

# UC Berkeley

## Economics 211 - U.C. Berkeley Economic History Seminar

### Title

The Financing of 19th Century Internal Improvements

### Permalink

<https://escholarship.org/uc/item/7nh1c6df>

### Authors

Wallis, John

Weingast, Barry

### Publication Date

2005-02-03

*Rough Draft: Do not quote or circulate without permission*

# Equilibrium Federal Impotence: Why the States and Not the American National Government Financed Infrastructure Investment in the Antebellum Era

John Wallis and Barry R. Weingast\*

January 2005

## 1. Introduction

Limited government is widely agreed to be important to the promotion of economic development (Knack and Keefer 199\*, North and Weingast 1989, Shleifer and Vishny 2000). Yet the mechanisms that sustain limited government remain to be established. In this paper, we explore this question in the context of the early United States, enquiring about the institutions and incentives that both limited the scope of the national government and promoted the public provision of market-enhancing public goods. Madison and the other founding fathers created a Constitutional system of limited government by pitting ambition against ambition – but how did this work in practice? Specifically, how did the incentives facing public officials limit their ability to exercise political power?

In the antebellum era, American states rather than the national government actively

---

\*Professor, Department of Economics, University of Maryland and Research Associate, National Bureau of Economic Research; and Senior Fellow, Hoover Institution, and Ward C. Krebs Family Professor, Department of Political Science, Stanford University. The authors gratefully acknowledge Douglas Grob and Douglass North for helpful conversations.

promoted economic development, pouring huge resources into both financial institutions and large-scale internal improvements, such as canals and, later, railroads (Callender 1903, Goodrich 1960, North 1961, Taylor 1960, Larson 2001). Indeed, during this period their financial efforts were an order of magnitude larger than the federal government's. Between 1800 and 1860, the federal government spent \$54 million on transportation improvements, while state and local governments spent over \$450 million. Given the modern leadership of national government in virtually all aspects of social and economic policy, the relative absence of federal action for America's first century remains a major puzzle.

Several other aspects of early America make this contrast even more puzzling. First, economic theory suggests that the national government is a more efficient provider of these goods, since the country as a whole is better able to spread the risks across the entire nation, whereas individual states have much less capacity for this risk sharing. Second, during this era, the national government typically ran a budget surplus, so fiscal constraints played a limited role in the national government's failure to provide these market-enhancing public goods.<sup>1</sup> Third, President Andrew Jackson (1829-37) is known as the quintessential anti-internal improvements president. Emblematic of this view is his veto of the Maysville Road in 1830. "In the best view of these appropriations, the abuses to which they lead far exceed the good which they are capable of promoting."<sup>2</sup> And yet the evidence shows that federal spending on transportation projects was never higher in the ante-bellum era than during the twelve years of his presidency and that of his hand-picked successor, Martin Van Buren.

In this paper, we develop an approach to the political economy of governmental spending that provides an answer to these puzzles. By explaining why the federal government failed to act

in the area of internal improvements, we provide insights into the larger question of limited government, how the constitution created political incentives that fulfilled Madison's vision and constrained the activities of the national government. We argue that the striking limits on the national government reflected a national politics of impotence – of many sources of veto groups that prevented national action. The sources of this impotence are several.

To address these puzzles, we model the political economy of legislative choice when the object is funding a large infrastructure investment. The model has three related results. First, we show that the natural political constraints inherent in majority rule prevented the federal government from financing large infrastructure projects. These projects provided highly concentrated benefits with diffuse costs. Because federal financing of such projects would have made most areas of the country worse off, they could not command a majority of votes in Congress. Although logrolling, in principle, might enable several projects to be built at once, in practice the immense scale of these infrastructure investments, such as the Erie Canal or a transcontinental railroad, implied that only a few could be built at once.

Second, we show that for smaller projects, such as building lighthouses and roads or dredging harbors, two separate political forces push Congress toward “something for everyone” policies, or *universalism*. First, the coalitional politics of these projects push toward universalism (Weingast 1979). When members of Congress are uncertain about the winning coalition that will form, a universal coalition provides higher expected returns to each district and its representative, than a narrower majority coalition. Second, we argue that Congress was further constrained by what we term the *exit constraint*, the fear that states would leave the Union if federal policies left them significantly worse off (as the states of the south eventually

did leave the Union). Schlesinger (1922), for example, shows that there were secessionist movements in every state at some point during the antebellum era. The exit constraint also imposes a limit on coalition politics. It implies that minimum winning coalitions, especially regional ones, risk secession from the regional locked out of power. For this reason, (self-enforcing) democratic norms developed in the early national period against minimal winning coalitions based on region. As a result, the construction of small federal projects involved “something for everyone.” projects built throughout the country, in every state. Universalism emerged as a solution to both the majority constraint and the exit constraint.

Third, we show that “benefit taxation” provides another solution to the political constraints. If the government can tax each locality or state in proportion to the benefits it receives from the project, then regions outside the area benefitting from the project pay no taxes and thus are not financially harmed by the project. An institutional problem complicates the use of benefit taxation: the Constitution requires that federal direct taxes must be allocated among the states on the basis of population. The Constitution therefore prohibits the federal government – but not the states – from using benefit taxation to finance projects.

These results explain all the puzzles noted above. The Constitutional limit on benefit taxation combines with the logic of congressional politics to imply that the federal government could not finance large projects. In contrast, the states could use benefit taxation and we show that they did use it to solve political problems at the state level, allowing them to finance far more internal improvements than the national government. The state and federal governments persistently financed these projects in different ways. Similarly, the second result about universalism shows that when Congress sought to spend money on infrastructure projects, it did

so through something for everyone, whether in the form of large collections of small projects or proposals for “distribution bills”; that is, bills providing for distribution of federal revenues to all states in proportion to their population.

Finally, these results bear on our larger question about the incentives for limited government in early America. The Constitution created a series of explicit and implicit political constraints facing the national government, making it nearly impossible for it to finance large infrastructure projects. When it did seek to do promote infrastructure, it was either in form of financing large collections of small projects or proposing to distribute funds to every state. In short, the national government was political impotent with respect to the provision of the highest valued infrastructure projects.

In contrast, states were able to finance these projects because they could use benefit or Lindahl taxes, assessing property owners in proportion to their expected economic gains from the new project. Several incentives pushed states toward the efficient provision of these projects. First, competition among states for scarce capital and labor pushed them to provide valuable infrastructure that would help attract these scarce resources. Second, because these projects were so large relative to the state’s economy and budget, benefit taxation implied that only projects that provided net surpluses to the economy would be approved by voters.

The paper proceeds as follows. Section 2 develops the theory of coalition formation and legislative choice, and derives our various results about state and federal legislature policy decisions. Sections 3, 4, and 5 apply these results to the antebellum era’s national and state programs to finance economic development. Section 6 considers the role of constitutional constraints on federal finance.

### **3. A Theory of Legislative Choice and Infrastructure Investment**

We turn to the theory of legislative choice to understand the three phenomena to be explained: the federal government's inability to promote economic development through financing large infrastructure projects; its ability to finance many small projects; and why the states were not plagued by the same problems.

Today we think of the president as the national leader, the source of most major legislative initiatives. Yet this is a modern phenomenon, the product of the twentieth century. In the nineteenth century, Congress was at the center stage of national legislation. All the famous compromises that revised aspects of the American national framework and helped sustain the United States were negotiated and written in Congress, including those of 1820, 1833, 1850, and 1877.

We begin with expenditure policies, that is, those policies which seek to spend revenue in various ways across the country. Important policies in this category during the nineteenth century included building transportation links – roads, canals and, later, railroads – post offices, rivers and harbors projects, such as dredging rivers and harbors and providing for lighthouses.

The model applies to both the American federal and state governments, so we talk about generic legislatures and districts, rather than states, districts, or counties. Both Congress and state legislatures are geographically oriented.<sup>3</sup> Because legislators are elected from specific geographic constituencies their electoral incentives force them to concern themselves about the incidence of policies on their district. Although national or statewide interests matter, it is

primarily the effects of policies on their district that determine whether a given member favors a policy (Stewart 2002).

Consider an expenditure policy to provide a public good,  $\pi(x) = (P_1(x), P_2(x), \dots, P_n(x))$  where  $n$  is the number of districts,  $\pi(x)$  is a public policy, and the  $P_i(x)$  represent the incidence of the policy on district  $i$ .<sup>4</sup> The various functions are written as a function of  $x$ , which can be considered as a scale or scope factor that reflects the size of the policy.

$P_i(x)$  can be broken into the benefits,  $b_i(x)$ , and costs,  $c_i(x)$ , where  $P_i(x) = b_i(x) - c_i(x)$ . We assume that the benefits are concave and the costs are convex as a function of  $x$ ; that is,  $b_i' > 0$ ,  $b_i'' < 0$ , and  $c_i' > 0$  and  $c_i'' > 0 \forall i$ .

The total net social benefits for the state is represented as:

$$Z(x) = \sum_i P_i(x) = \sum_i (b_i(x) - c_i(x)).$$

The economically efficient policy,  $x^*$ , is such that at  $x^*$ ,  $Z' = 0$  and  $Z'' < 0$  so that at  $x^*$  the marginal net social benefits are zero; i.e.,  $\sum_i (b_i'(x) - c_i'(x)) = 0$ . Legislative outcomes are unlikely to meet this criteria, however.

Let  $C = \sum_i c_i(x)$  be the total costs of the project, and let  $T$  be the total taxes needed to finance the project. We assume a balanced budget constraints, so that  $T = C$ . Further, district  $i$ 's tax share is  $t_i$ , so that its tax cost for a particular project is  $t_i C$ .<sup>5</sup>

District  $i$ 's legislator's objective function is  $P_i(x) = b_i(x) - t_i C(x)$ .<sup>6</sup> Legislators consult only their own objective function, ignoring the effects of the project on other districts, and hence the project's social implications. When choosing between two projects, or between building a particular project and not, each legislator supports the alternative that provides higher net benefits. Moreover, we assume a convention about indifference: if a legislator's district bears no



costs for a project, she votes in favor even if her district receives no benefits.<sup>7</sup> It is clearly costless for such a legislator to do so.

