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1 The Origins of State Railroad Regulation: The Illinois Constitution of 1870

Mark T. Kanazawa and Roger G. Noll

1.1 Introduction

Between 1840 and 1890 the American railroad network was constructed, creating a transportation system that linked all but the most sparsely settled communities. By providing cheap, reliable transportation, the railroads brought the vast American hinterland into world markets for primary products, and thereby played an essential role in American economic development.¹ Of course, the economic significance of railroads was not lost upon public officials, and all levels of government actively promoted railroad development. The federal government subsidized the railroads through federal land grants, often providing more land than the railroad required for its right of way. States implemented the land-grant policy by selecting routes and granting other privileges in the corporate charters of railroad companies. Cities and counties provided tax forgiveness and capital subsidies to induce railroads to serve them.

In 1887 the federal government imposed economic regulation on railroads by passing the Interstate Commerce Act. Reflecting the fact that by this time the railroad network was essentially complete, research on the economic effects of railroad regulation has focused primarily on regulatory issues that arise

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1. Beginning with the classic works by Fogel (1964) and Fishlow (1965), economic historians have vigorously debated the economic significance of the railroads. All analysts agree that a national transportation infrastructure was an important element of national economic development, and all agree that for most of the nation railroads were the dominant technology. The debate focuses on the magnitude of the economic benefit from using railroads rather than other technologies.

in a mature industry. Examples are cross-subsidization across commodities and communities, the effect of economic regulation on railroad profits, the extent to which regulation increased the costs of railroad service, and whether regulation distorted intermodal choice by shippers.² Likewise, research on the political origins of federal regulation has focused on examining whether the subsequent effects on tariffs reflected the interests of the groups that were responsible for the passage of the 1887 legislation. The questions addressed in this literature are the extent to which regulation reduced the long-haul, short-haul rate differential, and whether regulation served primarily to bring prices closer to competitive levels or to make railroad cartels more effective.³ Broadly speaking, the primary findings of this research are that the creation of the Interstate Commerce Commission (ICC) led to some amelioration of price discrimination against communities that were served by a single railroad, that the major interregional railroads also benefited because regulation helped interstate rate-making cartels sustain supracompetitive tariffs between major transportation hubs, and that railroad regulation created substantial allocative inefficiency after World War I because relative prices across commodities and transportation modes were not sufficiently closely related to relative costs.

For the most part, research on the causes and consequences of railroad regulation has not dealt with the fact that, for three decades before the passage of the Interstate Commerce Act, many states regulated tariffs and routes for both passengers and freight. Prior to the Civil War, tariffs and routes often were specified in a state railroad charter, which took the form of either a state law dealing with a particular railroad or a franchise granted by a bureaucracy under a general act governing incorporation. Beginning in the 1850s, but with greater intensity after 1865, many states sought to regulate railroad tariffs by legislating changes in railroad charters or by establishing a regulatory authority to set price ceilings. The economic circumstances surrounding these actions were quite different from those surrounding later federal legislation, for the earlier attempts to regulate the industry were undertaken in the midst of rapid extension of the national railroad network. Hence, in contemplating the establishment of regulation in the middle of the nineteenth century, states confronted another economic issue: whether regulation would inhibit investment in new railroad lines.

The purpose of this paper is to extend research on the political economy of railroad regulation by examining the establishment of state regulation in the years surrounding the Civil War. To this end, we address two broad issues. The

2. Some influential studies of the economic effects of railroad regulation are Friedlaender 1969; Levin 1978; MacAvoy 1965; Meyer, Peck, Stenason, and Zwick 1959; Porter 1983; Spann and Erickson 1970; Ulen 1982; and Zerbe 1980.

3. In addition to the references cited in note 1, see also Buck 1913, 1920; Gilligan, Marshall, and Weingast 1989; Hilton 1966; Kolko 1965; Miller 1971; and Poole and Rosenthal, chap. 3 in this volume.

first is to test various versions of the economic theory of regulation by identifying the ex ante pattern of support and opposition to regulation among economic interests. An important element of this analysis is to ascertain whether the political behavior of citizens in areas unserved by railroads reflected a fear that regulation would inhibit railroad investments, and hence the extension of service to their communities. The second issue is whether regulation, once implemented, slowed the pace of railroad development, as opponents had predicted.

This paper focuses on the revision of the Illinois Constitution in 1870 for three reasons. First, Illinois was the first state to establish a permanent economic regulatory agency. The legislation implementing the regulatory provisions of the 1870 constitution was the subject of *Munn v. Illinois*, the first Supreme Court decision that declared state economic regulation to be constitutional.⁴ Second, Illinois was at an intermediate stage of railroad development in 1870. Some counties were served by multiple railroads, others by a single railroad, and still others by none. Hence, the full spectrum of shipper concerns—cartelization in competitive markets, monopolistic abuse in single-railroad markets, and retarded development in unserved markets—were relevant somewhere in the state. Third, the procedure for ratifying the constitution provides a unique opportunity to examine the linkage between economic interests and support for regulation. In the referendum to adopt the constitution, citizens voted separately on nine articles, including provisions to establish regulation of railroads and grain warehouses. Thus, county-level voting data can be used to test how differences in shipper interests were related to local support for regulation, and whether votes by county representatives to the constitutional convention reflected the preferences of their constituents or diverged according to the interests of the railroads.

Our major findings are as follows. First, regardless of the structure of the local railroad market, rural communities throughout the state overwhelmingly favored regulation, supporting the hypothesis that most citizens believed that regulation would redistribute income from railroads to shippers. Second, support for regulation was significantly weaker in counties without railroad service, which is consistent with the view that a substantial minority of voters thought that regulation would retard the extension of the rail network. Third, railroad regulation as actually implemented apparently did not inhibit railroad investment. Together, these findings are most consistent with the “public interest” theory of regulation: that it leads to lower prices, but not so low that railroads could not earn reasonable profits on investment.

4. *Munn v. Illinois*, 94 U.S. 113 (1877). *Munn* arose from the widespread refusal of grain warehouses to comply with a statute passed in 1873 that regulated them. As in other states, the grain warehouse law was passed at the same time as the railroad statute, and the legal challenge to the constitutionality of railroad regulation was rejected by the Court immediately after *Munn*. For a detailed account of the issues in *Munn*, see Kitch and Bowler 1979.

1.2 Legal Background

In the years immediately after the Civil War, many states, especially in the Midwest, enacted legislation to establish economic regulation of railroads and grain warehouses. But durable state regulation proved to be quite difficult to establish. In some states, such as Minnesota, the politics of regulation were closely balanced, and each session of the legislature reversed or substantially limited the work of the previous session.⁵ In states where regulation was overwhelmingly popular, such as Illinois, its proponents faced a serious judicial obstacle in that opponents successfully challenged the constitutionality of regulatory statutes.

Before the *Munn* decision the core argument against state economic regulation was that it violated state and federal constitutional provisions protecting the sanctity of contracts.⁶ The basis for this argument was the Supreme Court's *Dartmouth College* decision in 1819, which ruled that a corporate charter was a contract between a state and a corporation, "the obligations of which cannot be impaired, without violating the constitution of the United States."⁷ This decision was derived from article 1, section 10, of the federal Constitution, which prohibits states from passing a "law impairing the obligation of contract." The *Dartmouth* decision prevented states from passing legislation that altered a corporate charter or a prior act establishing mutual obligations between a state and a corporation.

In the case of railroads, corporate charters and other licenses granting rights of way specified the terms under which railroads would provide service. During the 1850s Congress passed several statutes authorizing states to give federal land to railroads as an incentive to construct new routes.⁸ States implemented these acts by conducting competitive bids and negotiations, typically including specifics about service and prices. In most cases the terms of the agreement were then adopted in legislation, while in other cases the agreements were concluded by a state government official operating under a general statute governing these arrangements. In both cases, the courts regarded an agreement between a railroad and a state as a contract. Except in unusual circumstances, a state could not unilaterally alter this agreement by passing new laws.

In *Dartmouth* and subsequent decisions, the courts recognized one mecha-

5. For a detailed history of regulation in Minnesota, see Larson 1926.

6. For a complete discussion of Supreme Court decisions about state regulation during the nineteenth century, see Rutten n.d.

7. *Dartmouth College v. Woodward*, 4 Wheat. 518 (1819), 650.

8. The federal government also chartered some railroads and granted them rights of way and other subsidies, beginning with the Union Pacific in 1862. The purpose of these railroads was to extend service across the western territories to the Pacific coast. Because the intervening areas were sparsely settled and contained few communities that were attractive terminal sites, the federal government could not realistically delegate responsibility for route selection and subsidization to them. For extensive discussions of the history of transcontinental railroads, see Ames 1969, Hunt 1958, and Trotman 1923.

nism by which a state could unilaterally change an agreement with a corporation. If either corporate charters or the state constitution contained a provision that explicitly reserved the power to revise a charter, the courts permitted laws that changed the terms of the initial agreement. Before the Civil War several states called constitutional conventions to consider, among other things, inserting a “reservation clause” into their state constitutions. For example, the Iowa Constitutional Convention of 1857 adopted a provision by which “the General Assembly shall have the power to amend or repeal all laws for the organization or creation of corporations, or granting of special or exclusive privileges or immunities, by a vote of two-thirds of each branch of the General Assembly.”⁹

Although a reservation clause or a provision that established the constitutional power of the state to regulate corporations was sufficient to pass the *Dartmouth* test, the constitutionality issue was not fully settled until the 1890s. In *Munn v. Illinois* and other contemporary challenges to state regulation, companies contended that states violated the Fourteenth Amendment to the federal Constitution. Passed in 1867, section 1 of the Fourteenth Amendment prohibited states from depriving “any person of life, liberty or property without due process of law.” The significance of the Fourteenth Amendment is that, before its passage, most of the rights defined in the Constitution were regarded as limiting actions by the federal government, but were not regarded as constraining actions by states. In *Munn*, the court ruled that restrictions on use of property “clothed with a public interest” were not prohibited by the Fourteenth Amendment and so could be regulated by state statutes, as monopolistic abuse had been controlled for centuries through common law litigation.¹⁰

Simultaneously with *Munn*, the Supreme Court issued several short rulings dealing with state laws regulating railroads.¹¹ These cases were actually more important, for they implicitly overturned an important aspect of *Dartmouth*. Prior to these decisions, railroads that were chartered before the adoption of a reservation clause could not be regulated.¹² In the Granger railroad cases, the Court asserted that state railroad regulation was acceptable unless the railroad’s charter specifically exempted it, and then found that the charters contained no such exemptions. This line of argument effectively reversed the precedent that states must reserve the right to change charters before the charters were issued or live with them forever (Kitch and Bowler 1979, 342–43).

9. Article 7, section 12, Constitution of the State of Iowa (Iowa Constitutional Convention 1857).

10. Majority opinion by Justice Waite, *Munn v. Illinois*, 126.

11. The Granger railroad cases that were decided in 1877 with *Munn* were *Chicago Burlington and Quincy Railroad v. Iowa*, 94 U.S. 155; *Peik v. Chicago and Northwestern Railroad*, 94 U.S. 164; *Chicago, Milwaukee, and St. Paul Railroad v. Ackley*, 94 U.S. 179; *Winona and St. Peter Railroad v. Blake*, 94 U.S. 180; and *Stone v. Wisconsin*, 94 U.S. 181.

