.85	.84	Separate but equal
209H	18 Dec 84	D	150-88	136-3	11-82	.82	.82	Previous question
210H	18 Dec 84	D	114-121	19-119	92-0	.84	.84	Ban racial discrimination
211H	19 Dec 84	D	157-58	135-3	20-53	.62	.62	Limit debate 5 min.
212H	19 Dec 84	D	73-130	9-114	62-14	.69	.78	Allow some rebates
213H	19 Dec 84	H	8-186	0-130	8-53	.13	.13	Kill by adjourning
215H	20 Dec 84	D	57-117	15-98	41-17	.43	.48	SHPC
216H	20 Dec 84	H	13-142	3-105	9-35	.00	.00	SHPC
292S	6 Jan 85	D	23-22	20-1	3-21	.82	.86	ICA (postpone)
221H	7 Jan 85	D	90-128	24-112	62-14	.59	.68	SHPC
222H	7 Jan 85	D	125-88	117-12	6-70	.80	.87	State court jurisdiction
223H	8 Jan 85	D	97-125	23-112	70-10	.69	.73	Establish commission
224H	8 Jan 85	D	93-131	17-121	70-7	.76	.77	Establish commission
225H	8 Jan 85	D	161-75	121-26	37-44	.17	.41	Passage
294S	9 Jan 85	D	26-24	13-10	12-14	.13	.00	ICC balance interests
296S	13 Jan 85	H	4-44	3-17	1-26	.50	.50	Freight pricing
301S	17 Jan 85	H	11-32	10-10	1-22	.15	.39	SHPC
303S	17 Jan 85	D	22-20	13-7	9-13	.15	.50	Establish ICC
310S	2 Feb 85	R[e]	22-23	22-0	0-22	1.00	1.00	No "Jim Crow" cars
311S	2 Feb 85	H	5-41	1-21	3-20	.00	.00	SHPC
312S	3 Feb 85	R	26-20	3-14	23-6	.55	.55	SHPC
313S	3 Feb 85	H	6-41	2-16	4-24	.00	.00	SHPC
314S	3 Feb 85	H	46-7	25-1	20-6	−.38	.00	Post rate schedule
315S	3 Feb 85	R	34-17	4-17	29-0	.80	.85	No "Jim Crow" cars
316S	3 Feb 85	R	35-18	7-15	26-3	.48	.52	Establish commission
317S	3 Feb 85	R	13-24	12-2	0-21	.79	.79	Adjourn
318S	4 Feb 85	H	8-32	6-11	2-21	.20	.30	SHPC

(*continued*)

Table 3.1 **(continued)**

Congress	Roll Call[a]	Date	Win[b]	Roll Call Vote			PRE1	PRE2[c]	Topic
				All	Dem.	Rep.			
	319S	4 Feb 85	H	5-35	4-10	1-24	−.20	.00	Regulate RR and water
	320S	4 Feb 85	H	5-35	0-15	5-19	−.60	.00	Regulate RR and water
	321S	4 Feb 85	H	10-21	1-11	9-9	−.10	.30	Regulate ocean transportation
	322S	4 Feb 85	H	7-38	6-9	1-28	.57	.71	No appeal from state court
	323S	4 Feb 85	H	43-12	11-11	31-1	.13	.19	Pass Cullom bill
49	29H	16 Mar 86	H	196-44	126-9	69-34	.11	.23	Suspend rules
	155S	5 May 86	D	29-24	24-2	5-22	.75	.75	SHPC (Camden)
	156S	5 May 86	D	32-27	30-0	2-27	.89	.89	SHPC (Cameron)
	158S	11 May 86	H	41-16	20-6	21-10	−.06	.00	Free passes
	159S	11 May 86	H	6-36	1-21	5-15	.00	.00	Rates for ministers
	160S	11 May 86	H	31-16	14-10	17-6	−.06	.00	Reduced rates
	161S	11 May 86	D	31-14	22-1	9-13	.36	.43	Regulate RR and water
	163S	12 May 86	D	23-24	1-23	22-1	.89	.89	SHPC (Edmunds)
	164S	12 May 86	D	26-24	23-1	3-23	.75	.82	SHPC (Camden)
	165S	12 May 86	R	27-24	2-23	25-1	.85	.85	SHPC (Edmunds)
	166S	12 May 86	D	20-29	2-21	18-8	.55	.50	Delete SHPC section
	167S	12 May 86	H	47-4	21-4	26-0	.00	.00	Final passage Cullom
	152H	21 Jul 86	R	142-99	63-71 (19-48) (44-23)	79-28	−.16	.12	Consider Senate bill
	153H	21 Jul 86	H	204-24	122-3	80-21	−.04	.04	Close debate

155H	22 Jul 86	R	102-151	90-50 (32-40) (58-10)	11-100	.42	.61	Consider Senate bill
177H	27 Jul 86	D	102-126	10-117	92-7	.83	.84	Hiscock: Reagan v. Cullom
190H	30 Jul 86	D	159-57	122-6	36-50	.40	.51	Order previous question
191H	30 Jul 86	D	134-104	119-17	14-86	.69	.78	Reagan v. Cullom
192H	30 Jul 86	D	70-158	6-127	64-30	.54	.62	Recommit Reagan bill
193H	30 Jul 86	H	192-41	125-5	66-35	.10	.29	Pass Reagan bill
344S	14 Jan 87	H	37-12	22-0	15-12	.23	.39	Consider conference report
345S	14 Jan 87	D	25-36	5-21	20-15	.26	.48	Recommit conference report
346S	14 Jan 87	H	43-15	20-3	23-12	.00	.11	Final passage ICA
231H	17 Jan 87	R	113-137	111-28	1-108	.76	.81	Consider conference report
239H	21 Jan 87	H	219-41	129-15	90-25	.00	.04	Final passage ICA

[a]H = House, S = Senate.

[b]D indicates that a majority of Democrats was opposed to a majority of Republicans and that the Democrats were on the winning side of the roll call. R is similarly defined for the Republicans. H indicates a "hurrah" vote in which majorities of both parties were on the winning side or one party was evenly split.

[c]Proportional reduction in error (PRE) is defined as

$$\text{PRE} = \frac{\text{Minority vote \{Yea, Nay\}} - \text{D-NOMINATE classification errors}}{\text{Minority vote \{Yea, Nay\}}}.$$

PRE1 and PRE2 refer to the one- and two-dimensional scalings.

[d]When the Democratic Party was clearly split along sectional lines, the northern Democrats and southern Democrats are shown below the total for the Democrats.

[e]Senator William Mahone (Readjuster-VA) sided with the Republicans.

a maximum value of 1.0. PRE1 is calculated from the one-dimensional spatial model, and PRE2 is calculated from the two-dimensional spatial model. Because we are maximizing likelihood and *not* minimizing classification error, it is possible that the D-NOMINATE estimates produce more classification errors than the majority prediction. Hence, a few of the numbers in table 3.1 are negative.

Note that, if a vote is purely along the first dimension with no error, then PRE1 = PRE2 = 1.0, and if a vote is purely along the second dimension, PRE1 = 0 and PRE2 = 1.0. Hence, the difference between PRE1 and PRE2 indicates the extent to which a two-dimensional model better accounts for voting than a one-dimensional model. For example, on the 1885 SHPC motion shown in figure 3.1, PRE1 = .59 and PRE2 = .68, with a cutting-line angle of about 45°. Inspection of the figure shows why the difference between the PREs was small. A few northeastern Democrats near the bottom of the second dimension voted against the SHPC, and a few midwestern Republicans near the top of the second dimension voted for the SHPC. Because of the large "channel" between the parties (see the discussion of figs. 3.2 and 3.3 above), the cutting line has to have a sharp angle to account for this pattern. Since there were relatively few representatives who deviated from the majority of their parties, the PRE for this sharply angled cutting line will not differ greatly from that of a cutting line that is perfectly vertical through the "channel."

Before proceeding to the specific analysis of railroad regulation, it is useful to ask if it is reasonable that a very simple, low-dimensional model can largely account for roll call voting on not only so many different national economic issues, such as the tariff and monetary policy, but also a whole grab-bag ranging from foreign policy to private bills for specific individuals. If the result sounds surprising, consider modern politics. If you were given the information that Congressman X opposes raising the minimum wage and voted for aiding the Nicaraguan Contras, then you could reliably predict that Congressman X would probably vote against President Clinton's stimulus package. This is known as *constraint* (Converse 1964), namely, the ability to predict, given knowledge of an individual's position on one or two issues, the individual's positions on all other issues. To some degree, constraint arises as a product of coalition formation as evidenced in Al Gore's conversion to a prochoice position and George Bush's swallowing of "voodoo" economics. The result is that such terms as "liberal," "moderate," and "conservative" denote packages of issue positions that informed observers of American politics can easily list.

