National Commerce, Local Interest, and the Judiciary Act of 1875*

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Abstract

In the early years of the United States, the national judiciary was exceedingly weak, hearing only a small range of cases. During the 19th century, though, the power of the federal judiciary expanded greatly, especially after the Civil War. This paper develops a model which incorporates the Federalist founders' concerns about local biases in judicial proceedings and shows that this fear incentivized Whigs and later Republicans to increasingly support a strong centralized judiciary over the course of the century in line with the development of a national economy, beginning out of the Northeast. In contrast, the more agrarian Southern and Western states resisted these changes which prevented them from repudiating debt in the lead-up to and aftermath of the Civil War. Throughout this period, Northeastern states experienced relatively better access to interstate and international credit than their southern neighbors, as predicted by the model.

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1 Introduction

A wide array of judicial structures incorporate aspects of federalism to varying degrees, guided by little more than convenience and legal or constitutional claims. Often judges, in determining the extent to which a case should be heard in local or federal courts—or both—cite laws or constitutional provisions; however, there is neither strong theory nor evidence to suggest that there is any benefit to maintaining such structures as opposed to a single unified judicial system. Why should judges on a national court be restricted in their ability to hear any case that arises within the nation, and conversely, why should the same court be able to remove cases from local courts? What is the justification for maintaining dual judicial systems and who is empowered to impose this structure? These are theoretical questions that have been left largely untouched, with only passing mention in the legal literature (Dodson, 2011; Glenn, 1994; Issacharoff and Sharkey, 2006) and almost nonexistent analysis in the political and economic literature (Cameron, 2005; Kastellec, 2017). My project initiates just such an analysis by examining the development of the federal judicial system of the United States during the 19th century in light of earlier research focusing on judicial behavior and separation of powers (Clark, 2009; Segal, 1997) to make an economic argument in favor of federalism and justify the observed outcomes under such structures in light of the self-interested preferences and biases of individual actors, especially those of legislators and local judges. In particular, I offer answers to the following questions: *Why did the United States expand access to the Federal Courts through diversity jurisdiction, and why did this occur when it did, with the Jurisdiction and Removal Act of 1875?*

I propose a model in which state actors–viewed here as judges but potentially representing other bureaucrats–are tasked with enforcing a Coasean policy when a representative member of his or any other state makes an investment within their jurisdiction. In a neutral setting, these actors would impartially apply the rule evenly to all other actors. However, each judge is also able to choose a level of bias or tax to impose on these transactions, which benefits only her own state and by extension her constituents. This can be viewed as an effort by the judge to pander to local constituencies to whom she must answer to maintain her position and introduces an inefficient externality to the system which harms the other parties. To remedy this problem, the states may turn to a national judiciary for relief and establish a legal system that is responsive to the whole nation rather than individual states, federating the judiciary.

This resulting federal system that allows cases to be removed up to the Federal Courts differs from traditional models of hierarchical judicial decision-making in two areas. First, there is an explicit legislative component affecting the capacity of the national court to resolve cases according to a national policy. This stands in contrast to traditional models which consider legislative involvement only in the context of the national judiciary, ignoring the effects of state judicial out-

comes. Second, this model does not depend on particular ideological preferences of the relevant actors, and is in fact agnostic as to whether policies in question are even consistent across states.

The remainder of the paper is organized as follows: First I describe the literature which this project draws on. I then build on the work of Loeper (2013) and Donaldson and Hornbeck (2016) to develop a simple model of the economic environment in which judges are operating, followed by a short federation game examining the politics of federation. Following the models, I place the development of the American judicial system in the context of these models using a historical analysis of the growth of diversity jurisdiction, including the Senate roll call to implement diversity jurisdiction as part of the Judiciary Act of 1875.

2 Federal Judicial Politics

Judicial rulings have a major impact across many areas of life. By interpreting statutes and developing common law, judges affect the economy, conceptions of human rights, criminal liabilities, and many other issues. It is very important, then, to understand how these decisions are made and how the resulting doctrine is likely to affect future outcomes and behavior. This task is sufficiently complicated within a single unified government, but in a dual system of government that results under federalism, it is even more challenging. Not only does it become important to understand how individual judicial bodies will make substantive decisions, but also how those bodies will allocate decisions between themselves. These challenges draw primarily on two broad strands of literature examining the decision-making processes of courts and on the behavior of self-interested actors in federal systems.

The literature on courts has explored many aspects of judicial behavior which are relevant to federated judicial structures. Hierarchical courts use their vertical alignment to better allocate resources between easy and hard cases, allowing trial courts and lower appeals courts to resolve most controversies while reserving the Supreme Court for more difficult cases. Higher courts have also been shown to use information gathered by lower courts–through such devices as appellate opinions and circuit splits–to make more-informed decisions on challenging questions (Clark and Kastellec, 2013). On the other hand, lower courts have been shown to take advantage of the limited capacity of high courts to try to stretch doctrine to fit the preferences of local regions or of individual judges (Kastellec, 2011). Each of these problems arises in a federal system which is comprised of a number of local courts and a (potentially) superior national court.

On the other hand, these hierarchical models do not fully capture the relationship between local and national courts in a federated system, since there is not an assumption of dual sovereignty that exists under federalism. Whereas in a single hierarchical system, all cases are subject to review by the higher court, a federated system restricts the ability of the higher court to intervene, limiting

it to hearing a certain subset of cases on the basis of the legal issues under consideration. These restrictions on jurisdiction may even go further by disallowing lower courts from hearing cases in those nationalized areas of the law, creating a complete dichotomy between the systems. Among issues that remain the providence of local courts, then, varying judicial rulings on policies may not simply reflect an effort by local judges to dodge the rules of a superior court, but instead they may represent rulings over explicitly different policies than those which are enacted in neighboring jurisdictions. This paper fills a portion of this hole that has been left largely unexplored in the formal and empirical literature. One exception which addresses these problem is Kastellec (2017), which empirically explores the representation offered by state courts in a federal system relative to their national peers.

Importantly, the existing literature has also explored many aspects of the relationship between courts and other departments, particularly the legislature, with often conflicting conclusions (Bergara, Richman, and Spiller, 2003; Clark, 2009; Curry, 2007; Ferejohn, 1999; Ramseyer, 1994; Vanberg, 2001). Both the reaches and the limits of judicial independence are explored in depth, largely with an eye to constitutional questions over federal law. In a federal system, this relationship becomes even more important, as legislators' preferences are not only manifested in the laws that are passed at the federal level, but also in local laws that represent outside options in the absence of a supreme national law. Indeed, a legislature in conflict with the court over the disposition of the federal courts not only has the ability to rewrite the laws that the court is tasked with interpreting, but also to restrict the court's very ability to interpret and rule on the laws in the first place. With respect to federal courts, these are particularly powerful tools that allow local actors to exert a dual-threat influence over the judiciary and its decisions. This is especially true when veto players in the legislative body (or bodies) adhere to a unified ideology and may credibly threaten to curb the authority of the court. For a broad discussion of these capabilities, see McNollGast (1995). Indeed, this is also the focus of Gillman (2002), focusing on the post-bellum period during which the young Republican majority imposed much of the modern structure of the federal courts. Conversely, a divided legislative branch leaves more room for the judiciary to impose its own will or to otherwise resolve cases in a manner that falls outside of any clear mandate (Graber, 1993).

Much of the literature in federalism, on the other hand, has emphasized fiscal problems and the allocation of taxing and spending authority between local and national institutions (Besley and Coate, 2003; Dixit and Londregan, 1998; Cremer and Palfrey, 2000; Gordon and Cullen, 2011; Oates, 1972). In a more recent series of papers, several authors have increasingly begun to emphasize the role of externalities and technology spillovers in setting national policies from a legislative perspective (Cremer and Palfrey, 2006; Loeper, 2013), however, these projects do not address these effects with respect to the judiciary and to law more generally. From a legal perspective, Burk (2006); Cooter (2000) and Ribstein and Kobayashi (1996) take on some of these challenges,

exploring the value of uniformity in state laws in the context of legislative policy. Dodson (2011); Issacharoff and Sharkey (2006); Lemley and McGowan (1998); Subrin (1989) and Williams (2005) provide evidence supporting the court's role in these decisions, both over the short-term and over the long term as new issues arise. On the other hand, O'Connor (1981) and Qian and Weingast (1997) discuss the potential for states and legislators to resist or support the federation or nationalization of courts.

This paper begins to address the gap between the judicial and federalism literatures, arguing that federal judicial systems, along with other federated bureaucracies, may arise out of similar economic considerations to those described in the literature on fiscal federalism, and that it is indeed economic considerations that have the greatest impact on federal judicial structures during the 19th century. I extend the analysis of Gillman (2002) and Cameron (2005) beyond party politics in the legislature to demonstrate the origins of legislators' and parties' preferences that led to the adoption of much looser access to the Federal Courts in the 19th century. Insofar as judges have a bureaucratic role as adjudicators of the law, as opposed to determining the content of the law, economic considerations drove much of the growth of the national judiciary during this period and, as modeled here, virtually all of the growth in diversity jurisdiction granted through Congress. Indeed, it was only in debates surrounding the Civil Rights Act of 1875 that non-economic motivations were seriously considered for expanding diversity jurisdiction (Wiecek, 1969). Moreover, in parallel with Kastellec (2017), I demonstrate that it is in fact local preferences which drove national action on diversity in the late 19th century. In the remainder of this article, I develop an model that demonstrates how these economic forces contributed first to widespread opposition to diversity jurisdiction but ultimately came to drive the adoption of that same policy over the course of 80 years preceding the Judiciary Act of 1875. I support this with an empirical analysis of roll call voting leading up to the passage of the Jurisdiction and Removal Act of 1875 that demonstrates—in line with recent work by Donaldson and Hornbeck (2016)—the link between massive economic growth driven by the transportation sector and interstate commerce in the North and representative legislators' support for expanded access to the Federal Judiciary.

3 The Economic Model

The economic environment in which the above questions play out takes on characteristics that are applicable to a wide array of problems beyond judicial politics. In particular, there are clear applications to models of international political economy and to relationships between states at the international level rather than simply at the national and subnational level. Indeed, in the absence of any intervention by a central government, the states are analogous to independent nations on the world stage. Even where the laws governing each state are identical, without any central authority

to interpret and enforce those laws, there is no inherent reason to suppose that the states will interpret those laws uniformly or consistently.

Furthermore, the decision-makers in this model—the judges—may be interpreted broadly as bureaucrats implementing a policy handed to them by an arbitrary policy-maker—the legislature. This could be a judge ruling on cases before the court, an economic official establishing trade policy for her country, or any number of other similar actors. Below, I use the term, *bias*, to refer to the rents that these actors extract from other players, recognizing that this may or may not be a deterministic fee such as a tariff. It may equally well represent a reduced probability of winning legal disputes or other challenges to the activity of a particular party that might benefit the bureaucratic agent tasked with enforcing the rule in question. I go into further detail on this point in Appendix A, where I offer a model of judicial incentives that motivate such a bias. The model here particularly focuses on the relationship between state decision-makers, residents of that state, and residents of other states.

3.1 A Simple Model with Two States

There are $N = 2$ states, each of which control a single divisible unit of capital that a representative investor—the same one presented above—may choose to invest locally in her own representative citizen or in any other state and its citizen. For purposes of this section, these investment decisions may be equivalently thought of as a state investing in itself or in neighboring states, and for that reason, I will typically refer to state i investing in state j rather than to the specific parties within each state. The returns on these investments are characterized in two dimensions of value, which may vary from state to state due to differences in legal regimes, existing resources and infrastructure, or chance, so that some states may be able to obtain high returns on investment whereas others will be relegated to lower returns. First, investors gain some positive value from their capital investment. On the other hand, the party that receives the capital investment also values the product of that capital. These benefits may be asymmetrical, but are assumed to be known and positive for both parties. I assume that these types are independently and exogenously determined by nature for each state.

Besides choosing investment levels, however, each state may also choose how large a bias to impose on transactions across state lines. This bias may be thought of in several ways. It may take the form of a standard monetary bias such as a tariff, (for which a local judge would find it difficult to deviate from the state statute), but it may also come in many indirect forms, such as through legal rules and policies that restrict non-residents from participating in the economy and legal system or through judicial proceedings in which justices pander to local constituencies. That is, the state chooses a local bias, $b_i > 0$, which it imposes on investors, whether that be through policy

(i.e. trade barriers) or the judiciary (i.e. biased proceedings) and which favors local residents. Within the judiciary, this bias may reflect the selection of biased judges, procedural hurdles that disproportionately harm alien litigants, or juries that are predisposed to vote against outsiders—such as one composed of small town farmers in a foreclosure case to which an outside financier is a party. Within the policy realm, this bias may come in the form of tariffs, licensing barriers, and residency requirements, among myriad other obstacles. This level of bias is the first choice made by the state. In particular, it is conceptualized here as a judicial ruling which favors local constituencies irrespective of the law as it is written as modeled in Appendix A, which presents the microfoundations of this bias.

Each state then chooses a level of investment, $x_{ij} \in [0, 1]$, in commerce with every state, j, subject to a budget constraint, $\sum_j^N x_{ij} \leq 1$, which may be thought of as the capital reserve of state i or its citizens. Each state earns a boost in utility proportional to the level of investment in the local economy and the economy of other states, as well as a boost from any bias against other states, also proportional to the level of investment. However, each states' welfare is reduced by an amount proportional to other states' biases. In particular, I consider an environment where the bias demanded by the state takes the form of a proportional bias on investments in the amount of $b_i x$, but the investor earns returns on investments within her own state in the amount of $\alpha_i \log(x)$ for $\alpha_i > 0$ and $\beta_i \log(x)$ for $\beta_i > 0$ for her own investments. This yields the payoff function on interstate trade,

$$U_i(b_i, \mathbf{x_i}|b_{-i}, \mathbf{x_{-i}}) = \sum_j^N (\alpha_i \log(x_{ji}) + b_i x_{ji} + \beta_i \log(x_{ij}) - b_j x_{ij}) \tag{1}$$

This is a standard Cobb-Douglas production function with a linear modifier. Here, I leave open the possibility that states reap different benefits based on individual parameters, α_i and β_i. Furthermore, note that the biases a state imposes on itself cancel out, as the benefits of those biases are rolled back into the local economy. Also, note that if we have only two states, we can rewrite the problem in terms of how much each state chooses to invest in the other. This returns,

$$U_i(b_i, x_{ij}|b_j, x_{ji}) = (\alpha_i + \beta_i) \log(1 - x_{ij}) + \alpha_i \log(x_{ji}) + b_i x_{ji} + \beta_i \log(x_{ij}) - b_j x_{ij} \tag{2}$$

For the remainder of this section, this is assumed to be the appropriate utility function. In Appendix C, a more general version of the model is described with arbitrary capital reserves and many states.

3.2 States' Reaction Functions

Taking states' decisions on biases as fixed, the investment decisions for state i solve

$$\text{argmax}_{x_j} U_i(b_i, x_{ij}|b_j, x_{ji}) \tag{3}$$

This yields the FOC,

$$0 = \mathrm{d}_{x_{ij}} U_i(b_i, x^*_{ij}|b_j, x_{ji}) = -\frac{\alpha_i + \beta_i}{1 - x^*_{ij}} + \frac{\beta_i}{x^*_{ij}} - b_j \tag{4}$$

which implies

$$x^*_{ij} = \frac{1}{2b_j}\left(2\beta_i + \alpha_i + b_j - \sqrt{4\beta_i^2 + \alpha_i^2 + b_j^2 + 2\alpha_i(2\beta_i + b_j)}\right) \tag{5}$$

Solving for x^*_{ij} yields two potential equilibria—one with a positive radical and one with a negative radical—however, noting that when $\alpha_i = \beta_i$, the maximum value of x_j that state i will choose is $\frac{1}{2}$, even when there is no bias. As a result, it becomes clear that the equilibrium we are concerned with is the lower-valued one presented.