12. The issue first arose when Ohio revised its constitution in 1848 to prohibit corporate charters from containing exemptions from taxation, and then imposed taxes on corporations that were chartered under the old constitution. The court declared these taxes to be unconstitutional according to the contract clause in *Piqua Branch of the State Bank of Ohio v. Knoop*, 57 U.S. 369 (1850).

Munn and the associated railroad cases did not settle the constitutional issue. In 1886 Justice Harlan, in dissenting from a decision concerning state railroad regulation, reiterated the standard argument against ex post regulatory statutes:

Does anyone believe that private capitalists would have supplied the money necessary to establish and maintain these lines of inter-state communication had they supposed that the States . . . reserved the right, by commissioners, to take charge of the whole matter of rates and abrogate, at their pleasure, such tariffs or charges as might be established by the companies under the power expressly conferred of fixing and regulating rates?¹³

Although a minority position in this case, the decision to gut state railroad regulation commanded a majority in October 1886, when the Supreme Court decided in *Wabash, St. Louis, and Pacific Railway Co. v. Illinois* that Illinois could not regulate prices for any portion of an interstate shipment because to do so violated the constitutional prohibition against state interference with interstate commerce.¹⁴ This decision effectively prevented states from correcting the long-haul, short-haul price differential on their own, and provided additional political impetus for the passage of the Interstate Commerce Act a few months later.¹⁵

The significance of the legal history of state regulation is that for approximately fifteen years, states could—and some did—engage in extensive economic regulation of railroads. After 1886, state regulation continued, but only at the sufferance of the federal government. Commencing with the *Wabash* decision and the Interstate Commerce Act of 1887, states continued to regulate aspects of the intrastate components of interstate commerce, but only when they were granted the authority to do so by federal statute.

1.3 The Political History of the Granger Acts

The core economic issues associated with the creation of railroad regulation have been much studied and are not in dispute. Beginning in the 1840s, spurred by federal land grants and subsidies from state and local governments, the railroads rapidly expanded their route structure in the vast, agriculturally rich

13. *Stone v. Farmers' Loan and Trust*, 116 U.S. 337 (1886).

14. *Wabash, St. Louis, and Pacific Railway Co. v. Illinois*, 118 U.S. 557 (1886).

15. For discussions of the importance of the *Wabash* decision in the passage of the Interstate Commerce Act, see Fiorina 1986 and Gilligan, Marshall, and Weingast 1990; for a contrary view, see Poole and Rosenthal, chap. 3 of this volume. Regardless of the causal role of *Wabash* in the passage of the Interstate Commerce Act, the fact remains that the act contained a clause that overturned *Wabash* in part by reestablishing the power of states to regulate railroad prices for intrastate shipments. This provision of the act subsequently was incorporated almost verbatim in subsequent statutes that established federal economic regulation of trucking, water transportation, airlines, pipelines, natural gas extraction, electricity transmission, telecommunications, and most recently (1992) basic cable television service. Thus, the long-run effect of *Wabash* was to transfer to the federal government the responsibility to regulate the intrastate portions of interstate transactions in infrastructural industries.

lands between the Appalachian and Rocky Mountains. The new transportation network facilitated the development of grain farming by proving a cheap, reliable and fast means for transporting grain to major eastern ports for transshipment to Europe. Relatively early in the history of railroad development, grain shipment between major midwestern cities and American seaports was competitive, in part because several railroads connected major eastern and midwestern cities, and in part because barges using the Great Lakes and the Mississippi River system provided a feasible alternative to rails when the waterways were open. But grain shipment from rural areas to transportation centers usually was not competitive. Most rural communities did not have access to water transportation and were served by only a single railroad. Out of this circumstance arose the "long-haul, short-haul" rate controversy.

Residents of rural communities complained that railroads set excessively high prices for the relatively short shipping distances between a rural depot and the nearest major transportation hub. In theory, if railroads enjoyed secure monopolies in rural communities along their rights of way, they could engage in price discrimination to extract the economic rent of agricultural land. In practice some railroad monopolies were more secure than others, depending on the proximity of a rural community to a navigable waterway, which might be reachable by wagons over toll roads, or another railroad, which might be induced to add a spur from its nearest track. In any case contemporary accounts and subsequent historical research confirm that most rural shippers faced higher prices for short-haul shipments than for competitive long-haul shipments. The traditional historical view of the rise of railroad regulation is that rural shippers organized a political movement to demand action against railroad monopolies.¹⁶

The origins of a political demand for regulation lay in the process by which the railroads initially obtained corporate charters and rights of way. Assembling rights of way privately was slow and expensive, requiring negotiations with numerous landowners plus communities that might serve as terminals. A quicker, cheaper method was for the state to assemble land for the railroads, combining public lands with private lands that were taken through condemnation.

Because the development of the American hinterland depended on the provision of reliable and inexpensive transportation of primary products to eastern cities, the public sector enthusiastically accepted the responsibility to assemble railroad rights of way. To facilitate settlement of the lands west of the Appalachians, the federal government began giving public lands to railroad companies. The procedure for making land grants to the railroads was a series of laws that gave states the authority to select the rights of way to be given to railroads through designated federal lands. Typically states implemented the federal land grant laws by inviting the railroads to make route proposals to the state.

16. See, for example, Buck 1913, 1920; Larson 1926; Goldstein 1928; and Miller 1971.

Because the economically feasible number of railroad routes and terminals was too small to make every community a railroad terminal, localities began to compete for selection as a terminal by offering subsidies to a railroad that would pass through them. This process gave rise to several major political issues. First, because the winning subsidy bids were necessarily based on expectations about the growth of a community after the railroad began operation, some communities bid more than they ultimately could afford, and some railroads were built before they were economically viable.¹⁷ Second, because routes and land grants were ultimately selected by state legislatures, corruption scandals developed over the selection of routes and the railroad companies that were granted franchises. Third, once a railroad was constructed, public concern shifted to monopolistic practices by the railroad.

In response to these issues, in the 1850s states began to establish rules and procedures governing railroad construction and operation. States passed laws and amendments to state constitutions that placed limits on the indebtedness of local governments and the subsidies that they could give to a railroad. States also wrote into laws that awarded land grants to railroads specific requirements regarding tariffs, services, and the rate of progress to complete the route. And, to make route awards more rational and less susceptible to corruption, states established bureaucracies to oversee the entire process. One of the early examples is the Michigan Board of Control, established in 1857 to implement an 1856 federal land grant act for the state. The board, composed of the governor and six appointed commissioners, was not a regulatory agency, for its purpose was to negotiate the terms of land grants (Michigan State Legislature 1857); however, its structure and procedures were clear precursors of economic regulatory bodies.

The price ceilings in charters and land-grant agreements soon proved to be ineffective. Real shipping costs fell during the 1860s due to technological progress in railroad technology, rapid growth in shipments that allowed railroads to capture scale economies, and the federal deflationary policy after the Civil War arising from repayment of government war debts.¹⁸ Hence, price ceilings adopted in the 1850s became increasingly generous as nominal costs fell. Competition forced railroads to set rates below the ceiling for long-distance shipments, but railroads would not voluntarily reduce short-haul tariffs unless the ceiling exceeded the monopoly price.

The final event encouraging the Granger movement was a change in the jurisdiction of the courts. Before the passage of the Sherman Antitrust Act in 1890, many monopolistic practices, including price discrimination, were grounds for civil claims under common law. Consequently, shippers in rural

17. See Ritten *n.d.*, 17–20, for a description of several Supreme Court decisions that arose when state and local governments attempted to back out of subsidy agreements with railroads after the benefits from the railroad boom of the 1850s proved to be less than anticipated. See Fogel 1960 for an analysis of the construction and early operation of the Union Pacific, an example of a railroad that was probably built earlier than was economically justified.

18. For a detailed study of the history of rail shipping costs, see Lebergott 1966.

areas could sue railroads for a short-haul, long-haul price differential that could not be justified on the basis of cost. Typically these cases were litigated in state courts, usually in the courthouse of the county in which the plaintiff resided. Beginning in 1863, a series of Supreme Court decisions and acts of Congress transferred jurisdiction over almost all private litigation against railroads from state to federal courts. Removal of jurisdiction to federal courts disadvantaged rural communities because federal cases were normally tried in the federal court in the state capital, which was usually much farther away than the county seat and was less likely to have a sympathetic judge and jury.¹⁹

By the late 1850s farmer discontent with railroad practices began to have important political consequences. For example, in 1857 Iowa called a constitutional convention to deal with problems of railroad charters and local government subsidies of railroads, and in 1862 a constitutional convention was held in Illinois in which railroads were a main topic of debate.²⁰ After the Civil War several vigorous farmer activist organizations became important in midwestern and southern politics.²¹ Foremost among them was the Patrons of Husbandry, more popularly known as the Grangers. Initially a social and educational organization, the Grangers quickly extended their activities to include political advocacy of farmer interests. In the late 1860s the Grangers grew to political importance in many states, but especially in Illinois, Iowa, Minnesota, and Wisconsin.²² One issue taken up by the Grangers was the farmers' discontent with railroad monopolies.

After several failed attempts, in 1873 and 1874 legislation regulating railroads and grain warehouses passed in all four of the Granger states. Typically these laws set ceilings on tariffs for passenger and freight transportation, limited the extent of price discrimination, and established prices, storage standards, and inspection systems for grain warehouses.

The railroads led the fight against these laws. In legal challenges to the constitutionality of regulation, as well as political arguments against their passage and later in support of their repeal, the railroads argued that regulation expropriated their capital investments.²³ Consequently, argued the railroads, regulation was not only an unfair (and unconstitutional) taking of property, but would also stop expansion of the railroad system, and hence the development of the

19. See Kutler 1968, Merkel 1984, and Wiecek 1969 for accounts of the expanded jurisdiction of the federal courts after the Civil War. Although state jurisdiction over railroad cases was not completely removed until the Judiciary Act of 1875, by the early 1870s enough jurisdiction had been removed to severely limit the effectiveness of state courts in resolving disputes between shippers and railroads.

20. For details about the 1862 convention, see Cornelius 1972, chap. 3.

21. The classic history of the Grangers and other agrarian reform movements is the two-volume sequence by Buck (1913, 1920).

22. In a survey of several important histories of the era, McGuire (1981) concludes that the Granger movement was most active and powerful in these four states. See also Buck 1913, chap. 2, and Miller 1971.

23. For an extensive compendium of public statements for and against the Granger laws, see Detrick 1903, 238–47.

West.²⁴ Many years later a sequence of Supreme Court decisions, beginning with *Smyth v. Ames* in 1898, established that regulated prices must be sufficiently high to enable regulated firms to earn a competitive return on reasonable capital investments, so that the claims of the railroads now would be overblown. But in the nineteenth century, before the Court established ground rules for economic regulation, a reasonable person could have been uncertain about the effects of economic regulation, and concluded that these claims were plausible. Hence, citizens with no love lost for railroads might have been concerned that regulation would halt railroad construction and thereby retard national economic development. Moreover, even a farmer in an area not served by the railroads would have preferred monopoly service to no service at all, because even the most rapacious railroad was unlikely to possess the information and market power necessary to extract all of the rents from local agriculture.

