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**REGULATION AND THE THEORY OF LEGISLATIVE CHOICE:
THE INTERSTATE COMMERCE ACT OF 1887**

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The positive theory of regulation has focused primarily on the formation and participation of interest groups (see Noll and Owen, 1983). While necessary, the focus on groups is not sufficient to understand regulatory outcomes. Explaining the economic effects of regulation also requires mastering the effects of political institutions that influence and constrain the actions of politicians.

In this paper, we argue that federal regulatory outcomes cannot be explained apart from congressional institutions. The specific pattern of benefits is directly tied to these institutions and is determined by two factors. The first concerns how the interests are represented within the Congress, and especially on the relevant committees with policy responsibility or jurisdiction. Committees are important because they enfranchise their members with important powers, notably, veto power over the proposals made by others. The second factor is bicameralism, the need to build majority support in two separate chambers.¹ This is relevant to the extent that interest groups are not distributed identically across both houses of Congress, for example, if different groups hold veto power in different houses.

Put simply, our thesis is that specific interests are advantaged in the legislative process, not because of some "organic" bias in favor of groups, but because of the representation of these groups within the political institutions. In order to make this point, we provide a model of political choice and demonstrate its applicability to the choice of complex regulatory legislation. Our method is constructive. We show how our model helps explain why one out of a range of policies becomes the final legislation.

We develop our ideas in the context of the inception of the first major regulatory agency, the Interstate Commerce Commission (ICC), in 1887. The inception of the ICC provided neither a cartel mechanism for the railroads (as with the pure capture view) nor solely a mechanism to correct market abuses by the railroads (as with the public interest theory). Rather, it provided an array of benefits, some to railroads and some to non-railroad interests, notably the so-called shorthaul shippers.

Our analysis contains three components. First, we develop a theory of legislative choice. Second, we provide a detailed review of the proposed regulatory instruments and study their effects, thereby offering considerable insight into the Act's beneficiaries. Third, from the analysis of the incidence of various bills, we derive testable implications about how congressmen could be expected to vote between different alternatives. Because proposals differed in their expected economic effects and had different implications across geographic regions, tests about the expected *economic* impact of the legislation can be performed by studying the *voting* decisions of representatives of these regions. We then perform these tests using logit analysis.

The empirical results support the interpretations derived from the analysis of the regulatory instruments and lead to the following conclusions. The final bill did not provide railroads with a cartel manager; rather, it was a compromise among many contending interests. Organized anti-railroad groups gained important restrictions on railroad pricing in some markets; the railroads benefited by earning supracompetitive profits in others. The net effect of regulation on railroad profits was small but positive. Finally, the most important effect of the ICA seems to have been a transfer of wealth among customer classes, specifically, from longhaul to shorthaul shippers.

This paper proceeds as follows. Section I develops an approach to modeling the economics of railroading and relates this to previous work. It also shows why previous tests of the impact of ICC have not resolved the issue of who benefited from the ICC. Section II focuses on the political economy of interest groups and develops the multi-interest group perspective necessary to study the problem. Section III presents our model of legislative choice and derives its implications for regulation. Turning to the political battle over regulation, sections IV and V reveal that the politics parallel the economic distinctions developed in section II. Section VI tests the hypotheses concerning economic impact using logit analysis of congressional voting.

SECTION I. A REVIEW OF RAILROAD ECONOMICS

Railroads have attracted the attention of economists, historians, and political scientists for decades. The extensive literature allows us to make the following characterization. The railroad system, like most networks, was actually a complex set of inter-related markets (Meyer et al., 1959, Friedlaender 1972). For our purposes, we distinguish two important categories of markets, the so-called *shorthaul* and *longhaul* markets, defined as follows. *Longhaul* markets are those served by several railroads and are naturally competitive. The railroads attempted to cartelize these markets. The cartels, though imperfect, meet with some success (see MacAvoy 1965; Porter 1983; and Ulen 1982). Shorthaul markets, on the other hand, are served by a single railroad and are naturally monopolistic. They are characterized by discriminatory pricing.²

These two markets are illustrated in Figure 1. This figure also shows that shorthauls are often a segment along a particular longhaul route. Thus, out of Chicago, there are four major competing roads to the east coast (according to Ulen, 73 percent of all dead freight out of Chicago is bound for Europe). However, along each of these routes are a series of shorthaul monopoly routes. Prices along these tend to be significantly higher than the price charged for the longhaul of which they are a part.³

This pattern of pricing resulted in two categories of markets. This implies that the railroad controversy cannot be seen as the railroads against some undifferentiated set of consumers. Railroad shippers were a heterogenous group with diverse preferences over regulatory outcomes. Notably, the pattern of pricing generated two *separate* sources of political support for regulatory intervention. The railroads sought regulation to improve their unstable private cartels.⁴ Shorthaul shippers, on the other hand, sought regulation to alleviate discriminatory pricing.⁵ The literature has also provided considerable evidence about the regulatory effects of the ICA, and is nearly unanimous on the following: shorthaul prices declined while longhaul prices increased. This pattern clearly benefited

shorthaul shippers and harmed longhaul shippers.⁶ The effects on the railroads, however, are more controversial. Were longhaul prices higher because regulation improved the railroads' private cartels (as argued in MacAvoy 1965, Kolko 1965, and Spann and Erickson 1970) or for some other reason? Ulen (1980, 1982), for example, notes that the success of the private cartels was positively correlated with the business cycle (see also the extensive analysis by Porter, 1983). Since the ICC began during an upswing, we would have expected longhaul prices to increase even without regulation. Furthermore, Zerbe (1980) challenges the results of Spann and Erickson, showing that their calculations were incorrect. His recalculations show that the gains to non-railroad interests appear to exceed those to railroads.

This issue appears even more puzzling when we consider the following comparative statics analysis of regulatory pricing.⁷ One of the chief regulatory mechanisms of the ICA was the *shorthaul pricing constraint* (SHPC), which made it unlawful "to charge or receive any greater compensation . . . for a shorter than for a longer distance over the same line, in the same direction, the shorter being included within the longer distance." To meet this constraint, railroads would both lower shorthaul prices and increase longhaul prices. Thus, even if the ICC played no direct role in facilitating the railroads' ability to coordinate and maintain prices above the competitive longhaul price, longhaul prices would have increased. Moreover, we show elsewhere that the effect of the SHPC on railroad profits is indeterminant: it can go either way. The SHPC could have increased railroad profits without facilitating longhaul railroad cartels.

To summarize, several hypotheses attempt to explain the inception of regulation. First, railroad regulation was designed primarily to provide the railroads with a cartel mechanism to replace their unstable private ones. Second, regulation sought to benefit shorthaul shippers at the expense of the railroads by eliminating shorthaul price discrimination. Third, regulation was designed to benefit both shorthaul shippers and railroads at the expense of longhaul shippers by lowering shorthaul rates and increasing longhaul rates. The latter need not have involved a governmentally managed cartel for the railroads, as the discussion of the SHPC suggests.

The evidence provided by MacAvoy and others about the decrease in shorthaul prices appears to rule out the first hypothesis. But the evidence does not allow us to discriminate between the second and third explanations. Moreover, if the latter is true, we need to explain how this coalition expected to produce mutually beneficial legislation.

To discriminate between the second and third hypotheses, we need to show that both shorthaulers and railroaders expected to benefit. We do so in two ways. First, in the present context, by studying the legislative process, the evolution of the proposals toward a compromise benefitting these two groups, and from an analysis of voting which shows that both these groups expected to benefit while longhaulers did not. Second, elsewhere (Gilligan, Marshall, and Weingast 1986) we use stockmarket analysis to show that the expected profits for longhaul railroads were positive.

SECTION II. POLITICAL ECONOMY OF INTEREST GROUP FORMATION

The simple *producer protection* thesis, based on a dichotomy between concentrated producers and diffuse consumers, fails to capture the underlying economic and political realities of the late 19th century railroad controversy. The struggle over the ICA was not simply the railroads against an undifferentiated set of consumers. Benson, discussing the rise of the railroad put it as follows. In the process of developing their paramount economics position, the railroads

had to affect adversely other powerful vested interests. Since those interests were unable to protect themselves according to the old rules of the economic game, they proposed to rewrite the rules. (Benson 1955, p. 241)

The analysis therefore requires a multi-interest group perspective.⁸ Let us consider some of the diverse but geographically concentrated interest groups that had an important economic stake in railroad pricing practices. Merchants in every corner of the U.S. depended upon the rails for their livelihood. City by city, they formed associations and organized groups so as to influence their political representatives. Many (e.g., those shipping from New York to the hinterlands) faced only one railroad and therefore monopoly prices. Similarly, the rise of the railroads dramatically affected commercial interests that dominated the old river towns along the traditional water transportation routes (e.g., those in the Mississippi and Ohio River Valleys). Lower cost railroads displaced whole local economies as hundreds of local collection points whose economy depended upon water traffic became technologically obsolete. Just as today's displaced groups provide political support for a host of relief programs for displaced industries, so did these groups.

