

Preempting Preemption in Federal Systems

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Abstract

This paper develops a formal model of rule making in federal systems where uniform rules are desirable, but resisted by ideologically diverse states. While individual states initially set their own rules, they do so under the threat of preemption by a national legislature that is able to impose a uniform standard nationwide whenever variation across states becomes too large. As this is costly to extreme states from an ideological perspective, those states can unilaterally decide to partially moderate their own rules relative to the rest of the federation in an effort to disincentivize such a legislative act and thereby preempt the preemption. I analyze these rule making outcomes in both a single-shot format and repeated play where the legislature acts probabilistically, with individual and social welfare implications for both.

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1 Introduction

On May 8, 2014, Governor Peter Shumlin of Vermont signed into law legislation strictly governing the labeling of products derived from genetically modified organisms (GMOs). This marked one of the first successful efforts to specifically target the use of such products in the United States despite many attempts by activists nationwide, and as such, supporters hoped that the legislation would not only serve the interests of activists in Vermont, but also provide a basis for model legislation nationwide or—even better—initiate a move by Congress to adopt similarly strict standards at the federal level.

Specifically, the legislation was expected to have two effects. First, it was expected to serve as model legislation that could serve the interests of activists across the country, especially in liberal states, and help usher in a general movement in favor of strictly labeling GMOs. Second, it was expected to impose such significant externalities on surrounding states that those states would ask Congress to intervene by preempting state regulations on the matter and that these regulations would favor the preferences of Vermont. Scott Faber, Vice President for Government Affairs at the anti-GMO Environmental Working Group explained the strategy, “They are using July 1 to try to force congressional action,” (Doering, June 16, 2016).

This paper will focus on both of these anticipated effects, but primarily on the latter, generating a formal model to motivate the decision by Vermont to adopt an extreme policy which was likely to both move state policy in a favorable direction, but which was even more likely to catalyze federal action to preempt the newly-formed state policy. I begin with a short discussion of the existing literature in federal lawmaking and preemption of state laws, followed by a short discussion of the legislative history of Vermont Act 120 and the subsequent National Bioengineered Food Disclosure Standard passed by the United States Congress. I then proceed to develop a simple model of lawmaking in a federal system where local jurisdictions may have their policies preempted by a democratically-driven central government.

2 Background and Literature

The nature of federal preemption of state law has been a subject of concern from the foundation of the United States. The Constitution itself entertains these concerns throughout the document, but most explicitly in the Supremacy Clause and the Tenth Amendment, where it both defines the areas where the national government is unable to assert its authority and specifies that where it does assert its authority that it is the supreme authority. Despite this clarity, the growth of the federal government over the course of the 20th century has driven a massive buildup of competing laws that have reinvigorated the debate over preemption in many policy areas, but particularly with respect to the economy.

The major turning point in the modern debate over federal policy-making came in the Supreme Court’s decisions in *West Coast Hotel Co. v. Parrish* (1937) and *Wickard v. Filburn* (1942), which first established a concurrent state right to regulate commerce and then established a broad reach of federal authority under the Commerce Clause to provide a vehicle for a massive new regulatory state governed by both state and national authorities. Within these new structures, policy areas that had previously been perceived as specifically under the purview of either the states or the national government suddenly fell under the potential authority of both regimes, forcing legislators,

particularly at the national level to consider not only the implications of particularly policy choices, but also of having any policy at all.

Several models have analyzed the normative implications of federal intervention in economic matters, primarily from a normative perspective. Oates (1972), as well as Oates (1991) and Dixit and Londregan (1998), provide the seminal bases for this line of analysis. These analyses study the individual and social welfare obtained in different regimes of policy making, focusing on the fiscal effects of federalism and the ability of different governing bodies to efficiently redistribute wealth. Still more models explore policy areas such as environmental and economic policies that impose interstate externalities due to negative side effects—as in the case of environmental regulation—or due simply to coordination failures—as in the case of many economic policies. Some of the economic models that address these policies from a federalism perspective include Besley and Coate (2003); Case and Hines (1993), and focusing on federal mandates, Cremer and Palfrey (2000).

The latter of these provides a particularly valuable assessment of policymaking in a federal system as it begins to consider the potential for the national government to actively choose the limits that it places on the choices of states. In this environment, the central government does not decide directly whether to preempt state law, but instead must choose how much to preempt the states, placing a bound on the level of variation and the level of externalities that can be imposed by individual states. With a broad or weak mandate, the states are given wide latitude to enact whatever policies they prefer, while with a narrow or strong mandate, the national government largely defines the policies that must be adopted by the states. Loeper (2011) and Loeper (2013) offer two particularly good assessments of these types of policies and demonstrates that where mandates are possible, there is always a mandate that is majority-preferred to decentralization when central policymakers can choose both the position and the breadth of the mandate. Sometimes, however, this level of flexibility is not available to policymakers. When establishing procedural rules or coordinating economic standards, the costs may come from the simple existence of variation rather than the extent of the variation—as with the case of railroad gauge measurements in 19th Century America or even 20th Century Europe. On other occasions, two policies that were developed independently may come into conflict as a result of new technologies, forcing one standard to be adopted without recourse to a more general mandate.