Although words like "ideological" and "liberal" have been "thoroughly muddied by diverse uses" (Converse 1964, 207), the best way to understand their use is within the context of these long-run consistent patterns of political behavior. As Hinich and Pollard (1981) argue, it is not necessarily the case that these patterns derive from coherent political philosophies. Modern "conservatives" for example, favor stringent regulation of private personal behavior (forced care of deformed newborns, abortion, and so on) but favor no or very

limited regulation of private economic behavior. What really matters is the predictability of the behavior—the existence of constraint across issues. Because issue positions are constrained, that is, highly correlated, a low-dimensional fit to the data is not surprising.

In the era of the debate over railroad regulation, the existence of constraint is nicely illustrated by Hewitt (D-NY) during the 1884 debate over the ICA in the House: "[M]en of business in New York despair of wise legislation upon these great commercial questions from this House. They have seen this House resist the resumption of specie payments. They have seen this House thrust the silver bill down the reluctant throats of an unwilling community; and now they behold this House and this side of it forcing reactionary measures upon the commerce of the country which will paralyze the business of the port which is the throat of the commerce of this country."[8]

From Hewitt's perspective, there was a basic "anticommercial" preference in the 1880s that led to a common coalition for not only railroad votes but also votes on the gold standard and bimetallism.

We now turn to exploring not only how this coalition, under Democratic leadership, developed legislation on railroad regulation in the House but also the countercoalition in the Republican-dominated Senate.

3.3 Roll Call Voting on Railroad Regulation: 1874–1887

3.3.1 Constituency Representation

In this section, we concentrate on roll call voting. This is, albeit very important, just one aspect of the interaction of legislators that produces regulatory policy. Roll call voting is the most readily available and easily quantifiable data in the historical record.

The standard approach to understanding how legislators make voting decisions uses, either implicitly or explicitly, the principal-agent framework in which the members of Congress are the agents and the constituencies are the principals (Poole and Romer 1993). Those working in this approach typically find aggregate variables, such as median income or percentage unionized, that are argued to represent the interests of the principals on the *specific* piece of legislation at hand. These variables then serve as regressors in an econometric analysis of one (or a handful) of roll call votes. The empirical work of Gilligan, Marshall, and Weingast (1989) on the ICA (see below) is just one of many, many studies in this genre.

What underlies this paradigm is that members of Congress are assumed to maximize their probability of reelection (Mayhew 1974). But the electoral interests of legislators are likely to be far more complex than the simple servicing

8. *Congressional Record,* 48th Cong., 2d sess., 19 December 1884, 368.

of a median voter implicit in the use of aggregate variables.[9] For example, the median-voter notion is sharply challenged by the facts that the voting patterns of a congressional district's representative change abruptly when a Republican is replaced by a Democrat or vice versa (Fiorina 1974; Poole and Romer 1993) and that the voting patterns of the two senators from the same state are remarkably different when they are not of the same party (Poole and Rosenthal 1984). The evidence suggests that principal-agent work should at the very least heed the warning of Peltzman (1984), that within-constituency party interests may be more relevant than median interests.

Rather than attempting to refine the principal-agent paradigm, in this section of the paper, we begin to elaborate an alternative mode of analysis. While not denying the relevancy of constituency interests in some form, we claim interests are largely summarized in long-term preferences that are more relevant than the specifics of an issue such as railroad regulation.

To demonstrate this point, we begin by providing a somewhat lengthy account of the legislative history of railroad regulation that began in 1874 and culminated with the ICA of 1887. The objective is to convince the reader that major legislation often grows out of a protracted process of coalition formation that results from strategic interaction.[10] Coalitions must be built, as we illustrate, in part because of the complexity of interests drawn to the issue. As a result, coalitions will be built, not around whether regulation should occur, but around the stringency of regulation.

The interaction in coalition building may involve vote trading and the enforcement of party discipline. Party discipline may be particularly important in avoiding strategic attempts to derail legislation via "killer" amendments. Similarly, a stable coalition is able to resist attempts to appeal to certain constituencies by tinkering with specific economic provisions of a bill.

Our scenario of coalition formation begins with the emergence of an issue. The issue initially fails to produce systematic voting patterns, but eventually becomes "mapped" into the basic space. This process occurred with the ICA and many other issues throughout American history. The time line of the process is characterized by roll call voting becoming increasingly structured along the lines of the basic, long-term preferences (Poole and Rosenthal 1991b, 1993b).

As a consequence, history matters. Contemporaneous variables related to the specifics of the roll call are likely to have only marginal success in explaining roll call voting. We document this point in section 3.4 by summarizing our earlier study of House voting on the ICA (Poole and Rosenthal 1993a) and extending it to the Senate. In section 3.5 we extend the empirical analysis to nonvoting. We show that the spatial model is quite successful in picking out

9. See, for example, Fiorina 1974; Fenno 1978.

10. For an analysis of the history of food stamp legislation that is much in the spirit of our analysis of railroads, see Ferejohn 1986.

those indifferent voters who fail to vote because they are sitting close to the spatial fence represented by the cutting line. In contrast, the contemporaneous economic variables are poor discriminators of abstention. In other words, what we show is that measures of a representative's general long-run preferences are better predictors of his voting on the regulation of railroads in interstate commerce than are available aggregate measures of his constituents' immediate economic interests.

3.3.2 Roll Call Voting and Coalition Formation

Economic interests had placed "the railroad problem" on the public agenda since at least the mid-1850s as manifest in the "pro rata movement" of 1858 to 1861, the investigations by the Ohio and Pennsylvania state senates in 1866 and 1867, the "Erie War" of 1868, and so on. Yet the first roll call vote on rail price regulation in Congress was delayed until 1874.

One factor that contributed to lack of congressional action was the prevailing opinion that, because railroads were state-chartered corporations, Congress could not regulate railroads without impinging upon the rights of states (Merk 1949; Haney 1968, vol. 2, chap. 21). The belief was so strongly held that during the Civil War Congress did not take action against railroads that were clearly hindering the war effort. Neither the Camden and Amboy Railroad, which had a monopoly in New Jersey, nor the Baltimore and Ohio, which disallowed connections with other railroads in Baltimore, was prosecuted.[11]

Another factor was that railroad interests were identified with the Republican Party which, until the end of Reconstruction, enjoyed unified control of the presidency and both houses of Congress.

The ability of the states to respond to merchant and farmer interests was limited, however, by the mobility of capital in the federal system. If one state harshly regulated the railroads, railroad capital would flow out of their states and into states with a more "friendly" environment (Miller 1971, 168, 195–96). Citizen frustration with the actions of state legislatures increased in the 1870s (Haney 1968, 2:278–79).

3.3.3 Early Action in the House

The demand for federal regulation was intensified by the Granger movement, which led to the Republican-sponsored McCrary (R-IA) bill of 1874 (Haney 1968, vol. 2, chap. 19). Table 3.1 shows all significant roll calls on regulating railroads in both houses of Congress up to the passage of the ICA in 1887. The first three roll calls pertain to the McCrary bill. This bill "forbade unreasonable [freight] charges and provided for a board of railway commis-

11. Indeed, as Merk (1949, 5) points out, the reason that the Sixth Massachusetts Regiment—which was on its way to defend Washington—had to fire on the Baltimore crowds on 19 April 1861 was that they had to march through the streets of Baltimore in order to make the railway connection. Four soldiers were killed—they were the first casualties of the Civil War.

sioners with power to make a schedule of reasonable maximum rates" (Haney 1968, 2:255, 283–85). The bill differed from the final ICA bill not only in substance, since the ICA did not include government rate setting, but in its sources of support.

Figure 3.5 (laid out like fig. 3.1) shows the final passage vote on the McCrary bill. The spatial model performs almost as well on this vote as on the 1885 SHPC vote illustrated in fig. 3.1; however, the cutting line is at a different angle. Democrats are unanimously *against* regulation at this time, and the Republican Party is split, with the more urban wing opposed to regulation. Even among those party members predicted to vote in favor, there are substantial errors as a result of the defection of New England and eastern-city Republicans. This fact is shown in table 3.2. Of the forty-four total classification errors, nineteen result from nays by New England and mid-Atlantic Republicans.

The lukewarm Republican support was even more evident in the Senate. Even though the Republicans had a 54–19 majority in this body, the McCrary bill was never brought to the floor. Perhaps the McCrary bill, as Granger legislation, was an internal Republican Party concession to farm belt representatives. In the House, they were allowed to exhibit "position taking" to their constituencies, but no regulatory legislation went on the books.