Following the coming of the rails, revolutions took place in other industries, markedly transforming the industrial organization of particular markets and even whole industrial sectors.¹⁰ While the rise of new industries made older producers economically defunct, the older interests did not simply vanish. Rather, they too should be expected to have formed organized interests seeking relief. We have considerable evidence that they did so.¹¹

Finally, with the coming of the rails, farmers had become specialized participants in international markets. As producers, they had a direct pecuniary stake in railroad pricing. But they were clearly not of one voice. Farmers in the midwest often faced a single railroad and hence discriminatory pricing, while farmers in the states west of Chicago seemed to benefit from competitive longhaul pricing. Since this was the most diffuse group, it is unlikely to have been the most active lobby (as Benson shows). Yet, their clear pecuniary interest implies that districts where farmers were the vast bulk of constituents, representatives would have undoubtedly shared their preference.¹²

Thus, a host of non-railroad interests had a stake in market intervention. Both sides were organized. But interests among the anti-railroad coalition were not coincident, and it seems clear that none of them could have been politically successful if acting alone. Showing that different groups provided support for particular types of market intervention is one thing: showing how these sometimes conflicting interests led to legislation providing benefits to their coalition is another. So the question remains, how were these interests coordinated (if at all), what provisions did they seek, and were they successful? In order to understand how the coalitions formed, we need to look at the

specific regulatory instruments in the various bills as they passed through Congress.

SECTION III. THE THEORY OF LEGISLATIVE INSTITUTIONS

The political battle over federal railroad regulation covered more than a decade and was played out in Congress.¹³ Understanding the effects of the Interstate Commerce Act (ICA) and its consequences for the economy requires understanding congressional institutions and their effect on policy choice. A comparison of the different proposals from this perspective yields testable implications about how specific congressmen could be expected to vote.¹⁴

Congressional institutions are well known to shape the form of legislation. In what follows, we make considerable use of two key institutional features.

(1) *Bicameralism*. A necessary condition for enacting legislation is that each house of Congress pass a version of the bill.

(2) *Committee veto power*. If the House and Senate pass different versions of the same bill, they must be reconciled through a "conference" procedure. If the two sides fail to agree on identical versions, the bill does not become law. The compromise is fashioned by a subset of members from the relevant committees in each house. Any agreement they produce faces a single, up-or-down vote; no amendments are allowed.

The implications of these institutions are as follows. The first implies that since different interests dominated the different houses, each interest in effect retained a veto over legislation. The second implies that, regardless of the divergence of the bills produced under (1), the different interests represented at the "conference" must come to an agreement. Therefore, if a compromise occurs, the theory of revealed preference implies that the interests represented at the compromise must expect to be made better off under the compromise than the status quo. The prohibition of amendments on the final vote over the compromise implies that the conferees can virtually dictate which of the many policies that command a majority against the status quo becomes the final outcome (Shepsle and Weingast 1986).

Because the different alternatives have varying incidences, incidence analysis yields predictions about the voting behavior of individual representatives. In order to develop these predictions, however, we need to appropriate theoretical tools, and to these we now turn.

The Theory of Legislative Choice

In developing techniques to study legislative choice of regulatory instruments, we follow Fiorina (1982), Weingast (1981), and Weingast and Moran (1983). This involves applying the standard spatial model of policy choice to our problem and provides the analytical power necessary to derive insights into the nature of the political controversy. We begin with the assumption that each legislator's preferences are based on the electoral contest he faces; in particular, each is assumed to maximize his electoral support based on the mix of interests in his district.¹⁵ Each therefore, has an *ideal* point, i.e., a policy alternative that maximizes his electoral support; further, he prefers alternatives closer to his ideal to those further away.

We argued in section II that the railroad controversy was actually two separate controversies, one involving shorthaul pricing and one involving longhaul pricing. The different interests would therefore have varying preferences over policies that affect these two problems. In order to be more precise about the relationship between legislator preferences and policy choice, we consider the following space of feasible policy choices. Let the first (horizontal) dimension be the price over shorthauls which may range from the competition price, p_{sc} , to the monopoly price, p_{sm} ; and let the second (vertical) dimension be the price over longhauls, which may range from the competition price, p_{lc} to the monopoly or cartel profit-maximizing price, p_{lm} . This yields a two dimensional policy space which is a compact subset of R^2 , as depicted in Figure 2.

Also shown on Figure 2 are several ideal points. A legislator representing solely a railroad constituency, for example, prefers alternatives in the upper right corner, i.e., (p_{sm}, p_{lm}) . Since the upper contour sets of railroad profits are convex over this price space, their representative's utility over alternatives falls off as we move further away from this point. The ideal of a representative from a district dominated by shorthaul shippers is along the lower border. Moreover, we assume that shorthaul interests—and hence their representatives—care solely about shorthaul prices, i.e., their preferences are lexicographic. Their indifference curve through any point, therefore, parallels the horizontal axis. We can also depict the preferences of longhaul shippers over the set of policy alternatives. We assume that they care solely about longhaul prices and therefore have lexicographic preferences. A longhauler's indifference curve through any point parallels the vertical axis.

Finally, we have also depicted the status quo, p^0 , on the figure. It is at the monopoly shorthaul price, p_{sm} , since railroads were free to charge the monopoly price in these markets. We place p^0 somewhat above the minimum longhaul price. While cartels were not governmentally supported, they were not strictly illegal in the pre-regulation environment; nor were they totally ineffective (Porter 1983).

The analytical power of this framework stems from its implications, which are twofold. First, it allows us to show how various regulatory instruments would alter the status quo (see Figure 3). Thus, a policy legalizing pooling, the major mechanism underpinning the railroads' cartel, would raise longhaul rates and can therefore be represented as a vertical move from p^0 . Finally, a bill that combines a prohibition on pooling and imposes a SHPC would move primarily left and up from the status quo.

Second, this approach allows us to show the divergent strategies of the two coalition leaders. Confronting the status quo, p^0 , each attempted to devise a set of legislative provisions that would move prices in a direction preferred by his constituents. For the railroads' representatives, this meant policies above, or above and to the left of the status quo. For representatives of the shorthaul shippers, this meant policies to the left of the status quo. For illustration, we show plausible locations for the legislative proposals of each coalition: p^s represents the bill favoring the railroads produced in the Senate, while p^h represents the bill favoring shorthaulers produced in the House. By varying the proposed bill, the coalition leaders determined which legislators joined them and which opposed them.¹⁶

SECTION IV. THE REGULATORY PROPOSALS: THE HOUSE VS. THE SENATE

As we have seen, by the mid-1880s, two major coalitions of interest groups had formed, each with their congressional sponsors, and each with a proposal to benefit themselves. There is nearly unanimous agreement that railroads dominated the committee with jurisdiction in the Senate while shorthaul shippers dominated the corresponding committee in the House.¹⁷ This pattern of dominance is assumed throughout, and is therefore a maintained hypothesis of the analysis. But the political controversy over the ICA was not simply debate between competing ideals; it was a battle over instruments and control mechanisms. To understand the ultimate incidence of the ICA, we must analyze three sets of instruments: those preferred by each side, those proposed by each side, and finally those in the final bill. This analysis allows us to give specific content to the abstract predictions made by our model.

The Railroad Bill. The railroads' ideal legislation provided for a stable cartel upholding monopoly prices (as shown in Figure 2). The railroads' ideal form of cartel included the following features.¹⁸ (1) legalized pooling arrangements; (2) published rates; (3) an anti-rebate, anti-drawback provision; (4) some weak form of SHPC; and (5) a commission malleable to the railroads' interests. These features are summarized in the first column of Table 1.