The case made by the railroads was influential in many areas. In some states, regulatory legislation was weak, and in others strong legislation was soon repealed or emasculated. Even in three of the four Granger states, railroad regulation was repealed or emasculated by the late 1870s. For example, in 1874 Minnesota enacted a tough statute that created a Railroad Board of Commissioners to set maximum rates (Minnesota State Legislature 1874, chap. 26, 140–50). A year later, rate-making authority was replaced by a general prohibition against price discrimination and “an unreasonable price for the transportation of persons or property,” and the Board of Commissioners was replaced by a single railroad commissioner whose duties were only to examine the books of railroads and to report to the governor whether the act was being honored (Minnesota State Legislature 1875, chap. 103, 135–38). Enforcement of the pricing rules was left to private litigation by aggrieved parties, with triple damages against a railroad found to violate them. The effect of this statute was to return to state courts the authority to police monopolistic abuses; however, the 1875 act also served to eliminate economic regulation of the railroads. Likewise, in Wisconsin one of the strongest Granger statutes, the Potter Act, was passed in 1874 but repealed in 1876 (Detrick 1903). This pattern of legislative rise and fall corresponds quite closely to the rise and fall in Granger membership (table 1.1).

In Illinois the Granger laws proved to be more durable, and eventually became examples for several states west of the Mississippi. Illinois regulation continued to be challenged by the railroads, and periodically returned to the Supreme Court for further scrutiny. Finally, in *Wabash* (yet another Illinois case) and the Interstate Commerce Act, state Granger laws were permanently circumscribed through federalization of regulatory authority for the short-haul component of interstate shipments. Nevertheless, the federal law paralleled the Granger statutes in that it limited long-haul, short-haul rate differentials and established the ICC to control rates. Moreover, the Interstate Commerce Act became the blueprint for subsequent federal regulatory statutes, such as the

24. For the economic argument on takings without compensation, see Michelman 1967.

Table 1.1 Grange Membership in the Granger States

Year	Granges per 100,000 Agricultural Population			
	Illinois	Minnesota	Iowa	Wisconsin
May 1873	109	238	631	82
March 1874	284	478	775	235
September 1874	376	549	806	289
January 1875	377	490	735	284
October 1875	194	441	452	251
July 1876	157	271	382	162

Source: Buck 1913, 58–59.

Federal Power Act, the Communications Act, and the Civil Aviation Act. Hence, the origins and effects of the Granger laws—and the Illinois law, in particular—can legitimately be characterized as the first important stage of the American experience with economic regulation.

1.4 The Economic Theory of Regulation and the Granger Laws

The economic theory of politics provides a conceptual model for explaining the origins of economic regulation. This theory emphasizes the ability of organized interests to influence public policy to their advantage.²⁵ Interests are more likely to become organized, and if organized more influential, if they have higher per capita stakes in an issue, more homogeneous interests among group members, and, *ceteris paribus*, more members. In regulatory policy, regulated industries are advantaged in that they have a common interest in cartelization and, because many fewer people work in an industry than pay for its products, much higher per capita stakes in regulation than their customers. Regulated firms are disadvantaged only by numbers, although even this may not be true if most of their customers are not citizens of the jurisdiction imposing regulation. In the battle over state regulation, railroads certainly were well-organized, but they could have suffered because some of their stockholders and employees were residents of other states, whereas all intrastate shippers, by definition, were citizens of the state imposing regulation.

The total economic stake of a group in a policy issue is related to the amount of support that it can gain for its preferred policies. Greater stakes increase the resources available to the group for influencing government officials, for informing members and other citizens about an issue, and for inducing citizens to vote as the interest group prefers. Hence, support for a policy as measured by votes in either a popular election or a legislature should be positively correlated with the magnitude of a group's stake in the outcome of an election.

Much of the research that develops and tests the economic theory of regula-

25. See Becker 1983; Peltzman 1976, 1989; and Stigler 1971. For a survey of the research literature on the economic theory of the politics of regulation, see Noll 1989.

tion focuses on the passage of the Interstate Commerce Act of 1887 and the subsequent federal regulation of railroads.²⁶ From this research, three competing accounts of the origins of railroad regulation emerge.

The traditional historical view of regulation, sometimes called the “public interest” or normative theory, held that railroad regulation arose to protect shippers, especially farmers, from monopolistic abuses. According to this account, regulation sought to force railroads to charge more competitive prices in monopolized, primarily short-haul, markets. In the framework of the economic theory of politics, the winning interest in the battle over railroad regulation was rural industry, primarily agriculture. Farmer activist organizations such as the Grangers were the interest groups that sought regulation and controlled its character.

The revisionist view, emphasized by the early research applying the economic theory of regulation, argued that regulation benefited railroads because it helped them organize more effective regional cartels to prevent competition in long-haul shipping. To revisionists the long-haul, short-haul rate differential was reduced by setting monopoly prices in structurally competitive long-haul routes, rather than by cutting monopoly prices in short-haul markets. Thus, the winning organized interest was the railroad industry.

More recent research has produced a third view. According to this account, the coalition that benefited from railroad regulation included some (but not all) shippers and railroads. Farmers, through activist organizations, received some relief from price discrimination, but the large regional railroads that competed in long-haul markets also received relief from intermittent competitive price wars that more than offset the loss of profits in monopoly routes. The losers were small railroads with little or no long-haul traffic, and shippers of products in competitive long-haul markets (especially manufacturers). Thus, on each side of the market, the better organized and more powerful interests succeeded at the expense of less powerful, less well organized interests.

Although the third view is not applicable to the rise of state regulation, it nevertheless provides an important insight that we will exploit in developing our model. The useful insight in the third model is that the relevant unit of analysis for understanding the politics of regulation is not necessarily either railroads or shippers as coherent groups, but subsets of each. The particular version of this approach that has been used to study the origins of the ICC is not applicable to state regulation because states could not control long-haul shipping rates, and therefore could not help long-haul railroads stabilize regional rate-making cartels. The only ways that state regulation could benefit railroads would be to prevent price competition in areas served by multiple railroads and entry in areas served by a monopoly. All railroads would share

26. See Gilligan, Marshall, and Weingast 1989; MacAvoy 1965; Porter 1983; Spann and Erickson 1970; Ulen 1982; and Zerbe 1980.

in this benefit, and all would suffer if regulation imposed lower prices in monopolized areas.

Among shippers, the effects of regulation could have been quite different, depending on the extent of railroad development in the community. The extent of competition in a local railroad market affects price and service, so that communities experiencing different levels of competition could face different expected gains or losses from regulation (depending on whether regulation favored shippers or railroads). In addition, regulation can affect the likelihood of future railroad entry and, consequently, the amount of competition a community is likely to enjoy in the future. Thus, to understand the source of diversity among shippers requires understanding the dynamics of railroad market structure and investment in new lines, which is examined in section 1.4.1.

A fourth view, emphasized in the debates about railroad regulation in the middle of the nineteenth century but largely ignored in academic research, is that the purpose of regulation was to expropriate railroad capital. Like the public interest theory, this account can be interpreted as a victory for organized farmer interests, but in this case the gains to the victors were not limited to the elimination of monopoly profits.

A fifth hypothesis is that members of economic interest groups more or less uniformly supported policies beneficial to most but not necessarily all of them. In principle, universal support for regulation among all shippers could be part of a logroll in which shippers who were not benefited by regulation received support on some other issue from their colleagues who favored regulation. In this case this explanation is insufficient, because in the ratification election citizens were allowed to vote on each constitutional measure separately, thereby allowing them to vote only for those elements of the logroll package that were in their interest. Thus, uniform shipper support despite divergence of interests among them requires altruistic behavior by some shippers. Although not usually associated with an economic theory of politics, this view has found general theoretical expression in Harsanyi's (1969) theory of "low cost objectivity." Harsanyi posits that citizens will behave altruistically if doing so is not very costly. Although Harsanyi's theory is too nonspecific for ascertaining its meaning in this case, a reasonable application of this idea is that rural shippers stuck together to rid some of their members of monopoly abuses by railroads, even if others had no stake in the issue or even actually suffered a small loss.

1.4.1 The Economics of Railroad Entry

As described above, in the mid-nineteenth century railroads were constructed through a two-stage competitive bidding process. Communities competed to be included in railroad route proposals, and railroads competed to obtain state approval of route proposals in order to receive land grants for rights of way. This process took place in an economic environment in which the demand for rail service was growing rapidly, fueled by the large world demand

for American primary products and by population growth in the areas along lines of rail. Because several railroads were rapidly extending service in the Midwest, the equilibrium in the bidding process would have had two interesting properties.

The first characteristic of the bidding equilibrium is that railroads will enter a local market at the moment when the discounted present value of the future stream of railroad profits, including any subsidies, is sufficient to produce a competitive return on investment over its entire useful life—which, for a railroad line, is a very long time. Obviously, the railroad would prefer to wait to enter until revenues in the entry period are sufficient to produce a competitive return on its capital investments. Competition for the market, however, will force railroads to enter sooner than this. Because the first entrant receives subsidies and expects a period of monopoly profits before a second entrant is viable, competition among railroads will produce entry before the entrant can earn a competitive single-period return on its investment. Indeed, even if no subsidy is available, railroads enter when, in discounted present value, the losses from early operations are exactly offset by the excess profits in the monopoly period. Eventually, as demand continues to grow, a second railroad will enter when its subsidy plus the discounted present value of future profits exceeds zero. As before, if at some point duopoly profits are positive but insufficient to induce immediate entry by a third railroad, the second railroad will enter before its first-period profits are nonnegative, and earlier still if it is offered a subsidy.

The second interesting feature of the bidding equilibrium is that a community is likely to provide a subsidy even though a railroad would enter in any case before it could begin to earn a competitive return. The rationality of subsidies derives from the economies of scale in railroads. Suppose that the railroad has a cost function of the form

$$(1) \quad C(q) = F + mq,$$

where q is the annual quantity of shipments, F is the fixed cost of track and terminal facilities, and m is the long-run marginal cost of a shipment, including only capital costs that are sensitive to shipping volume at the margin. This cost function is not realistic for all ranges of railroad output. At some point, the size of the market becomes large enough so that a railroad line suffers congestion costs, and eventually multiple railroads become economically efficient; however, initially railroads are economically beneficial and profitable long before a rail line is fully utilized, so that the production function exhibits significant economies of scale.²⁷

Even in multifirm railroad markets, each firm may have exploited scale economies. In the era of initial railroad entry, a community would have an incentive to induce competitive entry long before the first entrant was no longer

27. For evidence on this point, see Lebergott 1966 and Fogel 1979.

a natural monopolist. In particular, the community wants a second railroad when the gain in surplus from price competition offsets the fixed cost of investment.