This paper will address these latter scenarios, where a broad mandate is either not possible or not desirable, but the central government—supported by the representatives of a majority of states—may nonetheless wish to adopt a single uniform policy which preempts state policies. How do states react to such a threat? Is the central government ultimately able to get its way? I focus on how states with more extreme policy preferences that are likely to get rolled in majoritarian voting at the national level may choose to moderate their state policies relative to their true preferences in order to placate states with somewhat less extreme preferences that might otherwise vote to support a centralized policy, in effect implementing a self-enforcing mandate that leaves policy choices in the hands of the states while nonetheless reducing variation across the nation. Several authors have examined this effect in an assortment of scenarios ranging from constitutional interpretation (Williams, 2005) to economic policy (Ribstein and Kobayashi, 1996; Qian and Weingast, 1997) to legal procedure (Subrin, 1989; O'Connor, 1981; Cooter, 2000), but each of these analyses has largely taken the choice of venue as fixed, that is to say, the venue at which the policy choices were made was fixed *a priori*. Where the central government has authority to act, these projects largely revolve around how states with diverging preferences are able to circumvent that authority,

while those projects focusing on cases where the central government does not have authority to act have focused primarily on external forces, drawn from the externalities imposed by coordination failures, drive local policies to converge completely or in part.

In this analysis, I consider an environment where the ultimate choice of venue is endogenous to the chosen policies, limited only by the assumption, consistent with the United States Constitution, that when the central government does act to implement a nationwide policy, the resulting law supersedes all local policies. Several particular areas of the law have stood out as subject to this type of preemption or the threat of it. Many of these policy areas in particular fall under the general penumbra of torts within the United States.

In one example, laws governing product labeling and resulting liability standards have been subjected to a mix of local and central laws, depending on the specific nature of the product in question. In a specific example, two United States Supreme Court cases, *Wyeth v. Levine* (2009) and *PLIVA v. Mensing* (2011), affirmed different outcomes in cases concerning warning labels attached to medical prescriptions. In these cases, a name-brand product was found liable for side effects under a state statute, while a generic product was protected from state statutes governing such liability on the basis of a narrow preemption provided for under federal law that blocked the application of such policies at the state level as a means of facilitating the production of generic products and enhancing competition.

This issue has also arisen dramatically in the area of intellectual property (Nelson, 2000; Rice, 1991). While states have traditionally been given wide latitude to offer protections to holders of trade secrets, the federal government has established a separate regime of patent law that is enshrined not only in judicial precedent, but in the United States Constitution and in the United States Code under Title 35. These two separate regimes came into conflict with each other when the states, using the latitude afforded to them on trade secrets, began using those protections to ensure firms and individuals the exclusive rights to goods for periods well beyond those established by federal legislation for patents. As these protections became increasingly large, firms and individuals alike, concerned that these actions would threaten the goals of patent legislation, encouraged the federal government to assert that those uses of trade secret litigation ran counter to the goals of patent protections and were thus preempted by that legislation at the federal level.

Likewise, the federal government has seen fit to preempt state-level causes of action in many financial arenas (Painter, 1998). The 1995 Securities Litigation Reform Act in particular reversed existing legislation to explicitly block most state causes of action where the previous legal regime had explicitly permitted such causes. The reasoning attributed to this switch largely revolved around a perceived deviation from the position of the young Republican majority in Congress by several states toward legal regimes that favored plaintiffs in financial cases, especially class action suits. Indeed, this legislation was striking at the time as it came during a period where the lion's share of effort was directed at reigning in the powers asserted by the federal government, culminating in the passage of the Federalism Act of 1999. Nonetheless, the importance of securities law and the interstate nature of the parties affected by the law motivated the legislators to act to block the forum shopping that was perceived to be threatening firms engaged in nationwide activity.

Finally, there is one area that has been the subject of preemption by the national government but which falls outside the broad reaches of economic regulation, namely that of immigration law (Cortez, 2008). While immigration law has always been determined primarily by the national government, there have been several instances in which local and state authorities have attempted to clarify certain policies towards migrants, with mixed success. Controversial practices in multiple

states have led to very different outcomes based on how those practices are viewed by the national majority. Efforts by the state of Arizona, and particular cities and counties in the state have been the subject of concerted efforts by the federal government to preempt state actions aimed at enforcing immigration law. On the other hand, many municipalities across the country have been permitted to take their own course of action in rejecting the national immigration standards that are ostensibly set forth by the federal government. In these cases, most notably in San Francisco, the federal government, including Congress, has failed to preempt the choices of civic leaders to enact policies at odds with the uniform enforcement of immigration law.

