THE INSTITUTIONAL DETERMINANTS OF THE SMOOT-HAWLEY TARIFF

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The closeness in timing, and possible intimate connection, between the Great Depression and the Smoot-Hawley tariff continues to compel the curiosity of economists and political scientists. Despite the large amount of attention given to it, questions about the causes and effects of the tariff remain unresolved.

The most compelling issues involve the causes of the tariff, known for having produced the most protectionist tariff regime in U.S. history, and its effects on the economic crisis of the 1930s. As for the effects, in his 1932 presidential campaign, Roosevelt blamed Hoover's handling of the tariff for the depth of the depression.[1] Contemporary critics, including Bidwell (1932) and Slichter (1932), similarly assigned a large role to Smoot-Hawley for the economic contraction, and for decades this critical view of the effects of the tariff dominated. In the conventional view, the mechanisms were thought to work either through the direct effect of the tariff on relative prices or through indirect effects on international retaliation.[2] Eichengreen (1989), in a highly influential piece, argued that, in light of the evidence, neither of these effects was large enough in magnitude to explain the Great Depression. His contribution led a reversal of economists' views about the effects of the tariff. A recent study by Archibald and Feldman (1998) proposes to alter the current course and restore a causal link between the tariff and the depression by highlighting an overlooked mechanism. They argue that fierce opposition to the tariff in the Senate created investment uncertainty and triggered the stock market crash of October 1929.

Their proposed mechanism links the depression not so much to the outcome of the tariff legislation as to uncertainties, prior to the final outcome, about the form the legislation would take. These uncertainties arose especially from the majority party leadership's loss of control of the bill in the Senate in September and October 1929. The financial press in New York reacted negatively to the successes of a coalition of Democrats and insurgent Republicans who mounted a concerted opposition to the bill (Eckes 1998). This paper shows a connection between the institutions that governed the decision-making process in the Senate with the uncertainties highlighted by Archibald and Feldman, and Eckes. If one accepts their arguments about its effects, then a causal link is traced between the rules that governed decision-making in Congress and the Great Depression[AD3].

The focus of this paper is a quantitative examination of the political economy of the enactment of the Smoot-Hawley tariff. The original conventional view is attributed to E.E. Schattschneider's 1935 book, *Politics, Pressures, and the Tariff*, which canonized the Smoot-Hawley tariff as the quintessential example of interest-group politics gone awry. His book became a classic as a case study in interest-group politics, and its interpretation of the politics of the Smoot-Hawley tariff dominated scholars' interpretations until the 1980s. He argued that

legislators in the House and the Senate, especially in the standing committees that wrote and proposed the bill, engaged in a mutual accommodation, which he referred to as "reciprocal noninterference" in the protectionist demands coming from special interest constituencies from their respective electoral districts. In short, the record-level rates of tariff protection were awarded because of a grand log roll in Congress. The combined views of early analyses thus linked the severity of the Great Depression to interest-group politics in a Congress engaged in pork-barrel excess.

The main challenge to Schattschneider came from Pastor (1980), who argued that, though Schattschneider's interest-group interpretation of Smoot-Hawley "cut the lens through which Americans have visualized the making of U.S. trade policy," it was difficult to reconcile with the voting record in Congress. Only five Democrats in the Senate, and fourteen in the House, defected. So it is difficult to characterize it as anything other than a classic case of party politics. Either the protectionist ideology, which defined the Republican party at the time, or effective party organization seems sufficient to explain the bill's success.

Three econometric studies have since attempted to resolve this controversy over the causes of the Smoot-Hawley; yet rather than resolve the debate, they have reconfirmed it by giving support to both sides. Callahan, et al. (1994), conclude that the tariff was "the result of Republicans implementing their 1928 party platform," and that "taking into account the specific economic interests … makes surprisingly little difference" in voting behavior (pp. 683, 690). Cupitt and Elliot (1994) similarly find party membership to be the only consistently significant explanatory factor and no evidence that economic constituent interests were prominent. Both studies, thus, interpret their results as in support of Pastor's party-line explanation. If a grand log roll was responsible for the tariff it was that which was embodied in the divisions that separated Republicans and Democrats ideologically. Economic interest groups independent of party divisions, they conclude, had no significant influence on the legislative outcome. But contrary to these studies, Irwin and Kroszner (1996) find that the economic constituent interests, not captured by party membership, did strongly influence legislators' voting behavior. They also find evidence that protectionist special economic interest groups collaborated by trading votes, giving support to Schattschneider's argument that a log roll was responsible for the shape the bill took (p. 192).

We propose an alternative interpretation of the findings in these studies. By not fully developing the institutional framework needed, the studies cited are led to erroneous conclusions about the substantive significance of their findings. The study below reconciles many of the econometric findings in the previous papers, but it overturns their interpretations of those findings.

The argument focuses on how institutions both assisted and constrained the legislative outcome. Focus on two broad institutional features of congressional decision-making is needed to interpret their role properly. First, legislation in Congress does not come about by a single majority-rule decision; rather, it follows a process that includes multiple stages and series of votes and other strategic interactions. Congressional rules and procedures determine what is to be voted upon and in what sequence. Second, successful legislation requires cooperation between legislators, and legislators often form agreements to provide mutual support for each others' preferred policies. Such agreements are often noncontemporaneous; so to be effective, legislators must perceive them ex ante as credible. Congressional institutions provide mechanisms for enforcing agreements to cooperate. Our findings show how three types of institutional enforcement mechanisms that are prominent in the theoretical literature on congressional institutions influenced the shaping and passage of the Smoot-Hawley tariff. They include certain procedural restrictions, rules that assigned gatekeeping and veto powers to congressional committees and majority party leaders, as in Shepsle and Weingast (1987); and the central role of political parties, which Cox and McCubbins (1993) describe as legislative cartels, for enforcing party agendas.

How much influence a given legislator may have over the outcome differs from one stage in the process to the next. One expects legislators' behavior to vary with expected net gains and, therefore, the stage in the decision process at which the behavior occurs. Reinterpreted, the mixed econometric findings in the roll call studies of Smoot-Hawley cited above represent observations from different stages of a larger process of legislative decision-making that determined the Smoot-Hawley outcome.

The analysis proceeds as follows. To motivate our econometric model and empirical strategy, the next section offers our version of why the previous roll call voting studies of Smoot-Hawley differ. Section 2 gives some brief but essential historical background. Section 3 present our regressions on votes on amendments, comparable to Irwin and Kroszner (1996). Section 4 traces the path the bill followed as it went through the decision-making process and highlights key institutional constraints on that path. Section 5 presents our regressions on the votes in the Senate to pass the bill and compares them with the results in Section 3 and with the previous studies.[AD4]

1. Why Do Previous Roll call Studies Differ?

What explains the differences in the conclusions in the previous roll call voting studies of Smoot-Hawley? Significantly, each of the three studies chooses a different quantitative field of

observation from which to conduct its study. To explain, it was customary in the United States through 1930 to set tariff policy in omnibus tariff acts, which simultaneously set the entire range of duties on imported goods. Smoot-Hawley was the last omnibus U.S. tariff act of its genre. In the case of Smoot-Hawley, the number of roll calls conducted was quite large. Four different votes to pass the bill were held, one to pass the initial bills proposed in each chamber, House and Senate, and then one each to pass the final bill submitted by the conference committee. Besides these, some X votes were conducted on rules, and Y votes on amendments were held to modify specific tariff rates. Each study chooses a different set of roll calls from this pool to serve as the dependent variables for their regressions. Callahan, et al, look at the initial and final votes for passage of the bill in the House of Representatives. Cupitt and Elliot look at the votes on eleven amendments to alter particular tariff rates and the vote on final passage in the Senate. Irwin and Kroszner look at votes on amendments to modify tariff rates in five specific industries.

At first pass, it may seem natural to consider the roll call votes on the passage of the bill to be the best candidates for capturing the overall character of support for the bill. Callahan, et al., follow this logic, and focus their study on the initial and final passage of the bill in the House in May 1929 and June 1930. They find robust significance for partisanship but no evidence of economic interest-group pressure for increased protection. [AD5] As noted, they interpret these results as a corroboration of Pastor and a rejection of the interest-group explanation offered by Eichengreen or Schattschneider.

As criticism of Callahan, et al., Irwin and Kroszner (1996) point out that one should expect different results depending on whether the vote was for passage of the bill or on an amendment to modify the bill prior to passage. Using votes on passage of the bill, they argue, biases the test against finding special-interest influence. As an omnibus bill, the vote for passage involved a decision to accept or reject the entire package of tariff rates bundled together. Legislators, who had commitments to multiple constituencies, faced offsetting demands in support and in opposition to the bundle of tariff rates. Offsetting special-interest demands would therefore dilute their salience in the final vote.[3] Votes on amendments did not face the same degree of multidimensionality. A large number of the amendments submitted were proposals to alter a single, sector-specific tariff rate. In these cases, organized special interests had greater incentive to exert pressure on their representatives. It was understood that the battle over their preferred piece of the legislation would be fought and won (or lost) either in the committee proposals or in the amendment process. It follows that, even if economic interests are not detected in votes on passage, special, sector-specific economic interests may have had substantive

influence in the shaping of the bill, prior to its passage. If so, it is inaccurate to conclude that economic interests did not matter for the legislative outcome.

To test for special-interest influence on amendments, Irwin and Kroszner (1996) examine votes on amendments in the Senate to modify the tariff rates on five specific items – sugar, lumber, cement, glass and petroleum. Not surprisingly, they find that variables reflecting the prominence of the corresponding special economic interests in each state are statistically significant in four of the five sectors.[4] Though party was also a significant factor, their results challenge the previous studies' findings that economic interests were an insignificant influence. Their analysis goes further to test for the existence of a log roll between these four sectors, using a test for logrolling introduced by Thomas Stratmann (1992), for which they find also evidence. Besides the interest-group explanation, this results lends support as well to Schattschneider's proposition that the notoriously protectionist character of the act was the result of a grand log roll in Congress.

Despite the valuable insight, their results do not settle the debate. First, the evidence in the literature overall remains mixed. Cupitt and Elliot (1994) perform similar tests on both the final vote and eleven amendments to modify specific tariff rates in the Senate. Yet, contrary to Irwin and Kroszner, they find little support, even in the amendments, for sector-specific constituent interests, but consistent and strong support for the influence of party affiliation.[5] Second, even if we accept Irwin and Kroszner's finding that special economic interests helped the "shape" the bill, it does not lead necessarily to a rejection of Pastor's party-line explanation of the bill's passage. Instead, it suggests that Schattschneider's and Pastor's propositions may not be mutually exclusive, competing explanations. Third, a similar problem limits the generalizability of the findings of Callahan, et al. Their study is framed narrowly to test a specific protectionist coalition of economic interests that was proposed by Eichengreen (1989). Their test leads us to reject Eichengreen's coalition[AD6] as an explanation for the final passage of the bill, but it does not rule out other possible coalitions of interests.