Here, x^*_{ij} is intuitively decreasing in α_i, since a state that offers strong returns on local investments will have an incentive to allocate more resources toward those in-state investments. Conversely, x^*_{ij} is increasing in β_i, since there are diminishing returns to scale on investments in each location. Finally, x^*_{ij} is decreasing in b_j, which follows straightforwardly, as investors are less likely to invest outside their own jurisdiction when those investments are likely to be expropriated or heavily biased. Also note that in order for the first order condition to be satisfied subject to the budget constrainwith a finite bias, we must have $x_{ij} \in (0, 1)$.

Proposition 1. *States will invest more in other states when they place a high value on those investments as a result of diminishing returns to scale. They will invest less whenever they place a high value on local investments or when other states place a high bias on investments from out-of-state.*[1]

Now we can consider the optimal bias that this induces for the states, conditioning on x_i and x_j. Taking the FOC with respect to b_i,

$$\begin{aligned} 0 &= \mathrm{d}_{b_i} U_i(b^*_i, x^*_{ij}|b^*_j, x^*_{ji}) \\ &= \left(-\frac{\alpha_i + \beta_i}{1 - x^*_{ij}} + \frac{\beta_i}{x^*_{ij}} - b_j\right)\mathrm{d}_{b_i} x^*_{ij} + \left(\frac{\alpha_i}{x^*_{ji}} + b_i\right)\mathrm{d}_{b_i} x^*_{ji} + x^*_{ji} \end{aligned} \tag{6}$$

[1] All proofs for this section are in Appendix B.

Letting $q_i \equiv \sqrt{\alpha_i^2 + 4\beta_i^2 + b_j^2 + 2\alpha_i(2\beta_i + b_j)}$ we have

$$\mathrm{d}_{b_i} x_{ji}^* = -\frac{1}{2b_i^2}\left(\alpha_j + 2\beta_j - q_j + \frac{b_i\alpha_j + b_i^2}{q_j}\right) \tag{7a}$$

$$\mathrm{d}_{b_i} x_{ij}^* = 0 \tag{7b}$$

And so the preceding equations reduce to

$$0 = \left(\frac{\alpha_i}{x_{ji}^*} + b_i^*\right)\mathrm{d}_{b_i} x_{ji}^* + x_{ji}^* \tag{8}$$

Solving for b_i yields

$$b_i^* = \frac{1}{2\alpha_i}\left(\alpha_j\beta_j + \beta_j^2 - \alpha_j\alpha_i + \beta_j\alpha_i \pm (\beta_j - \alpha_i)p_i\right) \tag{9}$$

where $p_i = \sqrt{(\alpha_j + \beta_j)(\alpha_j + \beta_j + 4\alpha_i)}$. Noting that a large α_i should decrease incentives to impose a bias, it is clear that we are interested in the larger of the two solutions,

$$b_i^* = \frac{1}{2\alpha_i}\left(\alpha_j\beta_j + \beta_j^2 - \alpha_j\alpha_i + \beta_j\alpha_i + (\beta_j - \alpha_i)p_i\right) \tag{10}$$

With this solution, we can make several observations. First, b_i^* is decreasing in α_i. Intuitively, as a state values receiving more investments, it is in the state's interest to improve the environment in a manner conducive to bring in those investments. Second, b_i^* is increasing in β_j for all $\beta_j > 0$.

Proposition 2. *States impose a low bias rate when they place a high value on receiving investments locally. They may also impose a low bias rate when other states place a sufficiently low value on out-of-state investments relative to local investments. However, they will impose a high bias rate whenever other states place a high value on out-of-state investments.*

This result suggests that as alien investors increasingly value making investments outside their state, local officials will impose greater biases on those investments, as the alien investors will be less-willing to pull their investments out. Finally, b_i^* is increasing in α_j when $\beta_j > \alpha_i$, constant when $\beta_j = \alpha_i$, and decreasing when $\beta_j < \alpha_i$. This condition follows similar logic to the preceding one, examining the problem from the perspective of the value to alien investors keeping their resources in their own states. Wherever states place a sufficiently low value on receiving investments from out of state, they will raise biases on those investments that they do receive. States that place a high value on receiving investments, however, will establish lower bias rates to incentivize such investments.

4 Political Implications

With the preceding equilibrium in mind, we can now begin to consider the political choices that are likely to result. While it should be unsurprising that the states have identical preferences when their economic parameters, α_i and β_i, are identical, it is not clear what exactly those preferences amount to politically or what happens to those preferences as the parameters begin to change, both absolutely and relatively. First, consider the welfare implications of a bias in the two states.

4.1 Welfare Considerations

We wish to determine whether the option to impose a bias on activity can or does benefit the states. To do this, we will compare the welfare induced by the equilibrium above to that of a similar regime in which the states do not have the option of introducing the bias. First, consider the welfare of states in an environment where the states can commit to not imposing any bias against outside investors. In this environment, the utility function for state i reduces to

$$U_i^\dagger(b_i, x_{ij}|b_j, x_{ji}) = (\alpha_i + \beta_i)\log(1 - x_{ij}) + \alpha_i \log(x_{ji}) + \beta_i \log(x_{ij}) \tag{11}$$

Taking the FOC with respect to x_{ij} yields,

$$0 = \mathrm{d}_{x_{ij}} U_i^\dagger(b_i, x_{ij}^\dagger|x_{ji}) = -\frac{\alpha_i + \beta_i}{1 - x_{ij}^\dagger} + \frac{\beta_i}{x_{ij}^\dagger} \tag{12}$$

which implies

$$x_{ij}^\dagger = \frac{\beta_i}{\alpha_i + 2\beta_i} \tag{13}$$

This is indeed the limit of x_{ij}^* calculated above as $b_j \to 0$.

Proposition 3. *Total social welfare is decreasing in the magnitude of bias imposed by any state. Whenever biases are positive in any state, there will be at least one state which suffers a welfare loss.*

Plugging this back into the utility function, each state's total utility becomes

$$\begin{aligned} U_i^\dagger(x_{ij}^\dagger|x_{ji}^\dagger) &= (\alpha_i + \beta_i)\log(1 - x_{ij}^\dagger) + \alpha_i \log(x_{ji}^\dagger) + \beta_i \log(x_{ij}^\dagger) \\ &= (\alpha_i + \beta_i)\log\left(\frac{\alpha_i}{\alpha_i + 2\beta_i}\right) + \alpha_i \log\left(\frac{\beta_j}{\alpha_j + 2\beta_j}\right) + \beta_i \log\left(\frac{\beta_i}{\alpha_i + 2\beta_i}\right) \\ &= (\alpha_i + \beta_i)\log(\alpha_i) + \beta_i \log(\beta_i) - (\alpha_i + 2\beta_i)\log(\alpha_i + 2\beta_i) \\ &\qquad + \alpha_i \log(\beta_j) - \alpha_i \log(\alpha_j + 2\beta_j) \end{aligned} \tag{14}$$

This will serve as our baseline welfare. Now consider what happens when there is bias. Using the values identified above, we have

$$U_i(b_i^*, x_{ij}^*|b_j^*, x_{ji}^*) = (\alpha_i + \beta_i)\log(1 - x_{ij}^*) + \alpha_i \log(x_{ji}^*) + b_i^* x_{ji}^* + \beta_i^* \log(x_{ij}^*) - b_j^* x_{ij}^* \quad (15)$$

To compare the two, define

$$\Delta U_i(b_i^*, x_{ij}^*, x_{ij}^\dagger|b_j^*, x_{ji}^*, x_{ji}^\dagger) \equiv U_i(b_i^*, x_{ij}^*|b_j^*, x_{ji}^*) - U_i^\dagger(x_{ij}^\dagger|x_{ji}^\dagger) \quad (16)$$

Any state for which the difference, ΔU_i, is positive benefits from the availability of the bias term, whereas in any state that has $\Delta U_i < 0$, there is a loss of utility as a result of that term. Note too that the total social welfare must decrease when a bias is introduced, as the transfers due to bias are zero-sum but introduce distortions which induce states to invest more than the efficient level of resources into the local economy to avoid suffering losses due to the bias of other states. As a result, at least one state must suffer a net loss of utility whenever there is positive bias. This effect is exemplified in Figures 1 and 2. Whenever a state has a sufficiently weak valuation on local investments relative to that on out-of-state investments or when the total value of investment returns is small, the state may be able to improve its welfare by introducing high biases on other state's investments. However, as can be seen graphically in the images, there is always a region (white in the graphic) where neither state benefits under a regime which allows bias relative to the baseline of a regime that prevents such activity.

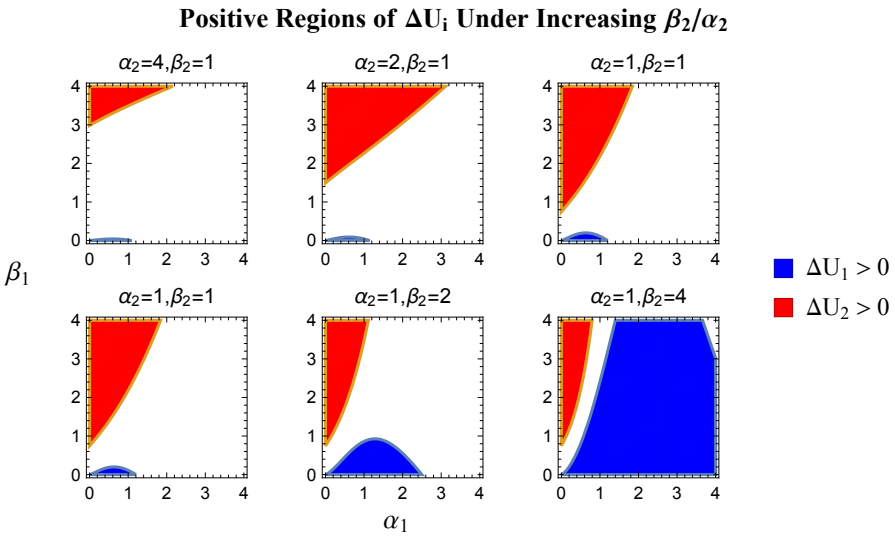


Figure 1: Colored regions represent conditions under which one state is better-off under a dispersed enforcement. White regions represent areas where every state is better-off under a centralized enforcement regime with no bias. Both states benefit more under the bias regime when they place a low value on receiving investments relative to making their own outside investments

To interpret these images, we may consider low measures of α and β to be indicative of generally inefficient states where there are low returns on capital. In particular, the product of the two, $\alpha\beta$, serves as a crude measure of the overall efficiency of the state's economy. Alternatively, the dividend of the two, α/β, may broadly measure the level of saturation in the states local economy relative to other states', so that a high ratio is indicative of ample opportunities locally, while a small ratio is indicative of opportunity to be had in other states. With this interpretation, states are most likely to benefit from a decentralized regime that allows individual states to implement policy when those states are generally inefficient ($\alpha\beta < 1$)and have particularly low levels of saturation ($\alpha/\beta > 1$), so that they are predisposed to keep their own capital at home where it is not exposed to other states. In this environment, they can still extract rents from other states' investment without significantly being harmed themselves. Further, while there is necessarily a net loss of total utility, states are most likely to suffer disproportionately when they are saturated locally ($\alpha/\beta < 1$), so that the most valuable investments are out-of-state.

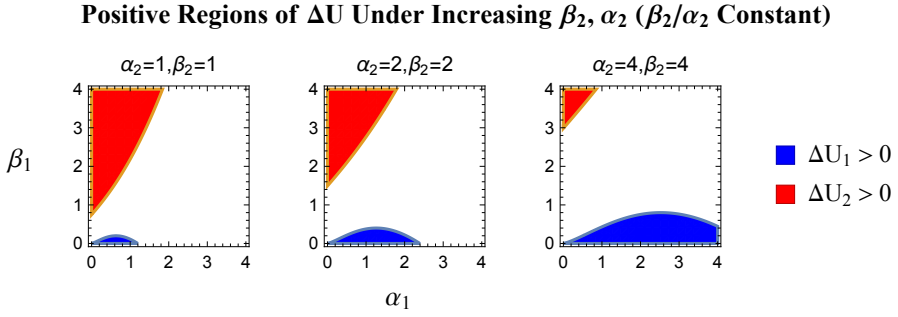
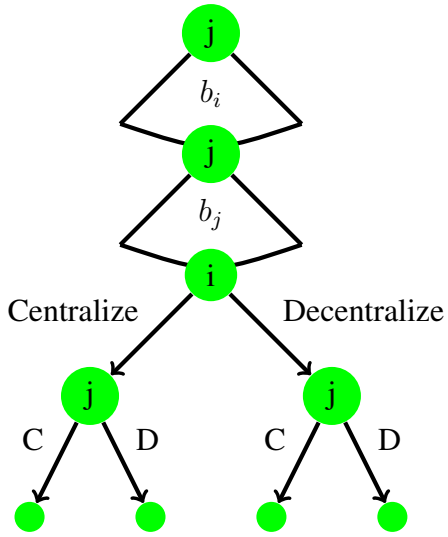


Figure 2: Colored regions represent conditions under which one state is better-off under a dispersed enforcement. White regions represent areas where every state is better-off under a centralized enforcement regime with no bias. Both states are more likely to benefit from a centralized regime when they place a high value on investments relative to bias revenue.

4.2 Political Outcomes

With the above welfare considerations in mind, we now consider the political implications of this model. In the simple case examined above, assume each state is represented in a national legislature that has the opportunity to vote over policy, and without loss of generality, assume that state i represents the 'majority' while state j represents the 'minority.' The legislature may choose to maintain either a centralized or decentralized regime with respect to the judiciary. In the former option, an judge is assigned at the national level, responsible to the legislature as a whole and all of its members equally so that it does not have an incentive to impose a bias on the citizens of one state over another and the states reap the benefits of the unbiased regime. In the latter option, the

Figure 3: Political Game Tree



states are permitted to administer policy themselves, including the imposition of any biases desired and outcomes are realized accordingly.

If the states vote according to simple majority rule, with the 'majority' state serving as a tiebreaker in the event of a tie, then for the duration of that period, the majority state will implement its preferred policy choice, either local or national control. It is straightforward to see that when that majority is better-off under the decentralized regime, $\Delta U_i > 0$, it will vote in favor of decentralization and such a regime will prevail, and vice-versa when the state is better-off under a centralized regime, $\Delta U_i > 0$. Similarly, when the minority is better-off under the decentralized regime, $\Delta U_j > 0$, it will vote in favor of decentralization, and vice-versa when better-off under a centralized regime, $\Delta U_j > 0$. When $\Delta U_i = 0$ (or equivalently $\Delta U_j = 0$), the state will be indifferent and may choose any mixing strategy when voting over the two regimes. Of course, when both states agree on a regime (necessarily the centralized regime), there is unanimity and the chosen regime prevails, while if the states disagree, the majority serves as the tiebreaker and implements its preferred regime.

As discussed above, the majority is most likely to prefer a decentralized regime in an undeveloped, inefficient economy and when there is little opportunity in for investments in the remaining state, j. This is especially true when the remaining state has a large β and is therefore very eager to participate in the majority's economy, making the cost of imposing the bias relatively low. Nonetheless, there are conditions, even in very inefficient states, where the majority may prefer a centralized regime, and even be in agreement with the other state that such a regime should prevail. The two states will never simultaneously agree to a decentralized regime. Moreover, if the economies develop over time, so that $\dot{\alpha}$ and $\dot{\beta}$ are positive, the likelihood of the two states coming

together in agreement will increase, and for sufficiently similar states, will eventually reach 1.