Legislatures are constrained in two ways. First, passage of individual legislation is only possible if a majority of legislators benefit from the proposed legislation.<sup>8</sup> This *majority rule constraint* applies to individual pieces of legislation. Logrolling makes it possible to fund individual projects (as opposed to legislation) that benefit a minority of legislators, as long as the project is paired with enough other projects that a majority of legislators receive positive net benefits from the entire package. For simplicity, the majority rule constraint requires that all of the necessary logrolls be bundled into one bill.

Second, the *exit constraint* applies to totality legislation passed by the legislature. With respect to the national government, every state must receive positive net benefits from the sum of all legislation passed, or it “exit.” The exit constraint requires that no district is hurt, on balance, by the aggregate actions of the government. We embody this constraint by requiring that:

$$\sum_j P_{ij}(x) > 0 \text{ (summed over } j \text{ policies, } \forall i \text{ )}.$$

We will return to consider the historical relevance of both the majority and the exit constraint later. With respect to states, mobile factors of capital and labor will leave the state if some region is a permanent minority that receives too little benefits in comparisons with its taxes.

## Results

The legislature must make simultaneous decisions about the size of the project, the allocation of benefits across districts, and the allocation of tax burdens across districts. We characterize legislative outcomes under four different mechanisms of public finance: normal

taxation, benefit taxation, universalism or something for everyone, and taxless finance. These categories are not mutually exclusive, nor are they exhaustive, but they give us a framework to discuss the choice set facing Congress and the state legislatures in the early 19<sup>th</sup> century. We continue to consider one big project, like the Erie canal.

**A. One large project: Normal taxation.** Normal taxes are the general revenue instruments already in use by the government. In the case of the federal government in the early 19<sup>th</sup> century, financing expenditures by normal taxation involved revenue from import duties, the national government's principal tax.

Large projects have several relevant characteristics. First, they require very large expenditure relative to the budget, implying that at most only one or two such projects can be built at once. Second, these projects concentrate the benefits in a small geographic area while spreading the tax costs across the entire state. This implies that some districts receive large benefits relative to their tax cost:  $b_i(x^*) > t_i C(x^*)$ ; but many districts receive no benefits while bearing their tax cost:  $P_i(x) < 0 \forall x > 0$ , since  $b_i(x) = 0$  while  $t_i C(x) > 0$ .

The concentration of benefits in a few districts implies that most districts pay taxes while receiving no benefits. These districts both naturally oppose the project and comprise a majority, so the majority rule constraint implies that no project is built. The size of the project makes it impossible to find enough logrolling options to compensate districts that do not gain from the large project. Even if it is possible to find a project that benefits a majority of districts, a simple majority fails to meet the exit constraint. In short, it is difficult for government to build a large, expensive, geographically concentrated project through normal taxation.

**B. One large project: Benefit taxation.** The first result assumed that the financial costs

of the project were spread across the state through general taxation. Suppose instead that the project could be financed by a tax scheme, *benefit taxes*, also known as Lindahl taxes. In this scheme, district  $i$ 's tax share is a function of the benefits it receives from the project.

Let the  $B(x) = \sum_i b_i(x)$  be the project's total benefits. Define a *benefit taxation scheme* so that  $t_i = b_i/B$ . Under this tax scheme, districts that receive no benefits from the project also pay no taxes regardless of the project's total cost:  $b_i = 0$  implies that  $t_i = 0/B = 0$ . Districts pay their share in taxes in proportion to the benefits they receive.

As long as the project's total benefits exceed the total costs ( $B > C$ ), each district with positive benefits also has positive net benefits after paying their tax share.<sup>9</sup> Thus, assuming that representatives who are indifferent to the project – including legislators whose districts receive no benefits but also incur no costs – vote in favor of the project, every legislator (weakly) favors the project, so it will pass. In contrast to the case where projects are financed out of general revenue, benefit taxation implies that, even in the case of a large project like the Erie canal, most districts receive no benefits and incur no costs, and so they can costlessly support the project.

The widespread use of the property tax provided states with a potential mechanism for creating a benefit tax. When the value of transportation improvements is capitalized in land values and property taxes are used to fund construction, it is possible for every district to, at worst, be indifferent to the large project. The use of benefit taxation to finance a single large project simultaneously satisfies the majority and exit constraints.

The central problem with a single large project is the inability to balance off the losses to districts that do not benefit from the project because the state is unable to afford multiple large projects. Benefit taxation solves that problem. The Constitution explicitly prohibited the federal

government from using benefit taxation: “Representation and direct taxes shall be apportioned among the several States which may be included in this Union, according to their respective Numbers...” (Article 1, Section 2).<sup>10</sup>

**C. One large project: Taxless finance.** There are several alternatives to financing a project through taxes. We consider four financing schemes that share a common element: building the project does not entail raising current taxes, thus *taxless finance*. We might also call these schemes contingent tax finance, since two variants involve the assumption of a contingent liability by taxpayers.

Suppose the canal is expected to generate a stream of toll revenues, but its construction requires government assistance in the form of eminent domain, limited liability, or some other privilege.<sup>11</sup> Private entrepreneurs may be willing to privately finance the project in exchange for a corporate charter granting these and other privileges, such as the right to charge monopoly prices. In return for the grant of special privilege, the government acquires an ownership interest in the private company.<sup>12</sup> Public grants of monopoly were common in 18<sup>th</sup> and early 19<sup>th</sup> century Britain and the United States, as was state ownership of private company stock. This scheme requires only that some districts benefit from the charter, as no additional taxes need be raised.<sup>13</sup>

Of course, the first variant of taxless finance requires that private owners raise capital themselves. In antebellum America it was difficult to use this mechanism alone to finance large transportation projects.<sup>14</sup> A second variant of taxless finance used the good faith and credit of the government to secure operating capital by issuing bonds. The government then invested the borrowed funds in the private corporation by purchasing stock. Expected dividends from the government’s investment would cover the government’s interests costs. Taxpayer’s liability in

this case was contingent on the success of the project. If the project succeeded, the government received a steady flow of dividends, net of interest costs, allowing it to lower taxes. If the project failed, the government and its taxpayers would assume the debt service.<sup>15</sup> The First and Second Banks of the United States were financed in this manner.

Sometimes projects were so large that private entrepreneurs could not be found. A third variant of taxless finance was for the government to construct and operate the enterprise itself. In this case, the government borrowed sufficient funds to cover both building the project and the interest charges in the early years of the project before revenues were expected to materialize. Of course, borrowing funds left taxpayers with a contingent liability. If *ex post* the project failed to generate sufficient revenues to cover the costs of the bonds, taxpayers had to pay the difference in proportion to their tax share. This type of taxless finance was common at the state, but not the federal level in the early 19<sup>th</sup> century. It was, however, used by the federal government to finance intercontinental railroads in the 1860s.

A fourth method was used extensively by the federal government: land grants. In these schemes, the federal government would give project promoters grants of federal land, which the promoters could sell to raise funds. Federal lands were an important source of federal revenue. The idea was that taxpayers would gain from the grant, because building the canal or railroad would raise land values on the land the federal government did not give away. The rise in land values would offset the loss of land revenue from the grant. Grants were made to Ohio, Indiana, and Illinois in the 1820s, and the Union Pacific Railroad in the 1860s.

Taxless finance works politically because of the implicit benefit received by all districts. Current taxes may not rise, but taxpayers do assume an expected, contingent liability:

$$CL_i = t_i C(x)(1-s)$$

where  $s$  is the *ex ante* probability of project success. If the project fails *ex post*,  $CL_i$  will be positive for all districts. Note that  $P_i(x)$  is negative for any districts who receive no immediate benefits, i.e. for whom  $b_i(x) = 0$ .

A taxless finance scheme that does not provide benefits to all districts, *ex ante*, will have a negative expected value to a majority of districts and will not be supported:

$$P_i(x) = b_i(x) - t_i C(x)(1-s) < 0 \quad (\forall i \text{ where } b_i(x) = 0).$$

Taxless finance does not work that way, however. All three variants propose that the project will return money to the state treasury, either in the form of dividends on the government's investment in the private corporation or in the form of toll revenues or profits. If  $M$  represents the potential profit of the enterprise to the government, then the calculation of net benefits for each district becomes:

$$P_i(x) = b_i(x) + t_i M(s) - t_i C(x)(1-s).$$

That is, each district expects its taxes to go down by  $t_i M$  if the project is successful. The critical issue for districts who do not benefit directly from the canal, districts where  $b_i(x) = 0$ , is whether  $t_i M(s) >> t_i C(x)(1-s)$ . Taxless finance works politically because it promises every district that its taxes will be lower if the project succeeds.<sup>16</sup> Of course, a major element in whether these schemes are perceived by citizens to have positive expected value depends on  $s$ , the probability of success.

As with benefit taxation, taxless finance can simultaneously satisfy the majority constraint and the exit constraint.

**D. Many projects: Universalism or Something for Everyone.** We have emphasize the

financing of a single large project because of its relevance for state transportation investments in the antebellum era. But the provision of small transportation projects was also relevant for federal investment. Many antebellum expenditure policies fell into this category, rivers and harbors projects, lighthouses, post offices, and roads.

We argue that in this setting two separate political forces push the legislature toward universal or something for everyone solutions. Consider a legislature facing decisions over a range of projects, each with concentrated local benefits and paid for through general taxation.<sup>17</sup> For simplicity, we assume that each legislator has one proposed project; and that each project benefits her district and her district alone.<sup>18</sup> Moreover, assume that each project is small relative to the budget, so that there is no problem financing many or all at the same time. Let the benefits to each district from its project be  $b$ ; that these are identical across districts, as are all the costs,  $c$ ; and that each district pays an equal tax share of  $1/n$  of the total costs.<sup>19</sup>

Legislators now consider bundles of projects. Given each legislator's preferences, the ideal bundle of projects is simple to characterize. Each legislator receives positive benefits only if the project for her district is built. Building any or all other projects merely raises the district's taxes. So each legislator's ideal policy is to build her project alone. Unfortunately any legislation of that type will be defeated by a vote of  $n-1$  to  $1$ , with only the legislator benefitting voting in favor. Legislators therefore have an incentive to create bundles of projects through logrolling.