The first feature would play a role in the extracting of monopoly rents and the stability necessary to maintain them. Pooling was one of the major contractual agreements facilitating coordination of the firms making up the cartel.¹⁹ The other features were intended to maintain cartel prices in the face of incentives of the individual railroads to cheat. The second and third, and also the fourth, would play this role by changing the costs and benefits from cheating. MacAvoy's discussion of the instruments contained in the final legislation pertains here as well:

Regulation under [these provisions] reduced the profits from cheating on official rates. Under circumstances in which disloyalty did not violate the law, cheating resulted in smaller profits for a shorter period of time under regulation for two reasons. First, any rate cut that was "just and reasonable" had to be extended to all traffic—so that increased profits from cutting rates on grain to NY had to be accompanied by lower profits from required cutting of local rates. Second, the discount had to be announced and announcement—if followed by reduction of the official rate—reduced the length of time in which the disloyal firm received larger profits. (MacAvoy, p. 124)

Moreover, these features changed the incentives to police cheating by other railroads and by other customers not receiving the discount. Reporting the information to the commission would lead to legal sanctions, whereas prior to any legislation, the only available response was retaliation. Thus, (2) was to help deter cheating: tariffs had to be filed with the commission so charging anything but the published rates was sufficient evidence of violation of the Act. The purpose of (3) and (4) was to allow railroads to continue discriminating (charging monopoly prices on the shorthaul), but also to prevent cheating on the longhaul cartel by individual railroads who sought to give specific price discounts. Additionally, the third would mitigate the monopsony power of certain shippers (such as Standard Oil). The fifth provision would blunt the influence of other interest groups on regulation, and would allow a commission the flexibility to enforce a stable cartel agreement and to adjudicate

disputes among railroads.²⁰

Thus, it is clear that the railroads hoped a commission would serve their interests. From the strong opposition of the anti-railroad coalition and the large number of citations of railroad influence over the state commissions, this bias seems likely. This inference is also supported by Hilton's report that "writers who favored establishment of a commission in this controversy were uniformly in favor of legalization of pooling," (p. 105); that is, those favoring cartelization also favored a commission.

The bill put forth by Senator Cullom of Illinois became the major legislative vehicle in the Senate and included some but not all of the above provisions (see Table 1). Its major features were as follows. First, and most significantly, the bill did not provide the legal underpinnings for Pooling. In this important sense, the bill failed to include the major cartel mechanism, and was therefore less than the railroads' ideal. The anti-rebate provision and the published rate provision were included, as was a "weak" and "elastic" SHPC. Finally, the Cullom bill called for enforcement by a commission. A commission was valuable (to the Senate as well as the railroads) because the Senate confirms appointees to the commission and therefore could bias appointees in the railroads' favor (see Fiorina 1982, 1984).

The Anti-Railroad Bill. The anti-railroad coalition comprised more diverse interests than the railroads comprised, though all suffered from shorthaul price discrimination. Judge Reagan, a representative from Texas, played the major role in forming the coalition by combining a series of related provisions and pushing them through the House. The logic underlying Reagan's bill is as follows. First, because the unifying factor underpinning this coalition was that nearly all were victims of some form of local monopoly price discrimination, all favored elimination of this form of price discrimination. Reagan's bill therefore included a strong SHPC (see Table 1). Second, they were against cartelization and allowing railroads undisputed and unregulated control over prices. This coalition sought to prohibit pooling because the fall in shorthaul rates under the SHPC depended on the longhaul rate. Pooling implied higher longhaul rates and hence weakened the impact of the SHPC. Third, they favored published rates to ease enforcement of violations. Fourth, a Senate-appointed and railroad-dominated commission was unsatisfactory to them. Since railroads were sure to be the more active, aggressive participants in and regulatory process, a commission was likely to bend the interpretation of the Act in their favor.²¹ Hence, a provision for direct enforcement by the courts was preferred. As Fiorina (1982) points out, this was the enforcement strategy adopted three years later in the Sherman Antitrust Act. Additionally, part of the coalition was primarily against rebates, drawbacks, and other provisions that gave price breaks to specific shippers.²²

The diversity of the anti-railroad coalition forces us to address a further issue. Could the diffuse and varied interests in the Reagan coalition really expect to reap benefits once the Act passed? How did they anticipate succeeding when the railroads were sure to be a constant and potentially overwhelming opponent in the post-legislative environment? These questions need to be answered in order to make our account of the Reagan proposal plausible.

The answer is revealed by the manner in which regulatory instruments were devised. The bill did not delegate broad, discretionary powers to a commission, as is common for modern regulatory agencies. Reagan and his followers rationally feared railroad domination of a commission. Reagan's proposal instead attempted to minimize the possibility of interpretive bias in favor of railroads. It did so by creating provisions with easy tests that could be applied by the courts: was a shipper charged anything but the published rates? Did the published rates violate a specific provision of the Act (e.g., was the rate from New York City to Vermont greater than the rate from New York to Chicago along the same line)? Did a specific shipper get a price break not offered to other shippers of the same class? The proposed provisions placed specific, enforceable limitations on railroads' pricing behavior with clear incidences in favor of Reagan's coalition.²³ Put simply, the prohibitions were designed to limit the railroads' influence in the post-legislative era.

Comparing the two bills. The major differences between the Cullom and Reagan bills can be summarized as follows (see Table 1): (1) The Cullom bill, while not legalizing pooling, did not prohibit it; the Reagan bill contained an unambiguous prohibition; (2) the anti-rebate and discrimination clauses differed; (3) the Reagan bill contained stricter SHPC; (4) the Reagan bill called for an enforcement through the courts, while the Cullom bill called for enforcement by a commission.

The railroads' first preference was for legalizing pooling; their second was surely to leave it in legal limbo. The anti-railroad coalition, on the other hand, clearly sought to prohibit pooling; hence its exclusion in the Reagan bill. Regarding the SHPC, the railroads' interest was twofold, first to maintain their monopoly power between points which lacked competition, and second, to prevent cartel cheating on routes served by competing railroads. Hence, the clause in the Cullom bill was more ambiguous, and in part relied (as Hilton has noted) on judicious enforcement by a sympathetic commission. The members of Reagan's coalition, on the other hand, were unanimously against local monopoly pricing and sought a strict clause to eliminate it. Moreover, this provision was undoubtedly a necessary condition for this coalition to support any legislation or compromise. Without it, Reagan's coalition probably would have attempted to block the legislation.²⁴

SECTION V. ANALYSIS OF THE COMPROMISE BILL

The sequence of regulatory proposals played out over a decade. Bills passed the House in 1874, in 1878, and in the lameduck session following 1884 elections. The first passage of a bill by the Senate occurred in early 1885, also in the lameduck session. However, the two sides failed to reach a compromise so the bill died. Deadlock again occurred in 1886: the Senate passed its version (May) and the House its version (July), with no compromise forthcoming.

This pattern of radically different bills unaccompanied by compromise forces us to ask whether a compromise was feasible.²⁵ Reagan represented shorthaul shippers and Cullom the railroads; committee veto power implies that each interest must be made better off by the compromise. But was this possible? Did there exist policies preferred by both sides to the status quo? The answer is not obvious, especially because the interests of the shorthaulers seemed antithetical to those of the railroads. Historians, for example, have also provided considerable evidence as to the overt hostility of this group to the railroads (see Buck 1920 or Benson 1955).

Importantly, the theory developed above provides an answer.

Turning to Figure 4, we show diagrammatically that the feasible region of compromise is non-empty. The figure depicts the set of policies preferred to the status quo by each coalition, the set of policies preferred by Reagan to p^0 , $H(p^0)$, and the set preferred by Cullom, $S(p^0)$. The former was concerned with shorthaul prices and would clearly be willing to trade off increases in longhaul prices for decreases in shorthaul prices. From the status quo, the railroad's iso-profit lines imply that they would trade decreases in prices (and profits) from shorthauls for increases in prices (and profits) from longhauls. This implies a non-empty region of mutually preferred alternatives, $H(p^0) \cap S(p^0)$, as depicted in Figure 4. This represents the set of feasible bargains between two interests.

The model has several implications. First, in comparison with their original bills, each interest gains less under the compromise. Second, the compromise contains provisions benefiting each so that the package as a whole makes each interest better off than under that status quo.²⁶

Provisions of the ICA. An analysis of the provisions included in the compromise confirms the prediction made immediately above, namely it cannot be considered a complete victory for either side. The Senate agreed to *prohibit* pooling, and to accept the House's version of the strict SHPC. The House agreed to enforcement by a commission. The implications are as follows. (1) It is hard to read this bill as a cartelization package for the railroads. They lost on pooling (failing to get even their second preference) and on the SHPC clause. The latter was not given the flexibility needed to police cartel cheating while maintaining an individual railroad's ability to charge monopoly prices in regions where they were the sole railroad.²⁷ (2) On the other hand, it was surely not an onerous set of controls. The railroads obtained one of the measures designed to maintain prices—the anti-rebate anti-price discrimination clause; and this clause also mitigated the monopsonistic power of certain shippers. Moreover, by raising longhaul rates, strict enforcement of the SHPC may have enhanced railroad profits. (3) The anti-railroad coalition got their major pricing restriction, the SHPC clause. This clause clearly provided Reagan's coalition with expectation of benefit, and according to MacAvoy, the expectation was borne out.