Of course, this model does not yet address one key challenge to this arrangement, namely that of federal capture. If one state (presumably the majority) is able to capture control of the administrator at the national level, that state may then exert authority over the remaining state in a way that reimposes the bias against the other state, but does not allow that state the opportunity to impose a bias on the dictatorial one. In this scenario, the majority state is able obtain her optimal rents as under the biased regime without paying the costs associated with the other state's rents in that regime.

5 The Model in American Judicial Development

One of the central themes of the literature on federalism is the role of different levels of government in choosing and administering policies. In his analysis of fiscal federalism, Oates (1972, 1991) notes the advantages of allowing national administration of tax policy while using intergovernmental grants to implement spending according to local preferences. When the policies in question are not so clearly separable, however, as in the case of most legal rules, this duality becomes much more difficult to implement.

In the case of judicial administration, there are arguments for local judicial interpretation of rules, but also for national interpretation. Local courts are well-situated to hear cases arising under local law in a way that national courts are not, since the judges of national courts would have to learn and comprehend the laws of all local jurisdictions in order to be prepared to resolve any case that might come before them. On the other hand, national laws are likely to be best-interpreted by national courts that are unswayed by local preferences. Local courts that are responsive to their own constituencies are likely to attempt to twist the interpretation of these various rules to fit the preferences of their constituents, potentially at the expense of alien litigants. This model concentrates on the latter scenario, and the development of the national courts in response is discussed below. I begin with a discussion of the Founders' reasoning behind the establishment of diversity jurisdiction in the Early Republic and the initially successful efforts to restrict that jurisdiction. I then address the changes, especially the development of railroads and broader interstate commerce, that drove Northern states to ultimately shift in favor of a more centralized legal enforcement regime and the adoption of more relaxed diversity jurisdiction after establishing a robust majority in the post-bellum era.

5.1 Economic Development and Diversity Jurisdiction in the Early 19th Century

There is a large literature focused on the growth of the federal state in American politics during the post-bellum period, both with respect to the regulatory state and the judiciary. After the Republicans solidified their majority in the years following the Civil War, they quickly turned their attention from slavery and reconstruction to the expansion of the economic union and associated federal powers. However, this was not done in a vacuum and indeed many of the foundations on which the regulatory state was developed, especially the judiciary, were themselves quietly built up over the course of several decades prior, beginning in small steps during the latter years of the Marshall Court and accelerating sharply under Taney as the Democratic majority of the first half of the century weakened and ultimately crumbled.

From the outset, America's founders, particularly the Federalists, were concerned with the potential effects of permitting locally-selected judges to rule over economic matters that involved out-of-state actors. In determining which courts were best-suited to administer different aspect of the law, they noted that while in a locally-administered system of courts, the judges benefit from familiarity with local law and custom, making them well-suited to tailor its decisions to local conditions. However, the same local court suffers from several constraints. It is constrained by local constituencies and the associated politics, possibly making it difficult to render unbiased decisions when non-residents are before the court and preventing the court from internalizing any externalities that may be associated with local administration of the law, and even if judges avoid intentional efforts to conduct themselves in this way, their own socialization may lead to biased outcomes, a problem that continues to present itself in the modern era (Rush, 2014). These state judges then, responsive to their own constituents, were viewed as being unlikely to be able to commit to fairly and uniformly interpreting some legal rules and avoid pandering to their constituents whenever there might be a case before them in which only one party is a member of their constituency. In particular, the founders' worries focused on the manners in which economic development could be hampered by populist laws and juries that over-expropriate speculators and lenders, and the local courts' powerlessness to prevent as much. This matter was addressed directly in the Early Republic by both Alexander Hamilton in Federalist 80 and Chief Justice Marshall in his opinion in *Bank of the United States v. Deveaux* (1809). In Hamilton's words,

> The reasonableness of the agency of the national courts in cases in which the State tribunals cannot be supposed to be impartial, speaks for itself. No man ought certainly to be a judge in his own cause, or in any cause in respect to which he has the least interest or bias. This principle has no inconsiderable weight in designating the federal courts as the proper tribunals for the determination of controversies between different

> States and their citizens. And it ought to have the same operation in regard to some cases between citizens of the same State. Claims to land under grants of different States, founded upon adverse pretensions of boundary, are of this description. The courts of neither of the granting States could be expected to be unbiased. The laws may have even prejudged the question, and tied the courts down to decisions in favor of the grants of the State to which they belonged. And even where this had not been done, it would be natural that the judges, as men, should feel a strong predilection to the claims of their own government. Hamilton (1788)

Perhaps the most glaring example of this effect—or rather the consequences to judges when they did not behave in this manner—appears in a case in which the justices of the court did not bias their decisions in favor of local litigants. In the first decades after the ratification of the Constitution, much of the country remained relatively isolated, with relatively little interstate commerce. The major interstate activities that did exist were largely in the form of land speculation and financing, especially financing of state expenditures, but even these endeavors were limited to the extent that they affected relatively few individuals, and these individuals were disproportionately concentrated in coastal areas and Northern States where international trade made mercantilistic practices more profitable. This gave local legislatures, especially in the South, ample opportunity to pander to their constituencies by passing laws granting wide-ranging options for debtors to obtain bankruptcy protection and other relief, as well as granting extensive rights for land tenants over title holders. Such laws were widely popular among many voters and largely harmed non-residents, who were left with little recourse in state courts. Moreover, because the population of people harmed by these conditions was so small across the entire Republic, there was little effort by any state or the national government to remedy the problem from a legislative perspective. Rather, when such efforts to abet the financiers and speculators did occur, they typically faced a very strong backlash as occurred after the Supreme Court ruled against a debtor state in *Chisholm v. Georgia* (1793).

In *Mississippi v. Johnson* though, the Mississippi Supreme Court not only made the rare decision to allow the state to be sued, waiving sovereign immunity, but subsequently ruled in favor of non-resident bondholders. In particular, the state had authorized the sale of 15 million dollars worth of bonds to finance a state bank. A large portion of these bonds having been sold to a Philadelphia financier, the state subsequently refused to honor the debt, even going so far as to attempt to write legislation barring the repayment of the debt. Having lost in lower courts, the state subsequently appealed to the High Court of Errors and Appeals, then the court of last resort in the state, where three justices, Chief Coatesworth Smith, Judge William Yerger, and Judge Ephraim Fisher, ruled in favor of the bondholder.[2]

[2]The opinion relied heavily on *Green v. Biddle*, (21 U.S. 1, 1823), noting that while Kentucky guaranteed rights

The immediate response to this decision was an active campaign during subsequent elections that not only installed a governor who was openly opposed to obeying the ruling, but also saw the responsible justices, among the first high-court members to be elected in the United States, removed from office as their terms ended and replaced with judges more sympathetic to local interests. The first of these judges to be defeated was Judge William Yerger, who was replaced by William Handy following elections in November of 1853. Subsequently, Judge Ephraim Fisher would also resign before completing his term of office, and Chief Coatesworth Smith died in office (Mississippi, 1898, 1904).

The fallout of this incident extended well beyond the immediate case, though, and the elections which followed. Subsequent efforts by the state to secure funding for major infrastructure projects, in particular a massive railroad improvement, were severely hampered by the ruling (Shortell, 2008). Creditors, especially those from other states and countries, saw the state's response to the ruling and the defeat of the justices responsible as an indicator that the state was unwilling or unable to commit to honoring the debts it was seeking, resulting in a chilling effect on the state's credit line.

Of course, while the particular example was one which largely turned on a question of state law, this scenario can apply to cases turning on either local or national law, with judges being equally biased against alien litigants in both cases. Indeed, it was the justices' consideration of national law and their refusal to ignore the law of contract that led them to rule in favor of the bondholders and to ignore the efforts by state actors to nullify their commitment.

In a second possibility, which was touched on by the judges in *Johnson* with their response to the state's position, populist legislatures may pass legislation making it difficult for alien litigants to gain access to redress in local courts.[3] This also introduces a bias against fair implementation of national rules which taxes nonresidents in individual states. At the same time that Mississippi was rebuking justices unwilling to pander to local constituencies, Arkansas took this approach. While

and privileges inherited from Virginia, these rights were subsequently eroded over the period between 1789 and 1823 until the United States Supreme Court restored those rights. Graber (2000) complements this discussion with an analysis of the federal court's ultimate ability to overrule many comparable land transfers (as exemplified by *Polk's Lessee*,*Percheman*, and *Pollard's Lessee* when both parties were constituents of the court and thus equally empowered to influence the court. In these cases, although the court seemingly rejected the will of Congress, repercussions were minimal.

[3]With regards to the state's position that the state was not bound by its commitments and could subsequently deny those commitments with new legislation, Chief Smith had the following to say in *Johnson*, "You can evade the constitution, but you cannot violate it. True, the courts hold that an evasion of law is equal to its violation; not so with constitutions; they are mere abstractions; avoid their dead letter and you may evade their living spirit, when and how you choose; although Chief Justice Sharkey has vaguely imagined 'that the spirit of a constitution was entitled to a higher degree of respect than that of a law, being the paramount law couched in general terms, and this respect it must receive from the courts whenever they are called on to enforce contracts which so palpably conflict with the constitution.' The end here is not called on to justify the means, but the means is held to sanctify the end. Strange reasoning; the last product of the doctrine of implied power; a doctrine which is never so true to itself as when it is false to the constitution." (25 Miss. 673, 1853)

litigation was pending in *Beers v. Arkansas* (1854)—again relating to the delinquent payments to non-resident creditors—the Arkansas legislature passed laws which compelled the bondholders to relinquish their original bonds to the state prior to any litigation being accepted by the courts. As this forced the creditors to hand over all evidence against the state prior to litigation proceeding, it placed an excessive burden on the financier and biased the court's proceedings in favor of the state and local constituents without directly rejecting the Contract Clause (Shortell, 2008). This strategy had the particularly attractive effect of solving the problem even before it reached the justices, as many bondholders were unwilling to give up their bonds to have their cases heard in the first place.

In both of these environments, the states' efforts represented an assault on actors that were politically weak within the state, in particular non-resident creditors. The legislature in Arkansas and newly elected judges in Mississippi both put effort into visibly pandering to their constituencies which would otherwise be required to suffer an greater tax bill to finance the repayment of those bonds issued by the state. Moreover, as the creditors were primarily non-residents, those taxes would subsequently leave the state rather than provide new tangible future benefits to the residents. In other cases as recently as *Felder v. Casey* (1988) and *Haywood v. Drown* (2009), the United States Supreme Court also ruled in cases under which state statutes in Wisconsin and New York explicitly limited the ability of state courts to resolve cases arising under national law after local courts affirmed the states' positions. In both of these cases, moreover, the target was not simply out-of-state residents, but more generally politically-unfavored groups that might seek relief under 42 U.S.C. § 1983.

Finally, juries themselves in the trial courts, composed of local citizens, may be loathe to hand down rulings which harm their friends, neighbors, and peers while protecting the interests of aliens. As such, the distribution of cases is likely to be taxed in favor of local residents, even when there is ostensibly a single national rule. Again in the context of debt, financiers owed money by states and even individual landowners might face an uphill climb to obtain relief from juries that would be on the hook as taxpayers or as potential debtors themselves for paying after ruling in favor of those financiers. Of course, as in the first case, this scenario need not be restricted to cases in which the law in question is a national one; juries may exhibit biases that tax alien litigants whether the legal question is one of local or national law.

In each of these scenarios, actions by local constituencies interfered with the courts in such a way as to induce a tax against alien parties before the court. The result of such activities throughout much of the 19th century was not only a reduction in access to debt markets for those states that were guilty of such actions, but also a reduction in the ability and willingness of corporations to expand across state lines (see McGurdy (1978)). Notably, after refusing to honor the ruling in *Johnson*, Mississippi failed in 1859 to secure funding for its massive railroad improvement projects the state. In many instances, though, the perceived short-term benefits of local courts

allowing moratoria on debt outweighed the long-term damage caused to local commerce, making them tolerant of such action in an effort to secure reelection. This, however, did not account for the externalities imposed on neighboring states, whose financiers and manufacturers would suffer in losing the gains from trade that would accrue in the absence of the threat of default.

In American jurisprudence, the primary doctrine aimed at overcoming the challenge of these local biases in the courts became that of diversity jurisdiction. Hamilton and the Federalists ensured that litigants from different states would have the opportunity to have their cases heard in a national tribunal that was perceived, rightly or wrongly, to be more neutral than state courts. Indeed, in many cases, especially those relating to financial concerns, the national courts and juries were viewed as predisposed to favor the claims of alien parties, forcing debtors to honor their debts. The Chief Justice's comments in *Deveaux*, while more generous to the goals and integrity of his fellow justices that Hamilton, acknowledged a broad view of the necessity of the doctrine, arguing that the mere perception of bias is sufficient to justify diversity consideration:

> However true the fact may be, that the tribunals of the states will administer justice as impartially as those of the nation, to parties of every description, it is not less true that the constitution itself either entertains apprehensions on this subject, or views with such indulgence the possible fears and apprehensions of suits, that it has established national tribunals for the decision of controversies between aliens and a citizen, or between citizens of different states.

In both examples, the statesmen addressed the concern that local judges in the United States are selected and serve at the pleasure of local constituencies. Wherever there is an imbalance in the distribution of types within a local jurisdiction, the local courts are likely to be biased in favor of the dominant local constituency and against the alien type in general. In particular cases, this effect will be smaller due to the presence of local residents who take on the alien type—such as local creditors; however, judges and juries will nonetheless be inclined to rule against non-residents whenever such actors come before the court. This problem was only exacerbated in the Early Republic by the inclination of many voters to view themselves more-strongly as citizens of their individual states rather than of the nation as a whole.

By allocating decisions over matters where such asymmetries exist to the national courts, though, the justices—now presiding over a nationwide constituency—were able to free themselves from local pressures and also internalize the costs of the biases introduced in the states. This is what ultimately occurred in both *Felder* and *Haywood*. The benefits to this are twofold. First, following Cremer and Palfrey (2006) and Loeper (2013), the use of national courts can serve as a means of restricting local courts' abilities to introduce costly externalities by unfairly taxing aliens in their decision-making process. Second, a majority of states with strong commercial sec-

tors and correspondingly greater gains from trade that might be willing to commit to not imposing taxes themselves could impose fair proceedings on less-commercial states that open markets which would otherwise be inaccessible due to the threat of biased proceedings.

Yet although diversity jurisdiction at the national level was granted in Article 3 of the Constitution and reaffirmed in the Judiciary Act of 1789, it remained, as with most other sources of jurisdiction, difficult to secure in the Early Republic. Following the strong rebuke against national intervention in the States after *Chisholm*, the national courts exhibited little willingness to impose their authority over state courts. Rather, in the first decades of the Republic, the national courts hewed as closely to the legislative line as it could. In this environment, with a relatively undeveloped national economy and few salient benefits accruing to most people as a result of large-scale interstate activity, there was not the political support in Congress to push for a stronger national judiciary, and there certainly was not enough to support an effort by the national courts to unilaterally assert authority.[4] Indeed, of the states in the Union at the time of the passage of the 11th Amendment, only the relatively commercial states of Pennsylvania and New Jersey failed to take action on and ratify the change. In the context of the model presented above, this is consistent with both of these states operating with relatively large βs and a high reliance on interstate commerce, while the remaining states, especially in the South, operated under a regime with greater αs relative to their respective βs. Of course, beyond this distinction, there was a further distinction in that the Northern States in general had stronger economies, making them still less-inclined to favor a dispersed regime.

This was particularly apparent in matters of corporate diversity that characterized many of the early cases on debt or land rights. In 1809, the United States Supreme Court under Marshall ruled in *Deveaux* that corporations could only use diversity claims to access national courts when there was complete diversity of citizenship between all of the natural persons associated with the parties in the case, so that corporations were required to demonstrate complete diversity with respect to all of their shareholders. This case was affirmed in two companion cases, *Hope Insurance Company of Providence v. Boardman* (1809) and *Maryland Insurance Company v. Woods* (1810), and occurred despite the Chief Justice's acknowledgment of the Founders' goals with respect to diversity. The threat of a legislative response curbing the still nascent court was sufficient during this period to act as a restraint on the justices willingness to assert their authority to rule on diversity cases except in the most exceptional circumstances.