The internal split in the Republican Party made a coalition centered in this party an unlikely basis for regulatory policy. Indeed, Oliver H. Kelley, the founder of the Grange, believed in a "blend" of the interests of the West and South against the "radical tariff interests of the East" (Miller 1971, 163). This coalition was in fact formed and provided the impetus for the ICA.[12]

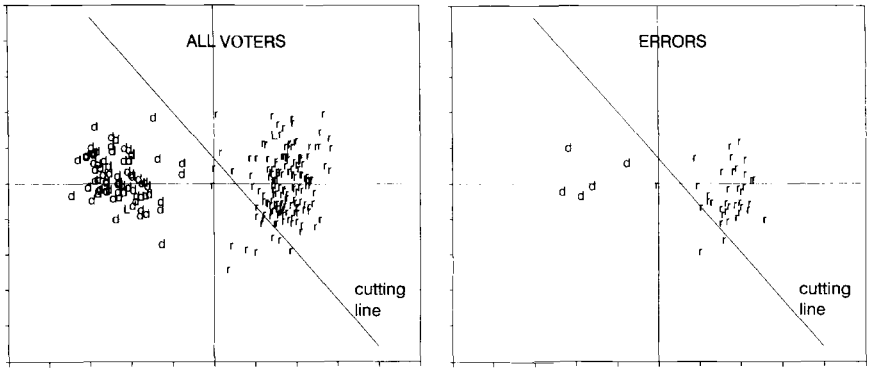

Fig. 3.5 Final passage of the McCrary bill, 25 March 1874

Notes: See note to fig. 3.1. Members to the right of the cutting line were expected to favor the bill.

12. The farmers in the Granger states were not the first of their lot to agitate for railroad regulation. The "pro rata movement" of 1858–61 in the mid-Atlantic states had significant farmer support (Merk 1949) but the farmers were the followers, not the leaders (Benson 1955).

Table 3.2 Regional Breakdown of the Final Passage of the McCrary Bill

	Actual Votes						Errors from Spatial Model					
	All[a]		Dem.		Rep.		All		Dem.		Rep.	
Region	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Major cities[b]	0	14	0	5	0	9	0	0	0	0	0	0
New England and mid-Atlantic[c]	28	41	2	15	26	26	3	26	2	0	1	26
Border, West, and Midwest[d]	65	24	2	18	63	6	5	6	2	0	3	6
South[e]	28	34	1	31	27	3	1	3	1	0	0	3
Totals	121	113	5	69	116	44	9	35	5	0	4	35

[a]Only Democrats and Republicans shown.

[b]Boston, New York City, Philadelphia, and Baltimore.

[c]All states north of Maryland plus Delaware.

[d]Maryland, West Virginia, Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, Oregon, Nevada, and California.

[e]Eleven Confederate states plus Kentucky.

The switch from a Republican-led coalition to one centered on Democrats was initiated by a Pittsburgh Democrat, James D. Hopkins, who, after the failure of the McCrary bill in the 43d House, introduced a bill in the Democrat-controlled 44th House. Hopkins was responding to independent oil refiners pressured by John D. Rockefeller's Standard Oil Company (Nash 1957). The bill did not emerge from the Commerce Committee, but its prohibitions on rebates and discriminations and provision for posted prices (Nash 1957, 184) began a line of legislative initiatives ending in the ICA. After modification in 1877 by George Hibbard, a lawyer working for the independents, the bill was reworked by a Texas Democrat and former Confederate postmaster general, John Reagan, in the summer of 1878. The "Reagan bill" emerged in December of that year (Haney 1968, 2:288; Nash 1957, 187).

Reagan managed his railroad regulation bill for the next decade. Reagan did not believe federal regulation to be constitutional until the *Munn v. Illinois* decision of 1 March 1877.[13] Reagan was evidently influenced by the Court's reasoning that "when private property is devoted to a public use it is subject to public regulation." This declaration by the Court about the nature and function of railroad property coupled with the unquestioned authority of Congress over interstate commerce evidently changed Reagan's mind.

13. Nash (1957, 185) cites comments made by Reagan on the House floor on 11 May 1878. Actually Reagan does not *disagree* with comments made *about* his views by Clarkson Potter (D-NY): "The learned gentleman said that when bills of a character like this were being considered in a former Congress he thought that Congress had no power under the authority to regulate interstate commerce to make provisions such as those contained in this bill. But he thinks he finds in the decision of the Supreme Court . . . he cited, the case of *Munn v. Illinois,* that the high court had held that such a power could be exercised, and therefore is ready to support his bill" (*Congressional Record,* 45th Cong., 2d sess., 11 May 1878, 3405).

The remainder of the South did not follow him immediately when the bill passed the 45th House on 11 December 1878. Unlike the McCrary bill four years earlier, which could be understood in party and regional terms, the 1878 vote on the Reagan bill not only split the two parties internally (69–49 Democrats, 68–55 Republicans; see table 3.1) but also does not fit the spatial model. The PREs are only .02 and .19, respectively.

Table 3.3 shows the aggregate PREs of the spatial model for the votes shown in table 3.1. In contrast to the SHPC motion shown in figure 3.1 and the McCrary bill shown in figure 3.5, aggregate PRE over the three votes on the 1878 Reagan bill is very low: .12 and .25, respectively. Note that in the 48th and 49th Congresses the aggregate PREs are much higher.

Table 3.1 shows that the coalitions in the House were beginning to jell in the narrowly Democratic-controlled 46th House. A move to consider the bill was rejected in the lame duck session in February 1881. In March, the Republicans, eager to filibuster other legislation, moved to consider the bill. Reagan refused to bite on this strategic ploy, and the bill was not considered by a large majority

Table 3.3 Aggregate PREs from the Spatial Model

		House			Senate		
Congress	Roll Call Category	PRE1	PRE2	*N*	PRE1	PRE2	*N*
43	ICA	.586	.644	3			
	Other	.476	.558	466			
	Total	.477	.559	469			
45	ICA	.115	.247	3			
	Other	.621	.660	359			
	Total	.617	.656	362			
46	ICA	.295	.446	2			
	Other	.638	.670	423			
	Total	.637	.669	425			
47	ICA	.410	.526	1			
	Other	.617	.648	286			
	Total	.616	.648	287			
48	ICA	.644	.712	23	.407	.487	20
	Other	.450	.497	289	.487	.544	398
	Total	.467	.515	312	.484	.542	418
49	ICA	.421	.535	11	.496	.547	14
	Other	.503	.562	280	.494	.539	436
	Total	.501	.561	291	.494	.539	450

Note: Aggregate PRE is defined as

$$\frac{\sum_{j=1}^{n} \text{Minority vote } \{\text{Yea, Nay}\}_j - \sum_{j=1}^{n} (\text{D-NOMINATE classification errors})_j}{\sum_{j=1}^{n} \text{Minority vote } \{\text{Yea, Nay}\}_j},$$

where n is the number of roll calls in the group being aggregated.

(roll call 417). The vote, in contrast to earlier votes in the Reagan era, fit the spatial model reasonably well.

The elections of 1880 switched control back to the Republicans in the 47th House. Nonetheless, as we indicated before, the sentiment for regulation was less a question of if than to what extent. When the Republican-controlled Commerce Committee refused to report out Reagan's bill, he tried a discharge petition. The supporting majority, 61 percent, fell short of the necessary two-thirds.

What is striking about the votes related to the Reagan bill through 1882 is that they do not fit the spatial model well. In the 45th and 46th Congresses the PREs for the roll calls are not very high, except for the last vote (417), which had a PRE2 of .70. The single vote to discharge in the 47th House had a PRE2 of .53, but this level is lower than those for the substantive votes in the 48th and 49th Houses.

This poor fit occurs perhaps in part because legislators were still acquiring information about how the issue related to long-term preferences and perhaps in part because stable coalitions had not been formed. However, the vast majority of issues eventually became "mapped" into the basic low-dimensional space. This process is also illustrated by our previous work on minimum wage (Poole and Rosenthal 1991b) and a variety of other issues (Poole and Rosenthal 1993b). Once the mapping occurs, there is little to be gained from searching for correlates of roll call voting in constituency economic variables. By the 48th Congress, the railroad mapping had occurred.