[Local] shippers benefited from the prohibitions against discrimination. Reductions in short-distance rates . . . were not dictated by market conditions but rather followed from the imposition of regulatory rules. (MacAvoy 1965, p. 201)

(4) Longhaul shippers seem to have lost.

Through shippers were deprived of any observable benefits. When rates were maintained, the grain spreader's costs were increased and Chicago-New York grain price differences were greater. During seven years of strong regulation, the price difference average 6 cents per 100 pounds more than in the succeeding six years. (MacAvoy 1965, p. 201)

(5) The compromise, the product of two groups with diverse interests, necessarily contained some elements preferred by one side along with elements preferred by the other and omitted important provisions sought by each. It would thus surely pursue cartelization inconsistently and incompletely. This explains, in part, the "inconsistencies" studied by Hilton (1966). Moreover, Hilton's discussion

of how legislation after 1900 transformed the ICC into a more explicit cartel manager provides further evidence that the original ICA was not designed solely for this purpose. (6) Hence, the major effect of participation of the railroads seems to have been to protect their interests—i.e., to make sure they do not lose too much, and to possibly gain a little—rather than to obtain a complete, government-managed cartel. (7) In this sense, the bill can be interpreted as a redistribution of wealth among customer classes—specifically, from longhaul shippers to shorthaul shippers. Since a large portion of the longhaul traffic was bound for Europe, a non-negligible portion of this transfer was borne by European consumers. The net welfare effects of this transfer for the U.S. may have been positive. That aside, the clear inference is that several non-railroad interests appear to have gained from the ICA.

SECTION VI. LOGIT ANALYSIS OF CONGRESSIONAL VOTING

Our analysis suggests major differences between the congressmen who supported the Cullom bill and those who supported the Reagan bill. Several hypotheses follow about the pattern of voting in Congress. Longhaul shippers should favor the Cullom bill over the Reagan bill. Hence, the West (defined as those congressional districts whose main roads feed into Chicago) should vote for Cullom; similarly, those districts containing major cities *with two or more railroads* to the east coast are more likely to vote for Cullom than for Reagan. Second, shorthaul shippers should favor the Reagan bill. Hence districts where most inhabitants faced only one railroad to the coast should be observed to vote disproportionately for Reagan over Cullom. Third, districts with large concentrations of railroad interests should be disproportionately disposed towards Cullom over Reagan.

This section presents results from the analysis of two votes in the House: the Reagan Bill vs. the Cullom Bill in July 1886, and the vote on the final passage of ICA in January 1887. They allow us to investigate the voting decisions of congressmen over the regulatory proposals studied in sections IV and V.

Data. The dependent variables in our analysis are the votes noted above. Votes are taken from the *Congressional Record*.²⁸ On the first vote, a vote for Reagan is coded as a one, a vote for Cullom as a zero. On the second, a vote for the ICA is coded as a one, a vote against as a zero.

The explanatory variables are intended to represent the concentrations of railroad, longhaul shippers, shorthaul shippers, and farming interests in each district. The hypotheses derived above yield predictions about signs and significance of coefficients.

(1) *Railroad variables.* The *Statistical Abstract* provides data by state on (a) the value at costs of railroad property, plant and equipment, and (b) annual revenues.²⁹ The components of (a) are combined to produce the variable CAPITAL. The variable ROI is computed as revenues per dollar of capital investment, and is calculated on a *per state* basis.

Railroads were clearly one of the major participants in the political battle. The more important the railroad's operating is to the local economy (e.g., employment, traffic flows, and as a source of local tax revenue), the greater the influence the railroad should exert on the district's representative. CAPITAL attempts to measure this. CAPITAL has a mean value of .34 and a standard deviation of .28 billions of dollars. Moreover, holding constant for CAPITAL, the greater

the railroad's stake in a particular area, the greater influence it is likely to exert. ROI is a proxy for this. ROI has a mean value of 11.07 and a standard deviation of 5.08 percent.

(2) *Farmers.* Fogel (1964) provides estimates by state of the value of farm land. His estimates are based on the 1890 *Census of Agriculture*.³⁰ We use his figures to produce the variable LAND. The more important farmers are in a district, the greater the influence on their representatives. LAND has a mean value of .345 and a standard deviation of .273 billions of dollars.

Since the data in (1) and (2) are reported by state, the districts within a state are assigned identical values of the variables.

(3) *Other variables.* The remainder of the data consists of dummy variables identifying differences among the districts that are not readily quantified. CENTER takes on the value one for districts that contained major shipping centers or were served by more than one major carrier.³¹ Shippers and merchants in centers face the choice of at least two railroads for transport and are less likely to be victims of railroad monopoly price discrimination. They are therefore less favorable than other districts to the strong SHPC in the Reagan Bill. Approximately 17 percent of all districts are classified as CENTER.

A value of one for the variable WEST indicates an agricultural district north and west of Chicago. The least cost route of grain to the East from these districts passes through Chicago over the lines of the Chicago pool members. While shippers in these areas suffered from shorthaul discrimination, their position implied that the SHPC was significantly less beneficial to them than to the areas east of Chicago. The latter had the longhaul rates out of Chicago constraining their shorthaul prices, while the former, because of the relative absence of longhauls, would not be benefited by the SHPC. Moreover, they would be worse off to the extent that their own rates rose because the SHPC increased rates from Chicago to the east coast. Therefore, these areas should be less likely to support the Reagan bill, *ceteris paribus*. Approximately 9 percent of all districts are classified as WEST.

We also utilize the variable PARTY which takes on the value of one for Democrats. Democrats appear to have been more favorably disposed toward shorthaul shippers; indeed, Reagan was a Democrat while Cullom a Republican. To the extent that parties constrained the behavior of their members, this variable measures its effect. Approximately 56 percent of all Congressmen voting in *Cullom v. Reagan* were Democrats.

Our specific predictions from section IV are as follows. Higher levels of CAPITAL imply a lower probability of voting for the Reagan Bill; the same holds for ROI. LAND should have the opposite effect on voting: higher levels should increase the probability of voting for Reagan. For the dummy variables, both WEST and CENTER should lower the probability of voting for the Reagan Bill.

For the final vote on the ICA, our predictions are: farm representatives should vote favorably; representatives of longhaul shippers, shown to be potential losers in sections IV and V, should be more likely to vote against. We should observe railroads to favor the compromise: veto power held by the railroads' representatives in the Senate suggests that any proposal making them worse off would be vetoed rather than passed.

Results and Interpretations. The results for the first vote are reported in Table 2 and are remarkably consistent with the perspective presented in section IV. Nearly every coefficient comes out as predicted and they are statistically different from zero. Looking across all four models, we find the results robust with respect to specification. Both railroad variables are highly significant and lower the probability of voting for the Reagan bill; the variable representing farming interest, LAND, positively affects the probability. Finally, both CENTER and WEST are negative, as expected. The results also show that while party appears to have an important effect on voting, it does not affect the sign and significance pattern of the other variables, with the exception of CENTER (which is significant only in the presence of PARTY). In all four specifications, the percent correctly predicted far exceeds the null model's 56 percent.

To derive the actual effect of the variables on the probability of voting for the Reagan Bill, we report some additional calculations in Table 4 based on Specification B from Table 2. This reports the change in probability of voting for the Reagan Bill implied by the coefficients; these are calculated by holding all other variables constant at their means. A congressman representing a district characterized as a CENTER has a .06 lower probability of voting for Reagan; a congressman representing a district from the WEST has a lower probability of voting for Reagan of .33. We calculate the partial derivative of the probability for the continuous variables.³² In comparison with a district at the mean of the independent variables, these calculations imply the following: (1) a district with \$100 million more railroad capital has a .21 lower probability of voting for Reagan; (2) a district with \$100 million higher value of land has a .17 higher probability of voting for Reagan; and a district with a one percent higher return on railroad capital has a .03 lower probability of voting for Reagan.

Another way to interpret the implications of the estimates is to evaluate them at values representing different districts. The probability of voting for the Reagan bill at the mean of the independent variables is .56. For a grain producing district in southern Minnesota, the probability is .06: Western farmers facing low through rates strongly opposed Reagan. For a district in rural Indiana containing no centers, on the other hand, the probability is .84. This figure is typical of districts in rural Indiana, Ohio, and southern Illinois, and shows that the major farm areas in these states heavily favored Reagan over Cullom. Most of the south, containing few centers, and with greater value of farm land than of railroad capital, the probability is high, above .8, and often above .9. Finally, for eastern centers with large concentrations of railroads property and many railroads, the probability is typically low: for Philadelphia, it is .13.