In the subsequent years, especially after the decline of the Federalists and the fading of Revolutionary War debts from the face of politics, states were left with relatively wide latitude to adopt protectionist and mercantilistic laws which imposed costs on transactions across state lines. They

[4]This relates very closely to the cost term associated with the Supreme Court asserting authority in Cameron (2005).

were granted wide latitude to interpret the limits of their power under the United States Constitution, but also to impose structures which made access to local remedies difficult for non-residents. Particularly in the most agrarian and isolated states, populist legislatures often pursued policies granting short-term benefits to key constituencies at the expense of other interests. Land speculators were routinely expropriated in favor of local actors and debtor were granted wide relief against alien financiers, who were largely unable to respond effectively due to the structure of local laws and courts.

The original view of diversity was relaxed, however, as economic conditions and parallel political conditions shifted in favor of integration after the 1820s. In particular, the expansion of canals and introduction of the railroad opened many new industries to interstate activity and made that activity much more profitable, especially in Northern States where the beginnings of the Industrial Revolution increased the value of commerce and drove manufacturers to seek out markets beyond their local towns and cities. These changes led to increasing pressure on the national courts, consistent with increasing ratios, β/α, to reinterpret the diversity requirements established in *Deveaux*, especially from manufacturing regions where interstate commerce was becoming most important. For the Supreme Court, the pivotal moment came in 1844 with *Louisville, Cincinnati, & Charleston Railroad v. Letson*, which ruled that, for purposes of diversity, corporations should be viewed as citizens of the state in which they are incorporated. This case offered two changes to the standing doctrine. The first, smaller one addressed a loophole in earlier doctrine which suggested that corporate shareholders must all be residents of the same state that was not the same state of which any opposing litigant was a citizen. The second, important change rejected New Yorker Letson's claim against diversity on the basis that one shareholder in a corporation that owned shares in the railroad was in fact also a citizen of New York. Instead the court introduced the corporate fiction, which deemed the railroad to be a citizen of South Carolina where it was incorporated.

This event also coincided with another significant case in *Swift v. Tyson* (1842) two years prior, which established the existence of federal common law.[5] Thus, not only did Letson give corporations access to national courts, but it gave them access to a legal environment that was much less predisposed to rule against them. Moreover, 12 years later the court, in *Dodge v. Woolsey* (1856), further expressed a willingness to allow corporations access under diversity when it ruled that a shareholder could sue his own corporation in national courts provided he was a citizen of a state other than that in which the corporation was incorporated. Echoing Marshall's earlier words, the court declared, .

[5]This ruling was aimed directly at efforts by states to enact jurisprudence which favored local interests at the expense of economic activity. At the time of the ruling, the justices hoped that the case would help to consolidate widely varying state law toward a uniform national jurisprudence; however, this did not occur an the ruling was reversed by *Erie v. Tompkins* during the New Deal. The latter ruling, though, did not address diversity jurisdiction *per se*, as in this model, only the underlying law that was to be used in such cases.

> It is to make the people think and feel, though residing in different States of the Union, that their relations to each other were protected by the strictest justice, administered in courts independent of all local control or connection with the subject-matter of the controversy between the parties to a suit.

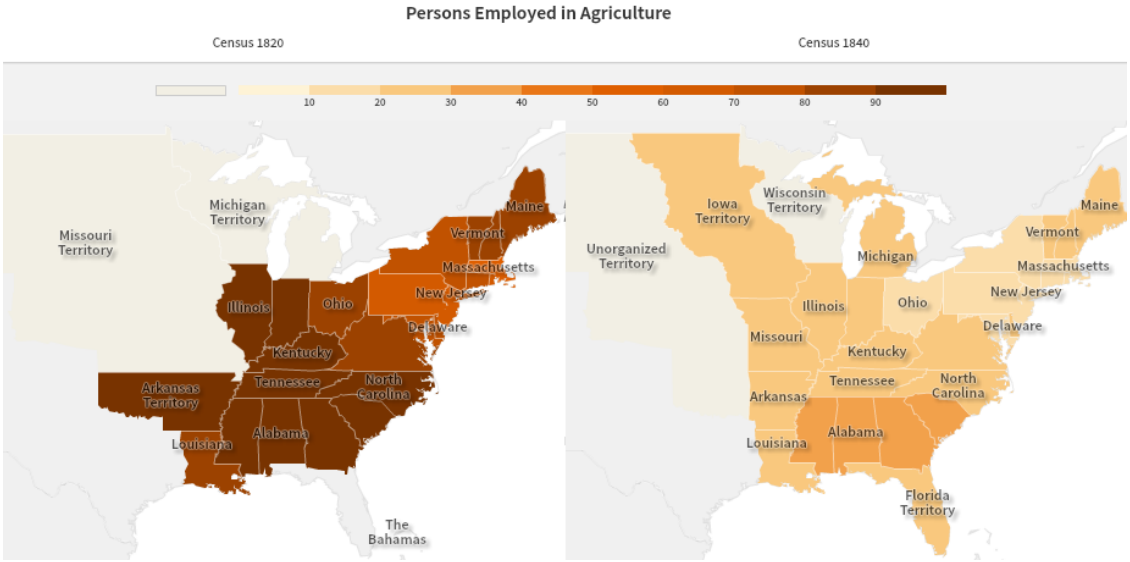
Of course, these rulings by the court were only as strong as the support they secured from legislative and executive actors at the national level. Without support from the other branches, the court was powerless to enforce its rulings, especially when those rulings were against states, which were particularly strong during this period. Indeed, this difficulty was demonstrated with very real clarity in the aftermath of *Johnson* where the state justices were not only unable to protect the creditors, but were themselves removed for their efforts. At the national level, the 11th Amendment also provides a glaring example of how legislative opposition could interfere with the court's decisions. By passing the amendment (and subsequently seeing the states ratify it), Congress, saturated with legislators still skeptical of a strong national authority, swiftly stripped the court of its ability under the law to rule on a broad class of cases. Moreover, the Democratic-Republicans, running on a platform of local self-determination, secured strong majorities that controlled the government for the following two decades, beginning with the election of Thomas Jefferson. Indeed, in the immediate aftermath of the amendment's ratification, the Supreme Court ordered dropped all pending litigation arising under its earlier *Chisholm* ruling with *Hollingsworth v. Virginia* (1798). With the threat of more curbing, the court under Marshall made very little effort to roll back states' authority prior to the election of John Quincy Adams, and even then the steps were very limited.

By the time of *Letson*, however, the growth of the industrial sector and interstate commerce had changed the political landscape, so that when populist legislators attempted to strip the court of its newly-asserted jurisdiction, especially in the rural South, they were unable to do so over objections by the growing strength of pro-economic union parties in the North, characterized primarily by the Whigs and later Republicans. The timing of this is particularly striking in light of the Whigs' takeover of the Senate only a few years previously and their subsequent efforts to block curbing legislation out of the House which, following Graber (1993), provided an opening for a farsighted court to act. Ultimately, despite several attempts to pass such curbing legislation over the half-century following the ruling, none were successful. Immediately prior to the Civil War, even some Southerners were willing to accept some expansion of Federal jurisdiction in light of the increasingly-common practice in the North of seizing slaves of traveling Southerners, culminating in the *Dred Scott v. Sandford* (1857). In arguing for curbing legislation at the end of the century, lawyer Seymour Thompson acknowledged the political constraints that were so successful in preventing Congress from acting,

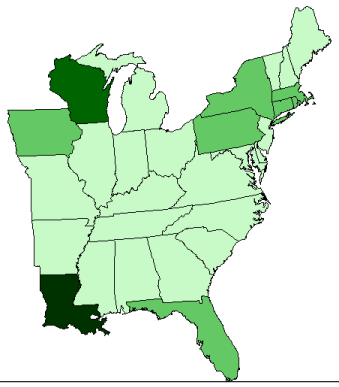
> [T]he rule was established in the beginning of the era of railroad building, in the case of a railroad company, at a time when public opinion ran strongly in favor of railroad

Figure 4: Employment by industry, with darker shades representing greater employment.

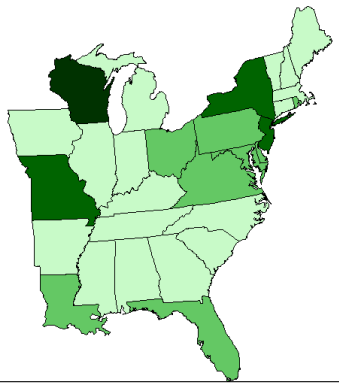
(a) Change in Agricultural employment, 1820-1840.



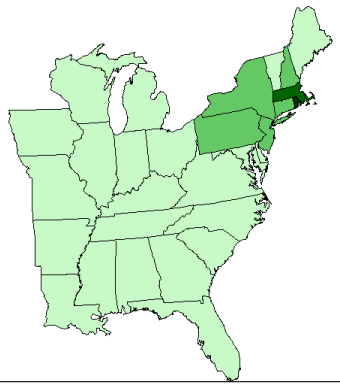
(b) Commercial employment, 1840.



(c) River and canal employment, 1840.



(d) Manufacturing employment, 1840.



> companies...[The decision] had behind it money, power, and respectability... [W]ith the success of Northern arms came a strong feeling in favor of strengthening the national authority (Thompson, 1895).

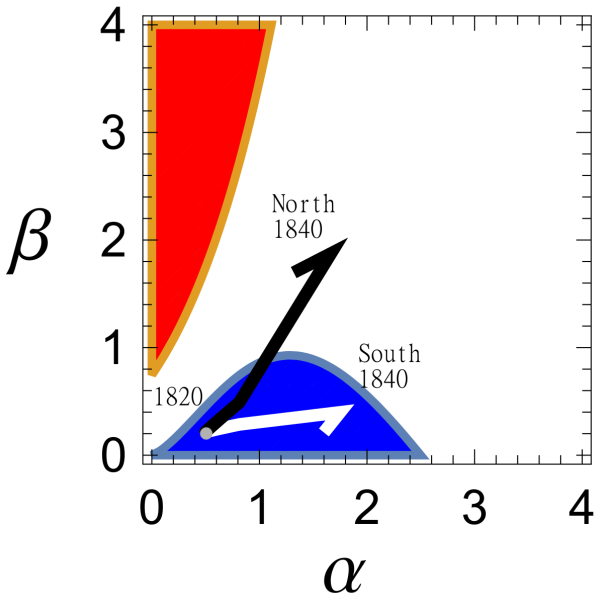
That is, the corporate fiction that the Supreme Court established in *Letson* and related cases was established at a time when the selectorate in many Northern States and, after the Civil War, the national level operated under the assumption of a high reliance on interstate commerce and correspondingly large β. Moreover, the increasing scale of the economy nationwide made the welfare losses associated with biased courts becoming more and more costly irrespective of the relative value of local and interstate commerce.

Figure 4 provides an indicator of how distinctly the North had come to differ from the South in the lead-up to this period beginning in 1840. While the South remained relatively undeveloped and maintained an economy that was nearly universally reliant on agriculture and slave labor, the North developed a more commercialized economy based on manufacture and trade. By 1840, not only were Northerners much more likely to be engaged in commerce, but they were much more likely to be engaged in manufacturing and trade, as well as in transportation and communication, than their Southern counterparts. As manufacturing improved, then, so did the relative efficiency of the local economy. Local workers were becoming much more productive, while the establishment of railroads and canals made interstate transactions much easier and safer, opening more opportunities for interstate commerce, which in turn increased the weight of Northern states' βs relative to their αs. This had the effect of pushing the North to increasingly oppose local control of the judiciary on most issues, with the exception of slavery, a feat at which the the states in question were quite successful once they gained control of the national legislature. The Southern states, on the other hand, saw the weight of their αs increase much faster relative to their βs, leaving them to favor local control and the ability to expropriate non-residents. Both of these trends are visualized in Figure 5. The single glaring exception to this rule was Louisiana, which relied heavily on the commerce and trade that ran through the Mississippi River and New Orleans and which represented a major portion of the economy in the Western United States. These motivations led to a rapid shift away from the earlier arguments in favor of local courts and a weak national court toward a strong national judiciary tasked with enforcing property rights of creditors and other wealthy actors in their dealings across state lines.

5.2 The Post-Bellum Period and the Judiciary Act of 1875

Subsequent to the Civil War and the collapse of slavery—the single institution on which the southern states supported a strong national judiciary—the Republican majority put extensive efforts into solidifying the pre-war jurisprudence of the Supreme Court and further expanding its jurisdiction.

Figure 5: Shifting weight of α and β in both the North and South during the Early 19th Century.



After minor efforts in the 1860s to change the nature of diversity jurisdiction, Congress used the Judiciary Act of 1875, passed out of conference in the waning hours of the 49th Congress, to statutorily entrench a definition of diversity aligned with the Supreme Court's ruling in *Letson* three decades earlier. The final driver of this legislation came when the Supreme Court cited and amendment to the the previous decade's Separable Cases Act, the *Local Prejudices Act*, in refusing to allow removal of *The Sewing Machine Company Cases* under diversity in 1874, despite the fact that two of the three defendant firms satisfied the diversity requirement. Prior to this, the growing political clout of the West had already pushed railroad interests and major farm creditors to clamor for support from Congress to counter the growing threat of the Granges, who by 1871 had not only forced the Illinois legislature to adopt strict new regulatory burdens against the railroads, but also had managed to secure almost complete control of the local judiciary. Indeed, in local elections that year, Republicans were only able to even muster candidates in four of 31 judicial districts (Sundquist, 1983), resulting in a grave threat to out-of-state railroads in particular and other corporate interests more widely and which specifically affected interests in the Northeast and Great Lakes regions where much of the new commerce was concentrated. Figure 6 offers a visual representation of this growth in the Northeast—and noticeable lack of growth in other regions—measuring the density of railroad tracks operating throughout the United States.

Northeastern legislators, keen to continue developing a strong economic union driven by railroads and interstate commerce, proposed a series of reforms to enhance the power of the Federal Courts (Gillman, 2002; de Figueredo and Tiller, 1996). Among these reforms, the final bill backed

Figure 6: Miles of railroad track per 100 square miles, with darker regions exhibiting greater density. Bold states are represented in Congress in the given year.