Suppose that for a given market demand and subsidy a railroad has decided to enter at a given time. To induce the railroad to enter one year earlier, the revenues for the additional year must cover that year's operating costs, mq , plus one year's opportunity cost of capital, rF , where r is the competitive rate of return. That is, the additional first-year subsidy, S , and the tariff on shipments, P , must satisfy

$$(2) \quad S + Pq \geq rF + mq.$$

Because the railroad prefers not to enter, the profit-maximizing price for the first (subsidized) year must be less than average cost. Thus, from (2) the minimum subsidy to induce entry, S , is

$$(3) \quad \underline{S} = rF - (P - m)q.$$

The benefit to the community from inducing the railroad to enter one year earlier is the consumers' surplus from q units of shipments at price P .²⁸ Let W equal the maximum total willingness to pay for q units of shipment per year. The community should be willing to induce entry one year earlier as long as

$$(4) \quad W - Pq \geq \underline{S}.$$

The necessary conditions for (4) to be satisfied are that demand be positive and less than perfectly elastic at $P = m$. The sufficient condition is that there exists a nonlinear tariff schedule that, if enforceable, could recover the one-period opportunity cost of capital, even though the profit-maximizing constant unit price could not. In equilibrium, entry will occur in the first year in which the consumers' surplus available from operations exceeds the amount of capital costs that are not recovered from tariffs.

The partial-equilibrium, surplus-maximizing agreement would be for the railroad to set $P = m$, and for the community to pay $S = F$ (or to pay rF annually). This solution was also plausibly the optimal solution in general equilibrium, for in a nineteenth-century rural community the tax base for raising the subsidy was almost exclusively a property tax in which virtually all value was in land, making the tax nondistortionary. In principle, the initial subsidy agreement could specify $P = m$; however, because the future nominal

28. The analysis here closely parallels the "social savings" analysis that economic historians have pursued in calculating the economic benefits of railroad investment, as summarized nicely in Fogel 1979, and the analysis of the economic costs of transportation regulation, as summarized in Braeutigam and Noll 1984. Assuming no transactions costs or inefficiencies in the implementation of policy, the willingness to pay subsidies by local, state, and federal governments equals the economic historians' social savings of the railroads minus the excess profits of railroad companies. Likewise, the willingness to pay for inducing early railroad entry through subsidies is calculated in the same way that, one hundred years later, economists measured the benefits of deregulation, except once again the latter includes, but the former excludes, the excess profits of railroads.

value of marginal cost is uncertain, a permanent price specified in a long-term contract is almost certain not to equal marginal cost. Hence, "public interest" regulation, which measures costs and resets prices as new information is received, is conceptually attractive and easy to characterize: set $P = m$ in each period, and allow investment subsidies through competitive bidding.

Of course, if regulation can legally expropriate capital, railroads may oppose the public interest regulatory agreement out of fear that, once the subsidy has been paid and the railroad has invested, the government will engage in ex post opportunism by setting prices below long-run marginal cost. If regulators cannot credibly commit to implement regulation according to this ex ante agreement, railroads will be reluctant to agree to the most efficient combination of subsidies and prices. Instead, railroads are likely to prefer the process that actually emerged, in which competition for the market established the subsidy and subsequent prices were controlled by a fixed price ceiling. The *Dartmouth* precedent is an important component of this agreement, of course, because it assures the railroads that the state will not be able to take ex post advantage of the railroad by unilaterally altering rates. Not until *Smyth v. Ames* in 1898 did a railroad have the legal protection that would have given it comfort in reaching this kind of agreement. In any case, reversal of the *Dartmouth* precedent to allow price-reducing regulation after the fact was expropriative, for in competing for the market, the winning bid from a railroad generates only competitive expected returns over the life of the railroad's initial investment.

A parallel analysis applies to the circumstance in which a community may be able to reach a mutually beneficial agreement to induce the entry of a second firm to break a profitable monopoly. Here the benefit to the community is the gain in surplus arising from more competition. Let $P(n)$ and $q(n)$ represent the equilibrium price and shipments in an n -firm market. Assuming that all firms have the cost function represented in equation (1) and share the market equally, then, analogously to (3), a railroad can be induced to be the next entrant one year early if its subsidy satisfies

$$(5) \quad S \geq rF - [P(n+1) - m]q(n+1)/(n+1).$$

Analogously to (4), the community will find this worthwhile if the increase in consumers' surplus offsets the subsidy. Assuming linear demand, this occurs if

$$(6) \quad [P(n) - P(n+1)]q(n) + .5[P(n) - P(n+1)][q(n+1) - q(n)] \geq S.$$

Given the assumption about the cost function, the first railroad can offer the community a better agreement by promising to lower its price slightly below the duopoly price and satisfy all demand. This agreement avoids the fixed cost of the second railroad, creating the possibility for a mutually advantageous agreement between the first railroad and the community. Again, the agreement could take the form of regulation in which price contains a markup over non-subsidized average costs that makes shippers at least as well off as if there were a second railroad. But for this agreement to emerge, the government must

be able credibly to commit to implement this pricing agreement and not to expropriate railroad capital ex post.

1.4.2 Railroad Dynamics and Shipper Stakes in Regulation

The interests of shippers under each of the theories of regulation can be categorized according to their access to railroad service. In particular, the preceding analysis can be used to examine the effects of different forms of regulation—cartelization, public interest, and expropriation—on the entry dynamics as well as the short-term price of service in different types of communities, and hence how rational voters in these communities should react to a proposal to regulate the railroads.

Unserved Communities

In communities lacking reliable transportation, whether by rail or water, the primary concern about regulation would be its effect on entry. Before railroad entry these communities had to resort to using wagons over trails and roads, which, in the nineteenth century, were of low quality and poorly maintained. The primary concern of these communities would be to obtain service, even at monopoly prices. Typically these communities offered subsidies to railroads to induce them to provide service.

If regulation cartelizes the industry, a community without service can expect never to benefit from price competition, even if entry occurs. In this case the first railroad can expect monopoly profits to persist long after a second railroad would have entered had regulation not been imposed. If cartelizing regulation is adopted, competition for the market will cause the first railroad to enter earlier and/or with a lower subsidy. Thus, the desirability of regulation to the local community depends on whether earlier entry with lower subsidies offsets the higher prices of sustained monopoly. If the community and the railroad face the same opportunity cost of capital, the community should oppose regulation.²⁹ The reduction in subsidy that exactly offsets the railroad's increased future monopoly profits must be too small to offset the discounted present value of the costs of monopoly to the community, because only the latter includes the deadweight loss of monopoly.

The analysis of the effect of regulation on an unserved community when regulation prevents monopoly pricing is the mirror image of the previous case. If the first railroad's profits in the monopoly period are reduced, a railroad will enter later and/or require a larger subsidy. If railroads and the community use the same discount rate, and if the higher subsidy under regulation leaves an

29. For two reasons the financial cost of capital was probably not the same for railroads and communities. First, railroads operated in international capital markets, while many local governments were confined to participation in regional markets, giving the railroads an advantage. But the courts had ruled that state and local debt, too, was a contract and so could not constitutionally be abrogated, reducing its risk to lenders. Because these factors work in the opposite directions, we see no a priori reason to assume anything other than that the cost of capital was approximately equal for railroads and governments.

entering railroad indifferent about whether regulation is imposed, the community is better off because it avoids the deadweight loss of monopoly.

If regulation expropriates railroad capital, railroads will not enter unless the initial subsidy is large enough to offset the subsequent expropriation. Assuming that long-run marginal costs include some capital cost, unserved communities will oppose this form of regulation.³⁰ The reason is that the incremental benefit to shippers from prices below long-run marginal costs is always smaller than the incremental cost incurred in providing service at these prices. Hence, the increased subsidy required by the railroad will always exceed the present value of future prices below marginal cost.

Monopolized Communities

Although a monopolized community is better off than an unserved locality, it still prefers to reduce the market power of its railroad. The two available means for reducing railroad tariffs are to regulate rates or to induce additional railroads to enter the market. The latter could occur if a nearby rail line could be extended to the community, which presumably would happen if either the duopolistic price exceeded the competitive equilibrium or the community offered a large enough subsidy to induce entry that would not otherwise occur. The regulatory alternative would be preferred by this community if it led to a lower price than the duopoly price plus the amortized unit cost of the subsidy to induce a second entrant.

If regulation cartelizes railroad services, monopolized communities would be unambiguously worse off, for regulation would not lower current prices and would eliminate the price effects of future entry. The latter effect would be offset in part by a lower subsidy to induce the second entrant, assuming that entry would still occur under cartelization; however, because of the greater deadweight loss under cartelization, the reduction in the subsidy would always be lower than the present value of the costs of cartelization to shippers. This effect exactly parallels the effect of cartelizing regulation on unserved communities; hence, if regulation cartelizes railroads, both unserved and monopoly communities should be opposed to regulation.

Under public interest regulation, the monopolized community is made unambiguously better off. Instead of waiting for a second entrant (and possibly subsidizing it) to obtain lower prices, the community can expect lower prices as soon as regulation is implemented. In comparison with unserved communities, monopolized communities derive immediate benefit from lower prices, rather than the former's discounted benefits after entry occurs. Because a larger stake in the outcome leads to more effective political organization for change,

30. Unserved communities would prefer a system that expropriates fixed costs but not capital costs at the margin, because the first-best agreement between a railroad and a community is for $S = F$ and $P = m$.

support for public interest regulation should be greater in monopolized communities than in unserved areas.

If regulation expropriates capital, the main effects are to transfer the wealth of railroads to shippers and to halt railroad investment. Although railroad capital would have to be replaced eventually and perhaps expanded, requiring that the community at that time pay the opportunity cost of capital, in the interim the community derives an even greater benefit than under public interest regulation, so that monopolized communities should support this form of regulation even more intensely than they support the former.

Competitive Communities

As the number of railroads increases, a community has less to gain, and more to lose, from regulation. In the long run, shippers cannot do better than to have competitive transportation service, so in these communities regulation can be attractive only if it expropriates railroad capital.³¹ Cartelization makes a community with competitive transportation unambiguously worse off. Public interest regulation might improve matters for a community having a railroad duopoly, but as the number of railroads increases, the benefit of public interest regulation diminishes. If a community has access to water transportation that is roughly as efficient as railroads, the benefits of public interest regulation are also small or nonexistent. Moreover, because regulation creates process costs, it can be expected to reduce the welfare of competitively served communities. Hence, as competition increases, support for even public interest regulation should diminish, and turn to opposition when transportation becomes reasonably competitive.

Expropriative regulation is attractive to all communities with railroads, although the benefits are greater in communities with less competition. Hence, if regulation is expected to be expropriative, all communities should support it, but support should be more intense in less competitive markets. Likewise, expropriative regulation should have more intense support than public interest regulation in all communities.