These results support the perspective developed in section IV. While railroads appear to have had considerable influence in the debates, so, too, do other participants. Farmers are the biggest group which appear to have suffered from local monopoly pricing. Our estimates imply that their representatives reflected this interest. Western farmers, benefiting from low through rates, were slightly less disposed to favor the Reagan Bill. Similarly, commercial CENTERS with significant concentrations of longhaul shippers were less disposed to favor the Reagan Bill over the Cullom Bill.

The results from the vote on the final compromise (Table 3) provide further support for our hypotheses. First, the effect of CENTER and WEST are both negative. At the mean of all independent variables, WEST lowers the probability of voting for the compromise by .27 (from .83 to .56). The railroad variables are negative while the farm variable is positive, suggesting that farm interests were more likely to support the compromise than were railroads. However, this does not mean that railroads voted against the compromise—only that they were on average less favorable than were farm districts.³³ To see this, we calculate the impact of a large change in railroad and farm variables on the probability of voting for the compromise. As reported in Table 5, adding \$300 million in railroad capital lowers the probability of voting for the compromise by only .26 (from .83 to .57). For farm land, this change increases the probability of a favorable vote by ~.33 (from -.83 to ~-1). By way of comparison, the same change for the vote on the Reagan v. Cullom bills lowered railroad support by greater than .56 (from .56 to -0) while it increased farm support by greater than .44 (from .56 to ~1). This casts further doubt on the hypothesis that the ICC was primarily a cartel manager for the railroads; farm interests clearly anticipated benefits.

VIII. CONCLUSIONS

The primary purpose of this paper was to evaluate the incidence of regulatory legislation by examining the political controversy surrounding its passage. Toward that end, we developed a model of legislative choice and used it to derive implications regarding the characteristics of the final legislation and the voting behavior of individual representatives. Our perspective shows that political institutions play a key role in enfranchising certain groups and endowing others with veto power.

We applied this perspective to the problem of the inception of railroad regulation. The railroads created two separate, though not completely antithetical, bases for support for regulation, cartel instability on the longhaul and local price discrimination on the shorthaul. Hence two different, opposing coalitions formed, each seeking political gain by rewriting the rules of the economic game.

Several conclusions emerged from the analysis. Far from having a unitary effect, the ICA was a compromise among many contending interests. Shorthaul shippers gained important restrictions on railroad pricing, improving their welfare (MacAvoy 1965; Zerby 1980). River towns and eastern production centers benefited from lessened competition due to higher longhaul prices (see, e.g., Miller 1971 and Benson 1955). The net effect of the ICA on railroads was small but positive (Gilligan, Marshall, and Weingast, 1986). The ICA did not spawn railroad cartels, but did help railroads earn supracompetitive prices in longhaul markets by explicitly relating shorthaul and longhaul prices.

Perhaps more importantly, however, the analysis has implications beyond the railroad controversy and for the development and testing of positive theories of regulation. First, a multiple interest group perspective is frequently necessary to understand the inception of regulation. Regulation, in many cases, appears not to follow the stylized pattern of a concentrated producer group against an undifferentiated and diffuse set of consumers. Often there are a variety of producer and consumer interests, neither of which have homogeneous preferences for regulation. Thus, the

results of this paper indicate that the continued development of multiple interest theories of regulation is fruitful.

Second, the ways in which these heterogeneous preferences are aggregated to form the final regulation depends critically upon the institutions of the legislative choice process. Recognizing the key features of these institutions, such as bicameralism and committee dominance, can greatly enhance the predictive power of regulatory theory. For instance, because of railroad's influence with the relevant committee in the Senate and the Senate's potential veto of any legislation, any regulation had to leave railroads no worse off. Because of shorthaul shipper influence in the House and the House's potential veto of legislation, the regulation had to make them (at least weakly) better off as well. The empirical analyses contained in this paper confirmed these predictions. The institutional characteristics of the legislative choice process are important determinants of the final form of regulation. Integrating these characteristics into formal models of regulation appears warranted.

And finally, tests of the theories of regulation are frequently limited by available data or by confounding interpretations of existing data. The methodology used in this paper indicates that political data, the voting behavior of legislators and the structure of legislative mechanisms, can be employed to test theories of regulation. The political analysis of the evolution of the provisions, from initial proposals to final legislation, provides information about the incidence of the Act. Comparing the effects of the provisions at different stages shows that the railroads obtained significantly less than their ideal. The sequence of legislation moved from their ideal to the proposal in Senate, and then further to the compromise with Reagan's coalition that became the final Act. The evolution from a set of different proposals to the final legislation typifies the legislative process. To the extent that the different proposals or bills can be tied to attempts to benefit specific (possibly conflicting) interests, analyzing the elements in these bills and the final compromise provides considerable insight into the anticipated balance of benefits.

Thus hypotheses about the *economic* impact of regulation can be tested using data from the political controversy over that regulation. Because the relevant economic interests are often geographically concentrated, hypotheses about the incidence of various bills can be tested by observing the behavior of *representatives* of these locations. These conclusions are also supported by the recent work on several aspects of environmental regulation (Ackerman and Hassler 1981, Crandall 1984, and Pashigian 1985). Institutional analysis of the political process, combined with an economic analysis of the instruments included in the legislation, appears to be a powerful tool for understanding why regulation occurs as well as its expected economic impact.

FOOTNOTES

- * Mr. Gilligan is Assistant Professor of Economics at the California Institute of Technology. Mr. Marshall is Vice President of Financial Strategies, Goldman-Sachs, Inc. Mr. Weingast is Professor of Economics and Political Economy, Washington University, and Visiting Scholar, Hoover Institution, Stanford University. The authors gratefully acknowledge comments from Keith Krehbiel, Mathew McCubbins, Terry Moe, Roger Noll, Douglass North, Mort Pincus, Kenneth Shepsle, and John Wallis; and from the seminar participants at the following universities: Chicago, Duke, Stanford, and Washington. We also thank Elizabeth Case for her editorial assistance and Eric Amel and Brian Marks for their research assistance. Mr. Weingast acknowledges the national Science Foundation (Grant No. SES 8440535) for partial support.
1. The majoritarian constraint, while obvious in one sense, has received little attention in the literature. It helps explain, for example, the following anomaly. Given the simple form of the capture theory, namely that concentrated producers provide greater political support than do diffuse consumers, why aren't all reasonably concentrated industries regulated? The answer is that this is hardly a sufficient condition for regulation. Greater political support does not guarantee *sufficient* (e.g., majoritarian) support.
 2. There is an extensive literature, mainly by historians, focusing on the effects of discriminatory pricing, and especially on the political reactions by various groups. Important studies include Benson (1955) on New York merchants; Buck (1920) on farmers; Nash (1957) on Pennsylvania oil producers; and Miller (1971) on the commercial centers of the older water transportation system. Several economists have analyzed the basis for this pricing system, e.g., Meyer et al. (1959) and Friedlaender (1969).
 3. For example, the rate from Boston to Vermont was reportedly 16 times the rate from Boston to Chicago via the same railroad. Much of the debate in Congress was over this issue (see Haney 1908).
 4. This aspect of political demand for regulation is studied extensively by MacAvoy 1965; Kolko 1965; Hilton 1966; Spann and Erickson 1970; Ulen 1980; and Zerbe 1980.
 5. This aspect of the demand for regulation is studied extensively by historians and political scientists as well as economists. Among the former are Buck 1920, Benson 1955, Bernstein 1957, Huntington 1952, Martin 1967, Miller 1971, Nash 1957; among the latter, Friedlaender 1969, Meyer et al., 1959. More generally, see the recent summaries of these literatures by Fiorina 1984 and Skowronek 1982.