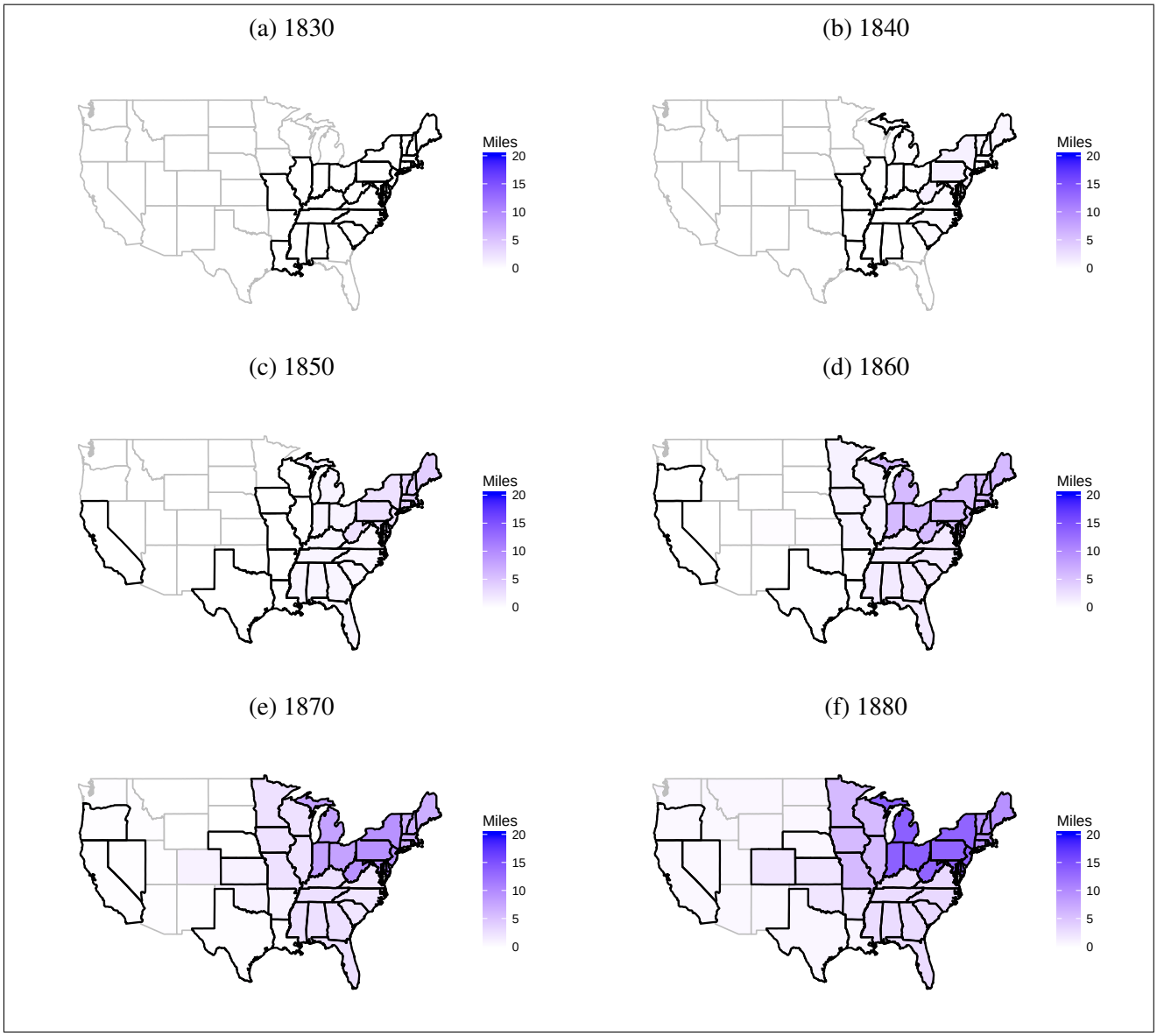


Table 1: Judiciary Act of 1875, Roll Call by Party and Region

		Northeast	Great Lakes	West	Border	South	Total
GOP	Yea	11	9	6	1	6	33
	Abstain	4	2	3	1	5	15
	Nay	2	1	1	0	2	6
	Total	17	12	10	2	13	54
DEM	Yea	0	0	0	1	0	1
	Abstain	0	1	0	1	0	2
	Nay	1	1	2	6	6	16
	Total	1	2	2	8	6	19
TOT	Yea	11	9	6	2	6	34
	Abstain	4	3	3	2	5	17
	Nay	3	2	3	6	8	22
	Total	18	14	12	10	19	73

**There was a single vacant seat in Louisiana at the time of this roll call.*
Source: Congress (1886)

away from the strict language of earlier Judiciary Acts that required complete diversity and allowed for partially-diverse parties to gain access to the federal courts. While this had little practical effect in many cases involving corporations, which already had access to the national courts in most diversity scenarios, this statutory change affirmed the Supreme Court's earlier ruling on such matters and also provided the same benefits to other litigants, regardless of whether they had economic interests or were organized as a single corporation. In conjunction with the relaxation of several other jurisdictional restrains on the Court, especially with respect to federal questions, this aimed to greatly expand statutory access to the national courts for economic claims. In proposing an amendment to adopt what would become the final language of the bill, Senator Matt Carpenter of Wisconsin noted,

> This bill gives precisely the power which the Constitution confers—nothing more, nothing less. The Senator from California proposes to limit the constitutional jurisdiction and restrict it because it was restricted in 1789. In that day to find a man two or three hundred miles or in two or three States away from his home and sue him was a hardship. It has ceased to be a hardship now, because we are nearly always away from home, we are roving and changing and traveling. The whole circumstances of the case are different, and the time has now arrived it seems to me when Congress ought to what the Supreme Court said more than 40 years ago it was its duty to do, vest the power which the Constitution confers in some court of original jurisdiction.

Although not convincing his peers from California–one abstained and one opposed the final bill—

his argument ultimately garnered the support of 34 senators, with 17 more abstentions and 22 opposing the bill on final passage. As demonstrated in Table 1, these votes were drawn almost entirely from the Northeast and Great Lakes regions, as well as a subset of Republicans in the South remaining in office due to the efforts of reconstruction. Notably, however, even a majority of these Republicans eventually did not support the bill.

Table 2: Ordered Logit on Voting Outcomes

	Dependent variable:					
	Vote					
	(1)	(2)	(3)	(4)	(5)	(6)
Miles RR per 100 mi^2, 1870	0.174**		0.172**			
	(0.081)		(0.081)			
Miles RR per 10k Pop., 1870		0.051	0.047			
		(0.056)	(0.056)			
Miles RR per 100 mi^2, 1880				0.125**		0.129**
				(0.056)		(0.058)
Miles RR per 10k Pop., 1880					−0.008	0.009
					(0.028)	(0.029)
GOP	4.058***	3.672***	4.018***	4.024***	3.731***	3.992***
	(0.804)	(0.745)	(0.799)	(0.799)	(0.760)	(0.806)
Intercepts						
Nay/Abstain	2.625***	2.283***	3.169***	2.681***	1.531***	2.853***
	(0.826)	(0.945)	(1.043)	(0.836)	(0.758)	(1.010)
Abstain/Yea	4.273***	3.871***	4.840***	4.334***	3.105***	4.508***
	(0.924)	(1.025)	(1.146)	(0.934)	(0.831)	(1.098)
Observations	73	73	73	73	73	73
Note:						*p<0.1; **p<0.05; ***p<0.01

To further emphasize the role of industry and commerce on the success of the Judiciary Act of 1875, Table 2 provide the results of an ordered logit analysis of the final roll call. Using data derived from the United States Census in both 1870 and 1880 (Adams, 1894), the regional density of railroads with respect to land area has a strong positive correlation with senators' decision

to support the bill on final passage. These results are robust to both party affiliation and state populations during the same period. Strikingly, Table 3, using intrastate railroad density rather than regional density, does not demonstrate the same effects, suggesting that it is indeed the *interstate* nature of commerce rather than the *intrastate* level of commerce that has a major effect. This is consistent with the lack of support observed from the senators from California who, while relatively invested in transportation infrastructure, were nonetheless isolated from much of the rest of the country at the time due to the sheer distances involved in interstate commerce.

Table 3: Ordered Logit on Voting Outcomes (Intrastate)

	Dependent variable:		
	Vote		
	(1)	(2)	(3)
Miles RR per 100 mi^2, 1880	0.026		0.034
	(0.040)		(0.041)
Miles RR per 10k Pop., 1880		0.008	0.011
		(0.015)	(0.015)
GOP	3.684***	3.627***	3.600***
	(0.745)	(0.750)	(0.752)
Intercepts			
Nay/Abstain	1.842***	1.774***	2.067***
	(0.696)	(0.663)	(.758)
Abstain/Yea	3.721***	3.353***	3.658***
	(0.783)	(.754)	(0.847)
Observations	73	73	73
Note:			*p<0.1; **p<0.05; ***p<0.01

These actions to expand the jurisdiction and the resources of the national judiciary had twofold benefits. In the first, straightforward case, granting the national courts the ability to decide cases they previous had not had access to gave the ability to rule on interstate commerce cases without the specter of bias hanging over the decision. Moreover, under the then-existing *Swift* doctrine, the national courts were able to establish uniform legal rules across the Union. Second, the expansion of the courts allowed the those courts to reduce the administrative and procedural costs of securing remedies under national law. Whereas prior to the 1875 Act federal questions were in general

initially answered by state courts, leaving them open to potential bias, the new legislation allowed litigants to take the case directly to the national courts. This Act allowed would-be litigants that might suffer at the hand of such bias in local courts to avoid litigating first in state courts which would only lead costly and uncertain efforts to appeal for a fair ruling in national courts. While this did not directly touch many aspects of interstate commerce, it was an invaluable tool for commercial enterprises in general, who could now seek relief in national courts that were established and manned by individuals more sympathetic to their interests than populist local courts. In hand, this provided the necessary legal support for an increasing number of corporations to expand into the national market in what ultimately became a strong feedback loop of increasing federal protections against state-level regulatory attacks (McGurdy, 1978).

In this environment, no Democratic majority was able to push through significant legislation stripping the court of its jurisdiction in this area or other areas gained in the Judiciary Act of 1875. Reentering national politics in the aftermath of Reconstruction, Southern legislators such as Representative Charles Crisp noted, "The East is the creditor and the South and West the debtor; the East is the money-lender and the South and West the money-borrower" (Congress, 1886). With this, he and a number of allies in the West—including some Western Republicans—made a push to undo some of the nationalization that had occurred during and after the Civil War (Freyer, 1979; Sundquist, 1983). Still, the Republican interests in the Northeast held fast and ensured that litigants would have access to the federal courts under increasingly broad terms designed to protect business interests, a condition which lasted until New Deal majorities garnered the support to roll back some of these advances, albeit largely through changes in the underlying law (as in the case of *Erie*) rather than in access to national courts. Yet even including this period, there have only been six instances of successful court curbing with respect to diversity jurisdiction, most of which were framed not as curbing efforts, but rather relief efforts designed to reduce the federal caseload (Curry, 2007). Still, despite the apparent reduction of the national courts' authority in *Erie*, the expansion of national statutory law more than made up for any such reductions in the national courts' authority by giving potential litigants still more pathways to the federal courts under federal question jurisdiction as opposed to the more restrictive diversity pathway.

5.3 Political Capture

These structural choices, though, are nonetheless subject to political capture. introduction of a national judicial system adds a layer of politics into the courts as actors–whether judges or legislators–are forced to assign which cases belong in which system. Powerful national interests that are weaker at the local level may try to institute rules which favor the national courts independent of efficiency grounds, but rather to simply see their policy preferences enacted. Conversely,

local interests, especially populist ones, may try to keep cases away from national courts where they cannot exploit externalities. Thus, the policy question falls to one in which there is not only a question of what laws should be in place, but also who should interpret those laws. If litigants are able to make these decisions on a case-by-case basis, moreover, the costs are likely to grow further as forum shopping fosters the development of uneven and potentially low-quality law. This suggests not only the need for a clear rule to be established governing which court should rule on each issue, but also a clear rule regarding who should decide which laws are to be implemented.

The model presented here supposes that there is no inherent value associated with any one policy over any other policy—that the legal rules are Coasean in nature. Moreover, every state and every market participant within each state have an equal impact on the political process at the national level. As a result, there is no value to imposing a particular policy at the national level, and no state or type of state can impose an excessively-biased judiciary on the market. However, this is often not the case in practice. Indeed, problems associated with forum shopping contributed in no small part to the Supreme Court's decision to overturn *Swift* in 1938 with *Swift v. Tyson*. These, problems, however, have effects which are largely orthogonal to the model presented here.

6 Conclusion

Federal systems always face trade-offs between yielding to local preferences and cooperating in the national interest. This is particularly true on matters of law and judicial policy, where the choice of venue can have a major impact on the outcome of cases, even in the absence of differences across states in terms of written policy. This project aims to assess one dimension of this challenge that has concerned lawyers, judges, and politicians alike since the founding of the American Republic. Namely, why—and under what conditions—should a federation allow a national court to rule on policies that might otherwise be adjudicated locally, even perhaps, under local law.

Whereas much of the research in federalism to date has focused on the challenges of reconciling policy differences across states, whether they induce externalities or otherwise. This paper has considered the problem from a different perspective that more-closely aligns with a club mentality in which the benefits associated with certain activities accrue to insiders differently than they do to outsiders. This model allows states to extract rents from each other not through externalities associated with policies themselves, but by manipulating the implementation of those policies according to the identity of the parties involved. In particular, it has allowed states to be biased against other states in the implementation of economic policy and in disputes over that policy, as feared by Hamilton and many in the legal profession over the past two centuries. In many instances, this has induced a race-to-the-bottom driven by judges, legislators, and juries alike which has threatened to harm the ability of states to borrow and participate in a national or international

economy.

The model has demonstrated conditions under which states, especially when they are underdeveloped, may choose to impose burdens on actors from other states attempting to conduct business across state lines. Furthermore, it has shown that while some states may be individually better-off in this scenario, the net result will be to reduce social welfare across the nation by inducing states to invest capital suboptimally across the federation, meaning that at least one state will suffer an overall loss despite drawing some rents from its neighbors.

This model was placed in the context of the development of the United States Judiciary over the course of the 19th century. While beginning the century relatively undeveloped and isolated, Industrialization and the growth of manufacturing and general commerce in the Northeast drove the union away from its early efforts to restrict federal jurisdiction in the courts towards an expansion of that power, particularly after the Civil War, when Republicans that dominated the commercial regions of the country came to also dominate the legislative and executive branches of the federal government for several generations. This continued into the 20th century, until the New Deal, when concerns about capture at the national level gave way to a more nuanced approach to federal judicial power.

October 18, 2017

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United States v. Percheman, 32 U.S. 51 (1832)

A Judicial Incentives

This section offers a simple model of judicial bias when one party before the court has disproportionate power to sanction the judge or remove her from office. The bias term, b, presented here represents a simplified version of the same bias term presented in the main model in Section 3 without the nuance that allows the judge to optimize the term for multiple constituencies, however the intuition remains the same. The actors here are modeled after a nonresident investor and a local citizen entrepreneur who probabilistically come before a judge to resolve a dispute. The judge rules on the merits of the case while also facing a reelection or sanctioning decision from the citizen. Throughout this model, the bias term should be interpreted broadly as the judge's ability to influence case around the margins through such methods as scheduling, evidence requirements, and interpretations of vague law—whether statutory or judge-made—and thereby influence the likelihood of a preferred party winning the case in question.

Consider a model of conflict resolution in which there are three actors: a representative investor, a representative citizen, and a judge. The investor has an opportunity to invest capital in a mutually beneficial transaction with the citizen, but the payoff from this transaction is not guaranteed. The transaction may result in costly failure in some scenarios. When this failure occurs, the two parties come before a judge to resolve the dispute, and this judge may either make an unbiased ruling or a biased ruling in favor of one party over the other, specifically a bias in favor of the citizen. The citizen must then decide whether to affirm or reverse this decision (alternatively whether to reelect the judge or not). First period payoffs are then realized, and the investor has one more opportunity to invest in a second transaction, with the judge now bound by the first-period ruling. The remainder of this section formalizes this model.