Our analysis reconciles many of the econometric findings in the these papers, but it overturns their interpretations. Mixed and apparently contradictory findings in previous studies can be explained as observations from different stages of a larger decision-making process. A key contribution of our analysis is to show how the influence of voting on the final shape of the bill was constrained by procedural or non-voting aspects of the decision-making process. Non-voting institutions, including procedural restrictions and party organization, explain why the econometric findings differ.

2. Historical Background: the Political Demands for the Tariff

Until the Great Depression, tariff policy in the United States was set by omnibus tariff acts, revised on average every seven years. "The tariff" dominated political debate and defined parties' electoral platforms. For more than half a century, every major Democratic tariff bill lowered tariffs, and every major Republican bill (except 1909) increased them. The average tariff reached an historical peak under the Republican Smoot-Hawley tariff, which revised upward the already high tariffs of the Republican Fordney-McCumber tariff of 1922 (Bailey, Goldstein and Weingast 1997, Irwin 1998a).

The 1930 revision came after Hoover's landslide victory in 1928. In that election, he had vowed to assist the depressed agricultural sector, and declared he would meet the promise with a limited tariff revision to increase trade protection of agricultural goods (Schattschneider 1935, p. 32). Farmers historically were not tariff enthusiasts, but in 1928 they sought to redress a perceived imbalance in the rate structure of existing tariffs since the Fordney-McCumber Act of 1922. The existing structure exhibited higher-than-average duties on import-competing inputs into agricultural production and lower-than-average duties on exported agricultural goods. Farmers' concern, then, was over their effective rate of protection, and that the tariff revision be limited to import-competing agricultural goods was an important issue for them. Furthermore, since farmers were exposed more to export competition, they also sought export subsidies as well (Bauer, de Sola Pool and Dexter 1972, pp. 17-22; Kaplan 1996; *Congressional Record*, 71st Congress).

Debate heated up in Congress as Hoover's proposal for a limited revision of agricultural tariffs was abandoned and replaced, as Schattschneider describes, by an across-the-board rate-hiking frenzy (Schattschneider (1935). Farm interests voiced strong opposition to the compositional change and demanded that the bill be restored to its original agriculture-only intent. Farmers lost the battle, however. In the final bill, the new rate structure reflected an across-the-board increase in tariffs. Tariff rates on agricultural products gained relative to the 1922 act, but remained below average *ad valorem*, and farmers' demands for export subsidies were not met.[6]

Some details in the debate are important for the construction of the empirical model below. The bill passed from the House to the Senate Committee on Finance in May 1929. While under consideration in Senate Finance, an opposition coalition of Democrat and insurgent Progressive Republican senators, led by William Borah (R-ID) and Robert La Follette (R-WI), mounted an attack against the proposed increase of tariffs on manufactured goods. During the five months from October to March, the Republican leadership lost control of the bill. The

insurgent coalition, working in the Senate Committee of the Whole, restored the agriculture-only character of the bill. Hundreds of amendments, affecting all fifteen tariff schedules, were proposed and passed by the insurgents, increasing duties on agriculture and lowering them on other products, especially those targeted as costs to farmers (*Congressional Record*; Kaplan 1996, pp. 25-29).

The bill passed from the Senate Committee of the Whole to the Senate proper on March 4. As it did, the Republican leadership led by Reed Smoot (R-UT), chair of the Finance Committee, mounted a counteroffensive to regain control of the bill and reverse the "damage" done by the insurgents. Leaders coordinated a series of amendments aimed at restoring some of the tariff rates that had been reduced or eliminated when the Republican leadership had lost control. The success of the counteroffensive gave the impression that the across-the-board character of the bill was being restored. However, it is obvious from the record that certain strategic sectors were targeted and given priority. The insurgent coalition scandalized the counterattack, blaming it on an alleged log roll consisting of the "strange concoction" of privileged interests – sugar, timber, oil, cement and glass – organized by Smoot, the chair of the Finance Committee.[7]

3.1 The Empirical Model of Senate Voting Behavior

Dependent variables. Previous studies have differed as to whether it is best to focus on votes for passage or on amendments to modify specific rates. As noted, Irwin and Kroszner (1996) choose votes on amendments as dependent variables to focus their study on the question of special-interest influences. Their dependent variables are roll calls on amendments to modify tariffs on five sectors – sugar, timber, oil, cement and glass – those sectors named in the alleged counteroffensive log roll. This choice clearly uses out-of-sample information – the allegations in the congressional deliberations – to increase the probability of detecting special-interest influence and logrolling behavior. The other studies cited favor examination of votes on passage to capture the overall political support for the bill. To establish greater comparability, we examine the votes on the five sectors alleged in the log roll (the same sectors Irwin and Kroszner examine). In Section 5, we examine the votes in the Senate to pass the initial and final bills[AD7].[8] Before doing this, in Section 4, we introduce additional structure which places the results from both sets of regressions into their larger institutional context. From this, we see that the two sets of regressions address distinct questions and their answers are non-competing.

The previous roll call voting studies of the Smoot-Hawley tariff adopt a standard theoretical framework, the Stigler-Peltzman rational-voter model , which posits an agency

relationship between legislators and constituents (Stigler 1971, Peltzman 1976). Constituents (principals) contract with legislators (agents) to act as representatives in exchange for a commitment to vote in support of their (the constituents') preferred legislation. Self-interested legislators who seek reelection have an incentive to represent their constituents' interests faithfully. Roll calls, then, provide evidence of legislators' voting behavior, which can be tested for special-interest influence. In the case of an amendment to raise or lower a sector-specific tariff, do legislators from states where this sector is concentrated tend to vote in the sector's interests?

The second influence we are examining is the influence of partisanship. Two literatures interpret the role of partisanship differently. Work associated with public choice, perceives ideologies and constituent interests as substitutes in legislators' policy preference functions. In this framework, the legislator who votes her personal ideology is seen as neglecting her constituents' interests.[9] Work in the last three decades in the political science literature on congressional institutions has transformed and largely replaced the former view. Significant here is Cox and McCubbins (1993), who argue that political parties and ideological agendas may be thought of as "legislative cartels" whose principal function is to organize and enforce the collaboration of legislators with similar overall, or long-run, preferences. In this frame, votes that follow an ideological pattern do not reflect the personal interests of legislators but, instead, their collaboration to achieve a joint goal. Measures of partisanship thus bundle economic interests along with any other interests of the parties' constituents.

We structure our test for these two influences using a standard approach, although our model, given in Equations (1.1) and (1.2), incorporates some features not included in previous studies intended to improve the efficiency of the estimation[AD8]. Focusing first on the votes on amendments, if $y_{ij} \equiv \text{Prob}(v_{ij} = 1)$, and v_{ij} is the vote announced by senator i , and j indicates one of the five sectors – sugar, timber, oil, glass, or cement.

$$y_{ij} = \beta_o + \beta_1 x_{1ij} + \beta_2 x_{2ij} + \beta_3 z_{ij} + \varepsilon_{ij} \tag{1.1}$$

$$z_i = \gamma_o + \gamma_1 x_{2i} + u_i \tag{1.2}$$

The explanatory variables fall into three categories: x_1 is a list of variables that capture the special interests in senator i's constituency; x_{2ij} represents general economic or political interests, and z are variables that capture the partisanship of senator i. The measures used in each category are explained below.

A shortcoming of the standard approach is an absence of structure for handling series of related votes. The episodes of insurgency and counteroffensive in the Senate Committee of the

Whole and Senate floor produced several series of related amendments – amendments that, in effect, rehashed former decisions. Amendments to modify specific tariff rates in each of the five sectors under consideration were brought to roll call votes multiple times. First, rates in each of the five sectors were lowered by amendments approved in the Committee of the Whole between November 6 and February 28. Then, after March 4, when the bill passed to the Senate proper, amendments were brought to the floor proposing to restore or raise the rates as amended by the Committee of the Whole. In most cases, the first attempt at counteroffensive failed, so these amendments were repeated until they succeeded (except for petroleum[AD9], which was abandoned after the fourth attempt).

An advantage of this rehashing for the current exercise is that it provides out-of-sample information that allows extension of the sample size and improves the quality of the estimates. Amendments rehashing rates on specific items meant that legislators repeatedly voted on nearly identical proposal pairs. This comes, in part, out of the nature of the institution of majority rule. Majority rule constrains the decision in any single vote to a binary choice – approve the "proposal" expressed in the amendment, or reject it thus preserving the status quo. As the bill went from the Committee of the Whole to the Senate floor, which of the two options in the pair was identified as the "proposal," and which the "status quo," was reversed; but the pairs being compared in each amendment were nearly identical. By assigning $v_{ij} = 1$ to votes in favor of raising protection, and $v_{ij} = 0$ to votes opposed, we pool the nearly identical votes on amendments submitted to raise or lower the tariff rates on the same item.

With this information, we can clarify the notation in Equation (1.1). Consider amendments k and m assumed to be inversely identical in the sense described above. Coding votes in favor of increasing protection as $v_{ij} = 1$ results in structural parameters, β_{ijk} and β_{ijm} , that are identical for given sector j and senator i . This is the case because all explanatory variables are senator-specific and invariant across amendments. Therefore, we suppress notation to distinguish amendments m and k in Equation (1.1) because the v_{ij} pool the roll calls on related amendments in a given sector that effectively rehash the same decision. Table A.1 lists the amendments included in the dependent variable for each of the five sectors. Pooling amendments in this way may violate the standard assumption of error independence, since votes cast by the same senator on different amendments are not independent. To account for this, we adopt robust standard errors that assume interdependence of errors associated with the same senator. The errors of different senators' votes are assumed to be independent.[10] The estimates are performed using a probit procedure.

Special economic interests. Equation (1.1) highlights three categories of explanatory variables – special and general economic interests and partisan influences. We identify two types of "special" economic constituent interests, x_1 in Equation (1.1). First are sector-specific *producer interests*. All five of our sectors faced import competition, and *producers* were in favor of increased protection in their sectors. Second are sector-specific *user interests*, which were industrial users of the items in question. They were opposed to increased protection in these sectors because it would raise their input costs. *Producer interests*, except in one sector, are measured as the ratio of the value produced in the specific sector to the value of aggregate production in each state. The exception is sugar. The prominence of sugar producer interests is measured in raw-sugar-equivalent metric tons produced per person in each state.

Sector-specific *user interests* are, in some cases, more difficult to capture because they are more dispersed.[11] We employ variables from among standard SIC categories from the U.S. Census of Manufacturing to approximate prominent industrial users of each of the five sectoral items. Industrial users of cement, glass and lumber are approximated by the shares of one or more subsectors of the construction industry in each state[AD10].[12] We attempt to capture petroleum-related user interests by the share of motor vehicle production in aggregate state-level production (to capture automobile producer interests), and net per capita sales of gasoline filling stations to capture automobile service and user interests. Industrial raw sugar user interests are measured by a dichotomous variable identifying states that had significant sugar refiner capacity,[13] and the share of the joint production value of confectioners and beverage bottlers in state production, which were the other most prominent industrial users of sugar. (See Table 1 for details about these variables.)