6. See, e.g., MacAvoy 1965, Spann and Erickson 1970, Friedlaender 1969, and Zerbe 1980.
7. This result is derived rigorously in Gilligan, Marshall, and Weingast 1986.
8. The analytical versions of this theory (e.g., Fiorina 1974 and Peltzman 1976) allow us to account for bias in favor of a compromise among many different opposing groups for regulatory contexts that involve many interest groups.
9. Benson (1955), for example, discusses the rise of a large number of commercial associations and lobby groups (e.g., Cheap Freight Railroad League, the American Cheap Transportation Association, National Anti-Monopoly Cheap Railway League, Boston Merchants Association, and the Chamber of Commerce of New York City). Benson also describes the coordination of many of these groups with various congressmen. Clearly these groups provided electoral support for non-railroad positions.
10. See Chandler (1977) for a colorful description of this transformation.
11. See, for example, Benson's (1955) description of the older cattle ranches in upstate New York being put out of business by new cattle raising areas in the west made feasible by the railroads.
12. In modern times, it is precisely this mechanism that underlies the political support for current agricultural programs benefiting this group.
13. While the president retained a veto over any congressional legislation, he appears not to have been an active player in this controversy, and thus receives scant attention in the literature in what follows. We conjecture that since so many different constituencies were mobilized on this issue, and that—as we argue below—the compromise appears to have required the support of most of these, any widely supported legislative compromise would be deemed satisfactory by the president.
14. One prefatorial remark is necessary. While railroad regulation by the ICC during most of the post World War II era included comprehensive political control of the industry (e.g., pricing, entry, and exit), the battle over the ICA in the 1880s concerned a considerably different form of regulation. It was not a bill to regulate railroad rates, though it contained important provisions affecting prices; nor did it address entry or exit. Rather, the political battle was fought over specific practices. As we show below, these had clear incidences with predictable effects for different groups. The Act provided no powers for the ICC to set rates. Reagan, the proponent of the House bill is quoted as saying, "One of the greatest troubles I have had even with the friends of legislation in this direction has been to get them to understand that this time [the Reagan Bill] is not a bill to regulate freight rates . . . I know the difficulties which would attend any measure attempting to prescribe rates." (Haney 1908, p. 309). When, several years later, the ICC attempted to set rates, the Supreme Court held the action beyond its statutory authority

(*ICC v. Cincinnati, N.O. & Tex. Pac. Ry.*, 1897). In modern times, we are accustomed to delegating considerable discretion to regulatory agencies with no (substantive) holds barred. But this was not the case for the ICC. While the ICA contained language similar to that used in modern grants of discretion, e.g., "All rates shall be just and reasonable," phrases of this type did not attain their current meaning until well into the 20th century with the development of administrative law.

15. This approach to legislators is standard. Both Fiorina (1974) and Peltzman (1976), for example, study policymakers of this type.
16. The model also yields predictions about voting behavior. Consider a vote between two different alternatives, e.g., p^s and p^n . Legislators vote for the alternative that they most prefer. Given a mix of interests in any given district, we can then construct the preferences each representative, and hence his voting decisions.
17. Widespread agreement exists on this point. See, for example, Kolko (1965); Hilton (1966) and Skowronek (1982) on Cullom vs. Reagan; see also Nash (1957) on Reagan.
18. These items are nearly identical to those proposed by Albert Fink for the railroads to stabilize their cartels. See Gilchrist's (1960) analysis of Fink's proposal to provide the legal underpinnings for cartels.
19. As Ulen (1980, 1982) shows, this mechanism was the primary enforcement provisions of the cartel. Legalizing pooling would make policing the agreements much more effective. See also Gilchrist (1960).
20. To quote Hilton on the advantages to the railroads from (4) and (5), appropriately interpreted by a friendly commission, . . .

[The railroads] wanted a prohibition of charging more for a shorthaul than for a longer haul which the Commission might waive so that they might continue the chronic, discriminatory form of long- and shorthaul ratemaking [i.e., local monopoly pricing], but avoid the competitive, rate-cutting version of the same practice. For this and for the more general necessity of providing day-to-day stability of the cartels, railroad men characteristically felt that a commission vested with a high degree of discretion in its power was necessary. (Hilton, 1966 p. 105)
21. There is nearly unanimous agreement on this point. See Haney (1908), Hilton (1966) and Fiorina (1984).

22. To quote Hilton, "the Reagan bill was formulated by . . . an attorney for the Petroleum Producers' Union, a group of shippers in the Pennsylvania oil fields who suffered chronic, discriminatory form of long- and shorthaul ratemaking. They were also heavily motivated by hostility." See Nash (1957) for an extensive analysis.
23. Furthermore, they did not require a small number of bureaucrats to contend with an army of railroad representatives over an in depth analysis of costs, revenue flows on profits that attend modern rate of return regulation. Railroads were sure to have overwhelmed the small commission in this type of process. This was clearly foreseen. Haney (1908, p. 308) notes that during the debates, "it was urged that so small a number of men could not possibly supervise so great a railway system."
24. One additional difference between the bills is instructive, and provides further evidence of the makeup of Reagan's coalition. The Cullom bill specified that shorthaul rates could not be higher than longhaul rates when one of the termini of the shorter route *coincided* with a terminus of the longer route. The Reagan bill imposed the same restriction, but on a broader class of routes: it covered *all shorter shipments contained* within the longer route. Since eastbound traffic out of Chicago and westbound traffic out of New York comprised the lion's share of traffic, the difference was clearly aimed at the smallest of all shippers, e.g., those shipping from a small town in Indiana to a small town in Ohio. It is no surprise the railroads were unconcerned about this group. Reagan apparently sought to include these diffuse, though politically active, interests in his coalition. As MacAvoy concludes, the "reductions in short-distance rates . . . provided the smallest of the shippers, seeing the most limited service, with somewhat lower cost of transport." (MacAvoy 1966, p. 201.)
25. To address this issue, we return to our model of legislative choice. The institutional underpinning of the compromise was the conference proceeding in which a small "delegation" from each chamber met together to forge an agreement. In practice, this meant that Judge Reagan and two of his supporters from the House met with Senator Cullom and two of his supporters from the Senate. Bringing a compromise bill back to the floor of each house required a majority of *each* delegation to approve the bill. This conveys to each coalition leader the veto power noted above.
26. One further event appears to have determined the timing of the compromise. During the 1886 period of deadlock, with no compromise in sight, the Supreme Court entered the battle. It announced *Wabash v. Ill.*, a surprise decision striking down state regulation of the railroads attempting to control the rates of commodities hauled in interstate commerce. The case involved state SHPC clauses, and the decision was delivered on October 25, just before the congressional election. This decision clearly changed the status quo by altering the restrictions on railroads in states with commissions dominated by anti-railroad groups and removing compliant enforcers in states with commissions dominated by railroads. After the decade-long legislative battle and deadlock, an acceptable compromise was fashioned within six weeks

following *Wabash*. To quote Fiorina (1984) on the surprise, "During the recess [for the 1886 congressional elections] the Supreme Court dropped a bombshell with its *Wabash* decision" (p. 3). "Furthermore, given the earlier debates and events there is good reason to believe that absent the *Wabash* stimulus, the House and Senate would have remained at loggerheads, continuing the decade-long debate into future congresses" (p. 4). This judgement is supported by contemporary observers. The *New York Times*, for example, reports the following. Two days following *Wabash* (Oct. 27), an article urged national legislation stating that *Wabash* was the strongest kind of argument in favor of long-delayed national legislation. By Dec. 10, the *Times* reported that there was little doubt that the bill would become law, and (two days later) that *Wabash* was believed to have pushed forward the legislation. The surprise view is widely held; see Hilton (1966), Haney (1908), Cushman (1941), and Schwartz (1973).

27. To quote Hilton on the compromise, from the perspective of those attempting to foster cartelization, this clause was "worse than vague":

Since it did not state forthrightly that its purpose was to prohibit competitive and preserve discriminatory longhaul ratemaking, there was no assurance that the courts would interpret the act in such fashion. . . . In fact, the Supreme Court interpreted it in absolutely the reverse fashion. (p. 106)

28. We have chosen to ignore abstentions, but have included the positions of "paired" congressmen, i.e., those announcing a position but not voting. These congressmen are coded as if they voted. Since they are a small fraction of the votes, this does not affect the results. We might have treated an abstention as a position (e.g., code them as a middle category in an ordered probit analysis) except for the following objection. This is not a homogenous category, but includes both those choosing not to vote as well as those who were absent but would have voted were they present.
29. We use gross revenues rather than net income so that income available for distribution to all claimants, rather than only equity, is measured. Thus the effects of what may be arbitrary variations in capital structure are eliminated.
30. To value "pure" farm land, he adjusts for the value of buildings, fence, and improvements.
31. These districts include the major grain shipping centers listed in the *Statistical Abstract*, cities with pools overseen by the Joint Economic Committee (the major railroad cartel pooling traffic to the East coast), the major port cities on the Gulf and the Atlantic, and cities that were evident as hubs on railroad maps.

32. The units for CAPITAL and LAND are in billions of dollars, which is larger than the range of these variables, so the derivative of 1.5 is not to be taken literally for changes of this magnitude.
33. The results that railroads were not as favorable on average to the compromise as farmers may simply indicate that the legislation also had clear distributional effects across various railroads. Those expecting lower benefits would have been less favorable.