Each of these cases provides a slightly different basis on which to view the national government's choice of whether to assert its authority to preempt state law. In some cases, such as the development of sanctuary cities and proprietary drug labeling, the federal government has chosen not to act, while in others, the federal government has chosen to act. What sets apart those cases where the government chose to act, however, is the growth of extreme policies in the states that deviated too far from the perceived national norm. Where the states limited the extent to which they pushed the boundaries of policy locally, imposing costly externalities on other states, the federal government entered, preempting the states and imposing uniform standards nationwide, as where it restricted the reach of state level trade secret protections that deviated too far from the national norms regarding patent protections and general intellectual property. The rest of the paper develops a formal model of this behavior, demonstrating both how even the threat of preemption can have a powerful moderating effect on the policies chosen by states in a small, three-state federation and how individual states can exploit their policy positions *vis-à-vis* other states to try to counter this moderation and induce the central legislature to act.

This model does not address the myriad legal ways that preemption can be effected in the modern regulatory state. While in many cases, state and national laws can coexist wherever they do not conflict, I do not consider how the text of any national policy might itself establish a level of preemption. I instead make the assumption that the national proposal, if passed, necessitates the preemption of state law to be effective in alignment with the reasoning behind the preemption of state trade secret protections that conflict with the goals of federal patent legislation.

3 Vermont Act 120 and Senate Bill 764

There is a long history of GMOs dating back to the earliest days of agriculture, during which selective breeding was used to preserve desirable traits in a wide array of domesticated plants and animals. Dogs, for example, were bred to assist in herding and hunting, while a handful of plant species from the genus, *Brassica*—containing the mustard plant—were cultivated into many of the leafy greens and salad ingredients commonly used across the world today, including cabbage, broccoli, and turnips among many others. The resulting evolution from such selective breeding was slow and incremental but ultimately produced many of the plant and animal products we use today.

In the past 30 years, however, and especially in the past 10, new techniques were developed to create transgenic organisms by directly implanting foreign genes into existing species through the use of recombinant deoxyribonucleic acid (rDNA). Most recently, techniques such as those exploiting Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) have allowed scientists and agricultural firms to change the timeline of these changes by editing the genetic sequences

of plants and animals directly, not only developing products that exhibit the most desirable traits from among those already present in the species, but even developing products exhibiting fully new traits. They can quickly produce plants that are highly resistant to strains of disease or pesticides, as Monsanto has famously done with many of the seeds it sells. Similarly, they can add or modify genes to allow fish to grow more quickly in less favorable conditions, as in the case of the AquaAdvantage salmon, which takes genes from other species, including the Arctic pout.

The advent of these new techniques has brought with it extensive controversy, however, as critics question the safety of these advanced techniques. These critiques, moreover, falls across several dimensions ranging from the long term effects on biodiversity and the ecosystem to direct health effects that such products are likely to have on individuals consuming the modified plants and animals. To that end, opponents of these techniques have targeted these GMOs as a potential threat and constituted numerous policy campaigns worldwide aimed at curtailing their use or banning their development outright. This opposition, moreover, has only been heating up despite a growing body of evidence favoring the use of GMOs, with the European Union taking the lead by banning the the sale or use of most GMOs within much of its jurisdiction. For a deeper discussion of this debate, see Nicolia et al. (2014); Tagliabue (2016); Gaskell et al. (1999) and Hino (2002).

Within the United States, the debate has been much more favorable toward GMOs than in much of the world. Indeed, most of the cotton, corn, and soybeans grown in the country, along with many other cereals, are genetically modified variants (Fernandez-Cornejo et al., 2014). Nonetheless, majorities in several states, including many in the Northeast and Pacific Coast regions, remain skeptical of the products and have pressed their legislators counter Congressional inaction and to enact local regulations governing the use of GMOs within local jurisdictions. Some of the earliest such efforts have included moves by several states to require labeling of very particular products, making only minor demands affecting small corners of the market such as Alaska did with Salmon in 2005. By 2012, these movements had become more ambitious and determined to adopt across the board standards requiring labeling of all GMO products. An electoral initiative in California was only narrowly defeated that year, while shortly after, both Maine and Connecticut passed bills through the legislative process requiring labeling that included triggering mechanisms that allowed the laws to go into effect only if enough other states adopted similar legislation so as to avoid disrupting the economy.

Vermont made the next jump with Act 120, sponsored by State Representative Kate Webb. This legislation, signed into law by Governor Pete Shumlin on May 8, 2014, required any product “offered for retail sale in Vermont and entirely or partially produced with genetic engineering” to adhere to strict labeling requirements by July 1, 2016. The law’s stated purposes included informing consumers about the products they were purchasing, supporting religious freedom, and protecting human and environmental health. Yet supporters also saw the legislation as an opportunity to lead the country in establishing a new national standard and forcing Democrats in Congress to pass their own legislation—ideally modeled closely after Vermont’s. Indeed, in signing Act 120 into law, Governor Shumlin announced, “I am proud that we’re leading the way in the United States to require labeling of genetically engineered food,” (Hopkinson, March 17, 2016) optimistically anticipating any subsequent congressional action, especially with a politically aligned Senate and President, would be modeled after his state’s legislation.