**1. The universalism tendency.** The literature has studied two natural types of bundles or logrolls. The first is a minimum winning coalition (MWC) whereby  $(n+1)/2$  legislators build

their projects alone.<sup>1</sup> For those legislators whose projects are built, this maximizes their net benefits. Enlarging the coalition gains votes beyond the minimum needed. Yet, because it raises each coalition-members taxes without increase their benefits, each is worse off. Of course, those legislators not included in the MWC are worse off since their projects are not built, but they pay their share of the taxes to finance the MWC's projects. This implies that, once a given MWC forms, it is hard to overturn: all members of the coalition benefit from this bundle; no bundle makes them better off; and they are better off than if no projects are built.

The problem is that there are too many such coalitions, and ex ante no legislator is assured of being in the MWC so that their projects will be built. Thus, MWC politics involves risk.

As an alternative, the legislature might institute and enforce a policy of *universalism*, the notion that rather than play MWC politics, the legislature will simply build a project for each district. Various "universalism theorems" show that, in comparison to the uncertainty of MWC politics that build fewer projects than one for each district (but at least a majority), every legislator is better off under universalism (Niou and Ordeshook 1985, Shepsle and Weingast 1981, Weingast 1979).<sup>2</sup>

Although the proofs of these results are a bit technical, the intuition is straightforward. For simplicity, suppose that the benefits to each district,  $b$ , are identical, as are all the costs,  $c$ ;

---

<sup>1</sup>Buchanan and Tulloch (1962) and Riker (1962) initiated the application of MWC's to legislatures.

<sup>2</sup>One potential qualification of universalism that we ignore here is that universalism may apply within majority party only, so that projects are not built in districts represented by the minority party.



and that each district pays an equal tax share of  $1/n$  of the total costs. Under the MWC politics, legislators whose projects are built receive the benefits from their project,  $b$ , minus their share of the tax costs of  $c(n+1)/2$ . As  $n$  becomes large, the size of the minimum winning coalition approaches  $1/2$  of the legislature, so we will approximate the MWC tax share as one half; that is,  $c/2$ . Further, since no one knows which MWC will form, we consider each equally likely. This implies that a given legislator's chances of being in the MWC that forms is on the order of one half.

Thus, ex ante, each legislator's expected value of the uncertain MWC politics is  $1/2[b - c/2]$  (when district  $i$ 's project is built) +  $1/2(-c/2)$  (when district  $i$ 's project is not built). Rearranging terms, the expected value of MWC politics is  $1/2[b - c/2] + 1/2(-c/2) = (b-c)/2$ . In contrast, under universalism, each district is assured its project, so the expected benefits are  $b-c$ . Because  $b-c$  exceeds  $(b-c)/2$  (as long as  $b-c > 0$ ), all legislators prefer to institute and maintain a set of institutions providing for universalism.

The universalism result shows that national expenditure programs can pass that provide large numbers of small projects, located across the country.

A second result concerns parties. If the coalitional structure is known in advance – e.g., a majority party or a region – then restricting universalism to that coalition provides its members with greater individual benefits to the party's members. Whether this happens depends on the geographic distribution of the majority party. If it is geographically concentrated, so that the minority is also geographically concentrated, financing the projects solely of majority party members is likely to violate the exit constraint.

The main point is that, when the legislature seeks to build large numbers of small

projects, the tendency is toward universalism. We discussed two variants: with and without a majority party. Without a majority party, universalism is likely to hold. With a majority party depends on geographic concentration. Without concentration, then majority party is likely to build projects solely for its members; but with concentration, doing so violates the exit constraint.

**2. Something for everyone.** Another variant on this solution is something for everyone. In contrast to building projects, the legislature might choose to provide funds to lower jurisdictions (e.g., grants by the Congress to the states; grants by state legislatures to counties or towns).

Suppose that spending is allocated among districts by some formula or rule of thumb (such as equal grants per capita). Grant shares to individual districts are given by  $g_i$

$$P_i(x) = b_i(g_i x) - t_i C(x).$$

Further suppose that at an arbitrarily small amount of spending,  $\epsilon$ , produces net benefits for all districts:

$$P_i(\epsilon) = b_i(g_i \epsilon) - t_i C(\epsilon) > 0 \quad \forall i.$$

Now the only problem facing the legislature is how much to spend. If the exit constraint is binding, expenditures will increase until the first district receives no net benefits. If the exit constraint can be eased by logrolling, then expenditures can increase further.

A simple virtue of something for everyone policies is that the same formula can often be used to allocate taxation and expenditures. For example, the constitution constrains the federal government to allocate direct taxes according to population. Direct taxes could be raised to finance expenditures and funds could be divided between states according to population. It is

important to note, however, that the  $t_i$  and  $g_i$  need not be the same. They only need to be known.

**E. Predictions about Legislative Choices.** Governments could finance investments in transportation and finance in four ways. Building a canal or bank with limited geographic benefits was politically infeasible using normal taxation. Too many geographic interests obtained nothing except the prospect of higher taxes. Building financial and transportation infrastructure with something for everyone policies was politically feasible, but fiscally impossible if the projects were large. New York could not afford to build an Erie Canal to every county. Universalist or something for everyone policies required equal, or close to equal, allocation of funds to every district. Small projects were politically feasible, but in the end did not develop an interregional transportation system.

A large canal investment could be made with benefit taxation or taxless finance. Benefit taxation worked very differently from taxless finance, however. Benefit taxation required that taxes be raised simultaneously with the onset of construction and borrowing. Taxless finance allowed taxpayers to assume a contingent tax liability, one that would only be assumed in the event the project failed. Both benefit taxation and taxless finance held out the promise of significant benefits.<sup>20</sup> The constitutional restrictions placed on federal direct taxation made it difficult, if not impossible, for the federal government to use benefit taxation.

The following table summarizes the model's predictions. The national government is limited to taxless finance and universalist or something for everyone solutions. In contrast, states can use benefit taxation. Although universalist solutions are feasible for states, these are less attractive for major projects since this strategy necessarily involves building very small projects of limited value.

Predictions:		Federal	State
Normal taxation	No	No	
Universalism/ Something for Everyone		Yes	Maybe
Benefit Taxation	No	Yes	
Taxless Finance	Yes	Yes	

We turn next to the policies used by federal and state governments to finance investment between 1790 and 1860.

### **3. The history of Federal Internal Improvement Spending**

The rough outlines of federal transportation policy are given in Tables 1, 2, and 3 and in Figure 1. Table 1 breaks down federal transportation expenditures by Presidential administration, both in aggregate and per capita terms. Figure provides nominal federal transportation expenditures per capita, per year from 1790 to 1860 as well as transportation expenditures as a share of total federal expenditures. Table 2 includes descriptive information about major episodes and changes in transportation policy. Table 3 breaks down federal expenditures by type of financing. Tables 2 and 3 will be explained in due course.

The federal government spent money on transportation in every year in the early 19<sup>th</sup> century and every Congress considered transportation legislation. As Figure 1 shows, nominal expenditures rise slowly from 1790 through the 1810s, stall during the early 1820s, rise rapidly to a peak in 1837, drop sharply back to their 1810s levels, then rise again in the 1850s. The picture is one of very small expenditures with only one significant expansion during the

administration of Andrew Jackson. Nominal per capita income in 1840 was roughly \$100, so federal transportation expenditures in their highest year were only .1 percent of national income, and were typically on the order of .01 percent of national income. The federal government steadily spent a small amount of money on lighthouses, navigation improvements, and rural roads. Beyond that they did very little.

Another way to view this history is as episodic. Congress continuously considered proposals for a variety of transportation projects. As we document below, most of the money the federal government spent was appropriated through small rivers and harbors bills. On occasion, however, debates occurred and legislation was passed that gave (or would have given had the legislation not been vetoed) the federal government a larger, permanent transportation policy. These major episodes are listed in Table Y. We'll begin with opportunities missed, as they define the inability of the federal government to implement a larger program.

There were four negative episodes. The first episode occurred in Jefferson's second inaugural speech in 1805 when the President encouraged Congress to consider spending the budget surplus on transportation projects. This led Congress to commission the Gallatin plan, which in 1808 laid out a \$20,000,000 program of eight major national improvements, each in a different part of the country. The Gallatin plan was derailed by Congress's inability to pass any of the pieces of the plan as individual projects and, in part, by financial costs of the War of 1812. The second episode occurred when Congress decided in 1817 to allocate the \$1,500,000 bonus paid by the Bank of the United States to a fund for internal improvement to be divided between the states on the basis of population, and contribute future dividends from the Bank to the fund.

Madison vetoed the Bonus Bill in one of his last acts as President.<sup>3</sup> Madison supported a constitutional amendment to allow the federal government to support transportation, but would not approve grants for transportation without an amendment.

The third episode was Jackson's decision to articulate his "opposition" to internal improvements. Jackson vetoed the Maysville Road bill in 1830. The Maysville road lay entirely in Kentucky (it was the route that Henry Clay took home from Washington to Lexington) and was one of several small road bills passed by Congress. Jackson vetoed the Maysville bill on the grounds that the road did not serve a national purpose. Since Jackson spent more on transportation than any President up to the Civil War, much of it on projects similar to the Maysville road, his opposition to internal improvements will be examined in some detail shortly. Then, in 1833, as part of the compromise negotiated by Clay to end the Nullification crisis, Congress passed a distribution bill allocating federal land sales revenues amongst the states on the basis of Congressional representation. Jackson signed the Force bill and the Tariff bill but pocket vetoed the distribution bill.

The final negative episode occurred when Henry Clay managed to include another distribution provision in the Land Bill of 1841, automatically distributing public land sales revenues to the states by Congressional representation. The distribution scheme, however, was tied to the tariff. If tariff rates increased, distribution would be canceled. President Tyler signed the Land Bill and shortly thereafter raised the tariff and suspended distribution.