A.1 Model Specification

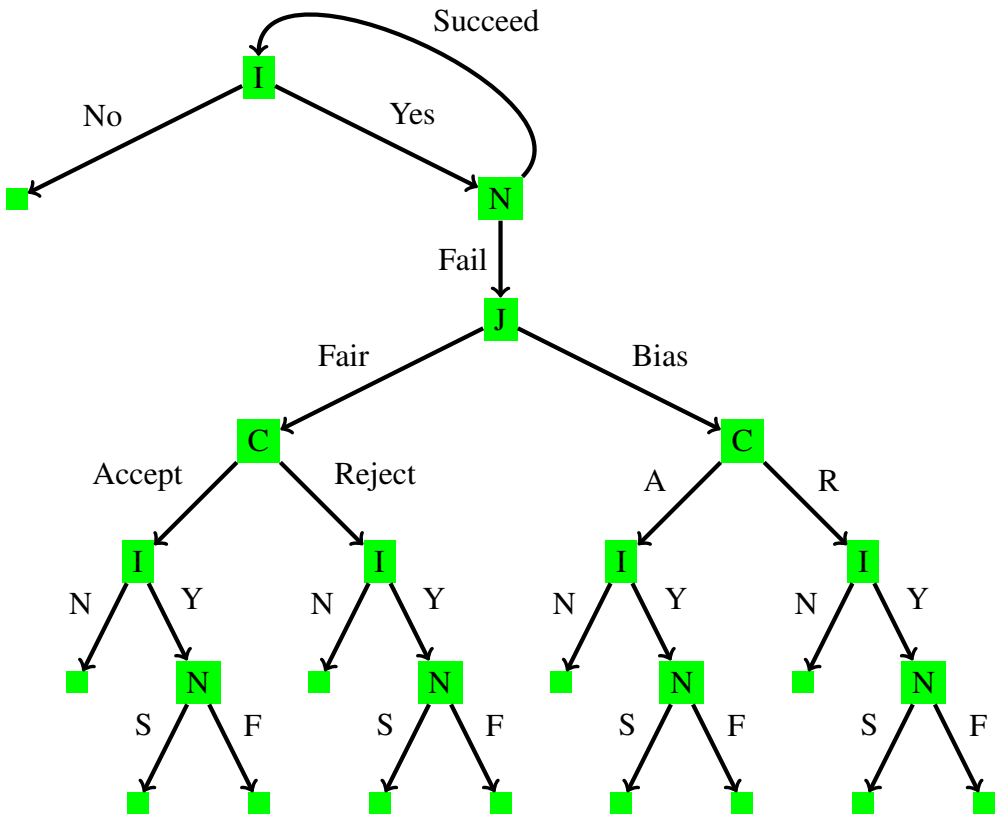
There are three players: an Investor, I, a Citizen, C, and a Judge, J. The investor, I, may be thought of as a capital source such as a bank or wealthy financier searching for an investment. Her actions, $a_I \in \{0, 1\}$, represent a choice of investment levels in a small business operated by citizen, C, which, when successful, yields a return in the form of a period payoff of 2 units and a return of 0 otherwise. The business will be successful with probability, $p \in [\frac{1}{2}, 1]$, which ensures that the Investor will choose to invest absent any other considerations. In the event of receiving an investment and succeeding, the Citizen earns a period payoff in the amount of the investment, a_I. After such a success, the game repeats.

If the Citizen's business fails, both parties to the transaction earn 0, but they also sue each other. Their case is heard by the Judge, who chooses $a_J \in \{-1, 1\}$, where $a_J = -1$ represents a biased outcome and $a_J = 1$ represents a fair outcome. In a fair outcome, the Citizen pays an amount,

$b \in [0, 1]$ to the Investor to settle the claim. In the biased outcome, the Investor must pay b to the Citizen. The citizen may then either accept, $a_C = 1$, or reject, $a_C = -1$, this judgment before the outcome is realized. This step is analogous to a judge facing reelection or legislative sanction as a result of her decision. In the case that the Citizen accepts the Judge's decision, the outcome reflects that chosen by the Judge, and the Judge earns 1 unit of utility. In the case that the Citizen rejects the Judge's decision, the outcome is the opposite of that chosen by the Judge and the Judge loses 1 unit of utility. Note that I do not allow the Investor to sanction the Judge n a manner analogous to the scenario faced by nonresident investors in state courts.

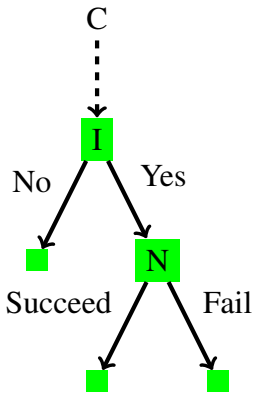
In the final stage of the game, the Investor must once again choose whether to invest a unit of capital in the Citizen's business, where the business again succeeds with probability, p. Here, however, if the business fails, the outcome of the case after the Citizen's input in the preceding period determines the outcome of the case in this stage. If the Investor ever rejects an opportunity to invest, the game ends.

Figure 7: Game Tree. The Investor (I) makes decisions over whether to invest or not. Nature (N) chooses whether the venture succeeds or fails. The Judge (J) decides whether to adopt a fair or biased ruling. The Citizen (C) chooses whether to accept or reject the ruling.



A.2 Equilibrium

Figure 8: Subgame Tree



I solve this game using backward induction. To begin, consider the final investment subgame. The payoff for the Investor in the second period after a judicial ruling is

$$\begin{aligned}\pi_{I2} &= a_{I2}(-1+2p+(1-p)ba_Ja_C)\\ &= \begin{cases} -1+2p+(1-p)b & \text{if } a_{I2}=1,\ a_J=1,\ \&\ a_C=1 \\ & \text{or } a_{I2}=1,\ a_J=-1,\ \&\ a_C=-1 \\ -1+2p-(1-p)b & \text{if } a_{I2}=1,\ a_J=1,\ \&\ a_C=-1 \\ & \text{or } a_{I2}=1,\ a_J=-1,\ \&\ a_C=1 \\ 0 & \text{otherwise} \end{cases}\end{aligned} \tag{17}$$

Since $p \geq \frac{1}{2}$, the investor is better-off making an investment whenever the outcome in the preceding period was fair, irrespective of the value of b. If, on the other hand, the preceding outcome was biased, she is better-off accepting the investment if and only if

$$\begin{aligned} -1+2p-(1-p)b &\geq 0 \\ \frac{2p-1}{1-p} &\geq b \end{aligned} \tag{18}$$

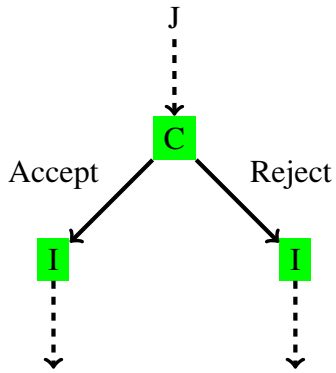
or alternatively when

$$p \geq \frac{b+1}{b+2} \tag{19}$$

Thus, the best response is

$$a^*_{I2} = \begin{cases} 1 & \text{if } a_J a_C = 1 \text{ or } a_J a_C = -1 \ \& \ p \geq \frac{b+1}{b+2} \\ 0 & \text{otherwise} \end{cases} \tag{20}$$

Figure 9: Subgame Tree



This investment decision also sets the payoffs for the Citizen in the second period. Her decision is somewhat more complex, however, since her decision over whether to accept or reject the Judge's decision affects her payoffs in both the first and second period of the game, her total payoff, conditional on reaching the history in which her decision matters, is as follows:

$$\begin{aligned} \pi_C &= p - (1-p)ba_J a_C + a_{I2}(p - (1-p)ba_J a_C) \\ &= \begin{cases} 2p - (1-p)2b & \text{if } a_{I2} = 1,\ a_J = 1,\ \& \ a_C = 1 \\ & \text{or } a_{I2} = 1,\ a_J = -1,\ \& \ a_C = -1 \\ 2p + (1-p)2b & \text{if } p \geq \frac{b+1}{b+2},\ a_J = 1,\ \& \ a_C = -1 \\ & \text{or } p \geq \frac{b+1}{b+2},\ a_J = -1,\ \& \ a_C = 1 \\ p + (1-p)b & \text{if } p < \frac{b+1}{b+2},\ a_J = 1,\ \& \ a_C = -1 \\ & \text{or } p < \frac{b+1}{b+2},\ a_J = -1,\ \& \ a_C = 1 \end{cases} \end{aligned} \tag{21}$$

Since the Investor will invest regardless of the judicial outcome if $p \geq \frac{b+1}{b+2}$, the Citizen will always prefer to see a biased regime implemented under such circumstances. If $p < \frac{b+1}{b+2}$, then the Citizen will prefer to see a biased regime implemented if and only if

$$\begin{aligned} p + (1-p)b &\geq 2p - (1-p)2b \\ b &\geq \frac{p}{3(1-p)} \end{aligned} \tag{22}$$

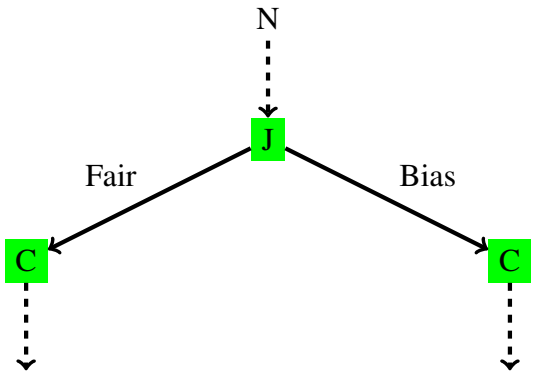
or alternatively if

$$\frac{3b}{1+3b} \geq p \tag{23}$$

Recalling that the judicial outcome is determined by the product, $a_J a_C$, the best response for the Citizen where her decision matters is

$$a_C^* = \begin{cases} 1 & \text{if } a_J = -1,\ p \geq \frac{b+1}{b+2} \\ & \text{or } a_J = -1,\ p < \frac{b+1}{b+2},\ \& \ p \leq \frac{3b}{1+3b} \\ & \text{or } a_J = 1,\ p < \frac{b+1}{b+2},\ \& \ p > \frac{3b}{1+3b} \\ -1 & \text{otherwise} \end{cases} \tag{24}$$

Figure 10: Subgame Tree



The Judge's decision is relatively straightforward then, since she only cares about not being reversed,

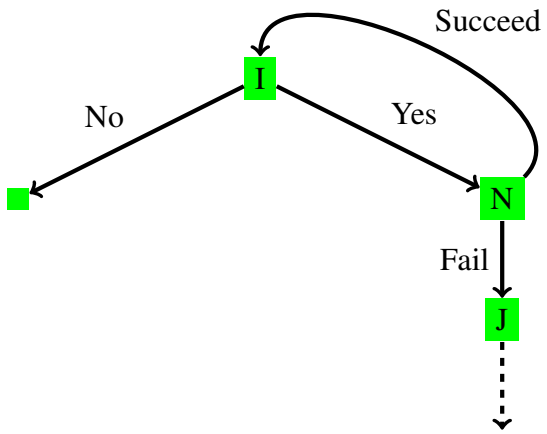
$$\pi_J = \begin{cases} 1 & \text{if } a_C = 1 \\ 0 & \text{otherwise} \end{cases} \tag{25}$$

Drawing from the best response of the Citizen, her best response is then,

$$a_J^* = \begin{cases} 1 & \text{if } p < \frac{b+1}{b+2},\ \& \ p > \frac{3b}{1+3b} \\ -1 & \text{otherwise} \end{cases} \tag{26}$$

To complete the analysis, consider the decision-making process of the Investor in the first period. Here, the investor's payoff is determined by both her own decision over whether to invest and the decisions of the Judge and Citizen that occur in the event of a bad outcome in the investment.

Figure 11: Game Tree



The full payoff function is

$$
\begin{aligned}
\pi_I &= a_{I1}\left[-1+p(2+\pi_I)+(1-p)(ba_Ja_C+\pi_{I2})\right] \\
&= a_{I1}\left[p(1+\pi_I)+(1-p)\left(ba_Ja_C+a_{I2}(-1+2p+(1-p)ba_Ja_C)\right)\right] \\
&= a_{I1}p\pi_I + a_{I1}p + a_{I1}(1-p)\left(ba_Ja_C(1+a_{I2}(1-p))+2pa_{I2}-a_{I2}\right) \\
&= \begin{cases} \frac{p}{1-p} + ba_Ja_C(1+a_{I2}(1-p)) + 2pa_{I2} - a_{I2} & \text{if } a_{I1}=1 \\ 0 & \text{otherwise} \end{cases} \\
&= \begin{cases} \frac{p}{1-p} + b(2-p) + 2p - 1 & \text{if } a_{I1}=1,\ a_{I2}=1,\ a_J=1,\ \&\ a_C=1 \\ & \text{or } a_{I1}=1,\ a_{I2}=1,\ a_J=-1,\ \&\ a_C=-1 \\ \frac{p}{1-p} - b(2-p) + 2p - 1 & \text{if } a_{I1}=1,\ a_{I2}=1,\ a_J=1,\ \&\ a_C=-1 \\ & \text{or } a_{I1}=1,\ a_{I2}=1,\ a_J=-1,\ \&\ a_C=1 \\ \frac{p}{1-p} + b & \text{if } a_{I1}=1,\ a_{I2}=0,\ a_J=1,\ \&\ a_C=1 \\ & \text{or } a_{I1}=1,\ a_{I2}=0,\ a_J=-1,\ \&\ a_C=-1 \\ \frac{p}{1-p} - b & \text{if } a_{I1}=1,\ a_{I2}=0,\ a_J=1,\ \&\ a_C=-1 \\ & \text{or } a_{I1}=1,\ a_{I2}=0,\ a_J=-1,\ \&\ a_C=1 \\ 0 & \text{otherwise} \end{cases}
\end{aligned}
\tag{27}
$$

Knowing that in equilibrium, $a_C = 1$ and applying her best response in period two in conjunction

with the best response of the Judge, the payoff function can be reduced to

$$\pi_I = \begin{cases} \frac{p}{1-p} + b(2-p) + 2p - 1 & \text{if } a_{I1} = 1,\ a_{I2} = 1,\ p < \frac{b+1}{b+2},\ \& \ p > \frac{3b}{1+3b} \\ \frac{p}{1-p} - b(2-p) + 2p - 1 & \text{if } a_{I1} = 1,\ \& \ p \geq \frac{b+1}{b+2} \\ \frac{p}{1-p} - b & \text{if } a_{I1} = 1,\ a_{I2} = 0,\ p < \frac{b+1}{b+2},\ \& \ p \leq \frac{3b}{1+3b} \\ 0 & \text{otherwise} \end{cases} \tag{28}$$

There are three conditions to analyze test for the Investor's best response. First, consider the condition in which $p \geq \frac{b+1}{b+2}$ $\left(\text{alternatively, } b \leq \frac{2p-1}{1-p}\right)$. The Investor will invest if

$$\begin{aligned} \frac{p}{1-p} - b(2-p) + 2p - 1 &\geq 0 \\ \frac{-2p^2 + 4p - 1}{p^2 - 3p + 2} &\geq b \end{aligned} \tag{29}$$

Noting that

$$\frac{-2p^2 + 4p - 1}{p^2 - 3p + 2} \geq \frac{(2p-1)}{(1-p)} \geq b \tag{30}$$

the best response for this condition is $a_{I1} = 1$. Now consider the case in which $p < \frac{b+1}{b+2}$ and $p \leq \frac{3b}{1+3b}$. Here, the relevant condition for investment is

$$\begin{aligned} \frac{p}{1-p} - b &\geq 0 \\ p &\geq \frac{b}{1+b} \end{aligned} \tag{31}$$

Since this condition holds for all $b \in [0, 1]$ for $p \geq \frac{1}{2}$, the best response in this region is $a_{I1} = 1$. Finally, consider the case where $p < \frac{b+1}{b+2}$ and $p > \frac{3b}{1+3b}$. In this case, the condition for investment is

$$\frac{p}{1-p} + b(2-p) + 2p - 1 \geq 0 \tag{32}$$

which holds for all $p \geq \frac{1}{2}$ and $b \in [0, 1]$, so that once again, the optimal strategy is to play $a_{I1} = 1$. This yields the full best response,

$$a_{I1}^* = 1 \tag{33}$$

This completes the full set of equilibrium strategies:

$$
\begin{aligned}
a^*_{I1} &= 1 \\
a^*_J &= \begin{cases} 1 & \text{if } p < \frac{b+1}{b+2},\ \&\ p > \frac{3b}{1+3b} \\ -1 & \text{otherwise} \end{cases} \\
a^*_C &= \begin{cases} 1 & \text{if } a_J = -1,\ p \geq \frac{b+1}{b+2} \\ & \text{or } a_J = -1,\ p < \frac{b+1}{b+2},\ \&\ p \leq \frac{3b}{1+3b} \\ & \text{or } a_J = 1,\ p < \frac{b+1}{b+2},\ \&\ p > \frac{3b}{1+3b} \\ -1 & \text{otherwise} \end{cases} \\
a^*_{I2} &= \begin{cases} 1 & \text{if } a_J a_C = 1 \text{ or } a_J a_C = -1\ \&\ p \geq \frac{b+1}{b+2} \\ 0 & \text{otherwise} \end{cases}
\end{aligned}
\tag{34}
$$

Notably, this model predicts that there will be a bias introduced in most scenarios as the judge panders to her constituent citizens. This arises even without a particularly rich discussion of the structure of the bias. Of course, expanding the discussion of this bias to allow judges to fine-tune the term to satisfy multiple constituencies provides motivation for the term as it is introduced in the primary model presented in Section 3. Significantly, if the model is adapted slightly such that the Investor also has a right to affirm or reject the judge's decision—such as when she is simply another citizen—the Judge trivially faces symmetric outcomes as a result of favoring either party and the incentive to impose a bias is negated. This difference exemplifies the key concerns of the Founders regarding diverse parties before the court and motivates the decisions of states to unfairly judge conflicts arising between residents and these investors.