As a result, the food industry, along with its allies were faced with a costly variation in state policies. On one hand, while they would be free to leave their products unlabeled and forgo sales in Vermont, doing so would eliminate a sizable portion of their market. They could instead choose to

label products destined for Vermont and leave other products unlabeled, Yet this was also unsatisfactory as it would require costly modifications to production processes and distribution networks while not eliminating the possibility that errant unlabeled products might nonetheless end up in Vermont where they would bring stiff and costly penalties. Finally, they could choose to label all their products, in essence allowing Vermont to dictate their preferences toward all consumers. However, given the continuing controversial nature of GMOs, this too was unsatisfactory to many food groups for fear that it would lead to needlessly lower sales in states without labeling requirements where the product might face competition from other identical goods that did not exhibit a warning label. As a final concern for many firms, there was the question of whether this legislation would induce a backlash in other states which might attempt to adopt a standard which disallowed labeling, creating the worst-case scenario of a patchwork of explicit requirements nationwide. Combined with allegations that the state of Vermont was actively attempting to sow confusion with respect to the law—Karen Batra of the Biotechnology Innovation Organization noted that “Food Companies don’t know how to comply, or if they are covered by the law. The Vermont attorney general stopped taking calls from food producers who were trying to figure the law out.” (Farquhar, September, 2016)—making it still harder to meet the stated requirements, these affected groups turned their focus to Congress.

With a two-year window to establish a national standard before Vermont’s law went into effect, the food industry and its allies first targeted the United States House of Representatives, successfully pushing for the passage of H.R. 1599, The Safe and Accurate Food Labeling Act of 2015. This legislation, also known by supporters of labeling requirements as the Deny Americans the Right to Know (DARK) Act, was structured to achieve two ends. Firstly, it eliminating any national labeling requirement, but secondly and more importantly, it preempted any state regulations and established a uniform national standard governing the labeling of GMOs. This bill, however, died in the Senate with the support of only 48 Senators.

However, by March of 2016, a growing sense of urgency led the Senate to reopen the matter with two competing pieces of legislation. First, S. 2621, the Biotechnology Food Labeling Uniformity Act, sponsored by Senators Merkley, Leahy, Tester, Feinstein, and Sanders, was proposed to establish strict labeling requirements nationwide in accordance with the goals of Act 120, supporting the motivations of supporters of the earlier Act. Second, S. 761, the National Bioengineered Food Disclosure Standard, sponsored by Senators Roberts and Stabenow offered a compromise in which the Food and Drug Administration (FDA) would be directed to formulate regulations requiring limited labeling of certain products but leave untouched the majority of goods such as those that were produced using GMOs but which do not themselves contain any GMOs. In a result that was unusually consistent with the traditional median voter theorem, this latter bill ultimately mustered enough votes to pass on July 7 as the Vermont law went into effect despite misgivings on both sides driven by the necessity to avoid the costs imposed by Vermont’s law. “‘I don’t think it’s the best bill that we could have, but it’s the best bill we could pass,’ [according to] Richard Wilkins, a Delaware Farmer who is President of the American Soybean Association. . . Congress was forced into this compromise by Vermont” (Charles, July 14, 2016).

The result has been a moderate policy in which some products have become subject to labeling requirements, and yet those requirements remain much weaker than those originally sought by the state of Vermont. Nonetheless, the resulting national policy did move the status quo from one in which GMOs were only required to be labeled under very specific circumstances in a few states to one in which many were subject to limited labeling nationwide, mildly vindicating Vermont’s

position. Scott Faber noted, “It’s not an insignificant achievement that a Republican Congress has decided to mandate a national GMO disclosure” (Charles, July 14, 2016).

The following section builds on the motivation inspired by this legislative activity to develop a model of federalism in which states with local policy preferences—as represented here by Vermont—may exploit externalities caused by policy variation within a federation to induce neighboring states to support the adoption of a nationwide policy on one hand, or in which they may use their ability to shift local policies strategically to disincentivize neighboring states to support nationwide legislation that would be unfavorable.

4 General Model

Consider a model with three states, $i \in \{1, 2, 3\}$, each described by a type, $\theta_i \in \mathbb{R}$. Without loss of generality, normalize $\theta_1 \leq \theta_2 = 0 \leq \theta_3$ so that state 1 may be considered the leftist state, state 2 is the moderate state, and state 3 the rightist states. Each state’s utility is described by quadratic preferences over local policies, peaking at their respective ideal points, as well as an externality term that is due to variation across states. This externality may be thought of as the utility lost by states when they engage in interstate activities such as commerce or environmental regulation, where the actions of a single state can harm the welfare of another state either by polluting across borders or by requiring costly efforts to adapt products or services to fit the preferences of nearby states. In particular, I focus on the case where the externality arises as the result of a coordination failure. Each state prefers a particular policy outcome, but also prefers to implement the same policy as every other state. The stage j utility function takes the form,

$$V_i^j(\mathbf{x}) = -(x_i - \theta_i)^2 - \beta \sum_{j \in I} (x_i - x_j)^2 \quad (1)$$

where $\mathbf{x} = \{x_1, x_2, x_3\}$ represents the set of policies chosen by the states, and $\beta \in \mathbb{R}^{++}$ is a measure of the weight of any externalities that arises due to policy differences across the federation.