General economic interests. There is a need to distinguish between "special," sector-specific, economic interests and "general" economic interests, which were motivated by the tariff question at a more aggregate level. The most salient general economic issue, according to the record of debate, was the struggle between agricultural and non-agricultural interests over whether the tariff reform bill would redress the effective protection rate structure imbalance against agriculture introduced by the 1922 tariff act or respond to the political demands for increasing manufacturing tariffs across the board.

To capture the farm-bloc opposition to the across-the-board tariff increase, the best measure is one that identifies those farm interests that did not face import-competition, where the opposition was most intense. "Reciprocal noninterference" could not benefit producers of non-import-competing goods. This was especially characteristic of grain producers, especially wheat and corn, and cotton producers in the South. We capture these demographically broader economic

opposition groups with two variables. "*Grains*" sums the value of wheat and corn relative to aggregate state-level production; and "*cotton*" is the value of cotton production as a share of aggregate state-level production. These two variables serve also as proxies for two regionally defined political blocs. *Cotton* naturally is highly correlated with the idiosyncratic Southern Democratic vote, and *grains* is closely correlated with insurgent Republican progressives, who were prominent in Midwestern grain-producing states, though also in many western states. We do not attempt to unbundle the economic and political influences captured by these variables because the political identities of these groups were so closely linked to the regional farm and plantation economies.[14]

Partisanship variables. We perform two sets of regressions that employ alternative measures of partisan influence. One set measures partisan influence as party affiliation, which is captured in the variable "*party*" defined as a dichotomous variable with Democrat = 1, and others = 0.[15][AD11] The second set measures partisanship using D-Nominate scores (Poole and Rosenthal 1997).

Poole-and-Rosenthal D-Nominate scores summarize the information contained in the complete roll call record for each senator into two numbers, locating him in a two-dimensional coordinate "spatial model" of roll call voting. The scores are typically interpreted as two dimensions of partisan "ideology," assuming that a senator's long-run voting record should reflect his ideology. The first dimension, or *x-coordinate*, is coterminous with party-line divisions and is usually interpreted as reflecting ideological positions that correlate closely with party agendas. The second dimension, *y-coordinate*, which is orthogonal to the first, is typically associated with ideological positions that may differentiate members of the same party. Poole and Rosenthal argue that the *y-coordinate* varies historically in importance and is often of little significance for explaining overall patterns in roll calls. Historical moments when it increases in salience are often associated with particular issues. For example, from the late New Deal to the 1970s, the *y-coordinate* reflects within-party divisions over the civil rights movement. In 1928-1930, increased salience of the *y-coordinate* reflected the progressive movement which created divisions in the Republican Party (Poole and Rosenthal 1997, p. 230[AD12]).

Party and *x-coordinate* are highly collinear, so they cannot be used to try to separate statistically the influences of party and ideology, so defined. We take the two partisan measures as alternative ways to capture partisan influence. On the one hand, the D-Nominate scores jointly help to identify the influence of prominent party-line and non-party-line political divisions. On the other, *party* focuses upon the direct effects of party membership and may be expected to

perform relatively better the greater the role of party discipline over ideology as a determinant of the votes on Smoot-Hawley.

Clearly, the D-Nominate scores embed influences of economic interests with other motives affecting senators' voting habits. The literature supports a similar conclusion – that the party affiliation of senators is endogenous with the interests of their economic constituencies, since in electoral competitions economic constituents use party agendas as an indicator of how well they may expect an affiliated candidate to represent their interests (see Peltzman 1984).[16] We correct for endogeneity by treating *party*, or the *x*- and *y-coordinates* as dependent on general economic and political interests, x_2 . [AD13]Roll call votes in Congress to determine tariff reform are assumed to be dependent recursively on party or ideology, as in Equations (1.1) and (1.2). To correct for endogeneity bias, we use an IV procedure to estimate Equation (1.1). Instruments for *party* and the *x*- and *y-coordinates* are the predicted values from regressions of Equation (1.2), shown in Table A.2.

Logrolling. The roll call record on the series of nearly identical amendments on sugar, timber, oil, cement and glass shows a considerable about of switching from a revealed pro- or anti-protection position to the other. Considering the five items together, … an average of X out of 96 senators changed his vote from supporting to opposing increased protection on the same item at least once. Of course, the counteroffensive led by the Republican leadership after March 4 to regain control of the bill could not have been accomplished without systematically convincing a sufficient number of senators to "switch" their formerly revealed positions on each item targeted. The structural model in Equations (1.1) and (1.2) cannot capture systematic switching, since it predicts that, except for the error term, senators always vote the same if presented identical amendments[AD15].[17]

According to one view in the historical record, the switching we observe betrays an organized effort of the Republicans to build a coalition on specific items through a log roll. To incorporate the proposed log roll into the structural model, following Irwin and Kroszner (1996), we adopt the Stratmann's (1992) proposed method for testing for sector-specific logrolling. Stratmann's proposal is to introduce as explanatory variables the predicted values of votes from other sectors that might be involved in a log roll. Inclusion of the actual votes could introduce estimation bias if the errors on votes in the sectors being tested for logrolling are correlated, but Stratmann proposes that replacing actual votes with predicted votes corrects for this problem.

When interpreting the results, it is important to note that the Stratmann method tests for vote trading between economic *sectors*, not individuals. As a result, the effectiveness of this method as a test for logrolling depends on whether the intensity of preferences for legislation is

sector-specific. If legislators in one sector have strong preferences for their sector-specific legislation and weak preferences for or against another sector, they may have an incentive to trade votes[AD16]. The Stratmann test does not constitute a general test for logrolling, since the offer to trade votes may not be given to all representatives with interests in a given sector. In this study, however, the test seems to fit the allegation—contemporaries alleged that a sector-specific log roll involving sugar, lumber, oil, cement and glass was at the center of the Republican counteroffensive. If the allegations were correct, then we expect to see the votes to increase protection in one of the five sectors to correlate with the votes to increase protection in the others.

To incorporate the test for logrolling, we augment the right-hand side of Equation (1.1) with an additional set of "Stratmann variables," which are the predicted votes on amendments in the sectors $l \neq j$ alleged to have engaged in the log roll with sector j, as shown in Equation (2).

$$y_{ij} = \beta_o + \delta\alpha + \beta_1 x_{1ij} + \beta_2 x_{2ij} + \beta_3(1+\delta\zeta)z_{ij} + \delta\beta_4 \hat{w}_{ij} + \varepsilon_{ij} \qquad (2)$$

where $\hat{w}_{ij}$ is the vector of four predicted values, y_{il} = Prob(v_{il} = 1), for $l \neq j$ among the alleged logrolling sectors. The predicted values are estimated from regressions assuming no logrolling, $w_{ij} = \beta_o + \beta_1 x_{1ij} + \beta_2 x_{2ij} + \beta_3 z_{ij} + u_{ij}$. [AD17] We can test the hypothesis that no log roll occurred, $\beta_4 = 0$, which is rejected if at least one element β_4 is positive.[18] Finally, the log roll between the five sectors was allegedly launched after March 4. To capturing the timing, we interact β_4 with a dichotomous variable, δ, defined as δ = 1 after March 4, and δ = 0 otherwise.

An alternative way to conceptualize the post-March 4 log roll underlines the role of the majority party leadership as an institution that enforces log rolls consistent with the party agenda (Cox and McCubbins 1993, pp. 248-49). The turnaround in support for increased protection for our five items after March 4 might be explained by an intensified enforcement of majority party discipline. It might be attributed to threats of retaliation if defecting Republicans did not tow the party line. Beyond disciplinary action, the majority party leadership had institutional advantages to enforce any log roll. Its control of the agenda lowers the transaction costs of establishing credibility over the deals brokered, whether enlisting within-party or cross-party support. Majority party leaders may have chosen to leverage these advantages in response to the loss of control of the bill.

A complex log roll may be difficult to detect. To attempt it, Equation (2) incorporates a term that allows for a structural change in the coefficient on party membership, z_{ij}, after March 4, captured in the multiplicative term, $(1+\delta\zeta)$. The actions taken by the majority party leadership could either increase party discipline or broker a deal with willing Democrats; therefore, the

expected sign of $\beta_3\zeta$ *a priori* is ambiguous. Increased party discipline implies $\beta_3\zeta < 0$, but a deal enlisting Democrats might produce a positive value for $\beta_3\zeta$.

3.2. The Empirical Results on Senate Voting Behavior

It is useful to benchmark our results against two polar views about modeling roll call voting in Congress. Peltzman (1984, 1985) argues that legislators behave strictly as agents of their constituents. If measurement errors could be eliminated, legislators' voting behavior would be fully explained by representation of constituents' interests. Poole and Rosenthal (1997) argue that the Peltzman view implies that roll calls could be predicted by legislator-agents who look at constituents' interests on each roll call independently and vote those interests uninfluenced by decisions on other votes. It fails in particular to acknowledge strategic voting. Comparing roll calls on prominent historical economic issues, they find that a two-dimensional regression model using D-Nominate ideology scores outperforms (in all the cases tested) a multivariate regression constructed, in the spirit of Peltzman, of only economic variables (pp. 118-45). More generally, their work using the D-Nominate scores shows that most of congressional roll call voting history can be predicted accurately with just a single dimension, *x-coordinate*. Some congressional eras require a second dimension, *y-coordinate*, but third and higher dimensions rarely add predictive power. They argue that the powerful predictive capability of the two-dimensional D-Nominate model, usually interpreted as indicators of ideology, does not refute the role of economic interests in roll call votes; but it challenges the validity of a "simple-minded" economic interest-group model which treats votes as independent. That voting patterns follow so few dimensions, they argue, is evidence of the strategic nature of voting, which causes legislators to form coalitions and cooperate in political parties to coordinate mutual interests.

Our main results combine economic and partisan variables, which in light of Poole and Rosenthal's findings should be interpreted with care. Partisan variables, *x-coordinate* and *party*, reflect strategic cooperation of legislators along mainstream political party lines. *Y-coordinate* strategic behavior that may reflect divisions within a party or cooperation across parties. In preliminary regressions, we calculated three sets of baseline results against which to compare our main results -- a bivariate D-Nominate baseline, a univariate party-only model, and pure economic baseline, including only economic constituency variables. We find that the D-Nominate baseline performs strictly better than the other two baselines, which is consistent with Poole and Rosenthal's findings of the predictive power of the two-dimensional model. In the paper, we present only the results of the D-Nominate baseline as benchmark for comparison against results

combining alternate measures of partisanship, D-Nominate scores and party; economic constituency measures, special-interest and general-interest; and tests for logrolling. Significance of economic variables in these results is best interpreted as capturing economic constituent influence not correlated with the party line. Based on the geographical nature of major political party divisions of this time, and economic correlates based on regional comparative advantage, one should expect *grains* and *cotton* to be correlated with *y-coordinate*, which Table 3 shows to be correct. Further interpretation is given below.