3.3.4 Action in the 48th House

The elections of 1882 switched control of the House back to the Democrats once again. The 48th Congress provides a better test of the "economic interests" versus the spatial model than does the 49th House, because in the 48th House, Reagan's bill was considered under a relatively open rule where it was read section by section with the opposition permitted to offer amendments to each section. There were recorded votes on disallowing rebates, the SHPC, and substituting a regulatory commission for the statutory prohibitions in the Reagan bill. If the "economic interests" model is correct, then each of these facets of economic regulation should have had a differential impact on constituencies, and we should observe different voting patterns on the various economic provisions of the bill. For example, the model set out in Gilligan, Marshall, and Weingast (1989) suggests that the vote on the SHPC section should divide short-haul shippers from long-haul shippers and the railroads but that only the railroads should support substituting a commission, which, if captured, would raise both short and long prices. In fact, however, the voting patterns do not differ significantly across these provisions.

Since the Reagan coalition held together on the economic aspects of the bill, the bill could not be defeated by manipulating voting cycles over the potentially multidimensional issue space represented by the various policy instru-

ments. What did almost succeed in killing the bill was a Republican amendment that banned racial discrimination in passenger service. Passage of the amendment would most likely have led the South to vote against the entire interstate commerce package. The amendment was clearly a "killer" amendment from the viewpoint of prorailroad forces.[14]

Legislative action in the 48th House began in earnest on 16 December when the House agreed to consider the bill.[15] Reagan's initial December motion (199) and the ensuing twenty-one votes on the bill all fit the spatial model very well. The aggregate PRE1 is .64 and the aggregate PRE2 is .71, well above the PREs for the roll calls not connected to the ICA (.45 and .50, respectively; see table 3.3). Ignoring the two lopsided votes (213 and 216), there are only two that have low PREs. One is the final passage vote (PRE2 = .41), which carried by a comfortable 68 percent majority, thereby permitting some "protest" voting. The other is on an amendment by Mills (D-TX) to limit passenger prices to at most three cents per mile. The obviously populist content of the Mills amendment made it a purely second-dimension vote (horizontal cutting line), supported by agrarian Republicans. On the other hand, voting was "noisy" on the amendment, since PRE2 only reaches .39. We suspect the noise arose because the amendment was relatively unexpected and was outside of the package represented by the bill not only because it concerned passengers rather than freight but also because it addressed pricing directly. During debate on the bill in 1878, Reagan had insisted, with reference to freight, that the bill was not intended to set rates.[16]

With respect to the votes that fit well, amendments began with the bill's first section, directed at price discrimination. O'Hara (R-NC) immediately moved to ban racial discrimination in passenger service (200). The intent of the amendment may have been a sincere effort to promote civil rights. O'Hara was an African American who represented North Carolina's "black second" district and who persistently supported civil rights legislation (Anderson 1981; Smith 1940). The amendment passed. A coalition of solid Republican support and a majority of northern Democrats voted for the amendment against overwhelming southern Democratic opposition (see table 3.1). Reagan, obviously feeling southern support for the bill was in danger, immediately moved to adjourn, succeeding on a nearly party-line vote. Notice that on both of these crucial votes PRE1 equals PRE2, indicating that the second dimension had little to do with the voting. The reason can be seen in figure 3.3. Because the southern

14. Grossman (1976) suggests that killing the entire bill may have been the motivation of some supporters of the O'Hara amendment.

15. On 9 April 1884, Reagan had unsuccessfully moved for consideration of the bill. Again the vote was not particularly well captured along spatial lines. This was largely due to the fact that on the seventh the House had agreed to consider bills from the Committee on Public Buildings and Grounds on the ninth, and Reagan's motion evidently violated this agreement.

16. *Congressional Record,* 45th Cong., 2d sess., 11 May 1878, 3404.

Democrats were clustered to the *left* of the northern Democrats, a vertical cutting line dividing the two wings of the Democratic party is able to account for the racial discrimination vote, while a vertical cutting line through the "channel" accounts for a purely party-line vote.

During the next two days, the battle raged back and forth, with the majority vacillating between the two positions on racial discrimination. Finally, an amendment (208) calling for "separate but equal" facilities carried the day by a bare majority (132–124).[17] The bill was saved, even though there were two further roll calls on the issue (209 and 210).

The victory of "separate but equal" gave Reagan clear sailing—although there were votes on amendments to allow for rebates (212), weaken or eliminate the SHPC (215, 216, and 221), and, in a final Republican effort, to replace the bill with an appointed investigative commission (223 and 224). The bill, which later could not be compromised with a Senate bill, passed the House on 8 January 1885 (225).

The sequence of votes in the 48th House is instructive for what it shows about the possibility of testing "economic interests" models of roll call voting. When the Reagan bill reached the floor, it represented a package that contained multiple regulatory provisions, which were expressed in the different sections of the bill. In principle each of these provisions represented a different "dimension," and constituency preferences could be diverse over these dimensions. Republican amendments to each section (i.e., dimension) could not destabilize the bill, as suggested by some theories of multidimensional voting (Riker 1980). Coalition members could foresee that going along with a modification of one provision would force the whole package to unravel. Since the coalition was built around representatives with similar "basic" preferences, the spatial model accurately accounts for the voting.

To upset the bill would have required finding a highly salient item outside the package (Riker 1986). The racial discrimination question provided one. Fortuitously for Reagan, preferences on economic issues and race issues in the 1880s were highly but not perfectly correlated. The white South wanted to control both northern capitalists and southern blacks. Consequently, as table 3.1 shows, a one-dimensional model handles both issues reasonably well. The Republican hope was that, in a final vote on an interstate commerce bill that incorporated a nondiscrimination provision, southerners would vote as if the bill were a race-related measure and northerners as if it were a regulatory measure. This would have led to a vote of "both ends against the middle," inconsistent with a one-dimensional spatial model.[18]

17. The "separate but equal" feature of Jim Crow policies appears to have first been enacted by the Tennessee legislature in 1881. The policy found full legitimacy in the Supreme Court's 1896 decision in *Plessy v. Ferguson* (Lofgren 1987).

18. Snyder (1992) claims that agenda control by gatekeeping committees reduces dimensionality. In the interstate commerce case here, the gates were open. Indeed, the bill was pried loose

The Republican action on nondiscrimination was widely recognized in floor debate as a strategic "killer" amendment.

> MR. REAGAN: . . . I have only the objection to [the amendment] that it comes here unconsidered by a committee, and not connected with the regulation of the transportation of freight. . . .
>
> MR. HENLEY: . . . the introduction of this race question . . . was seized upon by the other side and taken up for the purpose . . . of defeating this bill. . . .
>
> There are two ways of defeating a proposition. One is by fighting it fairly and squarely, the other by resorting to circuity and indirection, by encumbering the proposition with all sorts of foreign material which may make it objectionable. If the amendment . . . should be incorporated without modification in this bill, it is apparent to every one that it jeopardizes the bill; . . . it creates enemies to it.[19]

The Reagan forces, in stemming the tide on the discrimination amendments, kept the observed voting largely consistent with a one-dimensional spatial model.

The antidiscrimination roll calls were all fought along a single dimension of political conflict. The same is true for those roll calls dealing with economic regulation. The two sets of roll calls cluster into two distinct patterns of voting behavior.

The aggregate PREs for the antidiscrimination roll calls (199–204, 206–10) are .77 and .80, respectively, a gain of only .03 for the two-dimensional model. For the regulatory roll calls (212, 215, 221–24), the aggregate PREs are .67 and .73, respectively, a gain of .06. This is not a big difference but, substantively, it is a significant one.

The distinction is shown quite simply in figure 3.6. A group of roll calls that represents a single line or dimension of conflict should have cutting lines that are roughly parallel or, alternatively, have roughly equal angles of intersection with the main dimension of the basic space. As figure 3.6 shows, all the racial discrimination roll calls cluster tightly, with angles ranging from 90° to 103°—corresponding to the positioning of the parties shown in figure 3.3. The other tight cluster in the figure groups all roll calls dealing directly with alternative forms of regulation. (Thus, procedural and passage roll calls are excluded.) These are the nonhurrah (see table 3.1) votes on rebates, the SHPC, and an independent commission in the 48th House (212, 215, 221, 223, and 224), and the Hiscock (177) and Reagan versus Cullom (191) votes from the 49th House. For these roll calls, angles ranged from 34° to 58°. In other words, the racial discrimination votes were nearly pure first-dimension votes, with the cutting

from committee. But a two- or even one-dimensional model performs handsomely. This case suggests that the strategy of coalition maintenance, much more than the institutional and jurisdictional structure of Congress, is fundamental to why low-dimensional models are so successful in accounting for the data.

19. *Congressional Record*, 48th Cong., 2d sess., 17 December 1884, 318–19.