---

<sup>3</sup>Distribution bills typically divided money to be divided between the states on the basis of population or on the basis of representation in Congress. Since every state had at least 3 members of Congress, allocation of funds on the basis of Congressional representation had a small state bias.

The four major setbacks to a larger federal transportation program appear to be dominated by Presidential vetoes and opposition. But as historians of internal improvement have long acknowledged, the problems really lay with Congress.<sup>4</sup> Of the four setbacks, only the failure to enact the proposals of the Gallatin plan involved what we have termed normal taxation. The Gallatin plan would have funded \$20,000,000 in federal expenditures through a bond issue serviced out of normal tariff revenues at an expense of roughly \$1,000,000 per year. Consigned to a committee in 1808, Gallatin's plan was broken up and considered as individual projects. Only one (two) of the individual projects even made it out of the committee.<sup>5</sup> The other three setbacks, involved Presidential vetoes or adverse action on something for everyone plans. The Bonus Bill and the distribution bills of 1833 and 1841 were explicit formulaic allocations of bank dividends or land sales revenues by population based formulas. The Maysville road was, essentially, a rivers and harbors project without a river or harbor. That is, it was precisely the type of small, something for everyone legislation that could easily be logrolled. The fiscal magnitude of the Presidential vetoes will be estimated later. For now, it is enough to note that all of the Presidential opposition was to something for everyone policies.<sup>6</sup>

---

<sup>4</sup>See Goodrich, *Government Promotion*, 1960, pp. 43-48. "In the defeat of the federal program, however, the conflicts of state and sectional interests seem to have played a larger role part than either the belief in states' rights or any positive belief in the states' capacities. Throughout the debates these rivalries stood in the way of the adoption of specific measures or agreement on a general program." p. 45. In this section, Goodrich explicitly considers and rejects explanations of federal inaction based on constitutional concerns, the ability of the states to carry out projects on their own, or a preference for private rather than public enterprise.

<sup>5</sup>Goodrich, *Government Promotion*, 1960, pp. 26-37.

<sup>6</sup>It could be argued that Congress anticipated that Presidents would veto any legislation that attempted to spend money in any form other than universal, something for everyone programs. Therefore the predominance of universalism simply reflects the rational expectations of Congress. There are two objections to this line of argument. First, Congress rarely passes

What then of the positive accomplishments? The first accomplishment was to begin funding lighthouse construction in the first Congress in 1790. Funding small, geographically diverse projects continued on an annual basis, with the addition of roads in 18\_\_, rivers in 1824, harbors in 1824, and the first “rivers and harbors” bill in 1826.<sup>7</sup> Small omnibus lighthouse, roads, and rivers and harbor legislation accounts for \$41 million of the \$60 million in federal transportation expenditures. Funding for universal transportation projects was continuous and, with the exception of Jackson’s 1830s vetoes, never frustrated by the president. The second important federal initiative, and the second most important in fiscal terms, began in 1802 with the enabling act admitting Ohio to statehood. The enabling act set aside five percent of land sales revenues, after deducting expenses, for the “building of public roads” to and within the state of Ohio.<sup>8</sup> The Ohio legislature asked that three percent of the funds be expended inside

---

anything other than universalistic legislation. Second, when a President, like John Quincy Adams is willing to sign bills devoting normal tax revenues to geographically specific projects, Congress is unwilling to approve the projects.

<sup>7</sup>Goodrich, *Government Promotion*, 1960, p. 40.

<sup>8</sup>The arrangement was an explicit deal, in which Congress agreed to build roads to an in Ohio in return for Ohio’s promise not to tax federal lands for five years after they were sold to private individuals. Here is the relevant portion of the section 7 of the Act: “*Third*, that one-twentieth part of the net proceeds of the lands lying within the said State sold by Congress, from and after the thirtieth day of June next, after deducting all expenses incident to the same, shall be applied to the laying out and making public roads, leading from the navigable waters emptying into the Atlantic. To the Ohio, to the said State, and through the same, with the consent of the several States through which the road shall pass: *Provided always*, That the three foregoing provisions [relating to school lands, salt springs, and the five percent fund for road improvements] herein offered are on the conditions that the convention of the said State shall provide, by an ordinance irrevocable without the consent of the United States, that every and each tract of land sold by Congress from and after the thirtieth day of June next, shall be and remain exempt from any tax laid by order or under authority of the State, whether for State, county, township, or any other purpose whatever, for the term of five years from and after the day of sale.” Ohio Enabling Act, April 30, 1802, 7<sup>th</sup> Congress, 1<sup>st</sup> Session, as reported in Thorpe *Federal and State Constitutions*, p. 2289 and in Poore, *Federal and State Constitutions*, p. 1454.



Ohio and Congress agreed. The “two percent” fund for roads leading to Ohio began to accumulate, and in 1805 Congress authorized a survey of the route for the National, or Cumberland, Road. Construction began in 1808.<sup>9</sup> Construction continued into the 1850s, in the end accounting for \$7,000,000 in expenditures. The Ohio enabling act is remarkable for several reasons. First, similar provisions were included in the enabling acts of every state that entered the Union after Ohio, until Michigan entered in 1837. Second, the act clearly authorized the federal government to redistribute funds from one revenue source, sale of public lands, to another expenditure purpose, public roads (that were not post roads which were explicitly authorized in the Constitution). Third, the act authorized the construction of public roads within one state, with the consent of the state. In other words, the Ohio enabling act put policies into place that were repeated in other by Congress and signed into law by Presidents. Yet Madison and Jackson, who signed enabling acts with these provisions, simultaneously vetoed as unconstitutional bills containing exactly the same procedures and policies. What Madison and Jackson meant by “unconstitutional” in their veto messages was clearly not subject to consistency.

The third positive accomplishment developed in the administrations of Monroe and John Quincy Adams. Although a supporter of internal improvements, Monroe vetoed a bill authorizing the construction and maintenance of toll booths on the Cumberland Road in 1822.<sup>10</sup>

---

<sup>9</sup>Goodrich, *Government Promotion*, 1960, pp. 24-26; Jordan, *National Road*, 1948.

<sup>10</sup>“The power to establish turnpikes with gates and tolls, and to enforce the collection of tolls by penalties, implies a power to adopt and execute a complete system of internal improvement. A right to impose duties to be paid by all persons passing a certain road, and on horses and carriages, as is done by this bill, involves the right to take the land from the proprietor

On the same day that he issued his veto, he seemed to slam the door on federal internal improvements in a 25,000 word message to Congress in which he argued that federal improvements required a Constitutional amendment. But then, reversing his position, Monroe indicated in his seventh annual message to Congress (December 1823) that he would support projects of “a national object.”<sup>11</sup> In 1824, Congress passed and Monroe signed a General Survey bill authorizing the Army Corp of Engineers to begin surveying possible transportation routes to build an integrated national system. On his last day in office in 1825, Monroe authorized federal subscription in the stock of the Chesapeake and Delaware Canal. His successor, John Quincy Adams, laid out an ambitious agenda of federal expansion in his first message to Congress. Adams vigorously supported transportation projects, and by the end of his administration the federal government had subscribed \$1,921,000 to the stock of the Chesapeake and Delaware canal, the Louisville and Portland Canal, the Dismal Swamp Canal, and the Chesapeake and Ohio canal. The \$1,000,000 subscription to the C&O was the largest federal investment, and its

---

on a valuation and to pass laws for the protection of the road from injuries, and if it exists as to one road it exists as to any other, and to as many roads as Congress may think proper to establish... This power[s] can be granted only by an amendment to the Constitution and in the mode prescribed by it.” Richardson, *Papers and Addresses of the Presidents*, “Veto Message,” May 4, 1822, pp. 711-12.

<sup>11</sup>“Connecting the Atlantic with the Western country in a line passing through the seat of the National Government, it [a canal from the Chesapeake to the Ohio River] would contribute essentially to strengthen the bond of union itself. Believing as I do that Congress possess the right to appropriate money for such a national object (the jurisdiction remaining to the States through which the canal would pass), I submit it to your consideration whether it may not be advisable to authorize by an adequate appropriation the employment of a suitable number of the officers of the Corp of Engineers to examine the unexplored ground during the next season and to report their opinion thereon. It will likewise be proper to extend their examination to the several routes through which the waters of the Ohio may be connected by canals with those of Lake Erie. Richardson, *Papers and Addresses of the Presidents*, “Seventh Annual Message,” December 2, 1823, p. 785.

importance was emphasized by Adams taking off his suit jacket and turning the first spade of dirt for the canal on July 4, 1828.

Federal stock subscription was a form of normal taxation. Regular federal revenues, mainly from tariffs, were used to purchase stock (in the 1820s it was surplus revenues, no new taxes were levied or raised). Monroe and Adams were clearly willing to sign bills authorizing normal taxation, but despite presidential support, Congress could not come up with an integrated plan for a national transportation system. All four of the stock subscriptions were in projects originally identified in the Gallatin report in 1808. Congress instead pressed ahead with universal spending and a version of taxless finance. The first rivers and harbors bill passed in 1826. Also in 1826 Congress approved a series of land grants to individual states for the support of specific projects in Ohio, Indiana, Illinois, and Alabama. These land grants conferred to states the opportunity to sell public lands and use the revenues to support projects. Congress explicitly considered this a form of taxless finance. Even though the federal treasury gave up land revenues on the granted lands, Congress fully expected that transportation improvements would raise the value of adjacent lands. Grants were made in alternating strips on either side of the transit line, federal lands alternating with state lands (this was the origin of the land grant system used to finance the intercontinental railroads). The striking outcome of the Madison and Adams presidencies is the small amount of funding forthcoming from Congress, less than \$2 million of funds from normal tax revenues. Something for everyone and taxless finance were still the order of the day.

Jackson is credited with ending federal support for transportation. As Goodrich put it,

“the Era of National Projects may be thought of as ending in his administration.”<sup>12</sup> But as Table 1 makes clear, Jackson was not against federal support for transportation in general, more money was spent on transportation in Jackson’s administration than any other before the Civil War. Although Jackson’s expenditures were matched in nominal terms by administrations of Pierce and Buchanan, he spent a far larger percentage of federal expenditures on transportation than any other president. What Jackson killed in the Maysville road was the idea of an integrated federal system of internal improvements. This is what Monroe started towards in the General Survey Bill in 1824 and what Adams hoped to accomplish. To understand why Jackson spent so much money on transportation is to appreciate his political genius.