As a basis for ranking various combinations, Table 2 summarizes measures of overall performance for each set of regressions. First, each model represented in the table rejects a Wald chi-square test of overall model insignificance at the 0.001 level (except for the oil sector in the D-Nominate-only model, which rejects the test 0.002). However, inspection leads us to reject the Poole-Rosenthal hypothesis that adding measures of economic constituent interests contributes little to performance. First, adding economic and logrolling variables improves the log-likelihood ratios by between 20 and 30 percent, depending on the model specification. Pseudo-R^2 indicators suggest that inclusion of economic and logrolling variables more than doubles the amount of variation explained in four of the five sectors, and almost doubles it in the fifth sector (glass)[AD18]. Models that incorporate economic constituency and logrolling variables perform consistently better than those that incorporate only economic constituency. Replacement of D-Nominate scores with *party* to capture partisan influence does not lower performance significantly, except for the cement sector. Joint tests of exclusion [AD19]of the economic constituency and logrolling variables indicate significance at the 0.01 level in most cases and at the 0.1 level or better in all but the cement sector.

The coefficient estimates are shown in Table 3. To read the table, note that the model specifications (columns in the table) are numbered 0-6. Even numbers are those which use D-Nominate scores to measure partisan influence; odd numbers are those which use *party*. Models 1 and 2 include economic explanatory variables but not logrolling variables. Models 3 and 4 include both types of logrolling variable, Stratmann variables and the interaction term, δ**party*, which proposes to capture majority party leverage, which may have been deployed more effectively after March 4. Models 5 and 6 include the Stratmann variables but leave out the interactive party leverage term to give logrolling test results comparable to Irwin and Kroszner (1996).

We begin with some inferences regarding the introduction of economic constituent variables. First, although the D-Nominate scores perform well, explanatory power is improved significantly when economic constituent variables are introduced. *X-coordinate* is significant in

all sectors, and *y-coordinate* is significant in all except sugar. But as economic constituent variables are added, comparing models 1 and 3 with 0, the significance of *y-coordinate* is lost in all sectors except cement; also, *x-coordinate* becomes insignificant in two sectors, lumber and oil. By contrast, special-interest variables show strong and robust significance. Sector-specific *producers*, which are expected to favor increased protection, are significant in all sectors in one-tailed tests and have the expected sign; and industrial *users*, expected to opposed increased protection, are significant with the correct sign in all sectors, though in the glass sector *users* have the expected sign, but are insignificant when both logrolling tests are included.

When we substitute *party* for D-Nominate scores, the overall performance of the model weakens slightly, but not enough to lead us to strictly prefer one partisan measure over the other (see Table 2). However, in four of the five sectors, the significance of *party* improves when both types of logrolling variables are added to the economic variables. In all cases, *party* has the expected sign (negative, since 1 = Democrat), except for model 6 in the lumber sector. The general economic interests captured by *grains* and *cotton* show variable performance depending upon whether the D-Nominate or *party* variables are used to measure partisan influence. The pattern and explanation are as one might anticipate. *Grains* and *cotton* compete with *y-coordinate* for explaining variation associated with divisions within political parties and cross-party coalitions. This is because the opposition to the across-the-board tariff reform came from a cross-party coalition of Democrats and insurgent Progressive Republicans, the latter heavily representing Midwestern states where grains were a predominant sector. *Grains* and *cotton* tend, therefore, to be significant in models that use the *party* measure, where *y-coordinate* is excluded. Also, *cotton*, which closely correlates with the Southern Democratic vote, appears to compete with *party* for explanation of variation in the party-line dimension. In every sector, *cotton* and *party* are seen to trade-off significance – in some cases *party* is stronger, in others *cotton* is stronger. The simple explanation in both cases is that the competing pairs exhibit collinearities. One expects some instability and a bias against significance in tests on single coefficients [AD20]when included in the same regression.

The tests for logrolling after March 4 are shown in Panel B (panel on separate page) of Table 3. Begin with the Stratmann variables. As a test for Stratmann-type sectoral logrolling, the results are positive overall, showing reasonably strong evidence of sector-wide logrolling. However, not all the results are of the correct sign. First, as noted, in a multiple-sector log roll, one does not expect the predicted votes from all sectors $l \neq j$ to be significant in the regression for sector j . Rather, the predicted votes of each sector should be significant in at least one regression (one other sector); and in each regression (sector), the predicted votes of at least one other sector

should be a significant factor. This joint criterion holds for all sectors, except cement. The predicted votes for cement are significant in the lumber and oil regressions, but always of the wrong sign; and timber is significant but of the wrong sign in the cement regressions.

The "trouble" with cement is consistent with Irwin and Kroszner's (1996) findings, who failed also to find consistent logrolling evidence in the amendments on that sector. They accordingly dropped cement from their regressions. When we do the same we obtain results similar to theirs, though stronger because of greater degrees of freedom. However, we chose not to drop cement from the regressions presented because the historical record includes cement in the alleged post-March 4th log roll. The unexpected cement results are not necessarily inconsistent with the allegation. The Stratmann test assumes sector-wide vote-trading, but other possible trades involving at least some, but not all, representatives of cement interests are possible. If the bulk of cement-interest representatives did not participate, but one or two key figures did, one might expect the results we obtain. The regressions on final passage presented in Section 5 provide some support for this explanation. One must conclude from this that there are many possible, more complex, logrolling schemes that the Stratmann test might not detect.

Consider now the alternative test for logrolling, which proposes that the majority party deployed its leverage to restore its control of the bill after March 4. The sign and significance of the interactive term δ*party provides the test, which corresponds with $\beta_3\zeta$ in Equation (2). As noted, the expected sign is ambiguous. If the majority party imposed greater party discipline after March 4, δ*party will have a negative sign; but if the majority party made use of its capacity to make credible deals (commitments or threats) involving Democrats, its expected sign is positive. Table 3, Panel B shows that δ*party is always positive. In the D-Nominate model, it is significant in all sectors but oil. This finding is consistent with the fact that post-March 4th log roll was successful in restoring the higher tariff rates in all of the sectors examined, except oil. In the *party* model, oil and sugar are insignificant. If this suggests a weaker reliance on cross-party deals in the case of sugar, it is not surprising, since Reed Smoot (R-UT) outwardly announced himself as the key coordinator of the majority party counteroffensive; his main constituency interest, as senior senator from Utah, was (beet) sugar; and his position as chair of the Finance Committee put him in a better position than the other logrollers to reward (punish) majority party members who assisted (impeded) the restoration of his preferred piece of the bill.

The results overall support a rational-voter explanation of voting on amendments in the Senate to determine specific rates in the tariff reform, but not of the "simple-minded" variety, criticized by Poole and Rosenthal. Though the D-Nominate scores perform well in most specifications of the model, the models perform better and offer richer interpretations of

legislators' voting behavior when variables representing both special-interest and general economic constituency interests are included. The Stratmann and interactive variables incorporated to capture the alleged post-March 4th log roll give evidence of, possibly complex, strategic behavior. The consistent significance of the logrolling variables implies strategic behavior, meaning, on the one hand, that legislators did not vote purely based on the immediate economic interests of their constituents, independent of other votes; yet, on the other hand, that strategic behavior is not fully captured by the political party, sometimes said to be a cartel to support log rolls, or the related D-Nominate scores.

4. From Amendments to Passage

Before examining the roll calls to pass the bill, it is useful to consider the institutional path that the bill followed as it left the context studied in Section 3 and moved into the later stages of the political decision-making process. In Section 3, the rational-voter model is shown to be a framework for interpreting legislator's individual votes, but it has a shortcoming as a model of the legislative outcome. To obtain an outcome, legislators' individual voting decisions must be aggregated, by some means, into a single decision. Some authors have referred to legislator voting as analogous to a market clearing mechanism for legislators', and therefore their constituents', policy preferences; but that analogy cannot be carried too far. Majority rule as the institutional mechanism for aggregating individual votes imposes a constraint. A given vote is structured such that the aggregate decision determines only whether to accept a specific policy proposal or to reject it – in favor of the status quo policy. The legislator's vote signals which of the pair she prefers, but it cannot signal whether her most preferred policy matches one of the pair, and if not, how far either proposal is from her most preferred policy.

Figure 1 offers a depiction of the path the bill took. Alluded to in Section 2, primary sources reveal three salient positions in the debate over tariff reform. The most prominent was the party-line division between Republicans, who were more protectionists, and Democrats, who though not free-traders preferred moderate protection. Besides this division, the Republican Party was divided between a majority of party regulars and a significant minority of Progressives, who led the fight for an "agriculture-only" reform, while the party regulars sought a general, across-the-board increase in protection.[19]

The sequence of decisions that shaped the policy mix in the Smoot-Hawley bill is represented Figure 1, which traces the movements in relative ad valorem equivalent tariff rates on agricultural and non-agricultural goods from one forum to the next. Point *Q* represents the Fordney-McCumber (1922) rates, the status quo against which the bill was passed. The House

Committee on Ways and Means, which had the initial proposal right, reported its bill to the House in May 1929, represented by point *HWM* in Figure 1. Soon after, the House adopted a modified closed rule, which prevented amendments from the opposition on the floor. Bargaining to construct the House proposal was thus confined within the Republican party. Point *H* in Figure 1 represents the bill passed by the House on May 28, 1929, providing for an average increase of 25 percent, relative to Fordney-McCumber.

[Insert Figure 2 about here.]

Figure 1 highlights that, besides the vote, several other features of the decision-making process matter, including who makes the proposal and how it is made, whether alternative proposals may subsequently be submitted and voted upon, and what kind of procedural restrictions on proposal-making exist. In congressional institutions, rights to make initial proposals are given to standing committees. The theory of congressional institutions suggests two mechanisms by which seats on standing committees, and therefore rights to make initial proposals, are allocated. Legislators self-select and seek appointment on committees that match their constituencies' interests (Shepsle 1978). And specialized legislative demands cause legislators to acquire specialized human capital, and committee assignments match legislator human capital with the specialized jurisdictions of committees (Gilligan and Krehbiel 1990, Krehbiel 1991).

Legislators' preferences are heterogeneous, meaning that their views about ideal policies tend to differ in ways that are specific to their electoral districts. In general, few ideal policies can command a majority; therefore, successful legislation requires cooperation, or that is, the legislative process requires reaping gains to trade by forming agreements to trade votes, or log roll. Weingast and Marshall (1988) argue that such agreements often involve noncontemporaneous trades. Committee assignments, they argue, give a second-best solution to offering credible noncontemporaneous trades, where smaller numbers, self-selection, and common specialist interests facilitate informal enforcement. One problem, however, is that the proposal negotiated in committee can be unraveled by amendments on the floor, unless other institutions restrict the effect of amendments on the final proposal (Shepsle and Weingast 1987). One type of institution that assists enforcement of committee proposals in the House are procedural restrictions, such as closed rules on amendments. Another type of institution for enforcing committee proposals is the ex post veto, which is customarily granted to the standing committee with jurisdiction by giving it control over the appointment of delegates (managers) to the conference committee.