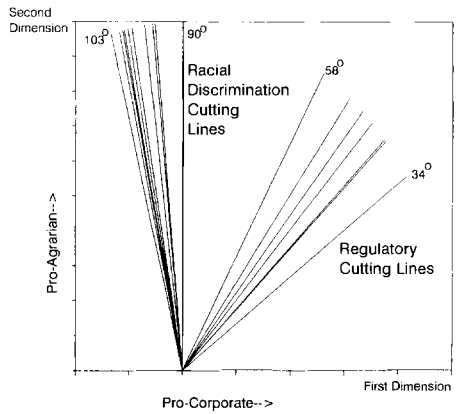

Fig. 3.6 Cutting-line angles for interstate commerce roll calls
Notes: See text for description of roll calls. Each line represents a single roll call.

line falling interior to the Democratic Party. In contrast, the regulatory votes, with cutting lines averaging around 45°, blended the two dimensions.

The clustering of the regulatory votes tells us that searching for particular economic interests on various facets of the bill will, at best, be of marginal value. Whether the proposal was to allow rebates, do away with the SHPC, institute a weak commission, or choose the Cullom bill over the Reagan bill, the votes were largely between a stable prorailroad coalition and a stable anti-railroad coalition.

3.3.5 Action in the 48th Senate

The 48th Senate was narrowly controlled by the Republicans (38 Republicans, 36 Democrats, 2 Readjusters). As seen in table 3.1, the bulk of the railroad votes had lopsided majorities. On the lopsided votes, PRE was low; the spatial model often fails to account for the handful of discontents on otherwise consensual motions. PRE is higher on close votes, but the voting, reflecting the very narrow margin of the Republicans, was largely along party lines. Many of the same issues, including racial discrimination, that had been voted on in the House also arose in the Senate.

The Republican majority led by Cullom (R-IL) crafted a bill that differed from the Reagan bill in many respects. Its key feature was the nine-member Interstate Commerce Commission (ICC). The Senate also struck the separate-but-equal language in the House bill. In addition, the bill prohibited personal discrimination in rates and services, rebates, and drawbacks, and made charging more than a "reasonable" rate a misdemeanor. On the other hand, the bill had only a weak SHPC and did *not* disallow pooling. Supporters of the bill felt that the ICC with its discretionary powers would be able to prevent short-haul/long-haul abuse and would be able to adequately regulate pooling activity by the railroads (Hilton 1966, 104).

3.3.6 Action in the 49th Senate

The elections of 1884 strengthened the Republicans in both houses of Congress. Still, there were only eight more Republicans than Democrats in the Senate, whereas the Democrats maintained a forty-two-seat edge in the House. In the Senate, party discipline continued in force, especially since a few absences could put the Republican majority in danger. Since there were more close votes in the 49th Senate than in the 48th, we consider it in more detail to illustrate the role of party discipline and the need to control turnout in maintaining a coalition.

Although the House and Senate had been unable to reconcile the Reagan and Cullom bills in the 48th Senate, both chambers saw a need for some action on railroad regulation. Debate began on a new Cullom bill in the Senate in May 1886. The 49th Senate subsequently took sixteen votes on the bill. We consider fourteen votes that had more than four votes on the minority side. Of these, five (155, 156, 163–65) were party-line votes concerned with the strictness of the SHPC constraint. Five votes (161, 166, 344–46) were position-taking votes that split the Republican Party and concerned whether there should be a bill at all (consider the conference report, recommit the conference report, and pass the conference report—all in 1887), whether water transportation should also be covered (in 1886), and whether the entire short-haul pricing section should be deleted (in 1886). Three votes concerned issuance of free passes, mainly to those entrusted with the "gospel" (158–60). Finally, even though the final passage vote on the Cullom bill on 12 May 1886 only received four negative votes (167), we leave it in table 3.1 for purposes of reference.

As can be seen in table 3.1, the close votes were all party line. This shows a critical distinction between the Senate and House. Because the Democrats had a large majority in the House, Reagan could tolerate more position taking than could Cullom, who worked with a slim Republican majority. The party-line votes in the Senate can be captured by the first dimension with vertical cutting lines through the "channel." This is reflected in the substantial aggregate PRE1 of .82 and in only a modest increase to .84 for PRE2.

The first SHPC roll call (155) was taken in Committee of the Whole on 5 May 1886 on Camden's (D-WV) motion to make the SHPC apply strictly and not just to fares "from the same original point of departure." The defections from straight party voting on this roll call were, from the Democrats, McPherson (D-NJ) and Brown (D-GA); from the Republicans, Mahone (R-VA), Riddleberger (R-VA),[20] Conger (R-MI), Morrill (R-VT), and Sherman (R-OH).

When the Camden amendment was approved in spite of the Republican majority, Cameron (R-PA) moved to go into executive session (156). This was supported by all Democrats and just one other Republican besides Cameron, Edmunds (R-VT), but opposed by Cullom. The previous vote on the Camden

20. Mahone and Riddleberger switched from Readjuster to Republican in the 49th Senate.

amendment was effectively a straw vote, since it had taken place in the Committee of the Whole. Given Edmunds's later role in proposing a slight compromise on "original point of departure," the intent was perhaps to open closed-door bargaining after an unexpectedly strong showing by the Democrats.

The Senate returned to voting on the SHPC on 12 May 1886. To understand the various versions of the SHPC that were voted on, consider four cities, *a, b, c, d,* on a rail line. Let P_{ij} be the price for freight originating in i and ending in j. For shipments in the a to d direction, the committee bill imposed only that $P_{ab} \leq P_{ac} \leq P_{ad}$ and $P_{bc} \leq P_{bd}$. It thus did not impose $P_{bc} \leq P_{ad}$ or $P_{cd} \leq P_{bd} \leq P_{ad}$ or $P_{bc} \leq P_{ac}$. The Camden amendment imposed all these additional constraints. The Edmunds amendment added to the constraints in the committee bill by requiring that $P_{cd} \leq P_{bd} \leq P_{ad}$ and $P_{bc} \leq P_{ac}$. Unless the line did not provide *ac* service and had no price on this route, the Edmunds and Camden amendments would seem to have identical implications. We are puzzled as to the fuss.

The Senate first voted on the Edmunds amendment (163) to include "same point of arrival" as well as "same point of departure." This was rejected, and the Camden amendment passed (164). But immediately after Camden passed, Edmunds arranged for another vote on his language and it passed (165). What transpired? On all three of the votes on 12 May, party discipline had increased with respect to the 5 May vote in the Committee of the Whole. Only Brown and Sherman remained as offsetting defectors. McPherson and Morrill offset by switching to vote with their parties. In addition, the Republicans gained when Mahone, Riddleberger, and Conger, all earlier Republican supporters of a strong SHPC, were absent on 12 May. These switches, however, did not suffice to allow Edmunds to win on the first try. He did not owe his eventual success to persuading supporters of a strong SHPC to vote for a weak one. (Pugh [D-AL] did support Edmunds the second time but not the first.) What was critical is that Edmunds got help from a few Republican absentees who showed up on the second try.

Note that on this decisive second attempt there are only three defections from a straight party vote among actual voters. Brown and Pugh, two senators from the deep South, split their delegations. It would seem difficult to explain these defections on the basis of economic interests on railroads since party delegations from the same state should not be split even in the party constituency version of the principal-agent paradigm. Sherman, the author of the antitrust act and brother of William Tecumseh, was probably his own man.

The spatial model does not do as well on the five position-taking roll calls where majorities are not threatened. The aggregate PREs are .29 and .39, respectively—not terrible, but nothing like the party-line votes. The final passage vote of the ICA (346) fit the spatial model very poorly. If it is excluded, the aggregate PREs for the remaining votes increase to a respectable .36 and .46, respectively. These votes split the Republican Party against a largely unified Democratic Party. The core of the antiregulatory Republicans was in the

Northeast. However, there were several split Republican delegations in the Northeast on the position-taking roll calls so that, although the second dimension does help to account for the voting on these roll calls, the results are quite noisy.

Finally, as we will show below, neither the spatial model nor economics can deal with the sublime.[21] Both models fail on the issue of free passes to ministers of the gospel (see section 3.4).

3.3.7 Action in the 49th House

After the Cullom bill passed the Senate, Reagan was unable to win procedural votes that would have brought railroad regulation to the floor. He ultimately secured an agreement for a direct vote between his bill, to be offered as a substitute, and the Senate bill. The winner would go to a final passage vote against the status quo (no bill).