BIBLIOGRAPHY

- Ackerman, Bruce A., and Hassler, William T. 1981. *Clean Coal/Dirty Air*. New Haven: Yale University Press.
- Adams, Charles F. 1878. *Railroads: Their Origins and Problems*. New York: Putnam.
- Alexis, Marcus. 1982. "The Applied Theory of Regulation: Political Economy at the Interstate Commerce Commission," in Meltzer, Ordeshook and Romer, eds., *Carnegie Papers on Political Economy, Public Choice* 39: 5-28.
- Barke, Richard and Riker, William. 1982. "A Political Theory of Regulation with Some Observations on Railway Abandonments," in Meltzer, Ordeshook and Romer, eds., *Carnegie Papers on Political Economy, Public Choice* 39: 73-106.
- Benson, Lee. 1955. *Merchants, Farmers, Railroads*. Cambridge: Harvard University Press.
- Bernstein, Marver. 1955. *Regulating Business by Independent Commission*. Princeton: Princeton University Press.
- Buck, Solon. 1920. *The Agrarian Crusade*. Toronto: Glasgow Brook and Co.
- Chandler, Alfred D. 1977. *The Visible Hand*. Cambridge: Belknap Press.
- Crandall, Robert W. 1983. "Air Pollution, Environmentalists and the Coal Lobby" in Noll and Owen (1983).
- Cushman, Robert E. 1941. *The Independent Regulatory Commissions*. New York: Oxford University Press.
- Elliott, E. Donald, Ackerman, Bruce A., and Millian, John C. 1986. "Toward a Theory of Statutory Evolution: The Federalization of Environmental Law." *Journal of Law, Economics and Organization* 1: 313-40.
- Fiorina, Morris P. 1982. "Legislative Choice of Regulatory Forms: Legal Process or Administrative Process?" in Meltzer, Ordeshook and Romer, eds., *Carnegie Papers on Political Economy, Public Choice* 39: 33-66.
- Fiorina, Morris P. 1984. "The Effects of Uncertainty on the Delegation of Legislative Power." Paper delivered at the Annual Meeting of the American Political Science Association Meetings, Washington, DC.

- Fogel, Robert. 1964. *Railroads and American Economic Growth* Baltimore: Johns Hopkins University Press.
- Friedlaender, Ann F. 1969. *The Dilemma of Freight Transport Regulation*. Washington, D.C.: Brookings Institution.
- Gilchrist, D.T. 1960. "Albert Fink and the Pooling System." *Business History Review* 34: 25-49.
- Gilligan, Thomas W., Marshall, William J., and Weingast, Barry R. 1986. "The Economic Incidence of the Interstate Commerce Act of 1887: A Theoretical and Empirical Analysis of the Shorthaul Pricing Constraint." Working Paper. Caltech.
- Hadley, Arthur T. 1885. *Railroad Transportation*. New York: Putnam.
- Haney, Lewis H. 1908. *A Congressional History of Railways*. Madison: University of Wisconsin Press.
- Hilton, George. 1966. "The Consistency of the Interstate Commerce Act." *Journal of Law and Economics* 9: 87-113.
- Hoogenboom, Ari and Hoogenboom, Olive. 1974. *A History of the ICC*. New York: Norton.
- Huntington, Samuel P. 1952. "The Marasmus of the ICC." *Yale Law Journal* 61: 467-509.
- Kitch, Edmund. 1979. "The Economics of the Interstate Commerce Act of 1887 and its Antecedents." Mimeo. University of Chicago.
- Kolko, Gabriel. 1965. *Railroads and Regulation: 1877-1918*. New York: Norton.
- MacAvoy, Paul. 1965. *The Economic Effects of Regulation: The Trunk Line Railroad Cartels and the Interstate Commerce Commission before 1900*. Cambridge: MIT Press.
- Martin, Albro. 1967. "The Troubled Subject of Railroad Regulation in the Gilded Age—A Reappraisal." *Journal of American History* 54: 339-71.
- Meyer, John R., Peck, Merton J., Stenason, John, and Zwick, Charles. 1959. *The Economics of Competition in the Transportation Industries*. Cambridge: Harvard University Press.
- Miller, George. 1971. *Railroads and the Granger Laws*. Madison: University of Wisconsin Press.

- Nash, Gerald D. 1957. "Origins of the Interstate Commerce Act of 1887." *Pennsylvania History* 24: 181-95.
- Noll, Roger and Owen, Bruce. 1983. *Political Economy of Deregulation*. Washington, D.C.: AEI.
- Pashigian, B. Peter. 1985. "Environmental Regulation: Whose Self-Interests are Being Protected?" Mimeo. University of Chicago.
- Peltzman, Sam. 1976. "Toward A More General Theory of Regulation." *Journal of Law and Economics* 19: 211-40.
- Porter, Robert. 1983. "A Study of Cartel Stability: The Joint Executive Committee, 1880-86." *Bell Journal of Economics* 14: 301-14.
- Schwartz, Bernard. 1973. *The Economic Regulation of Business and Industry*. Vol. 1. New York: Chelsea House.
- Shepsle, Kenneth A. and Weingast, Barry R. 1986. "Institutional Foundations of Committee Power." Mimeo. Washington University of St. Louis.
- Skowronek, Stephen. 1982. *Building a New American State*. Cambridge: Cambridge University Press.
- Spann, Robert and Erickson, E. W. 1970. "The Economics of Railroad: The Beginning of Cartelization and Regulation." *Bell Journal of Economics* 1: 227-44.
- Stigler, George. 1971. "The Theory of Economic Regulation." *Bell Journal of Economics* 2: 3-21.
- Ulen, Thomas. 1980. *Cartels and Regulation*. Unpublished Ph.D. Dissertation, Stanford University.
- Ulen, Thomas. 1982. "Railroad Cartels Before 1887: The Effectiveness of Private Enforcement of Collusion." *Research in Economic History* 8: 125-44.
- Weingast, Barry R. 1981. "Regulation, Reregulation, and Deregulation." *Law and Contemporary Problems* 44.
- Weingast, Barry R. and Moran, M. 1983. "Bureaucratic Discretion or Congressional Control: Regulatory Policymaking by the FTC." *Journal of Political Economy* 91.

Zerbe, Richard. 1980. "The Costs and Benefits of Early Regulation of the Railroads." *Bell Journal of Economics* 11: 343-50.

TABLE 1

Characteristics of Regulatory Proposals

Mechanisms	Proposals			
	Railroads	Senate	House	Compromise
Pooling	Yes	Absent	No	No
Published Rates	Yes	Yes	Yes	Yes
Anti-Rebate	Yes	Yes	Yes	Yes
SHPC	Weak	Weak	Strong	Strong
Commission	Yes	Yes	No	Yes

TABLE 2

Logit Estimation of House Votes

Variables	Votes			
	Reagan v. Cullom		Compromise v. Status Quo	
	A	B	A	A
PARTY	4.42 (0.62)	---	0.62 (0.38)	---
CENTER	-2.11 (0.68)	-0.36 (0.45)	-0.57 (0.45)	-0.45 (0.44)
WEST	-1.83 (0.82)	-3.60 (0.70)	-2.12 (0.65)	-2.47 (0.62)
CAPITAL	-5.48 (1.17)	-6.07 (0.91)	-2.45 (1.02)	-2.47 (1.01)
ROI	-0.22 (0.05)	-0.23 (0.04)	-0.11 (0.04)	-0.13 (0.04)
LAND	4.87 (1.27)	4.82 (0.72)	3.58 (1.12)	3.80 (1.12)
Log-Likelihood	-66.18	-113.80	-112.20	-113.52
% Correctly Predicted	88.70	81.20	82.00	81.30

^aAsymptotic standard errors in parenthesis; 239 observations.

TABLE 3

Changes in Probability of Voting for Reagan

Variable	ΔP	$\delta p / \delta x$
CENTER	-.060	--
WEST	-.331	--
CAPITAL ^a	--	-.206
ROI _b	--	-.030
LAND ^a	--	.166

Changes in probability are calculated at the mean of the independent variable and are based upon specification B.

^aPer \$100 million.

^bPer percent of return.

TABLE 4

Effects of Railroad, Shorthaul and Longhaul Influence

Calculation	Reagan v. Culom	ICA v. Status Quo
Probability of voting favorably at the mean of the independent variables	.56	.83
Probability of voting favorably given a \$300 increase in CAPITAL	~.00	.57
Probability of voting favorably given WEST equals one	~.00	.56
Probability of voting favorably given a \$300 increase in LAND	~1.0	~1.0

Calculations are based on specification B in both cases.