Comprehensive Tests of Alternative Theories

The preceding analysis produces the basis for a comprehensive test of which theories animated the adoption of state railroad regulation during the Granger

31. In theory, a community can do better than competition by subsidizing the fixed costs and having price equal long-run marginal cost, which is the best possible initial entry agreement and the most perfect form of public interest regulation. In practice, neither the initial entry agreement nor regulation is likely to achieve this objective. Moreover, a community will not want to induce entry to the point where the competitive market price equals long-run marginal cost because to do so will require that it pay multiple fixed costs through subsidies, all but the first of which are economically inefficient under the cost assumptions of the model. Thus, while it is optimal for the community to reach a deal with one railroad to set $S = F$ and $P = m$, it is not optimal for the community to induce sufficient entry that market competition will produce $P = m$.

era. Table 1.2 summarizes the pattern of observed support and opposition to regulation in each type of community, depending on expectations concerning the form that regulation would take. In the table more intense support or opposition is depicted by more pluses and minuses in an entry, indicating differences in support as one reads across columns and rows (but not across diagonals). The relative intensities of support or opposition are important, because the economic theory of politics predicts that more intense preferences, all else equal, are likely to be more effectively represented in the political process.

The three forms of regulation produce distinctly different patterns of support. Cartelization is opposed everywhere, with the intensity of opposition rising with the amount of service available. Public interest regulation is supported in all communities except those that already have competition, where it is mildly opposed because it imposes some process costs. Support should be most intense in communities with railroad monopolies, less intense in oligopoly markets, and still less intense in unserved areas. And expropriation is attractive in all communities except those that have no service, with the intensity of support among served communities declining as competition increases.

Harsanyi's theory of low-cost objectivity requires some slight amendments to the entries in table 1.2. Specifically, the two cells with negative entries in rows 2 and 3 are most likely to be affected by altruistic concerns. Farmers in areas with competitive service only mildly oppose public interest regulation, and farmers in unserved areas only mildly oppose expropriation. In both cases, all other communities would support the corresponding form of regulation. Hence, in both cases the farmers mildly opposed to regulation might actually support it for altruistic reasons, or to retain solidarity in farmer activist organizations.

The effect of each form of regulation on railroad entry is worth summarizing. Any form of regulation that reduces railroad profits in any period inhibits railroad investment. Communities can offset this effect by increasing their investment subsidies. In the case of public interest regulation, unless railroads and communities face different costs of capital, the net effect may be to retard

Table 1.2 Market Structure, Regulatory Orientation, and Political Support for Regulation

Expected Effect of Regulation	Preregulation Structure of Railroad Market			
	No Service	Monopoly	Oligopoly	Competition
Cartelization	-	--	---	----
Public interest	+	+++	++	-
Expropriation	-	++++	+++	+

Notes: + indicates support, - indicates opposition. Within columns and rows, but not across diagonals, the number of + and - entries indicates strength of support and opposition. For an explanation of derivation of entries, see text.

entry, but in any case economic efficiency is enhanced, for, in principle, the initial subsidy and subsequent price regulation will eliminate the deadweight loss in monopoly periods and produce optimal timing of investments. Expropriative regulation will force communities to provide larger subsidies to entrants, and because expropriative regulation creates deadweight loss, the effect will be to delay entry and to reduce economic efficiency. Finally, cartelization through regulation, by increasing excess profits for railroads, intensifies their competition for the market and so reduces initial subsidies and causes the entry of the first railroad to occur sooner. A well-managed cartel will also seek to retard investment in communities that are already served, and these communities, expecting no price reductions if entry does occur, will have no interest in trying to offset this result through greater subsidies. Hence, cartelizing regulation is expected to lead to an investment boom in unserved communities, but to reduced investment in other localities.

1.5 The Illinois Constitution of 1870

In 1870 Illinois adopted a new state constitution that was unusually detailed in its provisions regarding the regulation of railroads and grain warehouses.³² The constitution specifically ordered the legislature to pass laws establishing rate ceilings for railroad service and prohibiting price discrimination by railroads. Mergers and acquisitions of parallel railroads, and mixed storage of grains of different grades in warehouses were prohibited. Legislation that regulated grain warehouses more extensively was permitted, but not required. All of the railroad and warehouse provisions are reproduced in the appendix.

The detailed regulatory provisions in the 1870 constitution probably were in response to the difficulties the state had encountered in enacting regulatory statutes during the previous decade. Bills calling for railroad regulation were introduced regularly in the legislature throughout the 1860s. Although these bills were ardently supported by shippers, none succeeded except for a weak bill that was enacted in 1869 (Miller 1971, 62–75). An important factor in the defeat of many of these bills was the argument that rate regulation was an unconstitutional abrogation of contracts that would halt railroad investment. In 1869 Governor Palmer vetoed a strong regulation bill, citing the constitutionality issue (72). At the constitutional convention, Republican delegate William Pierce expressed his reaction to this position as follows: “The decision of courts that a railroad charter is a contract between the people and the Legislature, and that this contract is irrevocable and inviolable, must be overruled. We must have a new deal and new decision on this subject, and we in the conven-

32. The Illinois Constitution of 1870 contained several other important articles, including the enfranchisement of racial minorities and a unique system of multimember districts for the lower house of the state legislature. For a complete discussion of the 1870 constitution, see Cornelius 1972. For comparison of the 1870 Illinois Constitution to other state constitutions, see Braden and Cohn 1969.

tion must [*sic*] take the initiative, and declare what the law should be in this regard (Illinois Constitutional Convention 1870, 1645).

1.5.1 The Theory of Constitutional Conventions

The purpose of examining the adoption of a new constitution in Illinois is to infer what citizens and their representatives believed about the likely effects of regulation, thereby testing the alternative versions of the economic theory of regulation. To undertake this analysis requires some extension of the economic theory of politics, for most of this literature deals with political activity associated with legislation, not constitutions.³³ The process of adopting a new constitution differs from the legislative process in ways that may have an important effect on the behavior of delegates to a convention and voters in electing delegates and ratifying their proposals.

Superficially, the procedures for drafting a constitution and passing a statute are similar. In both cases popularly elected representatives collectively compromise their differences to develop language that will receive majority support among the delegates. The result is legally enforceable provisions that constrain public and private activities.

The major differences between constitutional and legislative processes arise from the one-shot nature of constitutions and the requirement that voters ratify the product of the constitutional convention. Delegates to constitutional conventions rarely expect to seek reelection to write another constitution. The absence of the possibility of reelection based on performance in office undermines the presumption that the revealed preferences of delegates are linked to the policy preferences of their constituents. In the modern positive theory of representation, the desire to be successful in seeking reelection motivates elected officials to enact laws that please at least a majority of their constituents.³⁴ Without the prospects for reelection, elected representatives have no incentive (other than an altruistic belief that they ought to be good representatives) to pursue the interests of their constituents in writing a constitution, for voters have no mechanism to punish representatives who do not carry out their wishes.

Two elements of a constitutional convention serve to restore the “electoral connection” to the behavior of representatives. One is ratification. The requirement that voters approve the delegates’ product does not force delegates to adhere to the wishes of their specific supporters, but it does impose the requirement that a majority of a state’s citizens prefer the new language to the old. In Illinois the fear of rejection led to an interesting procedure. Because the convention sought to achieve several forms that a majority of delegates regarded

33. A notable exception is the work of McGuire and Ohsfeldt (1984, 1986, 1989) on the federal Constitution.

34. See Fenno 1978 and Fiorina 1981 for classic discussions of how reelection incentives affect the behavior of legislators.

as important, the delegates decided to submit all of the most controversial provisions, including the regulatory articles, to separate referenda. This procedure assured that the entire constitution would not be rejected because a majority of citizens opposed one important provision. But it also guaranteed that separate provisions, both opposed by a majority, could not be combined in a logroll that caused both to be adopted.

The second aspect of the Illinois convention that provided an incentive for delegates to reflect their constituents' interests was that many of the delegates expected to have future careers in public life.³⁵ Even though they would not face reelection as delegates, many would face some subsequent election back home or would become candidates for a visible appointive office. In either case their actions at the convention could become an issue.

The convention also differed from the legislature in other ways. First, because the partisan delegates to the convention were roughly equally divided between Republicans and Democrats, and because the Cook County delegates were selected in nonpartisan elections, the organization of the convention was not partisan. Partisan organization enables the leadership of a legislature to control the agenda, to coordinate the activities of the majority party, and thereby to have a strong influence on outcomes.³⁶ Second, although the convention divided into specialized committees, membership on committees was not self-selected according to constituency interests, as in a legislature.³⁷ Hence, committee members were more likely to be a representative sample of the delegates than is normally the case in a legislature. Third, committee proposals were considered under an open rule—no limitations were imposed on the number of amendments or the sequence in which they were offered. Thus, unlike the circumstances in most legislative bodies, neither a committee nor the leaders of the body were in a position to offer an “all or nothing” bargain to legislators that varied substantially from the preferences of a majority.³⁸

All of these features reduced the extent to which the outcome of the convention was likely to reflect a partisan logroll among special interests, which is a common problem of legislatures (Lowi 1979; Ripley and Franklin 1984). On balance, these characteristics of the constitutional convention probably served to attenuate the strength of the connection between delegates and constituents, especially on issues in which interests have a narrow geographic base. Commercial farmers, however, were influential and well-organized throughout Illi-

35. From the records of the convention, we have been able to identify among the eighty-five delegates one future U.S. senator, two future members of the House of Representatives, two future judges, three future state senators, and twelve future members of the state assembly. The 162 delegates to the 1848 Illinois Constitutional Convention produced seven representatives, eight state legislators, seven judges, five U.S. senators, one governor, three delegates to the 1862 constitutional convention, three delegates to the 1870 convention, one delegate to both conventions, and one U.S. Supreme Court Justice. See Cornelius 1972, 30.

36. See Cox and McCubbins 1993, chaps. 4 and 5.

37. On self-selection, see Shepsle 1978 and Weingast and Marshall 1988.

38. For the procedural basis of committee power, see Shepsle and Weingast 1981.

nois in 1870. Their interests were largely homogeneous, except with respect to the effects of differences in the market structure of local transportation. The influence of the railroads was more indirect, arising through their ability to organize campaign support for candidates and positions reflecting railroad interests, and to lobby elected delegates. Hence, the influence of railroads can be expected to have been somewhat greater among delegates than among citizens, although this effect was certainly limited by the fact that their primary opponents, commercial farmers, were also effectively organized.

These theoretical conclusions can be tested by comparing voting behavior on the floor of the convention to subsequent ratification votes of citizens. Hence, our empirical analysis will proceed in two stages: an examination of the results from the referendum disaggregated by the districts that elected delegates to the convention, and a similar examination of the votes at the convention for the same provisions.

1.5.2 Data and Methods

To ascertain the basis of support for the regulatory provisions in the 1870 Illinois Constitution, and to test the alternative theories of regulation, we have undertaken an empirical analysis of the votes in the ratification election and the constitutional convention on the provisions that dealt with regulation of railroads and grain warehouses. Here we report our results with respect to railroad regulation.³⁹ Our analysis uses county-level data because the delegates to the constitutional convention were elected from either a single county or a combination of counties. The independent variables were selected to capture two factors that, according to the theoretical discussion in preceding sections, ought to have influenced constituency interests and hence votes. One set of variables measures the extent to which organized shipper interests were present in a district. The other set of independent variables reflects the state of competition in transportation within the district.