Voting moved to a substantive stage on 27 June 1886. Hiscock (R-NY) moved to amend Reagan's substitute by proposing the Senate bill with the trivial additional proviso that it would take effect 1 January 1887 (177). The effect of this maneuver was simply that a yea vote would mean support for the Senate bill whereas a nay was a vote for the Reagan bill. This vote, for all intents and purposes, was virtually identical to the key vote (191) between the Cullom and Reagan bills, which took place three days later on 30 July 1886. Of the 193 members voting on both bills, just five individuals switched from pro-Reagan to anti-Reagan, and another eleven switched from anti-Reagan to pro-Reagan.[22]

After the failure of Hiscock's tactic, the bill was next considered on 30 July. When attempts were made to propose amendments, Reagan asked to order the previous question (190). This was approved 159 to 57. Presumably only those strongly opposed to the Reagan bill voted against. The Reagan versus Cullom vote was then taken (191), with Reagan prevailing 134 to 104. Opponents of the bill then moved to recommit. Now yea votes would be expected only from those who preferred delay and uncertainty to a House-Senate conference. The motion (192) failed 70 to 158. Immediately thereafter (193), the Reagan bill was passed 192 to 41.

After the early procedural maneuvering, voting fit the spatial model very well. Excluding the lopsided final passage hurrah vote, the aggregate PREs for the four votes on 27 and 30 July were .65 and .72, respectively.

3.3.8 *Wabash:* A Critical Change in the Status Quo?

On 25 October 1886, the Supreme Court handed down the *Wabash, St.*

21. The aggregate PREs for votes 158–60 are −.05 and .00, respectively.

22. The Yules Q, which measures scalability of roll calls (MacRae 1970), is .99 between the Hiscock and Reagan versus Cullom motions.

Louis, and Pacific Railway Co. v. Illinois decision, which struck down the Illinois railway law as an unconstitutional regulation of interstate commerce. Haney (1968, 2:291) argues that the "decision had no slight effect in bringing to pass the Act of 1887; for, in declaring state regulation of interstate commerce unconstitutional, it made federal regulation more imperative." Fiorina (1986, 35) argues "that absent the Wabash stimulus, the House and Senate would have remained at loggerheads. . . ." Our reading of the floor debates from the *Congressional Record* leads us to agree with Kolko (1965, 33): "The common impression that the . . . Wabash . . . decision was responsible for action is largely incorrect, since that decision was handed down on October 25, 1886, and by that time both the Senate and House wanted legislation and were determined to have it. The only question was the form of the legislation." Although Gilligan, Marshall, and Weingast (1989) share Fiorina's position and argue that the changed status quo facilitated compromise between Cullom and Reagan, neither their empirical work nor ours can resolve this debate. There is no clean test of the role of *Wabash* since there was not a pre-*Wabash* and post-*Wabash* vote on the same pair of alternatives.

In any event, the bill returned from conference in the lame duck session of 1887. Reagan and Cullom had agreed to a compromise in which the Senate, on balance, came out ahead. Reagan insisted on prohibiting pooling but agreed to the ICC. The SHPC, which was the most debated provision in both Houses, was stronger than the Senate version, but the ICC was given the power to make exceptions. Finally, "the section requiring carriers to furnish reasonable and proper facilities was amended to require proper and *equal* facilities" (Haney 1968, 2:300, emphasis in original).

In Reagan's absence, final passage was managed by another southern Democrat, Crisp of Georgia. On 17 January 1887, Crisp moved to consider the conference report (231), which would have postponed action on pensions for at least one month. Crisp lost on a largely party-line vote. Pensions were evidently taken care of, because on 21 January the ICA was passed by the overwhelming vote of 219 to 41.

President Cleveland signed the ICA on 4 February 1887.

3.4 The "Economic Interests" Model versus the Spatial Model

In the three years prior to enactment of the act, the relevant roll call votes fit the spatial model fairly well—as we discussed above, when very lopsided votes and votes on issues (e.g., free passes for ministers) unrelated to the key regulatory provisions of the act are excluded, the aggregate PREs are in the range of .6 to .7.

The reason the spatial model does so well is the basic regional character of the voting. The bedrock of Reagan's coalition was the solid phalanx of southern and border-state Democrats. The core of the opposition tended to be from New

England and the big eastern cities. But, since both political parties had substantial numbers of representatives from the Northeast in the 48th and 49th Houses, the parties were at times split internally—West versus East for the Republicans, North versus South for the Democrats. These splits between regions and parties are indeed captured, as seen in figures 3.1 to 3.3, by the D-NOMINATE measures of long-term preferences.

These measures, as seen in the figures, allow for party-line voting. Party discipline can be critical in maintaining coalitions, as we saw both in the sequence of votes that led the House to separate-but-equal and the sequence that preserved a weak SHPC in the Senate. Constituent interests must have been largely similar for representatives and senators from the same state. Yet the expression of these interests in roll call voting could be cross-pressured by party allegiances as they were in much Senate voting on the ICA and in the key vote to adjourn the House after passage of the O'Hara amendment on racial discrimination. That is, some northern Democrats who initially supported nondiscrimination may have been genuine in their support. But since they may have valued railroad regulation even more strongly, they may have been willing to go against their preferences on the race issue in order to preserve passage of an interstate commerce bill.

Party allegiances are one way of trading votes. Another way is to trade with someone, in either party, who is relatively adjacent in spatial terms. Such trades are least likely to offend constituents who operate under low information conditions and use voting patterns to infer whether the representative is voting "correctly." Such trades may preserve a spatial voting pattern even if the cutting line fails to express "sincere" indirect preferences. Once votes are traded, simple constituency-interest models will not account for much of the voting.

Aggregate constituency variables will obviously have no marginal explanatory power on a pure party-line vote. Although constituency variables related to railroad issues may be correlated with party, such variables do not make much sense as an explanation of party control of a district unless one is prepared to argue that constituency interests on railroads outweighed all other issues, such as tariffs and coinage. Moreover, when there are deviations from party-line votes that split two senators from the same party and the same state (as we saw with the Alabama and Georgia delegations on the Edmunds amendment in the Senate), aggregate variables cannot correctly classify both votes. In contrast, if one senator's voting record consistently differed from the other's on a broad spectrum of issues, the split could be correctly classified by D-NOMINATE.

To demonstrate the weakness of constituency interest models in the ICA context, we utilize the variables constructed by Gilligan, Marshall, and Weingast (1989) to analyze voting in the 49th Congress. Three of these, return on railroad investment (ROI), railroad capitalization (CAP), and value of farmland (LAND), are measured at the state level and might be thought to apply

better to the Senate than to the House. Two others, north and west of Chicago (WEST) and rail center (CENTER), are dummy variables coded for each district. In our Senate estimations, we assigned each of these variables its average value for the state.[23]

Our basic technique is to run linear probability models on the votes, correcting for heteroscedasticity by using White (1980) standard errors.[24] We do this (1) for a regression in which the first- and second-dimension spatial coordinates of the senators/representatives are used as regressors, (2) a regression using the economic variables, and (3) a regression combining the two sets of variables.[25]

Table 3.4 shows the relative impact of the spatial coordinates and constituency variables by reporting both the adjusted r-squares and the percentage of the votes correctly classified for each of the three models.

In the Senate, the spatial model did very well with party-line votes (155, 156, 163–65). Although these were close votes, the spatial model achieved a very high level of classification. Almost all of this was from the correlation of the first dimension with party. The t-statistic, based on White standard errors, was never below twelve for the first dimension, whereas the second dimension was not significant, at conventional levels, for three of the five roll calls. In contrast, classifications and adjusted r-squares are poor for the economic variables. Indeed, when the two models are combined, adjusted r-square actually falls for three of the five votes relative to the spatial model.

Economic interests appear more significant on the five position-taking votes in the Senate (161, 166, 344–46). The gap between the two models is not large, and the economic model is better on votes 345 and 346. Neither model does particularly well by itself. However, the combination of the two appears to have some punch on votes 344 and 345.

Finally, neither model can account for religion (158–60).

In the House, the spatial model does better than the economic interests model on all the votes in terms of adjusted r-square. Overall, the economic variables add very little in terms of classification over the spatial model.[26]

The spatial model is particularly strong on the three closest votes, the Hiscock substitute (177), Reagan versus Cullom (191), and Crisp's move to consider (231). On these three votes, the economic variables classify only 73 to 81 percent, whereas the spatial model classifies 90 to 94 percent with adjusted

23. On WEST, only Illinois has a value other than zero or one.

24. We found very little difference in statistical tests done using White standard errors and tests based on standard probit estimates. The linear probability model, however, is more readily interpreted.

25. We dropped vote 167 for the Senate because it was too lopsided, 47–4, to estimate with any reliability.

26. However, the adjusted r-squares for the two models are almost identical on the final passage vote on the Reagan bill (193), and the economic variables classify better on the vote.