As noted above, House Republicans used a closed rule to enforce the bill submitted by Ways and Means, which had initial proposal rights in the House. The rule, actually a modified rule, rather than a strict closed rule, did not preclude all amendments, but it scheduled the vote on the final bill for May 28, applied the 5-minute rule to debate on amendments thus limiting the number of amendments, and required that that the bill be taken *en grosse* in the final vote (Macmahon 1934). Figure 1 shows that the modified rule did not prevent alteration of the tariff rate structure from *HWM* to *H*, but the change was consistent with the fact that the Democrats were excluded from the negotiation. It is striking to note, however, that when the House bill was reported to the Senate Finance Committee, that committee restored the rate structure to *SF* in Figure 1, nearly identical to the original rate structure proposed by House Ways and Means, *HWM*, suggesting significant prior coordination between the House and Senate standing committees with jurisdiction.

The fact of the closed, or modified, rule in the House does not imply that the bill went uncontested by the opposition in the House. The example of the sugar sector illustrates how this contest played out. Prior to the adoption of the rule, Republican representatives of east coast bankers, sugar refiners (users) and brokers who were heavily invested in sugar operations in Cuba, from which duty-paying sugar was imported, declared the increased sugar tariff rate from the status quo 1.7648 cents to 2.4 cents per lb. as "extortionate" and tried to force a floor vote to lower it. Western beet sugar interests, who favored the high tariff, fought to prevent a vote. Those efforts led to a meeting of the Republican party caucus to negotiate the modified closed rule, which kept the contest over sugar and many other items off the floor and within majority party institutional control (*New York Times*, May 10, 22, 24, 1929; Macmahon 1934; Kaplan 1996, pp. 23-25).

A similar institutional constraint was not available in the Senate. Such restrictions on amendments could be adopted in the Senate only by unanimous consent, and that wasn't going to happen. The Democratic-Progressive Republican opposition coalition took advantage of open rule in the Committee of the Whole to amend and unravel major portions of the Finance Committee's proposal. That is shown in the movement in Figure 1 from *SF* to *SCW*. Note the significance of the direction of the movement – increasing agricultural rates and decreasing non-agricultural rates, quite distinct from the Republican-controlled log roll in the House. Also identifiable in Figure 1 is the effect of the post-March 4th log roll after the bill left the Committee of the Whole and moved to the Senate floor, captured by the movement from *SCW* to *S*. That log roll preserved the increased rates for agricultural goods earned by the insurgents in the Committee

of the Whole, but it restored higher rates for several non-agricultural items that had suffered reductions when the insurgents had controlled the bill.

The votes on amendments analyzed in the regressions in Section 3 pertain to the stages in the legislative process represented by the movement from *SF* to *SCW* to *S*. Besides the partisan log roll that was clearly present throughout the legislative process, and the opposition coalition, which was correlated with grain and cotton-producing regions, the regressions identified strong special interests, both pro- and anti-protection. They also identified the log roll of five key sectors and ramping up of majority party leverage that seems to provide evidence that pro-protectionist special interests turned the tables, especially if one takes the reports in the press of the "strange logrolling concoction" at its word. Figure 1, however, puts the log roll into perspective. No matter how scandalous the log roll may have appeared – the scandal may have been heightened because it apparently involved dubious cross-party deals and defections, the fact is that its effect on the rate composition of the bill was neither large nor the final word. The movement in Figure 1 from *SF* to *SCW* clearly had a greater effect on the rate structure. And although the movement from *SCW* to *S* achieved a portion of the reversal, the greater part of it was accomplished after the bill was reported from the Senate, *S*, to the conference committee. The bill reported by the conference committee, *C*, submitted to the chambers for approval, clearly did more than the post-March 4th log roll in the Senate to restore the rate structure at least to the vicinity of the committee proposals.

It is noteworthy that the proposal reported by the conference committee was close to the two committee proposals. The impression given in Figure 1 is that the ex post veto, which works through the committee's control over the managers selected as conferees, was the key institution for restoring the rate structure after the loss of control in the Senate Committee of the Whole and the enforcement of the Senate Finance Committee's proposal. If the ex post veto was expected to be so powerful, what explains the concerted effort, admittedly organized by Smoot, to reverse the effects of the bill's unraveling in the Committee of the Whole? Why didn't he, as chair of the Finance Committee, wait until the conference to enforce the committee proposal?

The answer lies in the subtlety of rules for assigning conferees. First, Smoot's right to select the Senate conferees was a contingent right. Power to select conferees went by convention to the presiding officer of each house. Customarily, the presiding officer defers to the standing committee chair, but he is also expected to select members who were "general supporters" of the bill (Oleszek 1984, p. 207). This contingency may be interpreted as a condition to preserve balance to maintain the commitment of party members to the party agenda. When these two criteria conflict, the presiding officer must use discretion with the goal of preserving party

cohesion. Second, the conferees' right to negotiate depended on authorization by the parent chamber, which has a variety of mechanisms at its disposal to influence the outcome. By majority vote, authorization could be withheld generally, on specific items, or the floor could provide specific instructions to the committee (Krehbiel, Shepsle and Weingast 1987). Interestingly, the House used such a mechanism, and if he foresaw it, Smoot had an incentive to alter his strategy to account for it. (See below.)

Under the usual set of rules, Senate Finance committee members could expect to regain control in conference; but if the committee lost control of its proposal on the Senate floor, it could lose control of the ex post veto. The conference committee consisted of three majority party and two minority party members from each chamber, and agreement depended on majority approval by each chamber delegation (Macmahon 1930; U.S. Congress, *Senate Manual*, *Cleaves' Manual* 1929, p. 206, items 27, 28). The opposition argued that Senator Norris (R-NE) or Senator LaFollette (R-WI) should have been given a seat on the committee, both members of the progressive insurgency.[20] Comments from the *New York Times*, Mar. 7, 1930, suggest that La Follette's appointment as a conferee was certainly plausible. Its probability would have increased if Smoot and company had not retained control over the bill in the Senate. If one conference seat had been awarded to the progressive faction, collaboration with the Democrats, continuing the opposition coalition that had formed in the Committee of the Whole, could have usurped the Finance Committee's ex post veto.[21] That threat appears sufficient to explain Smoot's incentive, as chair of Finance, to organize the log roll.

There was apparently, however, another reason. As deliberations were carried out in conference, a disagreement over the sugar tariff, Smoot's constituency's preferred legislation, unexpectedly reemerged in the House as the conference committee was in deliberation. The House passed a resolution that refused to relinquish authority over the sugar duty to its conferees. Instead, a floor majority voted to accept the lower Senate rate, of 2 cents per lb., instead of the House rate of 2.4 cents.[22] Recall that, in the original House debate, House Republican leaders had negotiated the closed rule, in part, to ward off a vote on sugar on the House floor, where a majority would have chosen to lower the sugar tariff. Anticipating that a majority of the Senate conferees would likely concede to (prefer) the higher House rate (including Smoot, who was unhappy with the mere partial restoration of the sugar tariff in March), the House accepted the lower Senate rate. The effect was to take the sugar duty out of the purview of the conference.[23] Smoot, who could foresee the contest over the sugar tariff, may have recognized the strategic importance of at least partially restoring the sugar tariff increase in the Senate bill. If he had not done so, the House resolution would have restored the sugar tariff to the 1922 rate of 1.7468

cents. Without the post-March 4th log roll, Smoot would have been unable to restore the sugar tariff increase for his constituents because the action in the House precluded his ability to do it in conference.

The final point to be made about the ex post veto is that it is exercised by the chair of the committee, who is always a member of the majority party. In short, the ex post veto enforces the committee proposal, subject to the incentives of the chair of the committee, who in general is a collaborating member of the majority party – in the case of key standing committees, such as the Senate Finance, a member of the party leadership. In short, our finding of support for the ex post veto as a mechanism for enforcing the committee proposals also supports the Cox and McCubbins' interpretation of the political party as a "legislative cartel" that controls the party agenda, and orchestrates log rolls, to support the collective interests of its members. The existence of Stratmann-type log rolls or other arrangements involve either within-party or cross-party deals is consistent with the legislative cartel concept, but they do not capture the full extent of strategic or logrolling behavior. In the case of the restoration of majority party control of the bill in the Senate, the point is clear. Smoot's position as chair of Senate Finance and member of the majority party leadership have given him greater leverage to offer credible trades with majority party and minority party members alike – because he was in a pivotal position to enforce the arrangements agreed upon in subsequent stages of the legislative process.

5. The Votes for Passage

Section 4 provides us with the right context for distinguishing between the legislator influence identified in the regressions on amendments in Section 3 and those to be observed in the vote for passage of the bill. We look at the two votes to pass in the Senate. The initial vote to pass the bill in the Senate took place on March 24, 1930, after which a conference committee was appointed to reconcile the differences between the House and Senate versions of the bill. The final vote in the Senate, to approve the conference version, took place on June 13. Table 4 gives the results of the regression on the votes to pass. Besides the baseline, D-Nominate-only model, the table reports four regressions. Models 1 and 2 include general economic interests, *grains* and *cotton* combined alternately with the D-Nominate and *party* measures of partisan influence. Models 3 and 4 include, in addition to the variables in 1 and 2, all the special-interest variables included in the regressions on amendments in Section 3. Comparison of the model including and excluding the special interests offers a test of the hypothesis that special interests were insignificant for the passage of the tariff reform – the conclusion reached by Callahan, et al., and Cupitt and Elliot.

Clearly, once we begin to insert sector-specific interests, there is a theoretical basis for including many other sector-specific interests than those included. Including all relevant sectors is not possible because it would eliminate the degrees of freedom available for the regression. One rationale for including only the five sectors from Section 3 is that the scandal in the press associated with the post-March 4th log roll clearly heightened the political sensitivity of the tariff reform for constituents associated with these special interests. The findings in the previous roll call studies of Smoot-Hawley lead us to expect both general and special economic interests to be insignificant. If that expectation is born out, the conclusion that the final vote was determined strictly by party-line divisions on the tariff reform are corroborated. If not, we must seek an alternative explanation for the findings in the other studies.

Table 4 shows, contrary to the former studies, special economic interests did have statistically significant influence on the votes for passage, both in March and in June. Moreover, inclusion of special economic interests in the regression improves the overall performance of the model relative to any of the model specifications that exclude them. Largely, the special-interest variables have signs consistent with their positions in the regressions on amendments. A notable exception is cement, whose constituents on average voted against the bills. The general position of cement representatives toward the tariff bill may explain the weaker performance of the regression on cement in Section 3 as well as the unexpected results associated with cement in the logrolling tests.

The signs and significance of general economic interests, *grains* and *cotton*, require some interpretation. The signs and significance of *grains* reverses depending on whether the measure of partisan influence is the D-Nominate scores or *party*. This is explained, similar to the results in Table 3, as a consequence of collinearity between *grains* and *y-coordinate* because of the geographical concentration of the Republican insurgent progressives in the Midwest, where wheat and corn production is also concentrated. In models 1 and 2, which exclude the special-interest variables, both *grains* and *cotton* are insignificant when partisanship is measured by the D-Nominate scores. This specification most closely resembles the specification of Callahan, et al. (1994), which includes both a party dummy and Poole-and-Rosenthal scores as measures of partisanship and general economic interests, both agriculture and manufacturing. They find no economic significance for manufacturing but agriculture is significant in some specifications. Our results show that the weak and inconsistent significance of agriculture is explained by the presence of *y-coordinate* in the same regressions. *Y-coordinate* and *grains*, and to a lesser extent, *cotton*, serve effectively as alternative proxies for the division in the Republican party between regulars and progressives, which had ideological as well as economic dimensions. The Cox-

McCubbins interpretation of the party organization as a cartel to enforce party-agenda log rolls is thus a fitting interpretation.