To measure the political importance of farmers, we use the number of farms per capita (PCFARMS) and grain production per farm (PFPROD). The first variable is a measure of numerosity, while the second is a measure of the economic stakes of farmers in the transportation system. Interest-group theory argues that the stakes per member of a group motivate their participation in the political process. The only other major shipping interest in rural counties was the coal industry. Although the historical record provides no evidence that the coal industry played any significant public role in the debate about railroad regulation, it was an organized interest that had a stake in transportation access and prices. Therefore, bituminous coal production in a county (COALPROD) was also included as an independent variable.

39. A complete analysis of the railroad and grain-elevator provisions is undertaken in Kanazawa and Noll 1993. The basic findings are essentially the same in all regressions.

To measure the extent of railroad service in a county, we have examined county railroad maps of Illinois, subdivided into quarter townships (nine square miles). The measure of access to railroad service (RACCESS) is the fraction of quarter townships through which a line of rail passes. To measure the extent of railroad competition, we use two variables. The first is the inverse of the number of independent railroads (HERF) in the county, except that if no railroads are present, this variable is zero. HERF is the Herfindahl index if all railroads have equal market shares, which in this case is a reasonable measure of competition. Once a rail line is constructed, it can provide a wide range of quantities of service at roughly a constant long-run marginal cost by simply increasing the frequency of trains and the number of cars per train. Hence, the appropriate measure of effective market share is capacity, and this is roughly equal among railroads once a track has been laid.

HERF is not likely to measure the extent of railroad competition precisely because farmers might not find every railroad in a county equally accessible. Hence, we created a variable (RAILSDIF) that is the prediction error of a regression of the number of railroads in a county on RACCESS. RAILSDEF measures the extent to which actual competition differs from that which would be expected, given the amount of access in the county.

To measure water transportation, we took into account the availability of transportation to European markets using river shipments through St. Louis to New Orleans, and then transshipment by ocean freighter. River shipments through St. Louis represented a small fraction of Illinois production in 1870, but they were nonetheless sufficient to make rivers a plausible competitive threat. In 1870 the St. Louis Board of Trade reported 980 arrivals and 960 departures of riverboats from the upper Mississippi, and 312 arrivals and 318 departures for the Illinois River (Morgan 1871, 37). In 1871 St. Louis accounted for approximately 19 million bushels of transshipped grains, 6 million of which arrived by riverboat from the upper Mississippi or the Illinois, whereas Chicago accounted for about 72 million bushels (27, 41). At the time of the Illinois Constitutional Convention, St. Louis traders perceived themselves to be losing the competition with Chicago, but not for lack of trying. Instead, they attributed their fate to their superior morality: "while we may strive to increase our grain trade in every legitimate way, we must guard against all movements which would tend to bring our trade and our Exchange into the disrepute which has become so notorious at the grain depot at the foot of the lake" (27). To measure this unsuccessful but more honorable competition, we constructed dummy variables for the Mississippi, Illinois, and Ohio Rivers, each of which took the value of one for a county that contained a port on that river and zero otherwise.

An enduring debate in empirical studies of voting behavior is whether ideology and party measure an independent element of policy preferences (a taste for how government is used and organized), or instead represent permanent

coalitional aggregations of instrumental, self-interested preferences.⁴⁰ Without entering this debate, we nonetheless include a measure of party affiliation for reasons of conservatism. To do so mildly biases our results against finding effects of local economic interests on voting behavior. At the time of the Illinois convention, the two major parties differed on railroad policy. The Republicans strongly favored proactive federal policies (including subsidies and land grants) to speed the development of the hinterland, but also favored state regulation of the railroads. The Democrats were the advocates of limited government. With few constituents west of the Mississippi in the areas that benefited most from Republican policies, Democrats generally opposed railroad giveaways, but were less likely to favor regulation. To measure party (PARTY) in the analysis of the referendum votes, we use the fraction of the 1868 presidential vote cast for Republican Grant against Democrat Seymour. For votes at the convention, we use a dummy variable that is one if the delegate was a Republican and zero otherwise. Because Cook County delegates were nonpartisan, in the analysis of convention votes we add another variable (COOK) that is one if the delegate was from Cook County and zero otherwise. We expect the coefficient on PARTY to be positive if party tastes for regulation go beyond the economic interests of party members for partisan or ideological reasons.

The definitions and summary statistics of the variables are contained in table 1.3. The correlation matrix, shown in table 1.4, reveals relatively modest correlations among the independent variables, permitting reasonably efficient estimates of the regression parameters.

1.5.3 The Popular Referendum

The empirical analysis of the popular referendum examines the vote on the constitutional provision dealing with railroads (appendix). The dependent variable is the fraction of the vote favoring ratification (RRVOTE). This variable is bounded by zero and one. When interpreted as the probability that a citizen will vote in a particular way, the variance of the observed vote fraction depends on the expected vote share. Consequently, ordinary least-squares regression is inappropriate. We assume that the mechanism relating vote share and the independent variables is described by a logistic function, enabling us to perform a regression analysis on transformed values of the dependent variable. Thus, the estimated railroad equation is

40. For a review of this debate, see Cohen and Noll 1991, chap. 5. The most important study by economists in support of the idea that ideology is a distinct independent variable is Kalt and Zupan 1984. Virtually all other studies reject their conclusion that ideological voting by legislators represents "shirking" of their duty to represent the interests of constituents, for a majority of constituents may share the ideological predisposition of their representative. Thus, the scholarly debate tends to center on whether measures of ideology can be made to disappear if enough variables measuring the instrumental interests of constituents, plus party membership, are included in a regression analysis of legislative voting.

Table 1.3 Definitions and Summary Statistics for the County-Level Explanatory Variables

Variable	Mean	Standard Deviation	Minimum	Maximum
RACCESS	0.234	0.140	0.000	0.530
RAILSDIF	0.000	0.646	-2.429	1.826
HERF	0.549	0.354	0.000	1.000
PFPROD	1.003	0.402	0.378	2.088
PCFARMS	0.096	0.027	0.018	0.183
PARTY	0.545	0.120	0.347	0.870
COALPROD	25.975	89.307	0.000	798.810
MISSISSR	0.168	0.376	0.000	1.000
OHIOR	0.050	0.218	0.000	1.000
ILLINR	0.158	0.367	0.000	1.000

Notes: Summary statistics based on 101 observations (excluding Cook County). RACCESS = percentage of quarter townships within the county with at least one rail line. RAILSdif = difference between the actual number of different rail companies and the number predicted by a least squares linear regression on rail access. HERF = equal-shares Herfindahl index; defined as $1/N$, where N is the number of different rail companies owning rail lines. PFPROD = production of wheat, corn, and oats, in thousands of bushels per farm. PCFARMS = number of farms per capita. PARTY = percentage of total 1868 presidential vote going to Grant. COALPROD = production of bituminous coal, in millions of tons. MISSISSR, OHIOR, ILLINR = dummy variables of zero or one, indicating presence of a port town on the Mississippi, Ohio, or Illinois River.

$$(7) \quad \ln [RRVOTE/(1 - RRVOTE)] = b_0 + b_1 RACCESS + b_2 HERF + b_3 PFPROD + b_4 PCFARMS + b_5 COALPROD + b_6 PARTY + b_7 MISSISSR + b_8 ILLINR + b_9 OHIOR + b_{10} RAILSdif$$

To correct for heteroscedasticity, we estimate the parameters of this equation using the method of weighted least squares.⁴¹

The regression results are presented in table 1.5. All of the variables are at least marginally significant by conventional statistical tests except the measures of competition from riverboats along the Ohio and Illinois Rivers. Table 1.6 contains the partial derivatives of the vote share with respect to the independent variables. Table 1.7 presents the predicted vote share when a specific variable takes minimum and maximum sample values while all other variables take their mean values. The results in table 1.7 are the most useful for testing hypotheses about the beliefs of voters concerning the effects of regulation.

The first important observation from table 1.7 is that railroad regulation commands majority support in all cases, which is strongly inconsistent with the view that regulation would form a railroad cartel. This result is also weakly inconsistent with the other theories. Public interest regulation should be opposed in competitive localities, and expropriative regulation should be resisted

41. See, for example, Kmenta 1986, 551-52.

Table 1.4 **Correlation Matrix for County-Level Regression Variables**

	RACCESS	RAILSDIF	HERF	PFPROD	PCFARMS	PARTY	COALPROD	MISSISSR	OHIOR	ILLINR
RACCESS	1.00									
RAILSDIF	0.00	1.00								
HERF	0.13	-0.38	1.00							
PFPROD	0.34	0.09	0.19	1.00						
PCFARMS	-0.30	-0.19	0.11	-0.26	1.00					
PARTY	0.27	-0.18	0.07	0.12	-0.03	1.00				
COALPROD	0.26	0.25	-0.12	0.04	-0.20	0.09	1.00			
MISSISSR	0.03	0.01	-0.05	0.13	-0.10	-0.08	0.24	1.00		
OHIOR	-0.25	-0.10	-0.10	-0.29	-0.12	-0.07	-0.06	-0.10	1.00	
ILLINR	0.16	0.16	0.00	0.15	-0.25	-0.16	-0.03	-0.20	-0.10	1.00

Table 1.5 Weighted Logit Estimation of the Determinants of the Popular Vote on the Railroad Article

Variable	(1)	(2)	(3)
Constant	-3.09*** (-5.72)	-2.92*** (-5.32)	-2.73*** (-4.44)
RACCESS	1.63*** (2.60)	1.66*** (2.65)	1.54*** (2.39)
RAILSDIF	0.38*** (2.95)	0.29** (2.06)	0.29** (1.98)
HERF	—	-0.36* (-1.51)	-0.36* (-1.53)
PFPROD	0.75*** (3.79)	0.81*** (4.04)	0.78*** (3.82)
PCFARMS	5.69** (1.84)	6.07** (1.97)	5.03* (1.47)
PARTY	5.54*** (7.18)	5.41*** (7.00)	5.39*** (6.79)
COALPROD	1.95** (1.85)	1.96** (1.88)	1.94** (1.84)
MISSISSR	-0.48*** (-2.92)	-0.49*** (-2.98)	-0.52*** (-2.95)
OHIOR	—	—	-0.47 (-0.90)
ILLINR	—	—	-0.06 (-0.30)
R ²	.383	.398	.404

Notes: Figures in parentheses are standard *t*-statistics. The significance tests for RACCESS, HERF, PFPROD, PCFARMS, COALPROD, MISSISSR, OHIOR, and ILLINR are all one-tailed tests; the remainder are two-tailed tests.

*Significant at 90 percent. **Significant at 95 percent. ***Significant at 99 percent.

Table 1.6 Effects of Explanatory Variables on Popular Support for Railroad Regulation

Variable	<i>dP/dX</i>			
	On Mississippi		Not on Mississippi	
	(1)	(2)	(3)	(4)
RACCESS	0.293	0.299	0.219	0.222
RAILSDIF	0.068	0.052	0.050	0.039
HERF	—	-0.065	—	-0.048
PFPROD	0.135	0.146	0.101	0.108
PCFARMS	1.023	1.094	0.764	0.812
PARTY	0.996	0.975	0.744	0.724
COALPROD	0.351	0.353	0.262	0.262

Note: These values are calculated at the mean values of the explanatory variables.