In this environment, β is primarily a measure of the weight of coordination externalities that might arise for any number of reasons, but which are often discussed in economic terms. At the most mundane level, these may simply be measurement standards that everyone would prefer be consistent across the federation. Highway speed limits should be set in either kilometers per hour or miles per hour, but not both, for example. Alternatively, railroads should all have a consistent gauge to prevent economic losses that accrue when shippers are forced to transition between trains at borders simply for crossing those borders. Indeed, this was a major concern in the mid-19th century that eventually culminated in a massive two-day effort to regauge the Southern railways and bring them into alignment with Northern standards.

I consider a two-stage game in which the states:

1. Choose policies in the first stage,
2. Realize stage payoffs as a result of those policies,
3. Vote over whether to centralize,
4. Choose a central policy, $\chi = \{x_1, x_2, x_3\}$ for some $x_1 = x_2 = x_3$ (conditional on voting in favor of centralization),

5. Realize a second stage payoff.

The total payoff for each state is then,

$$U_i(\mathbf{x}, \chi) = \begin{cases} 2V_i(\mathbf{x}) & \text{if } v_m = d \\ V_i(\mathbf{x}) + V_i(\chi) & \text{if } v_m = c \end{cases} \quad (2)$$

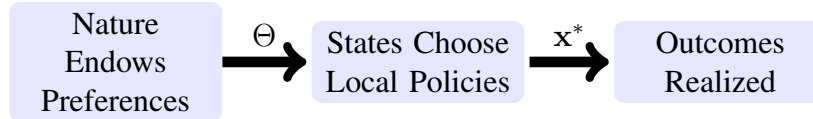
where $v_m \in \{c, d\}$ is the majority-preferred vote choice over whether to centralize (c) or not (d).

I now turn identifying subgame perfect equilibria to this game in several different forms. In the first, I consider the fully decentralized equilibrium in which the states are constrained from voting to centralize policy. This removes steps three and four from the above game form and sets the total utility to the condition where $v_m = d$. In the second, I constrain the states to a centralized equilibrium, which also removes step three from the above game form and sets the total utility to the condition where $v_m = c$. Next I consider the equilibrium behavior when step two is moved after step four, and finally, I consider the equilibrium in the full game form as written.

Fully Decentralized Equilibrium

The first example considers a game form that is applicable to a weak confederation in which the states are only loosely connected but in which there is little national authority to act, perhaps due to an earlier constitution or similar compact preserving relevant policy areas to the states. Here, only the states may set policy, while the legislature is restrained from enacting a preemptive policy. After nature endows preferences, the states merely select their policies subject to their own preferences and the policies selected by their neighbors, and outcomes are realized. I call this the *Fully Decentralized* or *Weak Confederation* equilibrium.

Figure 1: Fully Decentralized Game Form



In such a decentralized environment, states choose individual policies which optimize their welfare by solving the first order condition over their locally-implemented policy, yielding the best response function,

$$0 = -4 \left((1 + N\beta)x_i^* - \theta_i - \beta \sum_{j \in I} x_j \right) \rightarrow x_i^* = \frac{\theta_i + \sum_{j \in I \setminus i} x_j}{1 + \beta(N - 1)} \quad (3)$$

for any number, N , of states where the full set of best responses is denoted,

$$\mathbf{x}^+ = \mathcal{B}(\mathbf{x}) \quad (4)$$

For a Nash equilibrium, solve $\mathbf{x}^* = \mathcal{B}(\mathbf{x}^*)$, which yields

$$x_i^* = \frac{\theta_i + \beta \sum_{j \in I} \theta_j}{N\beta + 1} = \frac{\theta_i + N\beta\bar{\theta}_1}{N\beta + 1} \quad (5)$$

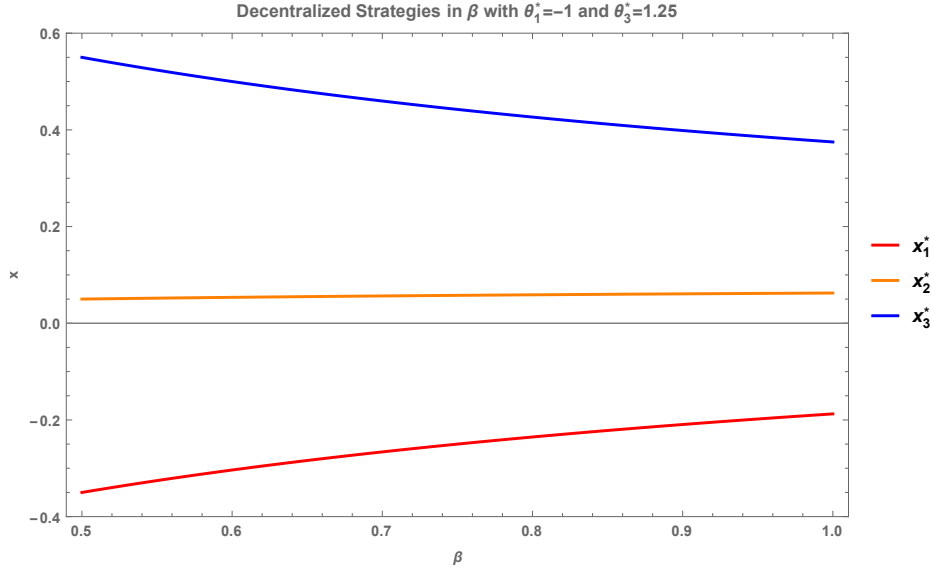
where $\bar{\theta}_n$ denotes the n th moment on θ . Denote the full set of equilibrium strategies given θ as