B Proofs

Proposition 1 *States will invest more in other states when they place a high value on those investments as a result of diminishing returns to scale. They will invest less whenever they place a high value on local investments or when other states place a high tax on investments from out-of-state.*

Proof. Recall that the state's best response with respect to taxation is

$$
x^*_{ij} = \frac{1}{2t_j}\left(2\beta_i + \alpha_i + t_j - \sqrt{4\beta_i^2 + \alpha_i^2 + t_j^2 + 2\alpha_i(2\beta_i + t_j)}\right) \tag{35}
$$

There are three parts to this proof, associated with each of the three variables which are relevant to the state's response. First, consider the effect of the state's preference for local investments.

Taking the derivative with respect to α_i yields,

$$\mathrm{d}_{\alpha_i} x_{ij}^* = \frac{1}{2t_j}\left(1 - \frac{\alpha_i + 2\beta_i + t_j}{q_i}\right) \tag{36}$$

where

$$q_i = \sqrt{\alpha_i^2 + 4\beta_i^2 + t_j^2 + 2\alpha_i(2\beta_i + t_j)} \tag{37}$$

Since the tax cannot be negative (under this model), I need only show that $\alpha_i + 2\beta_i + t_j > q_i$. Squaring both sides, we wish to show

$$\begin{aligned}(\alpha_i + 2\beta_i + t_j)^2 &= \alpha_i^2 + 4\alpha_i\beta_i + 4\beta_i^2 + 2\alpha_i t_j + 4\beta_i t_j + t_j^2 \\ &> \alpha_i^2 + 4\beta_i^2 + t_j^2 + 2\alpha_i(2\beta_i + t_j)\end{aligned} \tag{38}$$

Subtracting appropriate terms from the squared term, we are left with

$$\begin{aligned}4\alpha_i\beta_i + 2\alpha_i t_j + 4\beta_i t_j &> 2\alpha_i(2\beta_i + t_j) \\ 4\beta_i t_j &> 0\end{aligned} \tag{39}$$

which holds for any positive tax.

For the second part, consider the effect of β_i. Taking the derivative yields,

$$\mathrm{d}_{\beta_i} x_{ij}^* = \frac{1}{t_j}\left(1 - \frac{\alpha_i + 2\beta_i}{q_i}\right) \tag{40}$$

Again, since taxes are always positive, we may ignore the multiplicative term so that we need only show that

$$\alpha_i + 2\beta_i < q_i \tag{41}$$

Squaring as before yields

$$(\alpha_i + 2\beta_i)^2 = \alpha_i^2 + 4\alpha_i\beta_i + 4\beta_i^2 \tag{42}$$

which is straightforwardly less that q_i^2 when taxes are positive:

$$\begin{aligned}\alpha_i^2 + 4\alpha_i\beta_i + 4\beta_i^2 &< \alpha_i^2 + 4\beta_i^2 + t_j^2 + 2\alpha_i(2\beta_i + t_j) \\ 4\alpha_i\beta_i &< t_j^2 + 2\alpha_i(2\beta_i + t_j) \\ 0 &< t_j^2 + 2\alpha_i t_j\end{aligned} \tag{43}$$

For the third part, we wish to show that the derivative with respect to t_j is negative. Recalling

the derivative,

$$\mathrm{d}_{t_j} x_{ij}^* = -\frac{1}{2t_j^2}\left(\alpha_i + 2\beta_i + t_j - q_i - t_j\left(1 - \frac{\alpha_i + t_j}{q_i}\right)\right) \tag{44}$$

Once again, we may ignore the outer t_j term, and we need only show that

$$\begin{aligned}
\alpha_i + 2\beta_i + t_j - q_i - t_j\left(1 - \frac{\alpha_i + t_j}{q_i}\right) &> 0 \\
\alpha_i + 2\beta_i - q_i + \frac{t_j}{q_i}\left(\alpha_i + t_j\right) &> 0 \\
\left(\alpha_i + 2\beta_i\right) q_i - q_i^2 + t_j(\alpha_i + t_j) &> 0 \\
\left(\alpha_i + 2\beta_i\right) q_i - \alpha_i^2 - 4\beta_i^2 - t_j^2 - 2\alpha_i(2\beta_i + t_j) + t_j(\alpha_i + t_j) &> 0 \\
\left(\alpha_i + 2\beta_i\right) q_i - \alpha_i^2 - 4\beta_i^2 - 4\alpha_i\beta_i - t_j\alpha_i &> 0 \\
\frac{\alpha_i^2 + 4\beta_i^2 + 4\alpha_i\beta_i + t_j\alpha_i}{\alpha_i + 2\beta_i} &< q_i
\end{aligned} \tag{45}$$

Squaring both sides, we require

$$\frac{(\alpha_i^2 + 4\beta_i^2 + 4\alpha_i\beta_i + t_j\alpha_i)^2}{\alpha_i^2 + 4\alpha_i\beta_i + 4\beta_i^2} < \alpha_i^2 + 4\beta_i^2 + t_j^2 + 2\alpha_i(2\beta_i + t_j) \tag{46}$$

Let $\upsilon_i = \alpha_i^2 + 4\alpha_i\beta_i + 4\beta_i^2$ so that this becomes

$$\begin{aligned}
\frac{(\upsilon_i + t_j\alpha_i)^2}{\upsilon_i} &< \upsilon_i + t_j^2 + 2\alpha_i t_j \\
\upsilon_i^2 + 2t_j\alpha_i\upsilon_i + t_j^2\alpha_i^2 &< \upsilon_i^2 + t_j^2\upsilon_i + 2\alpha_i t_j\upsilon_i \\
\alpha_i^2 &< \upsilon_i \\
0 &< 4\alpha_i\beta_i + 4\beta_i^2
\end{aligned} \tag{47}$$

which always holds. □

Proposition 2 *States impose a low bias rate when they place a high value on receiving investments locally. They may also impose a low bias rate when other states place a sufficiently low value on out-of-state investments relative to local investments. However, they will impose a high bias rate whenever other states place a high value on out-of-state investments.*

Proof. First consider the derivative of t_i^* with respect to α_i:

$$\mathrm{d}_{\alpha_i} t_i^* = -\frac{(\alpha_j + \beta_j)(\alpha_j\beta_j + \beta_j^2 + 2\alpha_i^2 + \beta_j(2\alpha_i + p_i))}{2\alpha_i p_i} < 0 \tag{48}$$

where

$$p_i = \sqrt{(\alpha_j + \beta_j)(\alpha_j + \beta_j + 4\alpha_i)} \tag{49}$$

Here, every term in the fraction is positive, so that the leading negative is sufficient to show that the derivative is negative.

The subsequent claims in the proposition are less straightforward. Consider the derivative with respect to β_i,

$$\mathrm{d}_{\beta_j} t_i^* = \frac{1}{2\alpha_i}\left(\alpha_j + 2\beta_j + \alpha_i - p_i - \frac{(\beta_j - \alpha_i)(\alpha_j + \beta_j + 2\alpha_i)}{p_i}\right) \tag{50}$$

Dropping the $\frac{1}{2\alpha_i}$ term, we will look at the condition for a positive derivative.

$$\begin{aligned} \alpha_j + 2\beta_j + \alpha_i - p_i - \frac{(\beta_j - \alpha_i)(\alpha_j + \beta_j + 2\alpha_i)}{p_i} &> 0 \\ \alpha_j p_i + 2\beta_j p_i + \alpha_i p_i - p_i^2 - (\beta_j - \alpha_i)(\alpha_j + \beta_j + 2\alpha_i) &> 0 \end{aligned} \tag{51}$$

Rearranging yields

$$\begin{aligned} (\alpha_j + 2\beta_j + \alpha_i)\, p_i &> p_i^2 + (\beta_j - \alpha_i)(\alpha_j + \beta_j + 2\alpha_i) \\ (\alpha_j + 2\beta_j + \alpha_i)\, p_i &> (\alpha_j + \beta_j)(\alpha_j + \beta_j + 4\alpha_i) + (\beta_j - \alpha_i)(\alpha_j + \beta_j + 2\alpha_i) \\ (\alpha_j + 2\beta_j + \alpha_i)\, p_i &> \alpha_j^2 + 3\alpha_j\beta_j + 3\alpha_j\alpha_i + 2\beta_j^2 + 5\beta_j\alpha_i - 2\alpha_i^2 \end{aligned} \tag{52}$$

Here, if the RHS is negative, then the statement holds trivially, since the LHS is strictly positive. This is the the case whenever

$$\beta_j < \frac{-1}{4}\left(5\alpha_i + 3\alpha_j - \sqrt{41\alpha_i^2 + 6\alpha_i\alpha_j + \alpha_j^2}\right) \tag{53}$$

This solution is only positive when $\alpha_i < \frac{\alpha_j(3+\sqrt{17})}{4}$. When both sides of equation (52) are positive, we can approach this problem as in the preceding proof. Let $\nu_i = (\alpha_j + 2\beta_j + \alpha_i)$ and square both sides of the equation to obtain the condition,

$$\begin{aligned} \nu_i^2 p_i^2 &> \left(\alpha_j^2 + 3\alpha_j\beta_j + 3\alpha_j\alpha_i + 2\beta_j^2 + 5\beta_j\alpha_i - 2\alpha_i^2\right)^2 \\ \nu_i^2 p_i^2 &> \left(\nu_i^2 - \alpha_j\beta_j + \alpha_j\alpha_i - 2\beta_j^2 + \beta_j\alpha_i - 3\alpha_i^2\right)^2 \\ \nu_i^2 p_i^2 &> \nu_i^4 + 2\nu_i^2\left(\alpha_j\alpha_i - \alpha_j\beta_j - 2\beta_j^2 + \beta_j\alpha_i - 3\alpha_i^2\right) + \left(\alpha_j\alpha_i - \alpha_j\beta_j - 2\beta_j^2 + \beta_j\alpha_i - 3\alpha_i^2\right)^2 \\ 0 &> \nu_i^4 + \nu_i^2\left(-6\alpha_i^2 - 2\alpha_i\left(\alpha_j - 3\beta_j\right) + \alpha_j^2 - 3\beta_j^2\right) + \left(\alpha_j\alpha_i - \alpha_j\beta_j - 2\beta_j^2 + \beta_j\alpha_i - 3\alpha_i^2\right)^2 \\ 0 &> -4\alpha_i^2\left(-\alpha_i^2 + \alpha_i\left(4\alpha_j + 6\beta_j\right) + \alpha_j\left(\alpha_j + 2\beta_j\right)\right) \end{aligned} \tag{54}$$

Here, we can ignore the $4\alpha_i^2$ term, leaving

$$\begin{aligned} -\alpha_i^2 + \alpha_i\left(4\alpha_j + 6\beta_j\right) + \alpha_j\left(\alpha_j + 2\beta_j\right) &> 0 \\ 6\alpha_i\beta_j + 2\alpha_j\beta_j &> \alpha_i^2 - 4\alpha_i\alpha_j - \alpha_j^2 \\ \beta_j &> \frac{\alpha_i^2 - 4\alpha_i\alpha_j - \alpha_j^2}{2\left(3\alpha_i + \alpha_j\right)} \end{aligned} \tag{55}$$

There is a positive solution to this equation whenever $\alpha_i > \left(2+\sqrt{5}\right)\alpha_j$.Recalling the preceding condition from equation (53), we can see that there is a small interval of parameter values, $\alpha_i \in \left(\frac{\alpha_j(3+\sqrt{17})}{4}, \alpha_j\left(2+\sqrt{5}\right)\right)$, for which there is a region in which imposed tax rates, t_i^* are decreasing in β_j. Comparing the two conditions we have identified, however, we note that the critical value on β_j induced in equation (55) is less than that of equation (53), indicating that there is no value for which the derivative of the equilibrium tax rate with respect to β_j is negative:

$$\begin{aligned} \frac{-1}{4}\left(5\alpha_i + 3\alpha_j - \sqrt{41\alpha_i^2 + 6\alpha_i\alpha_j + \alpha_j^2}\right) &> \frac{\alpha_i^2 - 4\alpha_i\alpha_j - \alpha_j^2}{2\left(3\alpha_i + \alpha_j\right)} \\ \left(3\alpha_i + \alpha_j\right)\left(\sqrt{41\alpha_i^2 + 6\alpha_i\alpha_j + \alpha_j^2} - 5\alpha_i - 3\alpha_j\right) &> 2\left(\alpha_i^2 - 4\alpha_i\alpha_j - \alpha_j^2\right) \\ \left(\alpha_j + 3\alpha_i\right)\sqrt{41\alpha_i^2 + 6\alpha_i\alpha_j + \alpha_j^2} - 15\alpha_i^2 - 14\alpha_i\alpha_j - 3\alpha_j^2 &> 2\alpha_i^2 - 8\alpha_i\alpha_j - 2\alpha_j^2 \\ \left(\alpha_j + 3\alpha_i\right)\sqrt{41\alpha_i^2 + 6\alpha_i\alpha_j + \alpha_j^2} &> 17\alpha_i^2 + 6\alpha_i\alpha_j + \alpha_j^2 \end{aligned} \tag{56}$$

Squaring both sides yields

$$\begin{aligned} 369\alpha_i^4 + 300\alpha_i^3\alpha_j + 86\alpha_i^2\alpha_j^2 + 12\alpha_i\alpha_j^3 + \alpha_j^4 &> 289\alpha_i^4 + 204\alpha_i^3\alpha_j + 70\alpha_i^2\alpha_j^2 + 12\alpha_i\alpha_j^3 + \alpha_j^4 \\ 80\alpha_i^4 + 96\alpha_i^3\alpha_j + 16\alpha_i^2\alpha_j^2 &> 0 \end{aligned} \tag{57}$$

As both α_i and α_j are positive, this is straightforwardly true, so $\mathrm{d}_{\beta_j} t_i^* > 0$ for all $\beta_j > 0$.