Jackson’s grounded his campaign on being anti-Washington, anti-corruption, and anti-privilege. On a more populist base, Jackson and Van Buren duplicated the platform that brought Jefferson and Madison to power in 1800.<sup>13</sup> The strategy involved accusing the existing government of corrupting the political process through grants of economic privilege and, in Jackson’s case, the corrupt bargain between Clay and Adams that brought Adams the presidency in 1824. Jackson based his opposition to a federal “system” of internal improvements on the possibilities for corruption that such a system created. In his farewell address, Jackson crowed that he had “finally overthrown... this plan of unconstitutional expenditure for the purpose of

---

<sup>12</sup>Goodrich, *Government Promotion*, 1960, p. 42.

<sup>13</sup>The importance of “corruption” in early 19<sup>th</sup> century politics, particularly the danger of corruption flowing from government grants of economic privilege is discussed in Wallis, “Systematic Corruption.” For the 1790s and the Republican revolution see Banning, *Jeffersonian Persuasion*; and McCoy, *Elusive Republic*. For the 1830s and the rise of the anti-Jackson Whig party see Holt, *Whig Party* and Kohl, *Individualism*.

corrupt influence.”<sup>14</sup> Jackson genius was creating political capital out of opposing a federal system of internal improvements that Congress was never going to pass anyway. Thirty years of Congressional wrangling over transportation showed that.

Instead, Jackson had the luck to be in office during the largest public land boom in the nation’s history, 40 million acres of land were sold in 1835 and 1836, generating \$50 million in revenue alone when expenditures in 1830 were only \$15 million. While he was opposed to a system of internal improvements, he had no problem with approving expenditures for pork-laden, log-rolled, light house, road, and rivers and harbors legislation that Congressmen loved and already been passing since the 1790s. Political historians have long appreciated Jackson’s creation of a political party mechanism that enforced party loyalty in the Congress.<sup>15</sup> The dramatic expansion in internal improvement funding surely helped Jackson and his party leaders accomplish their objectives. Van Buren had the unfortunate luck to come into office just as the economy headed into six years of economic upheaval and depression.

One last aspect of Jackson’s administration seals the point. Henry Clay rose to become Jackson’s greatest opponent. A central element of Clay’s American System was distribution of federal land sales revenues to the states for support of internal improvements. Clay was furious with Jackson for vetoing the distribution bill he crafted to bring the Nullification crisis to a close in 1833. Jackson had no desire to see Clay earn more credit than necessary. Had Jackson signed the distribution bill in 1833, the 67 million acres of federal land sold between 1834 and 1839

---

<sup>14</sup>Cited in Goodrich, *Government Promotion*, p. 42, but we can get the original cite from Richardson.

<sup>15</sup>The is one theme of Remini’s biography of Jackson, made explicitly in Remini’s book on the *Bank War*. It is a central theme of Silbey’s work on Congress. And many others....

would have generated roughly \$42 million to be distributed to the states.<sup>16</sup> In 1836, the federal government sat on a budget surplus of over \$36 million. Clay and Calhoun proposed that Congress pass a distribution bill allocating the surplus between the states on the basis of population. In the end, Calhoun modified the bill to make it a “loan” to the states, which secured the bill’s passage. Clay, however, did not get political credit for the surplus distribution, Jackson did. Historically, the credit has been expensive: economic historians are still debating whether the mechanisms by which the distribution was carried out were a cause of the economic crisis that arose in May of 1837.<sup>17</sup> Jackson was willing to support distribution of federal money to state governments, just as long as it was not part of a federal system of internal improvements.

#### **4. Explaining the Pattern of Federal Financing of Internal Improvement**

Our theoretical framework identifies four ways the federal government could have used to finance internal improvements: financing large projects, one at a time; financing many small projects; using benefit taxation; and using taxless finance. Table 3 compares the model’s predictions about each method of finance with the amounts actually spent by the federal government. The main prediction is that the federal government will not finance transportation projects with normal taxation or benefit taxation, but will use taxless finance and universalism or something for everyone. The prediction is borne out. In total, 97 percent of all federal transportation expenditures were financed in using these two methods.

---

<sup>16</sup>The \$40 million figure assumes that half of the land revenues would have gone to the cost of administering the Land Office. 67 million acres sold at \$1.25 an acre generated \$84 million in revenues.

<sup>17</sup>Temin, *Jacksonian Economy*, argues that the distribution did not destabilize the banking system. For a persuasive argument that it did, see Rousseau, “Jacksonian Monetary Policy.”

The government financed 68 percent using universalistic something for everyone schemes. Rivers and Harbors bills were the main legislative vehicle for funding these improvements. Exhibit 1 presents the first omnibus “Harbors and Rivers” bill, HR 192, from 1826. The bill funds 19 projects (depending on how projects are counted) in eight states. All of the projects were small, and as was usually the case, individual bills embodied logrolling within one piece of legislation.<sup>21</sup> The national government financed another 28 percent of expenditures with taxless finance. The use of public land funds (the 3 percent funds that went to states), the Cumberland Road appropriations (much of which came from the 2 percent funds), and the direct grants of land to states like Indiana and Illinois for support of their canals were all taxless finance schemes.

We now consider the different federal policies related to financing internal improvements and related programs.

**Something for Everyone.** Expenditures for lighthouses, roads, navigation, and general rivers and harbors accounts for the lions share of expenditures made by the federal government between 1790 and 1840: \$41,435,000 out of \$60,152,000.

**Normal taxation.** Financing transportation expenditures through normal taxation was possible. In the Monroe and Adams administration, Congress appropriated funds to purchase stock in the Chesapeake and Delaware and Chesapeake and Ohio canals, as well as other smaller canals. Table 3 credits the \$1,917,000 for canals entirely to normal taxation; about three percent of federal spending during the antebellum era. These appropriations were made under Adams. Normal taxation was possible, it just did not amount to much.

**Benefit Taxation.** Benefit taxation was prohibited by the Constitution and was not used.

**Taxless Finance:** Taxless finance includes land grants and other projects.

**Land grants.** This includes the land given to states (valued at \$1.25 an acre), the revenues from the land fund created in state enabling acts transferred to the states, and the expenditures on the Cumberland Road. The motivation behind land funds and outright grants to new states was explicitly fiscal. The original 5 percent fund in Ohio was designed to raise land values and speed land sales in Ohio by lowering the cost of transportation to and from Ohio. If the federal government lowered transportation costs to the west, it could sell public lands at a higher price. Land grant schemes were predicated on the expectation that the value of public land near the improvement would rise. Unfortunately, higher land values did not translate into higher land prices at federal land auctions, in Indiana or elsewhere after 1820.<sup>22</sup> Land grants were *ex ante* taxless finance schemes that turned out, *ex post*, to cost federal taxpayers lost land revenues. This was a lesson Congress was quick to forget, however. In the 1860s it made large land grants to the Union Pacific and Central Pacific railroads, only to find that land sales did not justify the grants.

**Other Taxless Finance:** In 1791 and again in 1816, the federal government chartered national banks. The First Bank was chartered with a capital of \$10 million of which the government subscribed \$2 million. The Second Bank was chartered with a capital of \$35 million of which the government subscribed \$7 million. In both cases, the government paid for its stock by issuing federal bonds to the banks (private subscribers could pay in specie or federal bonds). The banks paid dividends semi-annually, and the dividends paid to the federal government for its stock always exceeded the interest payments on the bonds the federal government used to purchase stock. This illustrates the principle of taxless finance: no taxpayer paid higher taxes



because of the federal government investment in either Bank of the United States.

In 1862, the Union Pacific Railroad combined two forms of taxless finance, land grants and bond issues. The company's charter promised to give the railroad ten square miles of public land for every mile of railroad the company completed.<sup>23</sup> In addition, the federal government would give the company \$16,000 in federal bonds for every mile of track completed. The bonds were an "ipso factor ... first mortgage on the whole line of the railroad and telegraph." The company was responsible for servicing the bonds and repaying the principle.<sup>24</sup> Tax payers were not supposed to pay to service the bonds, and the value of federal lands were supposed to increase enough to outweigh the substantial acreage given to the railroad. The twists and turns of the Union Pacific are too complicated for us to follow. Suffice it to say in the end the federal government regretted that it had used taxless finance in this particular scheme.

**The Presidential Vetoes:** As we discussed, several important transportation bills were vetoed by Presidents. The last column of Table 3 attempts a simple counterfactual allocation of the spending that would have occurred had legislation not been vetoed. Significantly, all of the vetoed legislation would have resulted in something for everyone universalistic grants to states. The main conclusion that we draw from Table 3, that the federal government could not use normal taxation or benefit taxation to finance transportation expenditures remains unchanged by the inclusion of the counterfactual.

The table assumes that the entire \$1,500,000 bonus paid by the Second Bank of the United States as well as dividends of \$700,000 a year (a 10 percent return on the government's \$7,000,000 investment) for twenty years totaling \$14,000,000 would have been distributed to the states. Had interest on the federal bonds used to purchase the stock been netted out, this figure

would have been reduced to roughly \$7,000,000.

The impact of the distribution bills of 1833 and 1841 are estimated by taking half of actual gross land sales revenues between 1834 and 1841 (for the 1833 bill) and half of actual gross land sales revenues from 1842 and 1860 (for the 1841 bill). Both bills would have netted out the costs of the land office before grants were made to the states (as in the Ohio enabling act). By coincidence, nominal land sales revenues between 1833 and 1841 are the same as nominal revenues between 1841 and 1860 (a testament to the unusual sales in 1835 and 1836). One needs to be careful with this counterfactual, however. If the distribution bill of 1833 had not been vetoed, then the land sales revenues that accumulated in the federal treasury and were distributed in 1837 would never have accumulated. Since \$27,000,000 was actually distributed to the states, the \$42,000,000 figure for the 1833 act requires adjusting to \$15,000,000 if we take into account the surplus distribution that did occur.