Table 1.7 Predicted Vote Shares in Support of Railroad Regulation in Popular Referendum

Variable	At Sample Minimum (%)	At Sample Maximum (%)
RACCESS	78.2	89.5
RAILSDIF	67.6	91.3
PFPROD	76.7	92.2
PCFARMS	77.1	89.6
PARTY	63.7	97.0
COALPROD	83.3	96.0
MISSISSR	84.0	76.5

Note: The probability values for RACCESS, RAILSDIF, PFPROD, PCFARMS, PARTY, and COALPROD are calculated at the mean values of all other variables, with MISSISSR assumed equal to zero. The probability values for MISSISSR are calculated at the mean values of all other variables.

in unserved areas. The latter result can be reversed if communities have a higher discount rate than railroads, and universal support for regulation is also consistent with the low-cost altruism theory.

Table 1.7 also reveals that greater production per farm and bituminous coal production, the measures of interest-group stakes in shipping, are strongly associated with greater support for regulation. Likewise, the measure of the proportion of citizens involved in agriculture, farms per capita, is also positively associated with vote share, although this relationship is weaker and less statistically significant than the other two. Together these results indicate that producers of primary products with high economic stakes in shipping were most supportive of regulation, which also strongly contradicts the cartelization theory.

The variables measuring competition also tell an interesting story. Areas served by several railroads have a high value for RAILSDIF and a low value for HERF. These areas exhibited stronger support for regulation than areas with less service. This result is inconsistent with the public interest theory, which predicts declining support for regulation as competition increases, but is not inconsistent with the expropriation hypothesis. Areas with limited access and a single railroad can be conceptualized as a combination of two communities, one monopolized and the other unserved. The area with access reaps large benefits from the price reductions under expropriation, but the unserved area faces costs due to the halt in railroad investment. Consequently, districts with low access and few railroads would contain voters who intensely favor expropriative regulation and others who intensely oppose it.

The coefficients on the river variables all have the same sign, although only the Mississippi is statistically significant. The negative coefficients on these variables are most consistent with the public interest hypothesis: areas with competition in transportation have nothing to gain from a regulatory regime that attempts to mimic competition. In addition, this variable also measures an interest group: citizens engaged in river shipping in a port town. River shippers

would oppose expropriation of the railroads because it would undercut their business. Hence, the river coefficients do not refute this hypothesis.

In summary, the analysis of the popular referendum on railroad regulation strongly supports the traditional story that the basis of support for regulation was commercial agriculture in rural areas and overwhelmingly rejects the hypothesis that regulation would facilitate railroad cartels. The results also confirm modern interest-group analysis, finding that farm areas with higher per capita stakes in agriculture supported regulation more strongly, and that another organized shipping interest that has not been mentioned in the literature, coal mining, also strongly supported regulation. Moreover, the results support the hypothesis that the extent of transportation competition also influenced the vote. The pattern of results regarding the extent of rail development indicates that many citizens voted as if they believed that expropriation of railroad capital was a likely result of regulation. Nevertheless, because all areas—including areas without service—produced substantial majorities for regulation, a majority of voters behaved as if they believed that regulation would not inhibit warranted railroad investment. The regulatory theory that is most consistent with these results is the public interest theory.

1.5.4 The Constitutional Convention Votes

The proceedings of the constitutional convention contain nearly seventy pages of discussion of railroad and grain warehouse regulation and a dozen roll call votes on these issues. Our analysis focuses on one of the four votes that dealt specifically with price regulation of railroads.⁴² This vote dealt with the most radical departure of railroad regulation that was proposed in the constitution, the provision instructing the legislature to pass a law that established rate ceilings for all shipments. This went beyond the common law prohibition against price discrimination to control the overall tariff level. The actual vote was whether to eliminate this part of section 12 of the railroad article.

In the regression analysis, the dependent variable is the vote cast by a delegate, defined as one if the delegate voted to retain the provision. As before, the voting equation was estimated using logit analysis, although the meaning of the equation is slightly different because of the nature of the dependent variable. Here the predicted value of the dependent variable measures the intensity of a delegate's support. The standard interpretation of these values is that the basis for predicting votes is whether a delegate's score is greater or less than .5; however, except for a value of .5, the predicted intensity scores are not interpreted as voting probabilities, so that weighted least squares regression is not appropriate.

We expect that the independent variables will be somewhat less powerful in the convention equation than in the referendum equation, for two reasons. First, following the interest-group theory, railroads should be more influential

42. All four votes are reported in Kanazawa and Noll 1993, and all produce broadly similar results.

at the convention than in the referendum. Second, due to the nature of elections involving partisan nominees, convention delegates should represent a compromise between central preferences among members of their party and central preferences within their constituency; however, most of the independent variables measure the latter.

As explained above, the Cook County delegates were nonpartisan. They also represented segments of the county, so that the county-level data are less precise measures for these delegates. For delegates who represented multiple counties, we calculated the values of the independent variables for each county, and then computed their weighted average, using as weights the fraction of a delegate's votes accounted for by each of the counties.⁴³ The rationale is that delegates will orient their representation to the constituents who elected them.

Table 1.8 contains the results of the regressions on the convention vote, table 1.9 shows the partial derivatives of the dependent variable for each independent variable, and table 1.10 contains the predicted probabilities of a proregulatory vote for extreme values of the railroad access variable, assuming others take mean values, for regression 3 in table 1.8.

The most important result is that support for regulation was not as overwhelming in the convention as in the popular vote. About three-fourths of the delegates voted for price regulation in this vote, and the proportion was under two-thirds on another vote that obligated railroads to provide service to all who wanted it. In the referendum the railroad provision received at least a two-thirds majority in every county. Thus, between one-fourth and one-third of the delegates voted contrary to the preferences of a large majority of their constituents. This result is consistent with the notion that an organized special interest with few members but high stakes, like the railroads, will be more influential among elected officials than among voters.

Almost all of the explanatory power in the convention regression comes from two variables: railroad access and farms per capita. Delegates from areas with more completely developed railroad systems were substantially more likely to vote for regulation. Indeed, for delegates from unserved areas, the probability of voting for regulation, all else equal, was under 20 percent. HERF is positively associated with support for regulation, indicating somewhat greater support in areas with fewer railroads. RAILSDF also has a positive coefficient, indicating the opposite relation picked up by HERF; however, the coefficient is small and statistically insignificant. Likewise, the river variables have small and statistically insignificant coefficients. In general, these results support the view that all areas with railroads wanted regulation, but that monopolized areas supported regulation most strongly. These results are most consistent with the expropriation hypothesis, primarily because delegates from

43. Data are taken from Illinois Secretary of State n.d.

Table 1.8 Logit Results for VOTE3

Variable	(1)	(2)	(3)	(4)	(5)
CONSTANT	-4.88** (-2.02)	-6.71*** (-2.35)	-7.07** (-2.19)	-7.61** (-2.25)	-7.30* (-2.17)**
RACCESS	9.09** (2.20)	9.04** (2.21)	10.54** (2.17)	10.25** (2.10)	10.30** (2.09)
RAILSDIF	—	—	1.03 (1.34)	0.87 (1.05)	0.94 (1.09)
HERF	1.93 (1.26)	1.88 (1.21)	2.43* (1.37)	2.34* (1.31)	2.26* (1.30)
PFPROD	—	—	-0.12 (-0.08)	-0.03 (-0.02)	-0.05 (-0.03)
PCFARMS	28.19** (1.76)	47.55** (2.10)	44.01** (2.03)	49.93** (1.99)	48.46** (1.91)
PARTY	0.77 (1.14)	1.00 (1.40)	1.07 (1.43)	1.15 (1.49)	1.18 (1.51)
COOK	—	2.39 (1.28)	—	1.11 (0.49)	0.68 (0.28)
COALPROD	—	—	-03.7 (-1.48)	-03.1 (-1.18)	-03.3 (-1.21)
MISSISSR	—	—	0.81 (0.80)	0.80 (0.79)	0.65 (0.62)
ILLINR	—	—	—	—	-0.51 (-0.57)
Log likelihood	-30.01	-29.14	-28.24	-28.12	-27.96
% Correct Predictions	0.788	0.788	0.773	0.803	0.773

Notes: Figures in parentheses are standard t-statistics. Number of observations = 66. The significance tests for RACCESS, HERF, PFPROD, PCFARMS, COALPROD, MISSISSR, and ILLINR are all one-tailed tests; the remainder are two-tailed tests.

*Significant at 90%. **Significant at 95%. ***Significant at 99%.

Table 1.9 Effects of Explanatory Variables on Delegate Voting on VOTE3

Variable	<i>dP/dX</i>			
	Republicans		Democrats	
	Not on Mississippi River	On Mississippi River	Not on Mississippi River	On Mississippi River
RACCESS	1.283	0.673	2.313	1.533
RAILSDIF	0.125	0.066	0.226	0.150
HERF	0.296	0.155	0.533	0.353
PFPROD	-0.015	-0.008	-0.026	-0.018
PCFARMS	5.359	2.810	9.659	6.400
COALPROD	-0.451	-0.236	-0.812	-0.538

Note: These values are based on equation (3) in table 1.8 and are calculated at the mean values of the explanatory variables, except for PARTY and MISSISSR.

Table 1.10 Predicted Probabilities of Support for Regulation at Varying Levels of Railroad Access, VOTE3

	At Sample Minimum (RACCESS = 0)	At Sample Mean (RACCESS = .295)	At Sample Maximum (RACCESS = .530)
Democrats	0.085	0.675	0.961
Republicans	0.213	0.858	0.986

Note: These predicted probabilities are based on equation (3) in table 1.8. All other explanatory variables are set at their sample means, except for MISSISSR, which is assumed to be zero.

unserved areas behaved as if they bought the argument of the railroads that regulation would prevent the extension of service to their areas.

Another interesting feature of the vote is that the measures of organized interests within the district generally do not explain votes by delegates. Neither production per farm nor bituminous coal production is statistically significant, and the latter has the wrong sign. To the extent shipper organizations actively influenced delegates, they did not do so on the basis of the specific factors giving rise to effective organization in the district.

Finally, party affiliation appears to have been unimportant in the convention, even though party orientation was important in the popular vote. As indicated in table 1.10, Democrats were less likely to vote for regulation than were Republicans, but partisan differences apparently were captured by the independent variables measuring constituency interests.

Broadly speaking, voting at the convention was less consistent than the popular vote with the view that regulation would improve the efficiency of the railroads, and more consistent than the popular vote with the expropriation hypothesis. Of course, these results do not necessarily reveal what the delegates personally believed; the results fundamentally show that railroads had the most success with delegates from areas without service, and less success with delegates from monopolized areas than from more competitive ones. But delegates from competitive areas were too willing to vote for regulation to be consistent with the public interest theory. Either they thought their constituents would benefit from expropriation of railroad capital, or they were casting votes for farmers elsewhere who suffered from monopoly.

1.6 Subsequent Railroad Investment

If many delegates and voters behaved as if they thought regulation would expropriate railroad capital, subsequent events indicate that their expectations were in error. In 1903 Charles R. Detrick published extensive research on the effects of the Granger laws on railroad investment. Detrick found no substantial differences in the rate of railroad investment or the profitability of railroads

either between Granger and other states during the 1870s, or before and after the enactment of the Granger laws.⁴⁴ We reprise his major results here.