Finally, consider the derivative with respect to α_j.

$$\mathrm{d}_{\alpha_j} t_i^* = \frac{\left(\beta_j - \alpha_i\right)\left(\alpha_j + \beta_j + 2\alpha_i + p_i\right)}{2\alpha_i p_i} \tag{58}$$

This term is positive whenever $\beta_j > \alpha_i$, and negative otherwise. □

Proposition 3 *Total social welfare is decreasing in the magnitude of tax imposed by any state. Whenever taxes are positive in any state, there will be at least one state which suffers a welfare loss.*

Proof. Consider the utility functions of the state actors:

$$U_i(t_i, \mathbf{x_i}|b_{-i}, \mathbf{x_{-i}}) = \sum_j^N (\alpha_i \log(x_{ji}) + t_i x_{ji} + \beta_i \log(x_{ij}) - t_j x_{ij}) \tag{59}$$

Summing across the entire federation and noting that $\sum_i^N \sum_j^N (t_i x_{ji} - t_j x_{ij})$, the total social welfare becomes

$$\begin{aligned} U_{Total}(t_i, \mathbf{x_i}|i \in \{1, \ldots, N\}) &= \sum_i^N \sum_j^N (\alpha_i \log(x_{ji}) + t_i x_{ji} + \beta_i \log(x_{ij}) - t_j x_{ij}) \\ &= \sum_i^N \sum_j^N (\alpha_i \log(x_{ji}) + \beta_i \log(x_{ij})) \end{aligned} \tag{60}$$

Note that this welfare function is identical whether the states are using a centralized or decentralized enforcement regime, since taxes are zero-sum across the federation. Furthermore, since efficient investments by each state are independent of investments by any other state, the socially-optimal investment is that which maximizes the welfare of a single state in the absence of taxes; that is the one which solves

$$\mathbf{X}^* = \text{argmax}_{\mathbf{X}} \left\{ \sum_j^N (\alpha_i \log(x_{ji}) + \beta_i \log(x_{ij})) \, | i \in \{1, \ldots, N\} \right\} \tag{61}$$

for two states, this is the tensor, $\mathbf{X}$, which satisfies

$$\mathbf{X}^* = \text{argmax}_{\mathbf{x_1}, \mathbf{x_2}} \left\{ \sum_j^N (\alpha_i \log(x_{ji}) + \beta_i \log(x_{ij})) \right\} \tag{62}$$

This is simply the solution we identified for the states' investments in the absence of any taxes, which was identified in Section 4. Recall we had for each state individually,

$$x_{ij}^\dagger = \frac{\beta_i}{\alpha_i + 2\beta_i} \tag{63}$$

Any deviation from this allocation makes the states individually worse-off in the absence of taxes and so reduces the social welfare of the federation as a whole. Since states do allocate their capital differently under taxation, the federation as a whole is straightforwardly worse-off under a regime which allows states to individually impose taxes on economic activity. Moreover, since the total welfare of the federation is reduced, there must be at least one state that is individually made worse-off under such a regime. □

C Arbitrarily Many States with Variable Capital

In this section, the model is solved for a more general system of N states with arbitrary capital constraints. First, I consider the case of arbitrary capital with two states, and then I relax the number of states in the following subsection.

C.1 Arbitrary Capital Reserves

To begin this analysis, revisit the problem for two states, but instead of allowing the investor a single unit of capital, let the investors have k_i units available. The utility function then takes the form,

$$U_i(t_i, x_{ij}|t_j, x_{ji}) = (\alpha_i + \beta_i)\log(k_i - x_{ij}) + \alpha_i \log(x_{ji}) + t_i x_{ji} + \beta_i \log(x_{ij}) - t_j x_{ij} \tag{64}$$

Taking states' decisions on taxes as fixed, the investment decisions for state i solve

$$\text{argmax}_{x_j} U_i(t_i, x_{ij}|t_j, x_{ji}) \tag{65}$$

This yields the FOC,

$$0 = \mathrm{d}_{x_{ij}} U_i(t_i, x^*_{ij}|t_j, x_{ji}) = -\frac{\alpha_i + \beta_i}{k_i - x^*_{ij}} + \frac{\beta_i}{x^*_{ij}} - t_j \tag{66}$$

which implies

$$x^*_{ij} = \frac{1}{2t_j}\left(2\beta_i + \alpha_i + k_i t_j - \sqrt{4\beta_i^2 + \alpha_i^2 + k_i^2 t_j^2 + 2\alpha_i(2\beta_i + k_i t_j)}\right) \tag{67}$$

The comparative statics on this solution are identical to those in the original case with unit investment.

Now we can consider the optimal tax that this induces for the states, conditioning on $\mathbf{x}_i$ and $\mathbf{x}_j$. Taking the FOC with respect to t_i,

$$\begin{aligned} 0 &= \mathrm{d}_{t_i} U_i(t^*_i, x^*_{ij}|t^*_j, x^*_{ji}) \\ &= \left(-\frac{\alpha_i + \beta_i}{k_i - x^*_{ij}} + \frac{\beta_i}{x^*_{ij}} - t_j\right)\mathrm{d}_{t_i} x^*_{ij} + \left(\frac{\alpha_i}{x^*_{ji}} + t_i\right)\mathrm{d}_{t_i} x^*_{ji} + x^*_{ji} \end{aligned} \tag{68}$$

Letting $q_i \equiv \sqrt{\alpha_i^2 + 4\beta_i^2 + k_i^2 t_j^2 + 2\alpha_i(2\beta_i + k_i t_j)}$ we have

$$\mathrm{d}_{t_i} x_{ji}^* = -\frac{1}{2t_i^2}\left(\alpha_j + 2\beta_j - q_j + \frac{k_j t_i \alpha_j + k_j^2 t_i^2}{q_j}\right) \tag{69a}$$

$$\mathrm{d}_{t_i} x_{ij}^* = 0 \tag{69b}$$

And so the preceding equations become

$$0 = \left(\frac{\alpha_i}{x_{ji}^*} + t_i^*\right)\mathrm{d}_{t_i} x_{ji}^* + x_{ji}^* \tag{70}$$

Solving for t_i yields

$$t_i^* = \frac{1}{2\alpha_i k_j}\left(\alpha_j\beta_j + \beta_j^2 - \alpha_j\alpha_i + \beta_j\alpha_i + (\beta_j - \alpha_i)p_i\right) \tag{71}$$

where $p_i = \sqrt{(\alpha_j + \beta_j)(\alpha_j + \beta_j + 4\alpha_i)}$. This is once again identical to the example with a single unit of capital with the exception of the scaling factor, k_j.

Strictly Positive Returns

The equilibrium just defined may likewise be reinterpreted to ensure positive returns on investments. Throughout this model, the use of $\log(x)$ to measure returns on investment, especially with a unit capital reserve, has ensured that the returns on investments (prior to tax transfers) are strictly negative. To account for this, consider the alternative model where the use of $\log(1 + x)$ replaces $\log(x)$, ensuring positive returns when x is restricted to positive values. This is, however, also equivalent to an environment in which the total capital available to states is $1 + N$, and the equilibrium investment induced by the tax regime is $x_{ij} > 1$ for every pair of states, i and j, with tax receipts of the form, $t(1 - x)$.

Of course, in many instances, this will not be the case, as states will be induced to raise taxes in excess of the levels which would induce strictly positive investment in every state, in which case the offending states would receive no outside investments from the states which suffers as a result of those taxes. In large federations, this may range from a single state withdrawing all investments to every state doing so.

In the case where there are two states, this constraint is binding if and only if

$$k_i \leq \frac{\alpha_i + 2\beta_i}{\beta_i} \quad \text{or} \quad t_j \geq \frac{k_i\beta_i - \alpha_i - 2\beta_i}{k_i - 1} \tag{72}$$

It is straightforward to see that whenever any state which is so-constrained under a regime

allowing taxation will make its trading partner worse-off under that regime than under one which eliminates taxation. By reallocating all of its capital locally, state i prevents state j from accruing any benefits that would arise in the form of both taxes and economic output. Meanwhile, state j also suffers losses due to the taxation imposed by state i in such a regime, necessarily making them worse-off than they would be under an efficient no-tax regime. State i, on the other hand, may nonetheless benefit from from a regime allowing taxation, provided α_i and β_j are sufficiently large relative to β_i.

C.2 Arbitrary N

Let each of N states choose a tax rate, t_i and a level of investment, $x_{ij} \in [0, k_i]$, in commerce with each other state, j, subject to a budget constraint, $0 \leq \sum_j^N x_{ij} \leq k_i$. Also, let the payoff function for each state follow the same form as in the two-state model so that

$$U_i(t_i, \mathbf{x_i}|b_{-i}, \mathbf{x_{-i}}) = \sum_j^I \left(\alpha_i \log\left(x_{ij}\right) - t_j x_{ij} + \beta_i \log\left(x_{ji}\right) + t_i x_{ji}\right) \tag{73}$$

Taking states' decisions on tax as fixed, the investment decisions for state i solve

$$\text{argmax}_{\mathbf{x_i}} U_i(t_i, \mathbf{x_i}|b_{-i}, \mathbf{x_{-i}}) \text{ subject to } \sum_j^I x_{ij} \leq k_i \tag{74}$$

Taking the Lagrangian with respect to $\mathbf{x_i}$,

$$\mathcal{L}_i(\mathbf{x_i}, \lambda_i) = \lambda_i \left(k_i - \sum_j^I x_{ij}\right) + \sum_j^I \left(\alpha_i \log\left(x_{ij}\right) - t_j x_{ij} + \beta_i \log\left(x_{ji}\right) + t_i x_{ji}\right) \tag{75}$$

we are left with the following FOC:

$$0 = \frac{\alpha_i}{x_{ij}^*} - t_j - \lambda_i^* \; \forall \; j \neq i \tag{76a}$$

$$0 = \frac{\alpha_i + \beta_i}{x_{ii}^*} - \lambda_i^* \tag{76b}$$

$$0 = k_i - \sum_j^I x_{ij}^* \tag{76c}$$

So we have

$$x_{ij}^* = \frac{\alpha_i}{t_j + \lambda_i^*} = \frac{\alpha_i x_{ii}^*}{t_j x_{ii}^* + \alpha_i + \beta_i} \quad \forall \quad j \neq i \tag{77a}$$

$$x_{ii}^* = k_i - \sum_{j \neq i}^{I} x_{ij}^* = k_i - \sum_{j \neq i}^{I} \frac{\alpha_i x_{ii}^*}{t_j x_{ii}^* + \alpha_i + \beta_i} \tag{77b}$$

$$\lambda_i^* = \frac{\alpha_i + \beta_i}{x_{ii}^*} \tag{77c}$$

Applying these results to the states' utility functions, we have

$$U_i(t_i, \mathbf{x}_\mathbf{i}^* | b_{-i}, \mathbf{x}_{-\mathbf{i}}^*) = \sum_{j}^{I} \left(\alpha_i \log\left(x_{ij}^*\right) - t_j x_{ij}^* + \beta_i \log\left(x_{ji}^*\right) + t_i x_{ji}^* \right) \tag{78}$$

where (77a) makes it apparent that whenever x_{ii}^* is positive, so is every x_{ij}^*. As it is straightforwardly optimal for the states to make at least one positive investment, it is also optimal for them to make positive investments in every state. Furthermore, whenever a state prefers to reallocate some measure of capital away from any other state, the optimal reallocation of that capital will be spread over every remaining state, including itself. Thus, $\mathrm{d}x_{ij} \propto -\mathrm{d}x_{ik}$ for all $k \neq j$.

Now we can take the derivative with respect to t_i to identify the appropriate first order condition on taxation,

$$\frac{\mathrm{d}}{\mathrm{d}t_i} U_i(t_i, \mathbf{x}_\mathbf{i}^* | b_{-i}, \mathbf{x}_{-\mathbf{i}}^*) = \frac{\alpha_i + \beta_i}{x_{ii}^*} \frac{\mathrm{d}x_{ii}^*}{\mathrm{d}t_i} + \sum_{j \neq i}^{I} \left(\left(\frac{\alpha_i}{x_{ij}^*} - t_j \right) \frac{\mathrm{d}x_{ij}^*}{\mathrm{d}t_i} + \left(\frac{\beta_i}{x_{ji}^*} + t_i \right) \frac{\mathrm{d}x_{ji}^*}{\mathrm{d}t_i} + x_{ji}^* \right) \tag{79}$$

We can note here that a state's own investment decisions never depend on the local tax rate, so that we have $\frac{\mathrm{d}x_{ii}^*}{\mathrm{d}t_i} = \frac{\mathrm{d}x_{ij}^*}{\mathrm{d}t_i} = 0$ and the first order condition becomes

$$0 = \sum_{j \neq i}^{I} \left(\left(\frac{\beta_i}{x_{ji}^*} + t_i^* \right) \frac{\mathrm{d}x_{ji}^*}{\mathrm{d}t_i^*} + x_{ji}^* \right) \tag{80}$$

which is part of a system of N coupled differential equations. In particular, we have

$$\frac{\mathrm{d}}{\mathrm{d}t_i} U_i(t_i | \mathbf{x}_\mathbf{i}^*, b_{-i}, \mathbf{x}_{-\mathbf{i}}^*) = f(t_i, \mathbf{t}_{-i}) \; \forall \; i \tag{81}$$

Solving (80) for t_i^* yields

$$t_i^* = -\frac{\sum_{j \neq i}^{I} \left(\frac{\beta_i}{x_{ji}^*} \frac{\mathrm{d}x_{ji}^*}{\mathrm{d}t_i^*} + x_{ji}^* \right)}{\sum_{j \neq i}^{I} \frac{\mathrm{d}x_{ji}^*}{\mathrm{d}t_i^*}} \tag{82}$$

which can be characterized in part by noting that we have

$$\begin{aligned}\frac{\mathrm{d}x^*_{ji}}{\mathrm{d}t^*_i} &= \frac{\alpha_j\left((t_i x^*_{jj}+\alpha_j+\beta_j)\frac{\mathrm{d}x^*_{jj}}{\mathrm{d}t_i} - x^*_{jj}\left(x^*_{jj}+t_i\frac{\mathrm{d}x^*_{jj}}{\mathrm{d}t_i}\right)\right)}{(t_i x^*_{jj}+\alpha_j+\beta_j)^2}\\ &= \frac{\alpha_j\left((\alpha_j+\beta_j)\frac{\mathrm{d}x^*_{jj}}{\mathrm{d}t_i} - x^{*2}_{jj}\right)}{(t_i x^*_{jj}+\alpha_j+\beta_j)^2}\\ &= \frac{x^{*2}_{ji}\left((\alpha_j+\beta_j)\frac{\mathrm{d}x^*_{jj}}{\mathrm{d}t_i} - x^{*2}_{jj}\right)}{\alpha_j x^{*2}_{jj}}\\ &= \frac{1}{\alpha_j}\left(\frac{x^{*2}_{ji}(\alpha_j+\beta_j)}{x^{*2}_{jj}}\frac{\mathrm{d}x^*_{jj}}{\mathrm{d}t_i} - 1\right)\end{aligned} \tag{83}$$

Since $\mathrm{sgn}[\mathrm{d}_{t^*_i}x^*_{ji}] = \mathrm{sgn}[-\mathrm{d}_{t^*_i}x^*_{jj}]$, if $\mathrm{d}_{t^*_i}x^*_{ji} > 0$, then $\mathrm{d}_{t^*_i}x^*_{jj} < 0$, and

$$\frac{x^{*2}_{ji}(\alpha_j+\beta_j)}{x^{*2}_{jj}}\frac{\mathrm{d}x^*_{jj}}{\mathrm{d}t_i} - 1 > 0 \tag{84}$$

But this in turn implies

$$\frac{x^{*2}_{ji}(\alpha_j+\beta_j)}{x^{*2}_{jj}} < \frac{\mathrm{d}t_i}{\mathrm{d}x^*_{jj}} < 0 \tag{85}$$

which is an impossibility. Also, if $\mathrm{d}_{t^*_i}x^*_{ji} = 0$, then $\mathrm{d}_{t^*_i}x^*_{jj} = 0$, and we have $-\frac{1}{\alpha_j} = 0$, another impossibility. Thus $\mathrm{d}_{t^*_i}x^*_{ji} < 0$ and $\mathrm{d}_{t^*_i}x^*_{jj} > 0$ for every state.