The impact of the vetoed legislation is large in absolute terms: federal expenditures on transportation would have been two and-a-half to three times higher (by \$97,500,000 or \$70,500,00 depending on how the surplus revenue is treated.) Of course, none of this money would have been spent by the federal government, it all would have been spent by the states. There still would not have been a federal system of internal improvements. Our prediction that the federal government will use something for everyone universalistic expenditure programs still stands as verified. We need to address the question of why the federal government did not pursue more taxless finance, a question we will return to after examining what the states did do.

## **5. State Investment in Internal Improvements**

As noted, state investment in transportation outstripped federal investment by an order of magnitude. Goodrich estimates that state and local expenditures for transportation were a combined \$450 million before the Civil War, while federal government expenditures were \$60 million (Table 1).<sup>25</sup> An easy way to characterize state financial activity is to classify state debt outstanding in 1841 by type of financial method. The \$200 million outstanding in 1841 came just at the end of the dramatic expansion of state investment in canals, railroads, and banks in the 1830s. Since states faced the same political constraints as the federal government -- a democratic legislature attempting to build geographically concentrated projects to satisfy geographically diverse constituencies -- we expect to see the same pattern of outcomes with two differences. One, states are not prevented from using benefit taxation. Two, states are so small, with many numerous subdivisions (counties), that something for everyone is unlikely to be used to finance large projects, and small projects would be very small indeed.

Table 4 duplicates the structure of Table 3 for the \$200 million in state government debt outstanding in 1841. We are able to classify state expenditures for \$183 million of the \$200 million.<sup>26</sup> Almost all of the state borrowing was for large projects; no states borrowed to finance universalistic or something for everyone schemes. States did, however, use formulas extensively to finance education expenditures and to distribute road funds, but because these expenditures were not financed by debt issue they are not included in the table.

Moreover, per our model's predictions, no large state projects were financed by normal taxation.

States financed \$53 million in canals by benefit taxation. New York included a provision allowing for a special "canal tax" in counties bordering the canal should canal tolls and other

fiscal resources of the canal fund prove insufficient to service canal bonds. Ohio, Indiana, and Illinois moved explicitly to *ad valorem* property when they adopted their canal systems.<sup>27</sup>

States financed another \$53 million in bank investments using taxless finance. Southern states used several variants of the method used to finance the Second Bank of the United States. The states purchased stock in banks by issuing bonds that the banks were responsible for servicing. States had been successfully investing in banks in the United States since the 1780s.<sup>28</sup>

The final \$80 million were financed by taxless finance as well, only this borrowing was primarily for transportation. After the success of the Erie Canal, states like Pennsylvania and Maryland began borrowing to build canals, but did not raise tax rates. Instead, they paid current interest on their bonds out of bond premiums or out of current borrowing. Pennsylvania was the worst state in this regard, and by 1841 it had the largest debt of any state, \$33 million. New York began borrowing in the late 1830s to expand the Erie network, and did not raise taxes when it did so.

The state adventures were remarkable. In 1836 and 1837, Indiana, Illinois, and Michigan, with a combined population of slightly more than 1,000,000 people, authorized the issue of over \$25 million in state bonds. An amount greater than the entire federal expenditures for transportation in the Jackson and Van Buren administrations combined. All of the state internal improvement spending in the 1830s was financed by benefit taxation or taxless finance, just as the model predicts.

Of course, some of their investments came back to haunt the states during the depression that began in 1839. By 1842, eight states and the Territory of Florida were in default on their bonds. Mississippi and Florida repudiated all of their debts outright in 1842, Arkansas and

Michigan repudiated part of their debts, and Louisiana quietly failed to pay back some of its debts. New York, Ohio, and Alabama narrowly avoided default.<sup>29</sup>

In the 1840s, states reassessed how they got themselves into this mess. They concluded that taxless finance had been the problem. Many believed that unscrupulous promoters of canals, railroads, and banks had convinced naive and optimistic voters and legislators that internal improvement projects would not just pay for themselves, but return a fiscal dividend to the state. Bonds were issued, construction started, and when tolls and dividends failed to materialize, taxpayers were stuck with tax bill. Their contingent liabilities came home to roost. States concluded that the crisis that developed after 1839 was due to their reliance on taxless finance in combination with extremely bad economic conditions.

Beginning in 1842, twelve states wrote new constitutions. Eleven of them directly addressed the problem of taxless finance. First, new procedural restrictions on the issue of government debt required that any state, or local, government proposing to issue bonds had to impose taxes sufficient to service the bonds before the bonds were issued. Further, the higher tax rates had to be approved by the voters. Thus the bond referendum was born. By requiring voters to approve taxes before bonds could be issued, it was no longer possible to implement taxless finance. The political advantage of making tax liabilities contingent future liabilities was closed off.

Second, the new constitutions required states to adopt general incorporation laws. These laws allowed anyone who wanted to obtain a charter to do so. Free banking laws were general incorporation laws for banks. By opening chartering to everyone, the states significantly reduced the economic rents conveyed to the group holding a restrictive charter (the issue that

caused so much trouble for the First and Second Banks of the United States). Some states prohibited special charters. This eliminated another taxless finance option of promoting internal improvements through the creation of a special corporation that agree to finance internal improvements privately in exchange for special privileges.<sup>30</sup>

States financed internal improvements exclusively with benefit taxation and taxless finance. Both methods got states in trouble after 1839, when the depression began. States responded in the 1840s by systematically changing their constitutions to eliminate taxless finance as fiscal option.

## **6. Conclusions**

The central puzzle of this paper concerns why the states and not the federal government were the primary locus of the promotion of economic development during the antebellum era. As noted, states spent an order of magnitude more than the national government in providing various forms of economic infrastructure, notably, roads, canals, railroads, lighthouses, harbors, and banks. We demonstrate that these programs were popular with the voters and that the federal government regularly sought to promote them. Yet, while many states financed huge economic projects, the federal government's aggregate spending was not only much smaller, but typically focused on small projects, such as building lighthouses and dredging harbors, rather than on large and arguably more valuable projects.

To address this puzzle, we provide a model of political choice based on the theory of

legislative choice. The model yields several conclusions concerning the financing of large projects – where large projects are defined as those whose financial commitments are so large that only a one or two can be built at once. First, legislatures have difficulty voting to fund large projects because the benefits are typically concentrated, while the expenses are spread over all through general taxation. This means that a majority of districts receive no direct benefits from the project and yet pay their share of the costs. Because their net benefits are negative, these districts oppose building the project.

Second, benefit or Lindahl taxation affords a potential way out of this problem. Benefit taxation sets a district's taxes in proportion to the benefits it receives, so that districts with the most benefits pay the most taxes while districts receiving no benefits pay no taxes. Projects with perceived positive expected values can be financed in this way because there is no natural opposition.

Third, majority rule legislatures easily finance large packages of small projects; that is, when they simultaneously build different projects in most or nearly all districts. This includes the standard pork of rivers and harbors projects, lighthouses, post offices and postal roads. In contrast to a single large project, large packages of small projects gain majority support by including projects for most or nearly all districts,

The final piece of the puzzle is institutional: The United States Constitution created an asymmetry between the national and the state governments with respect to taxation. Although states were free to use benefit taxation, the Constitution prohibited the national government from using it: the Constitution requires that all direct taxes be in proportion to the federal ratio.

These results help explain the pattern of governmental expenditure in antebellum

America. First, the huge demand for market-enhancing public goods promoting economic development through infrastructure was quite popular with national and state voters. Yet the Constitutional asymmetry on benefit taxation implied that states were able to use this financial mechanism to create majorities in favor of large projects, whereas the federal government was not. Although proposals for promoting systematic, interregional infrastructure development regularly came to the Congress, few passed. The national government did, however, spend a considerable amount funding large collections of small projects, such as lighthouses, postal roads, and dredging harbors.

An additional benefit of our approach concerns the issue of federalism. A major concern in the literature on federalism concerns the question of what provides for federalism's stability. As Riker (1964) observed, most federal states fail, either by disintegrating or by becoming centralized ones. In order for federalism to be stable, it must be self-enforcing in the sense that government both national and subnational government officials have the incentive to abide by the restraints of federalism (de Figueiredo and Weingast 2003).

Our paper provides insights into this question for the antebellum United States. A major issue here is why the national government was relatively small in comparison to the states. Our approach shows that the Constitution provided a structure that allowed states to finance infrastructure projects but not the national government. This effect helped keep the national government smaller and the states larger. Were the national government able to use benefit taxation, it would have undoubtedly been far larger and the state governments far smaller.



## References

- Adams, Willi Paul. 2001. *The First American Constitutions*. Expanded Edition, Lanham, MD: Rowman and Littlefield.
- Atack, Jeremy and Peter Passell, *A New Economic View of American History*.
- Berry, Thomas Senior. *Western Prices Before 1861*. Cambridge: Harvard University Press, 1943.
- Bodenhorn, Howard, 2000. *A History of Banking in Antebellum America*, Cambridge: Cambridge University Press.
- Bodenhorn, Howard, 2003. *State Banking in Early America: A New Economic History*, Oxford: Oxford University Press.
- Callender, Guy Stevens. "The Early Transportation and Banking Enterprises of the States." *Quarterly Journal of Economics* , vol. XVII, no. 1, 1902.
- Collie, Melissa. 1988. "The Legislature and Distributive Policymaking in Formal Perspective." *Legislative Studies Quarterly*. 12: 427-58.
- Ellis, Richard E. 1987. *The Union at Risk: Jacksonian Democracy, States' Rights, and the Nullification Crisis*. Oxford: Oxford University Press.
- English, William B. "Understanding the Costs of Sovereign Default: American State Debts in the 1840's." *American Economic Review* 86 (March 1996): 259-75.
- Evans, George Heberton, 1948, *Business Incorporations in the United States, 1800-1943*. NBER, Baltimore: Waverly Press.
- Feller, Daniel. *The Public Lands in Jacksonian Politics*, University of Wisconsin Press, 1984.
- Fenstermaker, J. Van. *The Development of American Commercial Banking 1782-1837*. : Kent, Ohio: Kent State University, Bureau of Economic and Business Research, 1965.
- Ferguson, E. James. 1961. *The Power of the Purse: A History of American Public Finance, 1776-1790*. Chapel Hill: University of North Carolina Press.
- de Figueiredo, Rui, and Barry R. Weingast. 2003. "Self-Enforcing Federalism," Working Paper, Hoover Institution, Stanford University.
- Gates, Paul Wallace. *History of Public Land Law Development*. Washington, D.C.: GPO, 1968.