$$\mathbf{x}^* = \mathcal{E}(\theta) \quad (6)$$

This solution is simply a weighted average of local preferences and the preferences of each other state, with the mean policy preference of the coalition being represented by $\bar{\theta}_1$. Moreover, the equation demonstrates the attraction of the ‘consensus’ policy at $\bar{\theta}_1$, which comes to dominate the decision of the individual states as N or β grows large. This yields a utility of

$$\begin{aligned} U_i(\mathbf{x}^*, \chi^*) &= -\frac{2N\beta}{(1+N\beta)^2} \left(N\beta(\theta_i - \bar{\theta}_1)^2 + \frac{1}{N} \sum_{j \in I} (\theta_j - \theta_i)^2 \right) \\ &= -\frac{2N\beta}{(1+N\beta)^2} \left((1+N\beta)(\theta_i^2 - 2\theta_i\bar{\theta}_1) + N\beta\bar{\theta}_1^2 + \bar{\theta}_2 \right) \end{aligned} \quad (7)$$

Figure 2: Equilibrium policies for three states in a fully decentralized policy regime.



Applying the preferences of the three states in the baseline model yields the equilibrium strategies

$$x_i^* = \frac{\theta_i + \beta(\theta_1 + \theta_2 + \theta_3)}{3\beta + 1} = \frac{\theta_i + \beta(\theta_1 + \theta_3)}{3\beta + 1} \quad (8)$$

Proposition 1. *As the number of states increases, the local policies enacted in a decentralized equilibrium approach the mean ideal point, $\bar{\theta}_1 = \frac{1}{N} \sum_{i \in I} \theta_i$. As β increases, the policies chosen in the local equilibrium also approach $\bar{\theta}_1$.*

Proof. Taking the appropriate limits, we have

$$\lim_{N \rightarrow \infty} x_i^* = \frac{\lim_{N \rightarrow \infty} \frac{\partial}{\partial N} (\theta_i + N\beta\bar{\theta}_1)}{\lim_{N \rightarrow \infty} \frac{\partial}{\partial N} (1 + N\beta)} = \frac{\beta\bar{\theta}_1}{\beta} = \bar{\theta}_1 \quad (9)$$

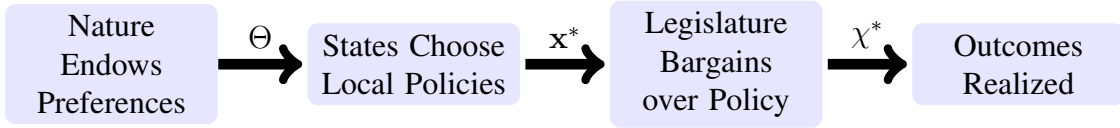
$$\lim_{\beta \rightarrow \infty} x_i^* = \frac{\lim_{\beta \rightarrow \infty} \frac{\partial}{\partial \beta} (\theta_i + N\beta\bar{\theta}_1)}{\lim_{\beta \rightarrow \infty} \frac{\partial}{\partial \beta} (1 + N\beta)} = \frac{N\bar{\theta}_1}{N} = \bar{\theta}_1 \quad (10)$$

□

Fully Centralized Equilibrium

In the second case, the legislature is obliged to act, enforcing a uniform national standard in the second period. While the states may still choose policies independently in the first period, they are necessarily preempted in the second period and do not realize a second payoff from their local policy. Note that the resulting equilibrium in this environment does not substantially change in the event that the state policy-making process is entirely eliminated, since the subsequent decision of the legislature is not determined on the basis of that outcome. I call this the *Fully Centralized* or *Strong Federation* equilibrium.

Figure 3: Game Form



If the states are bound to centralize policy and adopt a single national policy, χ such that $x_i = \chi \forall i$ in the second stage, the externality term goes to zero in that stage and they are left with utilities,

$$U_i(\mathbf{x}, \chi) = V_i(\mathbf{x}) - (\chi - \theta_i)^2 \quad (11)$$

Assuming an open amendment rule after the states choose to adopt a national policy, the median state's most-preferred policy, $\chi = \theta_m$ will be selected, following the standard median voter theorem. As a result, the preceding utility reduces to

$$U_i(\mathbf{x}^*, \chi_m^* | c) = V_i(\mathbf{x}^*) - (\theta_i - \theta_m)^2 \quad (12)$$

where, upon acceptance of a national rule, the moderate state's preferences are implemented in equilibrium. In Step 1, where the states choose the local policies for the first stage payoff, the equilibrium analysis is identical to the analysis for the decentralized equilibrium and yields the same equilibrium strategies, x_i^* .