Table 3.4 **Economic Interests versus Spatial Voting on the Interstate Commerce Act in the 49th Congress**

	Adjusted R^2			Correct Classifications					
Roll Call	Econ.	Spat.	Both	Econ.	Spat.	Both	Maj.	*N*	Topic
					Senate				
155	.476	.640	.702	82.3	88.7	88.7	54.8	62	SHPC (Camden)
156	.174	.859	.851	76.3	96.6	96.6	54.2	59	SHPC (Cameron)
158	−.002	−.013	−.024	75.8	72.6	72.6	72.6	62	Free passes
159	.113	.079	.113	91.1	84.4	91.1	84.4	59	Rates for ministers
160	−.100	−.023	−.136	66.7	66.7	66.7	66.7	53	Reduced rates
161	.161	.297	.351	83.0	78.7	89.4	70.2	47	Regulate RR and water
163	.317	.793	.786	75.5	94.3	94.3	50.9	53	SHPC (Edmunds)
164	.366	.689	.710	76.3	89.8	91.5	52.5	59	SHPC (Camden)
165	.291	.749	.748	74.1	93.1	93.1	53.4	58	SHPC (Edmunds)
166	.325	.390	.465	81.8	80.0	87.3	60.0	55	Delete SHPC section
344	.323	.359	.559	85.2	85.2	90.7	75.9	59	Consider conference report
345	.386	.344	.511	82.1	76.1	86.6	59.7	67	Recommit conference report
346	.169	.127	.196	77.6	77.6	76.1	73.1	67	Final passage ICA
					House				
29	.251	.267	.360	85.8	85.8	86.7	81.7	240	Suspend rules
152	.033	.065	.112	59.9	65.7	67.3	59.1	242	Consider Senate bill
153	.072	.191	.225	89.5	89.5	90.4	89.5	228	Close debate
155	.226	.504	.526	72.7	82.2	84.6	59.7	253	Consider Senate bill
177	.249	.750	.754	72.8	93.0	93.0	55.3	228	Hiscock: Reagan v. Cullom
190	.271	.488	.535	82.1	85.3	87.6	73.9	218	Order previous question
191	.375	.702	.737	81.1	90.3	94.1	56.3	238	Reagan v. Cullom
192	.424	.592	.667	91.7	87.3	85.6	69.0	229	Recommit Reagan bill
193	.322	.324	.411	86.9	87.7	89.8	82.6	236	Pass Reagan bill
231	.258	.705	.714	76.4	88.8	89.6	54.8	250	Consider conference report
239	.108	.126	.169	82.7	82.7	83.1	82.7	277	Final passage ICA

Notes: All figures refer to actual votes and pairs. *N* = total number of actual votes and pairs; *Econ.* = regression on constant, WEST, CENTER, CAP, ROI, and LAND; *Spat.* = regression on constant, first-dimension score, and second-dimension score; *Both* = regression on all above variables; *Maj.* = percentage on majority side. WEST = 1 is district is north and west of Chicago, 0 otherwise; CENTER = 1 if district is a rail center, 0 otherwise; ROI = return on railroad investment; CAP = value of railroad capitalization; LAND = value of farmland. For more details on these variables, see Gilligan, Marshall, and Weingast 1989 and Poole and Rosenthal 1993a.

r-squares all above .70. The combined model is not a great improvement over the spatial variables by themselves.

The improvement of the spatial model over the marginals is far more modest on those hurrah votes where the majority exceeded 80 percent (29, 153, 193, and 239) and the two early procedural votes (152 and 155) that also do not obey the usual regional pattern of voting. On this pair of votes, it might have been possible that voting was dominated by local constituency interests. Nonetheless, at least in terms of the economic variables, constituency interests do very poorly on these two votes.

It might be argued that the findings of this section are simply the result of the Gilligan, Marshall, and Weingast (1989) variables being poorly measured or inappropriate. But elsewhere, we have told a similar story for minimum wage (Poole and Rosenthal 1991b), strip mining (Poole and Romer 1993), and a larger set of roll calls (Poole and Rosenthal 1985). It is probably also the case that, in addition to the countless published studies where specific roll calls have been analyzed in terms of aggregate variables related to the issue, there are countless other studies with negative results that remain unpublished. If measurement is always an excuse, the narrow, issue-specific version of the principal-agent paradigm can never be falsified. We believe, moreover, that the long-term variables do better not just because of measurement advantages but because the issue-specific approach ignores the dynamics of coalition building in Congress. As coalitions are typically built within the long-term dimensional structure, most roll calls, even on very detailed economic policy provisions, are largely accounted for in the D-NOMINATE results.

3.5 Abstention of the ICA Votes

To provide further verification of the relevance of long-term preferences, we now analyze turnout as well as choice for the 323 members of the 49th House who voted on at least one of the eleven ICA votes.[27] Except for the final passage vote, where abstentions were only 14 percent, abstentions ranged between 21 percent and 33 percent in ICA voting. The rate of abstention on ICA roll calls was about the same as the overall abstention rate in the 49th House, which was 29 percent. These abstention rates are very high in comparison to those for the modern Congress (7 to 8 percent). The high rates result in a rich set of observations.

We hypothesize that abstention has two sources.

First, illness, a visit to the constituency, or some other business, may have made being present or paired unusually costly. These "costs" are thought of as independent of the alternatives in each ICA vote. As proxies for these costs, we use two variables. ABSPREV is a dummy variable coded one if abstention occurred on the immediately previous roll call. ABSAVG is the fraction of times the representative abstained on the second through twenty-sixth previous roll calls. The obvious hypothesis is that a poor recent record of turnout, regardless of the nature of the roll call, is predictive of current turnout.

Second, holding cost constant, we can expect nonvoting from indifference (Hinich and Ordeshook 1969). Members who see roughly equal utility from voting yea and voting nay, with utility indicated by D-NOMINATE, may stay away.

Our two "cost" variables may produce a bias *against* finding positive results

27. We excluded those who never voted from the analysis, since their abstention was almost certainly due to illness or other sources of absence not related to ICA preferences.

for the indifference hypothesis. Indifference on impending ICA roll calls could result in a decision to be absent for one or several days. Thus, our "cost" variables may indicate some effects that are truly indifference effects. We think this is not the case. ABSPREV is highly significant, even when, with votes 231 and 239, the previous roll call was two days before the current roll call. It is also highly significant when the previous roll call concerned silver (29), the navy (152 and 155), withdrawing a land grant to the Northern Pacific (177), a pension for Mary Anderson (190), agriculture (231), and support for common schools (239), as well as when the previous roll call was on the ICA (153, 191–93). ABSAVG is also always highly significant, even though at most four ICA votes enter into the twenty-five-vote average. Moreover, the qualitative results of this section, in contrasting the spatial coordinates with the economic variables, are preserved when ABSPREV and ABSAVG are not utilized.

We use a trinomial logit model to test both the cost and the indifference hypotheses on the basis of the D-NOMINATE utility model. The D-NOMINATE utilities for yea and nay are

$$U(\text{Yea}) = \beta\exp(-d_y^2) \qquad \text{and} \qquad U(\text{Nay}) = \beta\exp(-d_n^2),$$

where the distances (d_y or d_n) are from the legislator's spatial position and the spatial locations of the vote outcomes. The computed D-NOMINATE utility difference used in the logit results reported below is simply $(U(\text{Yea}) - U(\text{Nay}))/\beta$ computed from the estimated coordinates. (Abstention decisions were not used in the D-NOMINATE estimation.)

We normalize the utility of abstention to zero and allow it to be the residual category in the logit analysis. Each variable in the trinomial logit receives two coefficients, one for the comparison between yea and abstain, the other for the nay-abstain comparison.[28]

The hypothesis that abstention on recent roll calls is predictive of current abstention was easy enough to test. The coefficients for ABSPREV and ABSAVG should all be negative. All twenty-two (corresponding to eleven votes) coefficients were negative when the variables were a constant,

28. The underlying equations being estimated were

$$U(\text{Abstain}) = 0 + \text{error}$$

$$U(\text{Yea}) = \beta_{0y} + \beta_{1y}(\text{D-NOMINATE utility difference}) + \beta_{2y}\text{ABSPREV} + \beta_{3y}\text{ABSAVG} + \text{error}$$

$$U(\text{Nay}) = \beta_{0n} + \beta_{1n}(\text{D-NOMINATE utility difference}) + \beta_{2n}\text{ABSPREV} + \beta_{3n}\text{ABSAVG} + \text{error}.$$

In other specifications, the economic variables were included as additional linear regressors. A possible alternative approach would be to estimate an ordered probit or logit model, with the ordering of alternatives being nay, abstain, and yea. While the utility difference and the economic variables could provide a linear equation that is monotonically related to these categories, order should not be monotone in ABSPREV and ABSAVG. This fact rules out using ordered estimation.