FIGURE 1
ALTERNATIVE ROUTES FROM CHICAGO
TO THE EAST COAST

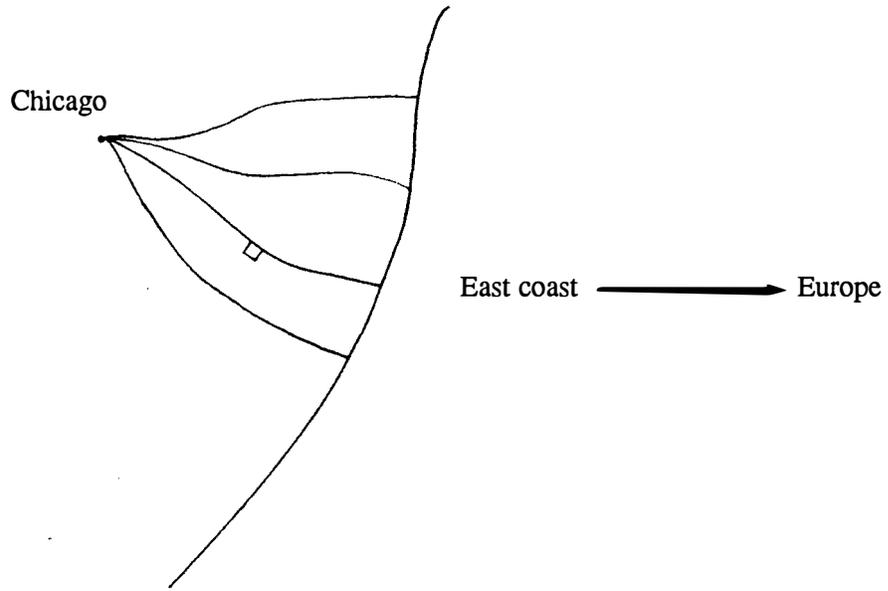


FIGURE 2
POLICY CHOICE SPACE WITH
LEGISLATOR PREFERENCES

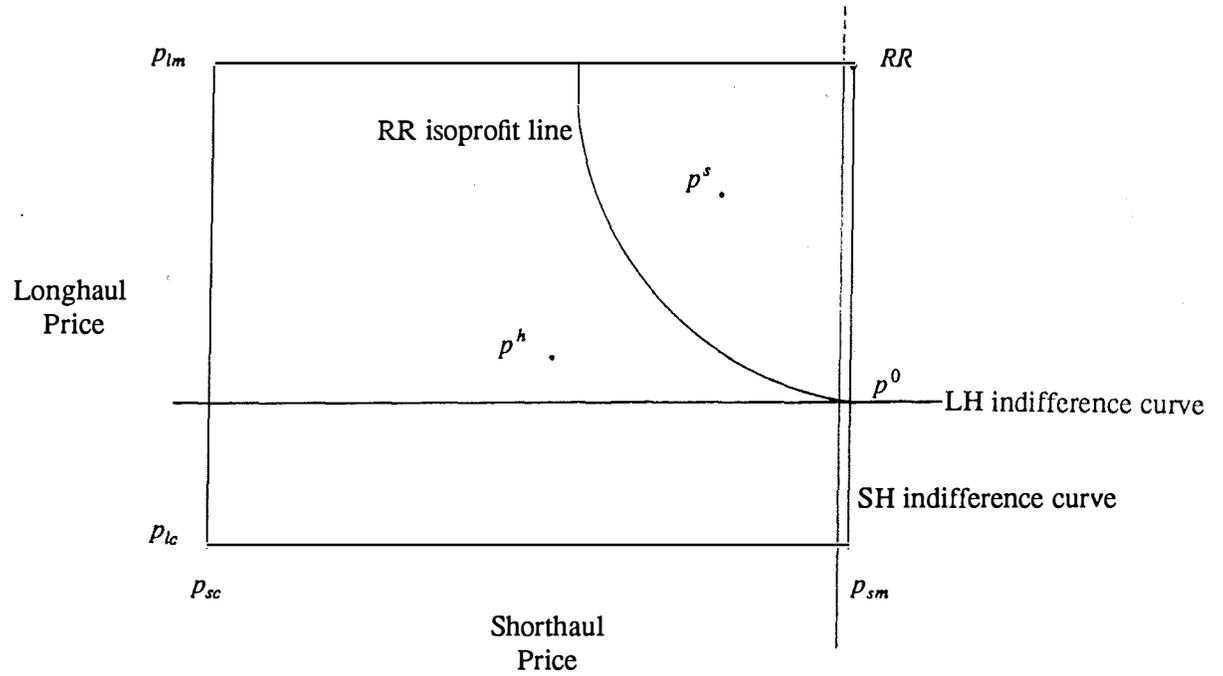


FIGURE 3
HOW VARIOUS PROPOSALS ALTER
THE STATUS QUO

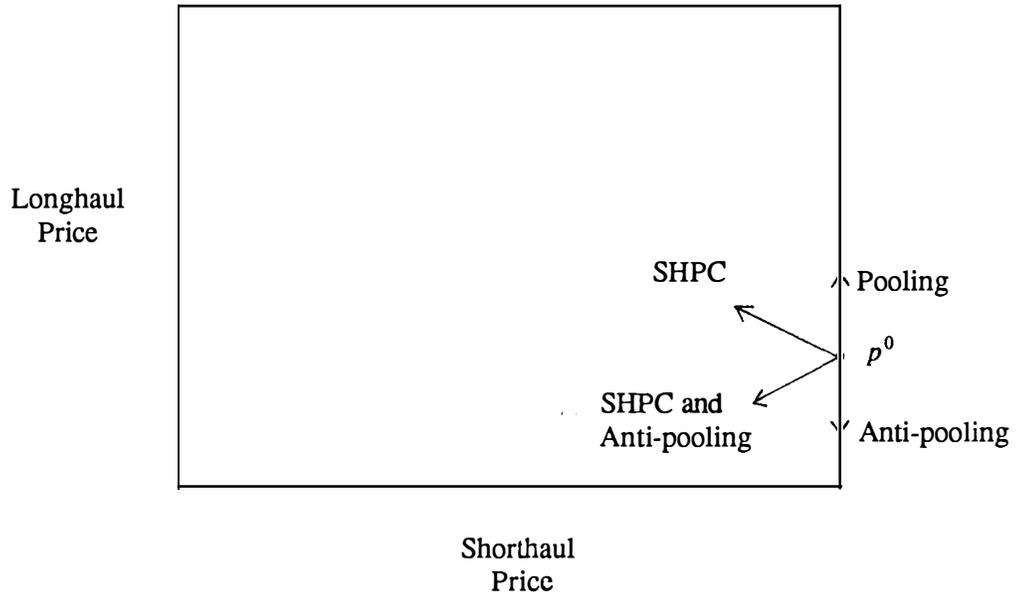
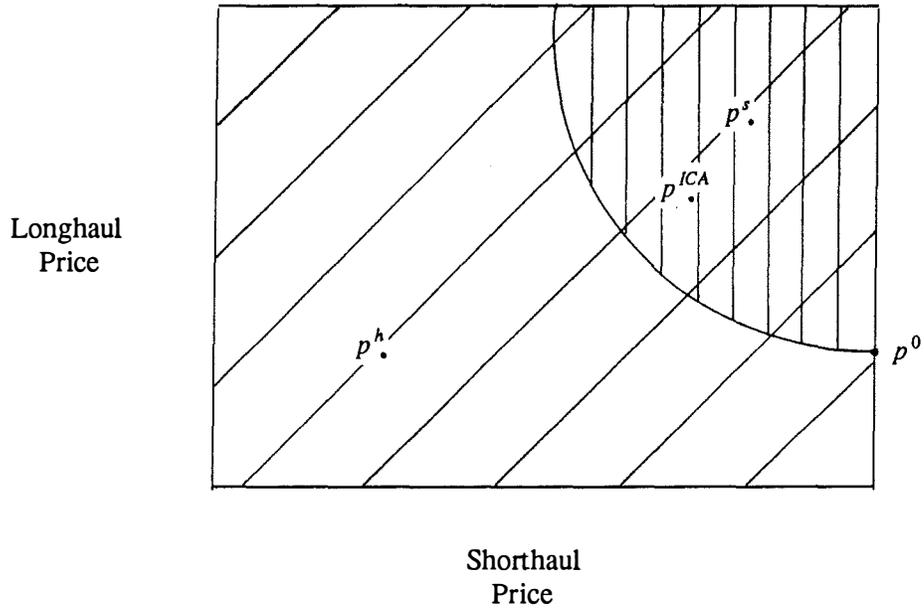


FIGURE 4
 SET OF FEASIBLE COMPROMISE BETWEEN RAILROAD
 AND SHORTHHAUL SHIPPING INTERESTS



Key

-  = $S(p^0)$ = Set of policies preferred by Cullom (and the RRs) to p^0
-  = $H(p^0)$ = Set of policies preferred by Reagan (and SH shippers) to p^0
-  = $S(p^0) \cap H(p^0)$ = Region of mutual gain (i.e., of feasible compromise)