Proposition 2. *In a centralized equilibrium, the states, through congress, select the median state's ideal policy, θ_m .*

Proof. The equilibrium follows directly from the standard Median Voter Theorem and Proposition 1. \square

Applying the ideal points for the three-state model so that $\theta_m = \theta_2 = 0$, yields the result,

$$U_i(\mathbf{x}^*, 0) = V_i(\mathbf{x}^*) - \theta_i^2 \quad (13)$$

In an extension of the model, I will consider the role of veto players in a legislature that might be able to restrict the movement of this policy and thereby change the equilibrium outcomes within such an environment.

Note that in this scenario, while the states may choose policies in the first period for purposes of payoffs, those policies will never survive to the second stage and the choice of policy will not affect the outcome in the second period. As such, states simply choose their ideal policies subject to the constraints described in the previous section as their local policies.

Voting Over Centralization

This introduces a new straightforward calculation for each of the states—namely whether to support centralization and obtain the moderate state’s optimal national rule or to support decentralization and obtain that outcome. Let $\tau_i \in \{c, d\}$ denote state i ’s vote over whether to centralize the policy or not. Where states act naively, without considering the effect of their policies on the votes of other states, this reduces to

$$\tau_i = \begin{cases} c & \text{if } U_i(\mathbf{x}, \chi|d) < U_i(\mathbf{x}, \chi|c) \\ d & \text{if } U_i(\mathbf{x}, \chi|d) \geq U_i(\mathbf{x}, \chi|c) \end{cases} \quad (14)$$

and the majority preferred choice of venue, denoted τ_m becomes

$$\tau_m = \begin{cases} c & \text{if } |\{\tau_i | \tau_i = c\}| \geq M = 2 \\ d & \text{if } |\{\tau_i | \tau_i = c\}| < M = 2 \end{cases} \quad (15)$$

In subsequent sections, I consider the choices of strategic states that select policies to influence the voting behavior of other states.

Proposition 3. *In three parts:*

1. *The median state, denoted $i = m$, always prefers centralization, $\tau_m = c$, whenever there is at least one state with a different local policy.*
2. *Without loss of generality, let state N be the most extreme state relative to $\bar{\theta}_1$ so that $\theta_N - \bar{\theta}_1 > \bar{\theta}_1 - \theta_1$. If all states play their decentralized equilibrium strategies, the most extreme state always prefers decentralization, $\tau_N = d$, when $\bar{\theta}_1 \in [\theta_N, \theta_m]$. More generally, for any state, i^* ,*

$$\bar{\theta}_1 \in [\min\{\theta_{i^*}, \theta_m\}, \max\{\theta_{i^*}, \theta_m\}] \quad (16)$$

there will be no incentive to centralize.

3. *For all other states such that $\theta_i \neq \theta_m$, there is a critical value, $\beta_i^*(\mathbf{x})$, such that for $\beta > \beta_i^*$, state i prefers centralization. β_i^* is increasing in the distance of state i ’s ideal point from θ_m .*

Proof. Each part of the proof corresponds to the equivalent part of the proposition:

1. The median state’s choice is straightforward. We have

$$\begin{aligned} U_m(\mathbf{x}, \chi|d) &< U_m(\mathbf{x}, \chi|c) \\ 2V_m(\mathbf{x}) &< V_m(\mathbf{x}) \\ V_m(\mathbf{x}) &< 0 \end{aligned} \quad (17)$$

If there is any variation in \mathbf{x} , $V_i(\mathbf{x}) < 0$, and the condition holds, so m prefers centralization.

2. If the states are all playing their decentralized equilibrium strategies, we have

$$\begin{aligned} U_e(\mathbf{x}^*, \chi|d) &\geq U_e(\mathbf{x}^*, \chi|c) \\ 2V_e(\mathbf{x}^*) &\geq V_e(\mathbf{x}^*) - (\theta_e - \theta_m)^2 \\ -\frac{N\beta}{(1+N\beta)^2} \left((1+N\beta)(\theta_e^2 - 2\theta_e\bar{\theta}_1) + N\beta\bar{\theta}_1^2 + \bar{\theta}_2 \right) &\geq -(\theta_e - \theta_m)^2 \end{aligned} \quad (18)$$

Under the assumption that N is the most extreme state, we can then simplify the preceding equation to

$$\begin{aligned}
0 &\geq -\theta_N^2(1 + \beta(1 + N) + \beta^2(2N - 1)) \\
&\quad - 2\beta\theta_N(1 + \beta(N - 1)) \sum_{i \in I \setminus N} \theta_i + \beta^2 \left(\sum_{i \in I \setminus N} \theta_i \right)^2 + \beta \sum_{i \in I \setminus N} \theta_i^2 \\
&\geq -\theta_N^2(1 + \beta + \beta^2(2N - 1)) - \left(N\beta\theta_N^2 - \beta \sum_{i \in I \setminus N} \theta_i^2 \right) \\
&\quad - \left(\theta_N(2 + \beta(N - 2)) + \left(N\beta\theta_N - \beta \sum_{i \in I \setminus N} \theta_i \right) \right) \beta \sum_{i \in I \setminus N} \theta_i
\end{aligned} \tag{19}$$