It is therefore certainly not accurate to conclude that the either the shaping or the passage of the Smoot-Hawley tariff act can be explained without reference to economic influences. Models 1 and 2 in Table 4 show that the D-Nominate scores used in previous studies embody one of the key general economic influences. When the alternative measure, *party*, is used alone to measure partisan influence, the significance of general economic influences is robust. Then, further, adding variables to capture salient special-interest influences adds explanatory power to the model. The final bill passed by a one-vote margin, 44-42. Eleven Republicans defected and voted against the bill, and 5 Democrats defected and voted for it. The significance of the sector-specific variables in model 3 and 4 of Table 4 suggest that special-interest considerations influenced at least some of the 16 defectors not to support their parties' agendas.

Conclusion

Each of the previous roll call studies of Smoot-Hawley performs its statistical analysis on different votes. One might naturally expect different results; however, in each of the studies, the authors interpret their results by making a generalized claim about the legislators' preferences and behavior with regard to the tariff bill. Although their results differ, each set of votes is taken as representative, in some general sense, of legislators' preferences or constituent pressures. What criteria were used to select the roll call votes? None of the studies neglects this question, but each answers it in a different way[AD21]. We show that the interpretations offered by the previous studies differ because of a failure to identify the position of a given vote, or set of votes, within the legislative process that, first, shaped and, then, achieved the passage of the tariff bill. When the process is accounted for, along with the institutions that govern it, the discrepancies in quantitative results make sense.

When one combines the inferences to be drawn from the regressions on amendments, regressions on the final vote, the path that tariff rate structure followed, and the institutions that constrained the decisions behind each, we find that economic interests were insignificant neither in the shaping nor in the passage of the bill. However, the extent to which special interests that deviated from party lines influenced the shape of the bill was limited because the majority party controlled rules that determined how the agenda was set for debating and voting on amendments, including procedural restrictions on amendments and the ex post veto. In particular, control by the chair of the standing committee with jurisdiction, in collaboration with the majority party leadership, constrained efforts to unravel the bill in the Senate. In effect, the special interests that

had the greatest influence shaping the bill were those involved in shaping the committee proposals. The special-interest groups that tried to reshape the bill to their liking, in the end, had limited success because the Smoot, who was chair of the Senate Finance Committee, effectively retained control of the ex post veto and used it to enforce the committee proposal.

When the bill came to a final vote, the binary choice presented to the chambers for a decision was a bill very close to those proposed by the House Committee on Ways and Means and the Senate Committee on Finance, which apparently had collaborated in the construction of their proposals, or the status quo, established by the reigning Fordney-McCumber tariff act of 1922. Eighteen months had by that time been invested in a tariff reform. Proponents would be loath to return to their constituents empty-handed after spending so much value legislative time on it. Even then, the decision was so close that both the party line and special interests had to be attended.

Table 1
Descriptions and Summary Statistics of Variables

Variable	Concept		Mean [a]	St. Dev. [a]	Expected Sign
OPPOSN [b]	instrument for partisan opposition (see text).		0.5656	0.4157	–
PRODUCERS [c]	importance of producers of the item in question in the legislator's constituency. (See appendix)	Sugar	0.0221	0.0562	
		Timber	0.0158	0.0246	
		Oil	0.0180	0.0427	+
		Cement	0.0013	0.0013	
		Glass	0.0015	0.0052	
REFINERS [c]	= 1, if state was home of a sugar refinery that used primarily imported raw sugar.		0.1042	0.3071	–
USERS [c]	importance of industrial consumers of sugar in each state.		0.2951	0.1901	–
URBAN [d]	share of urban population in each state.		0.4602	0.1982	–
GRAINS [e]	importance of non-import-competing grain production in each state.		0.0245	0.0302	–
COTTON [e]	controls for southern political idiosyncracy and non-import-competing cotton.		0.0165	0.0347	–

[a] Sample size for summary statistics is 96.
[b] This measure of partisanship differs from previous studies, which use party membership; but it is consistent with the theoretical framework of Section 1, which identifies preference clusters with factions rather than parties. In preliminary analysis, we compared the performance of the two conceptions of partisanship. The results (compare Table 2 and Table A.3 in the appendix) are similar, yet OPPOSN captures the partisanship influence more effectively—its estimated marginal effects were larger and less noisy.
[c] Opponents to protection of raw sugar were more concentrated and readily identifiable, relative to the other items considered. REFINERS and USERS capture the two main concentrated constituencies. Positions of interest groups are gleaned from testimony at the committee hearings and floor debate. Progressives opposed increased sugar protection, arguing that beet sugar farmers would receive less than 10 percent of the benefits. Duty-free sugar processors testified in favor of protection. Refiners on the eastern seaboard, who relied on imports from Cuba; industrial users of sugar; and Americans with investments in Cuba testified against increased protection. U.S. Congress, House Committee on Ways and Means (1929) and Senate Committee on Finance (1929); and *Congressional Record*, Jan. 16, 1930, pp. 1687-89.
[d] URBAN reflects states where urban buyer interests concentrated. Urban constituents would prefer less protection for the items under consideration since they are rural industrial products.
[e] GRAINS and COTTON represent non-import-competing farm interests. Grain farmers were on record in opposition to increased protection to each of these items. Although sugar might easily be misconstrued as an item for which farmers would favor protection, this was not the case. The opposition farm bloc argued that sugar was an industrial product, which 99 percent of farmers saw only as a cost. (*Congressional Record*, Jan. 16, 1930, pp. 1687-89.) COTTON also serves as a control for southern idiosyncrasy.

Table 2: Measures of Overall Fitness of Regressions on Pooled Amendments in Five Sectors: Sugar, Cement, Glass, Lumber, and Oil

	0	1	2	3	4	5	6
	PR baseline	PR + economic interests	Party + economic interests	PR + economic interests + log roll	Party + economic interests + log roll	PR + economic interests + Stratman n only	Party + economic interests + Stratman n only
	Log Likelihood ratios						
Sugar	-153.5	-129.6	-131.4	-118.0	-119.1	-117.9	-119.2
Cement	-144.7	-112.6	-115.9	-136.1	-138.9	-100.3	-107.1
Glass	-108.9	-83.5	-84.7	-70.3	-73.0	-68.5	-70.4
Lumber	-182.7	-151.3	-154.9	-136.6	-139.5	-137.1	-143.1
Oil	-264.9	-180.9	-183.2	-152.6	-154.1	-141.4	-145.7
	Pseudo R2						
Sugar	0.18	0.30	0.30	0.37	0.36	0.37	0.36
Cement	0.14	0.35	0.33	0.20	0.18	0.42	0.38
Glass	0.29	0.45	0.45	0.54	0.52	0.55	0.54
Lumber	0.13	0.28	0.26	0.35	0.33	0.34	0.32
Oil	0.06	0.36	0.35	0.46	0.46	0.50	0.49

Table 3: Regressions on Pooled Amendments in Five Sectors: Sugar, Cement, Glass, Lumber, and Oil

PANEL A

Model:	0	1	2	3	4	5	6
	D-Nom. baseline	D-Nom. + economic interests	Party + economic interests	D-Nom. + economic interests + log roll	Party + economic interests + log roll	D-Nom. + economic interests + Stratmann only	Party + economic interests + Stratmann only
Sugar							
x-coordinate	**2.220**	**1.623**		**2.744**		1.513	
	5.145	1.693		2.460		1.466	
y-coordinate	-0.268	-1.541		-2.161		-1.770	
	-0.384	-0.635		-0.845		-0.696	
party			-0.512		-0.881		-0.313
			-1.028		-1.545		-0.604
sugar producers		**7.697**	**6.997**	**7.302**	**6.405**	**7.108**	**6.666**
		1.889	1.711	1.863	1.665	1.776	1.744
sugar users (confectioners and bottlers)		**-2.335**	**-2.279**	**-1.846**	**-1.966**	**-1.791**	**-2.054**
		-2.743	-2.951	-2.187	-2.538	-2.199	-2.718
sugar users (refiners)		-0.449	-0.332	-0.649	-0.464	-0.534	-0.390
		-0.921	-0.699	-1.366	-0.984	-1.179	-0.860
grains		-6.945	**-22.048**	9.915	**-15.376**	2.528	**-13.093**
		-0.516	-3.684	0.690	-2.388	0.177	-1.870
cotton		-11.973	**-14.274**	-5.947	-11.110	-7.408	-11.109
		-1.385	-1.875	-0.737	-1.541	-0.995	-1.633
cement							
x-coordinate	**1.871**	**2.488**		**2.332**		1.906	
	6.131	2.131		2.708		1.622	
y-coordinate	**-1.231**	-3.110		-1.734		**-5.322**	
	-2.447	-1.286		-1.098		-2.143	
party			-0.590		**-1.064**		0.112
			-1.019		-2.197		0.198
cement producers		**4.490**	**4.590**	0.904	1.259	**3.850**	**4.041**
		2.398	2.582	0.765	1.111	1.993	2.197
cement users (construction)		**-30.100**	-18.890	-19.603	-10.506	-23.527	-12.813
		-1.947	-1.296	-1.534	-0.909	-1.550	-0.862
grains		-15.717	**-40.437**	-5.011	**-24.249**	-3.114	**-32.194**
		-0.990	-4.678	-0.482	-4.889	-0.204	-3.804
cotton		-16.955	**-18.442**	-3.518	-6.467	-16.125	**-15.409**
		-1.566	-2.059	-0.548	-1.339	-1.558	-1.910

Note: t-statistics given below coefficients. Boldface indicates significance at 0.05 or better.