- Gallman, Robert. 1992. "Capital Stock" in Gallman and Wallis, ed. *American Economic Growth and Standards of Living before the Civil War*. Chicago: University of Chicago Press.
- Goodrich, Carter. *Government Promotion of American Canals and Railroads*. New York: Columbia University Press, 1960.
- Green, Fletcher M. 1966. *Constitutional Development in the South Atlantic States, 1776-1860*. New York: Norton.
- Hammond, Bray. *Banks and Politics in America: From the Revolution to the Civil War*. Princeton: Princeton University Press, 1957.
- Handlin, Oscar and Mart Flug Handlin. *Commonwealth: A Study of the Role of Government in the American Economy: Massachusetts, 1774-1861*. Cambridge: Belknap Press, 1969.
- Hanna, Hugh Sisson. *A Financial History of Maryland (1789-1848)*. Johns Hopkins University Studies in Historical and Political Science, Series XXV, no 8-9-10. Baltimore: Johns Hopkins University Press, 1907.
- Harrison, Joseph Hobson. 1954. *The Internal Improvement Issue in the Politics of the Union, 1783-1825*. Unpublished PhD Dissertation, University of Virginia.
- Heckelman, Jac and John Joseph Wallis, 1997, "Railroads and Property Taxes" *Explorations in Economic History*, 34, pp. 77-99, January 1997.
- Hinich, Melvin J., and Micahel C. Munger. 1997. *Analytical Politics*. New York: Cambridge University Press.
- Inman, Robert P. 1988. "Federal Assistance and Local Services in the United States: The Evolution of a New Federalist Fiscal Order," in Harvey S. Rosen, ed., *Fiscal Federalism: Quantitative Studies*. Chicago: University of Chicago Press.
- Inman, Robert P., and Michael Fitts. 1990. "Political Institutions and Fiscal Policy: Evidence from the U.S. Historical Record." *J. of Law, Economics, and Organizations* 6: 79-132.
- Irwin, Douglas A., 2003, "The Aftermath of Hamilton's "Report on Manufacturers." NBER working paper, w9943, September 2003.
- Keyssar, Alexander. 2000. *The Right to Vote: The Contested History of Democracy in the United States*. New York: Basic Books.
- Kruman, Marc W. 1997. *Between Authority and Liberty: State Constitution Making in Revolutionary America*. Chapel Hill: University of North Carolina Press.

- Larson, John Lauritz. 2001. *Internal Improvement: National Public Works and the Promise of Popular Government in the Early United States*. Chapel Hill: University of North Carolina Press.
- Legler, John B., Richard E. Sylla, and John Joseph Wallis, 1988. "U.S. City Finances and the Growth of Government, 1850-1902," *Journal of Economic History*, 48, pp. 347-356, June 1988.
- Lutz, Donald S. 1988. *The Origins of American Constitutionalism*. Baton Rouge: Louisiana State University Press.
- Lutz, Donald. S. 1980. *Popular Consent and Popular Control: Whig Political Theory and the Early State Constitutions*. Baton Rouge: Louisiana State University Press.
- Malone, Laurence J. 1998. *Opening the West: Federal Internal Improvements Before 1860*. Westport, CT: Greenwood Press.
- McKee, Samuel Jr., ed. 1934. *Alexander Hamilton's Papers on Public Credit Commerce and Finance*. New York: Columbia University Press.
- Nettels, Curtis, 1924. "The Mississippi Valley and the Constitution, 1815-1829." *The Mississippi Valley Historical Review*, 11, 3, December, pp. 332-357.
- Niou, Emerson, and Peter Ordeshook. 1985. "Universalism in Congress." *American J. of Political Science* 298: 246-90.
- Poore, Benjamin Perley, ed. 1878. *The Federal and State Constitutions, Colonial Charters, and other Organic Laws of the United States, Second Edition*. Washington: Government Printing Office. Reprinted, 2003, Clark, New Jersey: The Lawbook Exchange.
- Richardson, James D. *Messages and Papers of the Presidents*, Washington: Bureau of National Literature, 1897.
- Riker, William H. 1964. *Federalism: Origins, Operations, and Significance*. Boston: Little, Brown, 1964.
- Schlesinger, Arthur Meier. 1922. "The State Rights Fetish," in his, *New Viewpoints in American History*. New York: Macmillan.
- Scheiber, Harry N. *Ohio Canal Era: A Case Study of Government and the Economy, 1820-1861*. Athens, Ohio: The Ohio State University Press, 1969.
- Schwartz, Anna 1987. "The Beginning of Competitive Banking in Philadelphia." In *Money in Historical Perspective*, NBER, Chicago: University of Chicago Press.

*Equilibrium Impotence*

- Shepsle, Kenneth A., and Mark S. Bonchek. 1997. *Analyzing Politics*. New York: W.W. Norton.
- Shepsle, Kenneth A., and Barry R. Weingast. 1984. "Political Solutions to Market Problems," *American Political Science Review* (June) 78: 417-34.
- Slaughter, Thomas P. *The Whiskey Rebellion: Frontier Epilogue to the American Revolution*. New York: Oxford University Press, 1986.
- Stein, Robert M., and Kenneth N. Bickers. 1995. *Perpetuating the Pork Barrel: Policy Subsystems and American Democracy*. New York: Cambridge University Press.
- Stewart, Charles. 2002. *Analyzing Congress*. New York: W.W. Norton.
- Sylla, Richard, John B. Legler, and John Joseph Wallis. "Banks and State Public Finance in the New Republic." *Journal of Economic History*, 47 1987.
- Tarr, Alan *Understanding State Constitutions*, Princeton: Princeton University Press.
- Wallis, John Joseph, Arthur Grinath, and Richard Sylla, "Debt, Default, and Revenue Structure." NBER Working Paper, and mimeo. 2001.
- Wallis, John Joseph, Richard Sylla and John Legler. 1994, "The Interaction of Taxation and Regulation in Nineteenth Century Banking." In Goldin and Libecap, eds. *The Regulated Economy: A Historical Approach to Political Economy*, Chicago: University of Chicago Press, pp. 121-144.
- Wallis, John Joseph, "The Property Tax as a Coordination Device: Financing Indiana's Mammoth System of Internal Improvements." *Explorations in Economic History*. July 2003.
- Wallis, John Joseph, 2000, "American Government Finance in the Long Run: 1790 to 1990," *Journal of Economic Perspectives*, January, 2000.
- Wallis, John Joseph, 2001, "History of the Property Tax," in *Property Tax*, Wallace E. Oates, ed., Lincoln Institute.
- Weingast, Barry R. 1979. "A Rational Choice Perspective on Congressional Norms," *American Journal of Political Science* 24: 245-262.
- Weingast, Barry R., Kenneth A. Shepsle, and Christopher Johnsen. 1981. "The Political Economy of Benefits and Costs: A Neoclassical Approach to Distributive Politics,"

*Wallis and Weingast*

*Journal of Political Economy* (August) 89: 642-664.

Wood, Gordon S. 1969. *Creation of the American Republic*. Chapel Hill: University of North Carolina Press.

*Equilibrium Impotence*

Table 1  
Federal Spending on Internal Improvements  
by President

Administration	Dates	Aggregate	Per Capita	Share of all Federal Expenditure
Washington	1788-1796	\$229,968	\$0.009	0.74%
J Adams	1797-1800	\$303,896	\$0.015	0.94%
Jefferson	1801-1808	\$994,678	\$0.020	1.36%
Madison	1809-1816	\$2,066,910	\$0.033	1.52%
Monroe	1817-1824	\$2,997,914	\$0.042	1.57%
J Q Adams	1825-1828	\$3,861,265	\$0.083	5.89%
Jackson	1829-1836	\$14,452,376	\$0.129	9.51%
Van Buren	1837-1840	\$7,528,064	\$0.118	5.62%
Harrison/Tyler	1841-1844	\$3,068,753	\$0.042	3.47%
Polk	1845-1848	\$3,197,824	\$0.038	2.29%
Taylor/Fillmore	1849-1852	\$4,071,541	\$0.043	2.31%
Pierce	1853-1856	\$9,642,863	\$0.091	4.33%
Buchanan	1857-1860	\$9,515,536	\$0.080	3.51%
Total		\$61,931,588.728		

Table 2  
Major Episodes in Federal Transportation Policy

Year	Program	Result
1802	Ohio Enabling Act allocates 5 percent of land sales in Ohio to building transportation to and within Ohio. The federal portion, 2 percent, forms the basis of the fund for constructing the Cumberland Road	Required 2% of land sales in Ohio to be dedicated to building a road to Ohio. Eventually resulted in \$8,000,000 in expenditures on the Cumberland Road
1805	Jefferson's Second Inaugural Speech Led to Gallatin Plan in 1808	Relatively little federal action. Most of Gallatin's proposed projects were built by the states
1817	Bonus Bill: Distribute the \$1,500,000 charter bonus and subsequent dividends from the Bank of the United States to the States on the basis of Congressional representation	Vetoed by President Madison
1821 - 1825	Monroe vetoes bill to repair Cumberland Road toll booths, but then promotes and signs General Survey Bill.	The survey bill results in surveys, and Monroe approves stock purchase in C&D canal.
1825 - 1828	JQ Adams supports a larger federal system in his inaugural speech.	Congress debates plans, and implements several large land grant projects and four stock purchases.
1830	Congress funds the Maysville road along with several other small road projects.	Jackson vetoes the Maysville Road bill.
1832	Congress passes a distribution bill, allocating a portion of federal land sales revenues to the states as part of Clay's compromise package to end the Nullification crisis.	Jackson signs the force bill and the tariff bill, but pocket vetoes the distribution bill.
1836	Congress votes to distribute federal surplus revenues to the states on the basis of Congressional representation, but not to tie the distribution to transportation.	Jackson signs the bill and \$24,000,000 is distributed to states in 1837. The fourth installment is never made.
1841	Congress includes a provision to distribute a portion of federal land sales to the states in the Land Bill of 1841, but includes a proviso that ties distribution to the level of the tariff.	Tyler raises tariffs and suspends distribution.