Detrick found that throughout the 1870s construction in the four Granger states was almost identical to construction in four adjacent states that were very similar but that did not enact railroad regulation at this time (Indiana, Michigan, Nebraska, and Missouri). From 1871 to 1873, when the Granger states attempted unsuccessfully to enact railroad regulation, rail trackage grew 44.5 percent in the Granger states, 45.4 percent in the other four, and 33 percent nationwide. In 1874 and 1875, when all four Granger states had Granger laws, their rail trackage grew by 6 percent, while in the other four states growth was 4.1 percent and in the nation as a whole 5.5 percent. In Illinois between 1871 and 1873, after the constitution was ratified but before a permanent enabling law was passed, railroad trackage grew by 37 percent, compared to 17 percent in neighboring Indiana. From 1873 to 1875, the first two years after the Granger act was passed, Illinois trackage grew by 11.8 percent, compared to 8.6 percent in Indiana. Finally, Detrick finds that net earnings of railroads actually grew faster in the Granger states than in the four comparison states from 1873 to 1876.

The only state in which enactment of regulation appears to have had a major effect on railroad construction was Minnesota. From 1871 to 1873 Minnesota trackage increased by 79 percent, but between 1874 and 1875, the year in which its Granger law was in effect, growth fell to 2.1 percent. After repeal, construction recovered somewhat, with trackage up 10 percent between 1876 and 1877 and approximately another 40 percent from 1877 to 1879. These results are very difficult to explain, because Minnesota's regulatory law was not the most Draconian. Wisconsin's Potter Act took that honor, and Wisconsin trackage grew by 36.6 percent from 1873 to 1875 under this statute. Detrick also found that, during the year of regulation in Minnesota, railroad net earnings jumped by 80 percent, the second largest figure he reports (Nebraska reported growth of 400 percent). His overall conclusion: "[A]s regards railroad building and receipts, [the Granger states] suffered less than the United States as a whole, and very much less than the southern and western states" (1903, 256).

Why did this investment in railroads persist? The 1871 Annual Report of the Illinois Railroad and Warehouse Commission provides two explanations:

The construction of railroads in this State during the past year, especially in the central and southern portion of it, has been pushed with unusual energy and activity. This has been stimulated, and chiefly occasioned, by the anxiety of the people living in the various localities interested to secure the con-

44. Detrick 1903, 248–56. Railroad construction and profits did tail off nationwide in the late 1870s, but Detrick finds that a national recession, not state regulatory actions, is the more plausible explanation because the slowdown hit all areas, not just the states that instituted railroad regulation.

struction of the roads before the local subscriptions voted in their aid by counties, cities and towns should be lost by the lapse of time or otherwise, and also by an anxiety on the part of the older and more powerful corporations to protect themselves against probable competitions or encroachments upon what they call their "legitimate territory," by reason of the construction of these new lines. (Illinois Railroad and Warehouse Commissioners 1871, 9)

Thus, local governments offered attractive subsidies to build new lines, and the established railroads concluded deals because they feared competitive entry if they did not. All of this took place after ratification of the Illinois Constitution of 1870, but before passage of the permanent enabling statute in 1873. This investment boom by the railroads is not consistent with the view expressed in the constitutional debate that regulation would expropriate capital.

1.7 Conclusions

The primary purpose of the research reported here is to advance understanding of the fundamental economic and political causes of regulation in the United States. The first application of economic regulation—public control of prices and entry—was transportation. For the most part, scholars have focused attention on the origins of federal regulation of railroads, but for three decades before the passage of the Interstate Commerce Act in 1887, several states attempted to regulate railroads. In many ways the economics and politics of state railroad regulation were more interesting than the circumstances surrounding passage of the Interstate Commerce Act, for during the thirty years prior to 1887 the railroads were rapidly expanding their route network throughout the Midwest and West, and national politics was much more contentious and unstable.

Because railroads were expanding rapidly in the decade after the Civil War, the effect of regulation on investment must be an extremely important component of an analysis of the economic and political causes of regulation. Hence, our analysis of the stakes of various economic interests in the Granger laws examines both the short-run price effects and the long-run effects on investment and competition of each possible form of regulation that might arise, whether a railroad cartel, a "public interest" simulation of competition, or expropriation of railroad capital.

The most important conclusion from our research is that state regulation of railroads was not adopted at the behest of the regulated to help them manage a more effective cartel. The railroads energetically fought the Granger laws and managed to have them repealed or emasculated in three of the four Granger states. Shipper interests, especially in agriculture as represented by new farmer activist organizations such as the Grangers, were strong, successful advocates of regulation, and delegates representing farmers were responsible for the passage of the regulatory articles in the Illinois Constitution. In voting

for ratification of the constitution, most citizens behaved as if the effect of regulation would be to lower prices, but not to cause profits to be too low to induce further railroad investment. More citizens voted as if they believed that regulation would expropriate the capital of railroads than as if they expected regulation to produce a railroad cartel. Furthermore, because the railroad article passed by large majorities throughout the state, citizens in areas served by several railroads apparently voted altruistically, favoring a policy that would benefit other farmers in areas that were less well served. Finally, a substantial minority of delegates to the constitutional convention clearly acted contrary to the wishes of an overwhelming majority of their constituents by voting to kill or to emasculate the regulatory articles during the convention proceedings. The railroads were much more influential at the convention, especially among delegates representing areas without railroad service, than they were in the popular referendum.

The Granger era raises potentially rich research issues that have been largely unexplored using the tools of modern economic analysis. The short life of the Granger movement and, except in Illinois, the quick repeal of the Granger laws remain unexplained. Likewise, the adoption of regulatory statutes in other states after the demise of the Grangers also merits further study. These issues suggest a larger question, thus far largely unexamined, about how agrarian activism, a prominent feature of American politics throughout the latter half of the nineteenth century, affected public policy. Finally, a more systematic study of the relationship between railroad performance—prices and growth—and regulation is needed to understand fully the circumstances confronting members of Congress and their constituents when *Wabash* finally emasculated state regulation and federal legislation was enacted as a substitute.

Appendix

Railroad and Grain Warehouse Provisions of the 1870 Illinois Constitution

Article 11: Corporations (Railroad Provisions)

Section 9. Every railroad corporation organized or doing business in this State, under the laws or authority thereof, shall have and maintain a public office or place in this State for the transaction of its business, where transfers of stock may be made and in which shall be kept, for public inspection, books, in which shall be recorded the amount of capital stock subscribed, and by whom; the names of the owners of this stock, and the amounts owned by them respectively, the amount of stock paid in, and by whom; the transfers of said stock; the amount of its assets and liabilities, and the name and place of resi-

dence of its officers. The directors of every railroad corporation shall annually make a report, under oath, to the Auditor of Public Accounts, or some officer to be designated by law, of all their acts and doings; which report shall include such matters relating to railroads as may be prescribed by law. And the General Assembly shall pass laws enforcing, by suitable penalties, the provisions of this section.

Section 10. The rolling stock, and all other movable property belonging to any railroad company or corporation in this State, shall be considered personal property, and shall be liable to execution and sale, in the same manner as the personal property of individuals, and the General Assembly shall pass no law exempting any such property from execution and sale.

Section 11. No railroad corporation shall consolidate its stock, property or franchises with any other railroad corporation owning a parallel or competing line; and in no case shall any consolidation take place, except upon public notice given, of at least sixty days, to all stockholders, in such manner as may be provided by law. A majority of the directors of any railroad corporation now incorporated or hereafter to be incorporated, by the laws of this State, shall be citizens and residents of this State.

Section 12. Railroads heretofore constructed or that may hereafter be constructed in this State, are hereby declared public highways, and shall be free to all persons for the transportation of their persons and property thereon, under such regulations as may be prescribed by law. And the General Assembly shall, from time to time, pass laws establishing reasonable maximum rates of charges for the transportation of passengers and freight on the different railroads in this State.

Section 13. No railroad corporation shall issue any stock or bonds, except for money, labor or property actually received and applied to the purposes for which such corporation was created; and all stock dividends, and other fictitious increase of the capital stock or indebtedness of any such corporation shall be void. The capital stock of no railroad corporation shall be increased for any purpose, except upon giving sixty days' public notice, in such manner as may be provided by law.

Section 14. The exercise of the power and right of eminent domain shall never be so construed or abridged as to prevent the taking, by the General Assembly, of the property and franchises of incorporated companies already organized, and subjecting them to the public necessity, the same as of individuals. The right of trial, by jury, shall be held inviolate in all trials of claims for compensation, when, in the exercise of the said right of eminent domain, any incorporated company shall be interested either for or against the exercise of said right.

Section 15. The General Assembly shall pass laws to correct abuses and prevent unjust discrimination and extortion in the rates of freight and passenger tariffs on the different railroads in this State, and to enforce such laws by adequate penalties, to the extent, if necessary for that purpose, of forfeiture on their property and franchises.

Article 13: Warehouses

Section 1. All elevators or storehouses where grain or other property is stored for a compensation, whether the property stored be kept separate or not, are declared to be public warehouses.

Section 2. The owner, lessee or manager of each and every public warehouse situated in any town or city of not less than one hundred thousand inhabitants, shall make weekly statements, under oath, before some officer to be designated by law, and keep the same posted in some conspicuous place in the office of such warehouse, and shall also file a copy for public examination in such place as shall be designated by law, which statement shall correctly set forth the amount and grade of each and every kind of grain in such warehouse, together with such other property as may be stored therein, and what warehouse receipts have been issued and are, at the time of making such statement, outstanding therefor; and shall, on the copy posted in the warehouse, note daily such changes as may be made in the quantity and grade of grain in such warehouse; and the different grades of grain shipped in separate lots shall not be mixed with inferior or superior grades, without the consent of the owner or consignee thereof.

Section 3. The owner of property stored in any warehouse or holder of a receipt for the same shall always be at liberty to examine such property stored and all the books and records of the warehouse in regard to such property.

Section 4. All railroad companies and other common carriers on railroads shall weigh or measure grain at points where it is shipped, and receipt for the full amount, and shall be responsible for the delivery of such amount to the owner or consignee thereof, at the place of destination.

Section 5. All railroad companies receiving and transporting grain in bulk or otherwise shall deliver the same to any consignee thereof, or to any elevator or public warehouse to which it may be consigned, provided such consignee or the elevator or public warehouse can be reached by any track owned, leased or used, or which can be used by such railroad companies; and all railroad companies shall permit connections to be made with their track so that any such consignee and any public warehouse, coal bank or coal yard may be reached by the cars on said railroad.

Section 6. It shall be the duty of the General Assembly to pass all necessary laws to prevent the issue of false and fraudulent warehouse receipts, and to give full effect to this Article of the Constitution, which shall be liberally construed so as to protect producers and shippers. And the enumeration of the remedies herein named shall not be construed to deny to the General Assembly the power to prescribe by law such other and further remedies as may be found expedient, or to deprive any person of existing common law remedies.

Section 7. The General Assembly shall pass laws for the inspection of grain, for the protection of producers, shippers and receivers of grain and produce.

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