glass

x-coordinate	**3.076**	**1.851**		**2.819**	1.824	
	6.079	1.651		2.263	1.385	
y-coordinate	-1.196	-0.430		-2.935	0.678	
	-1.529	-0.196		-1.250	0.215	
party			-0.865		-0.790	-0.836
			-1.613		-1.338	-1.259
glass producers		**144.250**	**147.948**	**139.401**	**134.345**	**129.805**	**133.934**
		2.948	2.967	2.975	2.711	2.202	2.136
glass users (nonhwy constructrion)		**-42.744**	**-37.598**	-25.044	-14.484	**-47.798**	**-39.163**
		-1.724	-1.658	-1.132	-0.726	-2.255	-2.243
grains		-16.981	**-27.798**	10.422	**-17.613**	-17.228	**-22.600**
		-1.220	-4.241	0.675	-2.706	-0.846	-2.889
cotton		**-32.257**	**-36.170**	**-36.120**	**-37.923**	**-26.886**	**-35.531**
		-2.819	-3.451	-2.553	-3.105	-2.053	-3.009

lumber

x-coordinate	**1.612**	0.470		1.101	-0.579	
	3.805	0.489		0.958	-0.602	
y-coordinate	**-2.053**	**3.218**		**2.945**	3.123	
	-3.174	1.618		1.499	1.527	
party			-0.615		**-1.015**		0.138
			-1.233		-1.891		0.270
lumber producers		**1.431**	**1.733**	**1.335**	**1.537**	**1.689**	**1.950**
		2.034	2.513	2.018	2.377	2.414	3.021
lumber users (border nonhwy construction)		**-42.485**	**-35.166**	**-40.580**	**-32.359**	**-33.289**	**-24.122**
		-3.590	-3.256	-3.287	-2.901	-2.868	-2.268
grains		**-43.961**	**-31.088**	**-32.097**	**-24.800**	**-44.393**	**-24.377**
		-3.021	-5.137	-2.220	-4.056	-2.824	-3.530
cotton		-4.206	-10.186	-1.070	-6.173	-6.948	-9.521
		-0.593	-1.636	-0.136	-0.955	-0.916	-1.418

oil

x-coordinate	**1.141**	0.413		1.314	0.524	
	2.806	0.399		1.066	0.438	
y-coordinate	**-1.292**	**3.822**		0.686	1.041	
	-1.994	1.536		0.246	0.394	
party			**-1.003**		**-1.238**		-0.528
			-1.896		-2.126		-0.826
oil producers		**151.903**	**140.379**	**159.285**	**151.699**	**162.661**	**141.549**
		5.901	5.287	4.946	5.269	5.411	5.235
oil users (gasoline filling stations)		**-0.085**	**-0.067**	**-0.105**	**-0.089**	**-0.102**	**-0.078**
		-2.501	-1.952	-2.961	-2.538	-2.869	-2.186
oil users (auto producers)		-0.001	0.000	0.003	0.003	0.003	0.004
		-0.270	0.092	0.719	0.780	0.834	1.116
grains		**-32.940**	**-17.180**	-2.614	-7.931	-11.066	-8.633
		-1.851	-3.654	-0.135	-1.401	-0.604	-1.463
cotton		-6.417	-10.613	-1.087	-1.234	-1.953	-2.896
		-0.709	-1.232	-0.136	-0.189	-0.237	-0.420

Table 3: Regressions on Pooled Amendments in Five Sectors: Sugar, Cement, Glass, Lumber, and Oil

PANEL B

Model:	3	4	5	6
	D-Nom. + economic interests + log roll	Party + economic interests + log roll	D-Nom. + economic interests + Stratmann only	Party + economic interests + Stratmann only
Logrolling variables on sugar				
δ*cement	-1.728	**-2.576**	-0.439	-0.509
	-1.248	-1.750	-0.551	-0.660
δ*glass	**1.454**	**1.461**	**1.533**	**1.450**
	1.768	1.736	1.864	1.767
δ*lumber	**1.766**	**2.051**	**1.032**	**1.165**
	2.129	2.476	1.222	1.456
δ*oil	0.209	0.674	0.206	0.488
	0.373	1.132	0.364	0.804
δ	**-0.780**	**-0.503**	**-0.808**	**-0.935**
	-1.950	-1.316	-2.571	-3.023
δ*party	**0.862**	0.307		
	1.695	0.606		
Logrolling variables on cement				
δ*sugar	**1.770**	**1.057**	**2.661**	**1.701**
	2.007	1.488	2.889	2.009
δ*glass	0.182	0.006	**1.367**	0.975
	0.295	0.010	1.858	1.426
δ*lumber	**-1.979**	**-1.556**	**-1.529**	-0.723
	-2.729	-2.392	-1.658	-0.822
δ*oil	-0.276	-0.049	0.464	0.712
	-0.615	-0.102	0.625	0.843
δ	-0.159	0.091	**-1.616**	**-1.476**
	-0.305	0.180	-2.549	-2.034
δ*party	**0.901**	0.653		
	1.705	1.326		
Logrolling variables on glass				
δ*sugar	**3.657**	**3.074**	**2.564**	**2.667**
	2.765	2.719	2.459	2.684
δ*cement	-0.506	-2.133	0.027	-0.499
	-0.271	-1.148	0.030	-0.509
δ*lumber	0.526	1.111	-0.389	-0.169
	0.391	1.009	-0.299	-0.150
δ*oil	1.498	**1.862**	1.317	1.508

	1.615	1.824	1.532	1.610
δ	**-3.395**	**-2.360**	**-1.675**	**-1.701**
	-2.949	-2.119	-2.361	-2.274
δ*party	**1.905**	1.015		
	2.191	1.313		
Logrolling variables on lumber				
δ*sugar	1.566	**1.983**	-0.059	0.800
	1.663	2.226	-0.070	1.137
δ*cement	**-1.988**	**-2.796**	**-1.058**	**-1.125**
	-1.606	-1.868	-1.680	-1.662
δ*glass	**1.569**	**1.723**	**1.903**	**1.591**
	1.867	2.116	2.230	2.201
oil	**1.100**	**1.099**	**1.093**	**0.900**
	2.071	1.961	2.128	1.596
δ	**-1.847**	-1.657	**-0.895**	**-1.104**
	-1.777	-1.443	-2.364	-2.998
δ*party	**1.635**	**1.428**		
	2.067	1.766		
Logrolling variables on oil				
δ*sugar	**1.957**	**2.263**	**1.782**	**2.119**
	1.948	2.580	1.694	2.368
δ*cement	**-2.933**	**-3.471**	**-2.394**	**-2.628**
	-1.433	-1.707	-2.788	-2.793
δ*glass	0.970	1.260	**2.367**	**2.387**
	1.000	1.416	2.683	2.793
δ*lumber	**2.283**	**2.143**	1.162	1.175
	2.485	2.417	1.180	1.285
δ	-1.206	-1.188	**-1.534**	**-1.625**
	-1.383	-1.412	-3.332	-3.451
δ*party	0.287	0.310		
	0.410	0.541		

Note: t-statistics given below coefficients. Boldface indicates significance at 0.05 or better.

Table 4: Probit Regressions on the Initial and Final Votes for Passage in the Senate, March 24, and June 13, 1930.

	Pass March					**Pass June**				
	0	1	2	3	4	0	1	2	3	4
	D-Nominate baseline	D-Nominate + general economic interests	Party + general economic interests	D-Nominate + general + special economic interests	Party + general + special economic interests	D-Nominate baseline	D-Nominate + general economic interests	Party + general economic interests	D-Nominate + general + special economic interests	Party + general + special economic interests
x-coordinate	**2.687**	**2.490**		**6.764**		**3.170**	**2.353**		**20.403**	
	4.930	2.205		2.889		5.413	2.012		2.928	
y-coordinate	1.159	0.659		**-9.587**		-1.096	-2.042		**-40.465**	
	1.527	0.282		-2.163		-1.181	-0.874		-2.814	
party			**-1.608**		**-1.607**			**-1.145**		-1.004
			-2.782		-2.374			-1.891		-1.482
	general economic interests					*general economic interests*				
grains		1.503	**-9.476**	**57.522**	-14.349		0.475	**-21.224**	**170.642**	**-30.767**
		0.098	-2.023	2.069	-1.677		0.031	-3.798	2.660	-2.919
cotton		-5.423	-11.195	-35.303	**-27.356**		-18.801	-18.681	**-124.864**	**-35.207**
		-0.522	-1.256	-1.668	-1.917		-1.440	-1.627	-2.638	-2.405
	producers					*producers*				
sugar				**7.828**	5.152				**15.848**	3.864
				1.791	1.205				2.925	1.177
cement				**-5.647**	-2.787				**-9.772**	1.489
				-1.854	-1.108				-1.806	0.545
glass				**175.348**	**123.041**				**440.918**	**133.711**
				2.706	2.350				2.973	2.720
lumber				0.303	0.275				0.829	0.519
				0.224	0.224				0.561	0.480
oil				0.686	3.710				2.489	0.092
				0.092	0.519				0.272	0.013

	users					*users*				
Conf. & bottlers				**-3.378**	**-2.298**				**-7.209**	-1.770
				-2.463	-1.876				-2.841	-1.480
Sugar refiners				-1.486	-1.112				**-4.048**	**-1.832**
				-1.599	-1.327				-2.897	-2.235
Construction				-36.517	-8.895				**-130.103**	-1.033
				-1.030	-0.300				-2.053	-0.040
Autos				0.013	0.005				**0.020**	-0.001
				1.193	0.629				1.913	-0.113
Gasoline filling stations				-0.038	-0.016				-0.074	-0.020
				-0.792	-0.357				-1.087	-0.415
log likelihood	-45.1	-44.9	-45.3	-29.3	-33.4	-46.1	-45.3	-45.5	-23.0	-32.6
Pseudo R2	0.28	0.28	0.32	0.53	0.47	0.31	0.32	0.27	0.65	0.51
Wald test	34.9	35.2	42.5	66.5	58.3	34.9	35.2	42.5	66.5	58.3
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: t-statistics given below coefficients. Boldface indicates significance at 0.05 or better.

Appendix: Data and Preliminary Regressions

Ad valorem equivalent tariff rates in Figure 2 are from *Tariff Review*, Sept. 1929, p. 275, with one exception. The House Ways and Means proposal is calculated using data from: *New York Times*, Mar. 23, 1930, pp. 23-27; U.S. Tariff Commission, *Comparison of Rates of Duty in the Tariff Act of 1930 and in the Tariff Act of 1922*. Washington, D.C. GPO, 1930; and U.S. Congress, House, *Tariff Bill of 1929: Comparative Print of The Tariff Act of 1922 With H.R. 2667 … committed to the Comm of the Whole House on May 9, 1929.*, 71st Congress, 2nd Session, House Doc No. 15. Washington, D.C., GPO, 1929. Agricultural rates are calculated using Schedule 7 of the Tariff Act; the non-agricultural rates are an import-weighted average of all other schedules.

Roll call votes and party membership were obtained from Poole and Rosenthal, *Voteview for Windows 1.0: Roll Call Displays of Congress (1789-1986)*. http://www.princeton.edu/~voteview/. "Yeas" and "nays" included paired votes; senators not voting were coded as missing observations. "Like amendments," pooled by sector to form five binary dependent variables, are listed in Table A.1.

Table A.1. "Like Amendments" for Five Contested Items

Amendment	Date	Roll call no.	Description	votes for: against
Sugar	Jan. 16	124	Eliminate increase duty on raw sugar	40:50
	Mar. 5	206	Increase duty on raw sugar	48:40
	Mar. 13	224	Motion to reconsider duty on raw sugar	49:40
Timber	Feb. 27	197	Set duty on timber	40:45
	Mar. 3	201	Broaden categories of woods under countervailing duty.	34:35
	Mar. 20	265	Set duty on lumber	42:41
Oil	Feb. 28	199	Set duty on crude and fuel oil, removing them from free list	34:46
	Mar. 19	260	Set duty on crude and fuel oil, removing them from free list	39:48
	Mar. 19	261	Set (lower) duty on crude and fuel oil	38:42
	Mar. 21	273	Set duty on crude and refined oil, no duty if price exceeds $1.50.	39:40
	Mar. 22	292	Remove crude and refined petroleum from free list	35:47
Cement	Jan. 31	147	Strike out duty on cement	38:43
	Mar. 7	215	Concur in SCW decision to strike out duty	48:40
	Mar. 13	225	Motion to reconsider duty on cement	48:39
Glass	Nov. 6	081	Reduce duties on glass	33:36
	Mar. 12	218	Concur in SCW decision to reduce certain duties on glass	41:35
	Mar. 12	219	Concur in SCW decision to reduce duty on plate glass	38:38

Note. Column 3 gives the *Voteview* roll call nos. SCW = Senate Committee of the Whole. The last column gives votes cast for:against increased protection of the item in question.