D-NOMINATE utility difference, ABSPREV, and ABSAVG. The 0.01 significance level was reached by twenty-one of the ABSPREV coefficients and nineteen of the ABSAVG.

A test of the joint hypothesis that voting has positive costs and that there is nonvoting from indifference is furnished by the cost and constant terms from the trinomial logit. All twenty-two of the constants (intercepts) were positive, twenty-one at the .01 level. But from these positive coefficients, the negative effects of ABSPREV and ABSAVG must be subtracted for the net effect. In fact, someone who never voted on the past twenty-six roll calls (ABSPREV = ABSAVG = 1) is always predicted to abstain when the person is strictly indifferent in terms of yea-nay utilities. And even with ABSAVG = 0, an indifferent voter who missed the previous vote is predicted to abstain on six of the eleven ICA roll calls. On the other hand, someone who had just voted is always predicted to vote even if all twenty-five previous roll calls were missed (ABSAVG = 1, ABSPREV = 0). In summary, if an individual's cost of voting can be approximated by his past turnout record, the cost becomes positive when the representative missed the previous roll call and had a sufficiently low level of turnout in the recent past.

The indifference hypothesis can be tested by the utility regressor. Its coefficient should be positive in the contrast of yea and abstention, negative in the contrast of nay and abstention. That is, we now test whether the spatial model can differentiate both "yea voters" from abstainers and "nay voters" from abstainers, whereas the earlier logit models tested whether a variable differentiated yeas from nays (table 3.4).

The test for the ability of the spatial model of differentiate voters from abstainers was highly successful. The utility regressor had a positive coefficient in the yea-abstain contrast and a negative coefficient in the nay-abstain contrast in the estimated equation for every roll call. The .01 level was reached by twenty-one of the twenty-two estimated coefficients (see table 3.5).

A similar test can be applied to the economic variables. If the variables can differentiate voters from abstainers, the variable's sign in the yea-abstain contrast should be opposite to its sign in the nay-abstain contrast. But, as seen in table 3.5, there are many instances when the economic variables do not have opposite signs. When opposite signs occur, the .01 significance level is reached by only one-third of the coefficients with opposite signs.

The D-NOMINATE utility variable thus better describes abstention than do the economic variables. This point is reinforced when the two sets of variables are used jointly. (See table 3.5.) The D-NOMINATE variable retains opposite signs in ten of the eleven equations, with sixteen of the twenty corresponding coefficients significant at the .01 level. In contrast, even when the economic variables have coefficients of opposite sign, the coefficients are almost never significant at the .01 level.

A large nonspatial component to abstention is demonstrated by the systematically strong results for ABSPREV and ABSAVG. But equally strong results

Table 3.5 **Opposite Signs in Trinominial Logits**

Variable	Coefficients Opposite in Sign	Opposite Coefficients Significant at the .01 Level
Spatial model		
D-NOMINATE	22	21
Economic model		
CENTER	4	0
WEST	16	5
CAP	14	5
ROI	18	7
LAND	12	4
Combined spatial and economic model		
D-NOMINATE	20	16
CENTER	4	0
WEST	10	0
CAP	8	2
ROI	10	1
LAND	12	1

Notes: The number of roll calls with opposite signs is half the number of coefficients shown in the first column. All equations are estimated with a constant and the variables ABSPREV (= 1 if legislator abstained on previous roll call, 0 otherwise) and ABSAVG (fraction of abstentions by legislators on second through twenty-sixth previous roll calls). D-NOMINATE = utility difference defined in the text. For the other variables, see the notes to table 3.4.

for the D-NOMINATE regressors indicate that abstention is also related to indifference. The economic variables were much less successful in capturing this indifference relationship. The estimated coefficients for the Cullom versus Reagan vote (191), shown in table 3.6, illustrate this point. The relatively parsimonious spatial model in the first column classifies 83 percent correctly, whereas the constituency-interest model in the second column classifies at a somewhat lower level, 79 percent. Combining the two models results in only one additional correct classification over the spatial model. While the economic variables as a set make a highly significant addition to the log-likelihood, the estimated coefficients for the combined model (column 3) show a limited impact on abstention. CENTER is the only economic variable with coefficients of opposite sign, and both of these coefficients are not significant, even at the .1 level. For WEST, CAP, and ROI, as these variables are increased, the probabilities of voting yea and voting nay both increase, while the opposite happens with LAND. None of the economic variables significantly differentiates yea voters from abstainers.

3.6 Conclusion

In this paper we have sought to convey how economic interests can be filtered and redirected by the political process. The need to form legislative majorities gives strong incentives for vote trading. Roll call votes reflect these

Table 3.6 Trinomial Logit Estimates for the Reagan versus Cullom Vote (191)

Coefficient	Spatial Model	Economic Model	Combined Model
Constant, yea-abstain	3.286*	4.355*	3.047*
	(0.541)	(0.798)	(0.848)
Constant, nay-abstain	3.080*	0.174	−0.188
	(0.529)	(0.813)	(0.921)
D-NOMINATE, yea-abstain	9.638*	—	9.508*
	(2.111)		(2.254)
D-NOMINATE, nay-abstain	−9.867*	—	−11.365*
	(2.105)		(2.676)
CENTER, yea-abstain	—	−0.475	−0.757
		(0.633)	(0.716)
CENTER, nay-abstain	—	−0.048	0.239
		(0.608)	(0.673)
WEST, yea-abstain	—	−0.960	0.950
		(0.972)	(1.061)
WEST, nay-abstain	—	2.743*	2.618*
		(0.894)	(0.950)
CAP, yea-abstain	—	−0.451	1.592
		(1.451)	(1.671)
CAP, nay-abstain	—	5.583*	4.863*
		(1.372)	(1.529)
ROI, yea-abstain	—	0.009	0.057
		(0.063)	(0.070)
ROI, nay-abstain	—	0.249*	0.281*
		(0.060)	(0.069)
LAND, yea-abstain	—	−0.125	−2.314
		(1.488)	(1.647)
LAND, nay-abstain	—	−4.663*	−4.522*
		(1.459)	(1.529)
ABSPREV, yea-abstain	−3.438*	−3.551*	−3.728*
	(0.549)	(0.512)	(0.610)
ABSPREV, nay-abstain	−3.181*	−2.969*	−3.663*
	(0.529)	(0.520)	(0.634)
ABSAVG, yea-abstain	−5.333*	−5.486*	−4.986*
	(1.047)	(1.019)	(1.019)
ABSAVG, nay-abstain	−4.487*	−4.509*	−5.152*
	(0.933)	(0.938)	(1.154)
Log-likelihood	−134.997	−186.164	−114.923

Notes: Asymptotic standard errors in parentheses. See tables 3.4 and 3.5 for definition of variables.
*Significant at .01 level.

trades; thus any simple relationship between economic interests on an issue and voting behavior is likely to be obscured, particularly when the vote is likely to be close. Political parties, even more so in the last half of the nineteenth century than today, are a key vehicle for the trades. The diversity of the economies of the geographic constituencies suggests complex, multidimensional patterns of interests. But majority rule induces coalition behavior that transforms these interests into relatively simple voting patterns.

The simple voting patterns that result from the formation of legislative majorities need not contradict the goal of obtaining an electoral majority in a constituency. Both in the 1880s and today, there are hundreds of roll calls in each Congress. Not taking the position indicated by aggregate economic variables on any one issue may not generate significant electoral damage, particularly if the legislator courts the favor of an intense minority on each issue (Downs 1957, 55–60).

Roll call voting following simple patterns consistent with the spatial model is evidenced in the votes on railroad regulation. When the issue finally reached the stage of recorded votes in Congress, it had become a question of the degree of regulation, not whether there should be regulation. By this time, there had been enough experimentation with regulation in the states that the effects of differing types of regulation were clear. Consequently, the various shades of regulation became the battleground and tended to be mapped into coalitions that followed the existing political party structure with some slight modification due to regional interests.

This coalition behavior appears to affect abstention as well. Abstention was common during the time period considered in this paper. Trips back home and illnesses both tended to be prolonged. Controlling for long absences, we found individuals close to being indifferent on an issue were likely to abstain.

We strongly suspect that abstention may also be strategically related to vote trades. Buying a nonvote is half as good as buying a vote; since nonvotes involve less harmful position taking than vote switching, two nonvotes may be cheaper than one switched vote. The shifting of opponents to abstainers and abstainers to proponents was shown to be critical in maintaining a weak SHPC in the Cullom bill in the Senate.

In summary, roll call voting and abstention decisions on railroad regulation can be viewed as a pattern of behavior that was manifested on many other issues that arose at the same time. The prevalence of this pattern suggests that students of legislation concerning a specific regulatory policy area must consider how that area relates to the overall activity of Congress.

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