*Equilibrium Impotence*

Table 3  
Model Predictions and Federal Spending Patterns

Method	Prediction	Amount	Cases	Veto Counterfactual
Normal Taxation	No	\$1,917,000	Chesapeake and Delaware Chesapeake and Ohio	
Something for Everyone	Yes Small Projects	\$41,435,000	Unspecified Navigation Rivers Harbors Aids to Navigation Internal Navigation Miscellaneous Roads  Distribution Bonus Bill Dividends 1833 Distribution Bill 1841 Distribution Bill	      \$1,500,00 \$14,000,000 \$42,000,000 \$42,000,000
Benefit Taxation	No	0		
Taxless Finance	Yes Big Projects	\$4,750,000 \$6,800,000 \$5,250,000	Public Land Funds Cumberland Road Land Grant Equivalents (4,000,000 acres)	
Total		\$60,152,000		
Other Taxless Finance		\$2,000,000 \$7,000,000 \$30,000,000	First Bank of the United States Second Bank of the United States Union Pacific Railroad	

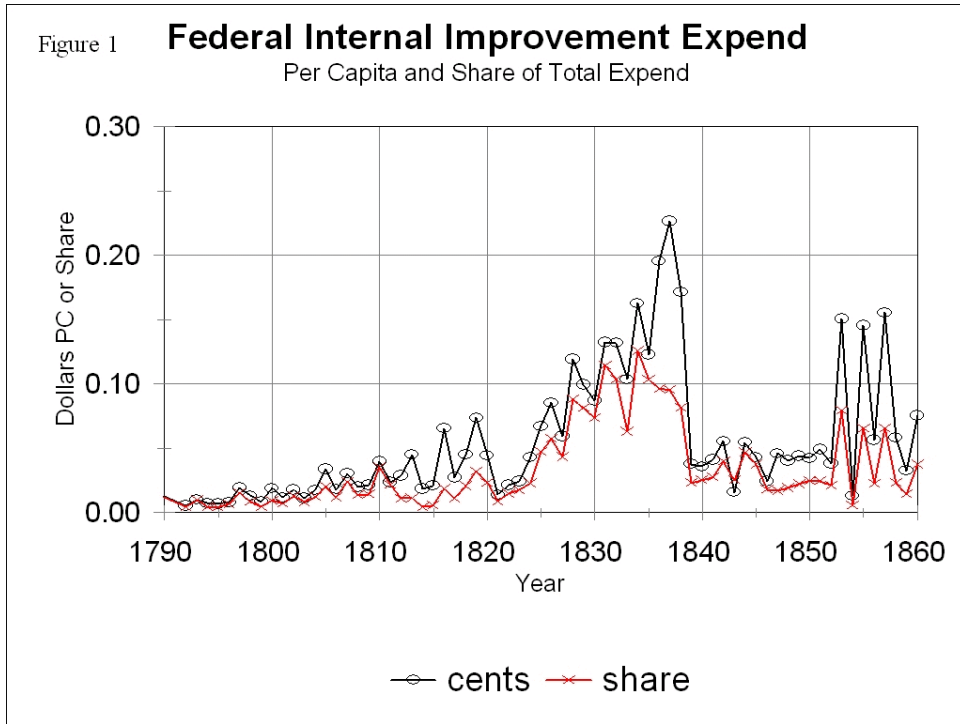


*Wallis and Weingast*

Table 5  
Model Predictions and State Spending Patterns

Method	Prediction	Amount	Cases
Normal Taxation	No	0	
Something for Everyone	Yes, but Unlikely Projects are too small	0	Some education and roads
Benefit Taxation	Yes	\$53,000,000	Canals and RR, in NY, OH, IN, IL
Taxless Finance	Yes	\$53,000,000 \$80,000,000	Banks in South Transportation in North
Total		\$186,000,000	

*Equilibrium Impotence*



Endnotes

1. Federal government finances were tight during the 1790s and during the War of 1812. In 1815 the national debt was \$137 million; by 1835 it was paid off completely. In the 1820s, annual federal revenues averaged \$22 million and expenditures only \$16, and in the 1830s annual revenues averaged \$30 million and expenditures only \$24 million. *Historical Statistics of the United States*.
2. Jackson's Veto Message of the Maysville Road Bill, May 27, 1830, p. 1053; Richardson *Messages and Papers of the Presidents*, 1897.
3. This discuss draws on modern theories of congressional decisionmaking, particularly in a historical context. See, e.g., Aldrich, Cox and McCubbins, Krehbiel, Polsby, Rohde, Schickler, Stewart, Shepsle, Sinclair, Weingast and Marshall.
4. In what follows, we adapt the models in Inman (1988), Shepsle and Weingast (1984) and Weingast, Shepsle, and Johnsen (1981).
5. For simplicity, we treat all costs as tax costs, but clearly the costs and benefits to constituents and legislators can come in many forms.
6. Each legislator  $i$  has an ideal policy of  $x_i^*$  which solves the problem  $\max P_i(x)$  and which occurs when the marginal benefits to district  $i$  equals the districts costs, i.e.,  $b_i'(x) = t_i C'(x)$ .
7. All voting models require an assumption about what happens when a legislator is indifferent between two alternatives.
8. Given a single dimensional policy choice, such as the choice over the scale of a single project, the majority rule equilibrium is the ideal policy of the median district. Standard results show that, except in very special circumstances, no majority rule equilibrium exists when the legislature chooses the scale of many projects simultaneously. These concepts are defined in Hinich and Munger (1907), Shepsle and Bonchek (1997), and Stewart (2002).
9. To see that  $b_i > t_i C$  under benefit taxation, substitute on the right hand side:  $t_i C = (b_i/B)C = (C/B)b_i$ . Since  $C/B < 1$ , the first inequality holds.
10. The federal government levied a property tax in 1799, 1814, and 1862, but the tax had to be allocated between states on the basis of population, it could not be allocated on the basis of benefits as measured in increased wealth or property values.
11. Canals required eminent domain and banks required limited liability and, often, the privilege of note issue.
12. It was common in early charters for the state to "reserve" shares of stock for the state at no cost to the state.

### *Equilibrium Impotence*

13. This, obviously, abstracts from any consideration of general opposition to corporations, or the possibility that the group that does obtain the charter may deprive some other group of the charter.

14. The inability of purely private corporations to engage in large scale transportation projects is a central element in Callender's [1902] argument about the need for state intervention in capital markets.

15. The second taxless finance variant was commonly used to finance state investments in banks.

16. By 1830, states were able to draw on 40 years of experience with investment in banks, with the expectation that "M" was positive and large, and that the probability of a successful investment, "s," was close to one. Canal investments in New York and Ohio had also proven profitable. Governor Ford of Illinois, spoke directly to the *ex ante* expectations of the Illinois politicians when he explained how the state got itself into difficulties in his message to the legislature of December 8, 1842 "No scheme was so extravagant as not to appear plausible to some. The most wild expectations were made of the advantages of a system of internal improvements, of the resources of the State to meet all expenditures, and of our final ability to pay all indebtedness without taxation. Mere possibilities appeared to be highly probable, and probabilities wore the livery of certainty itself." Quoted in House Document, p. 1051.

17. This subsection draws on the large literature on universalism, including Collie (1988), Inman and Fitts (1990), Niou and Ordeshook (1985), Shepsle and Weingast (1981), Stein and Bickers (1995), and Weingast (1979).

18. Both of these restrictions are easily generalized, for example, to projects that benefit a small number of (perhaps contiguous) districts simultaneously.

19. All of these assumptions can easily be generalized, so that the benefits,  $b_i$ , costs,  $c_i$ , and tax share,  $t_i$ , differ across districts.

20. Benefit taxation and taxless finance were not mutually exclusive policies, a state could use a little of each. Both benefit taxation and taxless finance legislation were easier to pass when there were large expected returns from the project.

21. The largest single federal project, aside from the Cumberland Road, was the Delaware breakwater, which received \$2.1 million in total. The breakwater funding was appropriated piecemeal, however, through rivers and harbors legislation.

22. Gates, 19\_\_.

23. The land was given in alternating one-square mile sections, in a strip ten miles to either side of the road. Land was transferred to the company after it completed each 40 mile long section of track. Section 3, *An Act to Aid the Construction of a Railroad*, 37<sup>th</sup> Congress, 2nd Session, Chapter 120.

*Wallis and Weingast*

24. Section 5, *An Act to Aid the Construction of a Railroad*, 37<sup>th</sup> Congress, 2<sup>nd</sup> Session, Chapter 120.

25. Malone reports \$54 million in federal transportation expenditures, but when we add up the figures from the 1892 Congressional report, we get \$60 million. We have not yet resolved the difference.

The \$450 million figure for state and local expenditure is an estimate made by Goodrich. There is no breakdown on the \$450 million that we can analyze by financing type.

26. This entire section of the paper is based on Wallis, "Constitutions, Corporations, and Corruption: State Constitutional Change 1842 - 1852." Mimeo, 2004.

27. See Wallis, 2003, for detailed consideration of the role that *ad valorem* property taxation played in Indiana, and an overview of actions in the other states.

28. For state involvement in banking see Wallis, Sylla, and Legler, 1994. In the 1810s, Massachusetts began taxing bank capital, well as investing in banks. When the state realized the capital tax was more remunerative than dividends, it sold its bank stock. By the 1830s, more than half of all Massachusetts state revenue came from the tax on bank stock. Pennsylvania receives roughly a quarter of its state revenues from bank dividends and bonus fees for bank charters.

29. The default crisis is covered in English, 1996, and Wallis, Grinath, and Sylla, 2001.

30. Again, the constitutional issues are discussed in Wallis, "Constitutions,..."