The opposition coalition index for OPPOSN was constructed using ten major agriculture-related Senate votes of the 71st Congress, consisting of *Voteview* roll call vote nos. 3, 31, 44, 45, 46, 63, 295, 331,

332, and 613. The index number for senator *i* is defined as the proportion senator *i*'s votes out of the total number of times senator *i* voted on the above 10 items (i.e. excluding abstentions and absences) that are consistent with the Republican Progressive leadership. Consistency with Republican Progressive leadership is defined as voting either the same as Robert LaFollette (R-WI) or William Borah (R-ID), who were the two most prominent progressive leaders during the Smoot-Hawley debates.

Domestic producer interests, in the case of sugar, are measured as production of raw-sugar-equivalent in metric tons per 1 million persons of state population. Data sources are Willett and Gray, *Weekly Statistical Sugar Trade Journal*, 1929 *passim*; and U.S. Department of Agriculture, Commodity Stabilization Service, *Agricultural, Manufacturing and Income Statistics for the Domestic Sugar Areas*, pp. 69, 83, 105. Producer interests for the timber, oil, cement, glass, wheat, corn, and cotton sectors are measured as percent of total state value of production. USERS proxies the main industrial sugar users as the sum of percent of total state value of production of the confectionery and carbonated beverage industries—the two industrial sugar users that testified in the public committee hearings. REFINERS is a dummy variable set to 1 when a major import-dependent refiner was located in the state. Value of production data and refinery locations are from U.S. Bureau of the Census, *Fifteenth Census of the United States: Manufactures, 1929*, Vol. 2, pp. 48, 115, 212, 443, 771, 835, 869; and total state production data are from *1930 Abstract of the Census*, pp. 151, 758-59, 858, 869, 916, 924, 956. URBAN is the percent share of urban in total population. Population and unemployment data are from U.S. Department of Commerce, Bureau of Foreign and Domestic Commerce, *Statistical Abstract of the United States, 1931*, pp. 48, 365-66.

Regression estimates of Equation (2.2) to obtain instruments for Tables 2, 3 and A.3 are reported in Table A.2.

Table A.2. Regression Estimates on PARTY and OPPOSN

	PARTY HISTORY	URBAN	GRAINS	COTTON	UNEMPL	Constant	N	Log likelihood *Percent correct*
PARTY	5.38	2.89	-6.09	31.92	-32.87	-2.68	96	-31.64
	(3.95)	(1.04)	(-0.36)	(1.27)	(-1.29)	(-1.29)		84.38
OPPOSN	0.30	0.01	5.95	8.82	-8.03	0.81	96	-61.49
	(1.43)	(0.01)	(2.23)	(2.27)	(-1.66)	(2.51)		-

Notes. The table reports regression coefficients. The figures parentheses are t-ratios calculated from asymptotic standard deviations using the estimator by Berndt, et al. (1974), in Greene (1990), p. 678. PARTY is binary, coded 1 if Democrat, 0 otherwise, and its model is estimated using a logit procedure. OPPOSN is an index on the range [0, 1], where 1 equals perfect consistency with Republican Progressive leadership (as defined above in the appendix). Its model is estimated using a tobit censored variable procedure with limits [0, 1]. PARTY HISTORY is the number of seats held by Democrats in the 63rd-70th Congresses (1913-1928) – 16 total (8 Congresses × 2 seats per state per Congress). UNEMPL is Class A and B unemployment rates. See text for other definitions.

Alternative estimates of Equation (2.1) using party membership (PARTY), instead of OPPOSN, as a proxy for partisan behavior are given in Table A.3. Party membership which has been the common proxy

for partisan behavior in previous studies. Our results using OPPOSN and PARTY are similar. For our approach, OPPOSN is preferred for theoretical reasons. It also gives estimated marginal effects that are larger and less noisy than PARTY.

Table A.3
Scaled Estimated Marginal Effects of Equation (2.1)
Using PARTY instead of OPPOSN
(t-statistics of the estimated coefficients in parentheses)

Dependent variables: Pooled votes on like amendments for five items.

	Expected	Sugar	Timber	Oil	Cement	Glass
PARTY	–	-0.069	0.087	-1.103	-0.366	-0.754
		(-0.508)	(0.805)	(-9.171)	(-2.106)	(-5.126)
PRODUCERS	+	0.086	0.415	4.110	0.353	9.479
		(6.248)	(4.040)	(32.163)	(2.947)	(52.589)
REFINERS	–	-0.056	-	-	-	-
		(-1.054)				
USERS	–	-0.083	-	-	-	-
		(-4.070)				
URBAN	–	-	-0.075	-0.688	0.122	-0.705
			(-0.693)	(-5.569)	(0.687)	(-3.476)
GRAINS	–	-0.138	-0.861	-1.058	-1.184	-1.193
		(-9.081)	(-9.643)	(-10.711)	(-8.818)	(-7.408)
COTTON	–	-0.102	-0.443	-0.059	-0.743	-2.296
		(-2.910)	(-4.583)	(-0.570)	(-5.424)	(-13.835)
Constant		-	-	-	-	-
		(6.430)	(1.567)	(5.249)	(1.438)	(4.558)
N		269	238	412	259	221
Log-likelihood		-130.8	-127.1	-178.1	-122.2	-84.7
Likelihood ratio		111.2	75.7	209.8	114.2	136.9
% correct		78.8	74.4	71.8	79.2	80.1

Notes. See Table 1.

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[1] The 1932 landslide Democratic victory and reversal of Republican control of Congress seems to suggest that the public held a similar view. (Prior to the New Deal, the tariff was the dominant economic issue of national scope in presidential elections.)

[2] Subsequent works supporting this view in various ways include Lewis (1949), Meltzer (1976), and Gordon and Wilcox (1981).

[3] Marks (1993), and Nelson and Silberberg (1987) make a similar observation about omnibus or generic bills. Nollen and Iglarsh (1990) fail to find specific economic interests to be significant in the vote on the passage of the Omnibus Trade Act of 1987, but Marks finds they are significant in regressions on key amendments to the bill.

[4] The 1996 article reports the results for only four of the five sectors. In a footnote, they mention that their results for the tariff on cement were insignificant. WHICH FOOTNOTE?

[5] The sectors they examine are broomcorn, munitions cartridges, coal, two amendments on plate glass, leather, pig iron, maple sugar, wire fencing, and wood veneers. Economic constituent interests are significant only in the votes on plate glass tariff, which is the only sector included in both their study and Irwin and Kroszner (1996).

[6] Fordney-McCumber provided for average ad valorem equivalent tariff rates of 22 and 36 percent for agricultural and non-agricultural goods respectively; Smoot-Hawley raised them to 34 and 44 percent.

[7] *Congressional Record*, Jan. 16, Mar. 5, 7, 1930; *New York Times*, Mar. 12, 1930; *Tariff Review*, Apr. 1930, p. 106.

[8] There are two additional reasons for focusing on votes in the Senate. First, the data to measure special economic interests in the Senate is subject to lower measurement error. State-level economic data aligns closely with Senate constituency interests, whereas constructing proxies for economic interests that correspond with House districts is subject to greater measurement error. Second, open rule in the Senate made amendments an effective institution for voicing opposition to specific provisions in the bill, but closed rule strictly limited their similar use in the House.

[9] A large empirical literature developed around the question whether legislators efficiently represent their constituents or partially neglect them by voting their own ideological preferences. See Kalt and Zupan (1984, 1990), and for a survey, see especially Bender and Lott (1996).

[10] This technique comes from Huber (1967) and White (1980).

[11] Irwin and Kroszner (1996) and Cupitt and Elliot (1994) account for protectionist producer interests, but neither accounts for industrial user interests, even though the record of debate shows that special-interest opposition to increased protection was an important source of controversy.

[12] Glass user interests are proxied by the building construction share; cement users are proxied by the combined share of building and highway construction. In lumber, we discovered that the relevant import-competing market was geographically specific to states bordering Canada, because elsewhere high transportation costs acted as a natural trade barrier. Lumber users are therefore, proxied by border-state building construction, created by interacting construction and a dichotomous variable identifying the states bordering Canada. The notion of applying the border-state condition comes from Eichengreen (1989), who proposes that bulk-item producers in states bordering Canada would be more sensitive to tariff rate changes.

[13] We employ the dichotomous variable instead of a continuous measure because refiners the census did not report state-level refinery production. If it had, in some cases state-level production was so concentrated that it would disclose individual refinery data and violate refiners' right to privacy.

[14] It is worth noting that the urban share of state-level population was included in early specifications of our model. The expected sign is ambiguous. Urban states might capture manufacturing interests that supported the across-the-board tariff increases, or consumer interests

expected to oppose tariff increases. Perhaps because of these offsetting influences, urban share was consistently insignificant. Since the tariff reform was proposed as agricultural economic relief, one might expect the intensity of economic distress to affect support for the reform. Early specifications included an index of statewide rural economic distress and general unemployment, but neither was significant.

[15] All zeroes are Republican, except that one senator from Minnesota is affiliated with the Farmer-Labor Party.

[16] See the review of findings by Bender and Lott (1996).

[17] Unstable positions among senators might be explained as weak policy preferences. That explanation does not explain the systematic behavior associated with the repeated, systematic rehashing of amendments.

[18] A sector needs only trade votes with one other participating sector to be classified as a participant in the log roll.

[19] These positions are derived from reading the committee hearings in U.S. Congress, House Committee on Ways and Means (1929) and Senate Committee on Finance (1929), and the *Congressional Record*, 71st Congress. Eichengreen (1989) comments that in the 1928 electoral climate, Democrats had adopted a moderate stance whereby some pronounced protection as desirable to equalize costs but proclaimed existing rates as extortionate, monopolistic, and harmful to consumers. See also Goldstein (1993), p. 120; and Fetter (1933), pp. 416-17. On the progressive influence in Republican party politics, see Brady and Epstein (1997).

[20] For the proposal on Norris, see Steiner (1951, pp. 43-44).

[21] The opposition argued at different points in the process that Sen. Norris (R-NE) or Sen. LaFollette (R-WI) should have been given a seat on the committee. Comments from the *New York Times*, Mar. 7, 1930, suggest that La Follette's appointment as a conferee was certainly plausible, and its probability would have increased if the opposition had retained control over the bill in the Senate. For the proposal on Norris, see Steiner (1951, pp. 43-44).

[22] This decision took place on May 2 in a vote of 239-170; 91 Republicans broke the party line.

[23] This action took the sugar duty out of the scope of the conference negotiations, since conference committees are restricted to consider only points of difference between the two bills.