Note that as N is the most extreme state by assumption, we must have $\frac{1}{N} \sum_{i \in I \setminus N} \theta_i \in (-\theta_N, \theta_N)$ and $\frac{1}{N} \sum_{i \in I \setminus N} \theta_i^2 < \theta_N^2$. Each term in parentheses must then be weakly positive (strictly positive when states vary in their preferences) so the right-hand expression as a whole must be negative for any $\sum_{i \in I \setminus N} \theta_i \propto \frac{1}{N} \sum_{i \in I \setminus N} \theta_i > 0$ and the condition is satisfied.

For three states, this condition will always be satisfied, requiring

$$\begin{aligned}
0 &< V_3(x_3^* | \mathbf{x}_{-3}) - V_3(\chi = 0) \\
&< \frac{-\beta(\beta + 1)\theta_1^2 + 2\beta(2\beta + 1)\theta_1\theta_3 + (5\beta^2 + 4\beta + 1)\theta_3^2}{(3\beta + 1)^2}
\end{aligned} \tag{20}$$

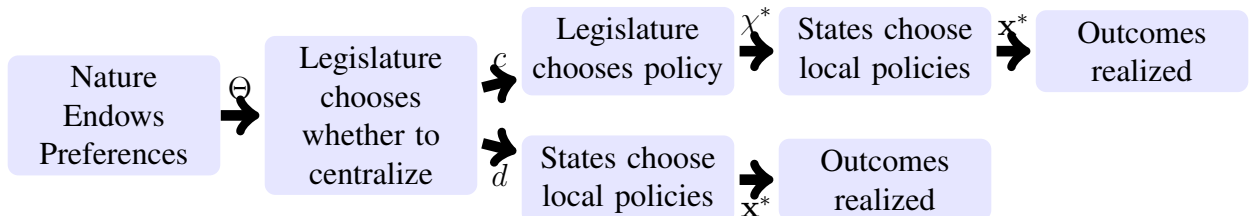
which always holds for the normalization, $\theta_3 > -\theta_1 > \theta_2 = 0$.

3. This proof follows whenever the conditions arising in Part 2 are not satisfied. Note that in Equation (19), only the terms related to the first moment, $\sum_{i \in I \setminus N} \theta_i$, are positive. These terms are increasing in both β and $-\sum_{i \in I \setminus N} \theta_i$ and take the initial value of 0 for either $\beta = 0$ or $-\sum_{i \in I \setminus N} \theta_i = 0$, so that for any mutually non-zero state there must be some threshold above which the state is incentivized to support centralization.

□

First-Moving Legislature

Figure 4: Game Form



In this section, I consider behavior when the legislature acts first, followed by the states. In this scenario, we might think of the legislative decision as a constitutional one in which the legislature must decide whether to tie its hands to prevent future attempts to assert policy-making authority or to adopt a centralized regime outright without observing the alternative state policies that will be implemented in the absence of centralization. Thus, once preferences are endowed, the states must first decide through their legislature whether to enact a national policy. In the event that they do vote to enact a national policy, they choose that policy as above (once again selecting the median). If they do not choose to adopt a national standard, no such policy is enacted and the states are free to choose their policies as in the *Fully Decentralized* case. I call this the *First-Moving Legislature* or *Constitutional* equilibrium. Note that if the legislature were to have the option of leaving open the window for asserting centralized authority, the game is substantively identical to that of the following section with first-moving states.

Clearly, as she will obtain her ideal policy in a centralized environment, the moderate state will be strictly better-off choosing to centralize whenever it is not the case that $x_i^* = 0 \forall i$, which only occurs for $\theta_i = 0 \forall i$. When that state does arise, she is indifferent between either venue, as the resulting policies are observationally identical. Of course, when this condition is satisfied, both other states are likewise indifferent over policy venues. For the rest of the analysis, then, I assume that there is at least one state such that $x_i \neq 0$.

In this event, the choices of the actors may change. As before, the moderate state will always prefer to centralize, but now the remaining states may prefer not to do so. Indeed, it may be the case that no extreme state prefers to centralize and instead prefers to retain a decentralized equilibrium. Now consider the conditions under which a state will support centralization. She will do so whenever

$$\begin{aligned} -\frac{N\beta}{(1+N\beta)^2} \left((1+N\beta)(\theta_i^{*2} - 2\theta_i^*\bar{\theta}_1^*) + N\beta\bar{\theta}_1^{*2} + \bar{\theta}_2^* \right) &< -(\theta_i^* - \theta_M^*)^2 \\ N\beta \left((1+N\beta)(\theta_i^{*2} - 2\theta_i^*\bar{\theta}_1^*) + N\beta\bar{\theta}_1^{*2} + \bar{\theta}_2^* \right) &> (1+N\beta)^2\theta_i^{*2} \end{aligned} \quad (21)$$

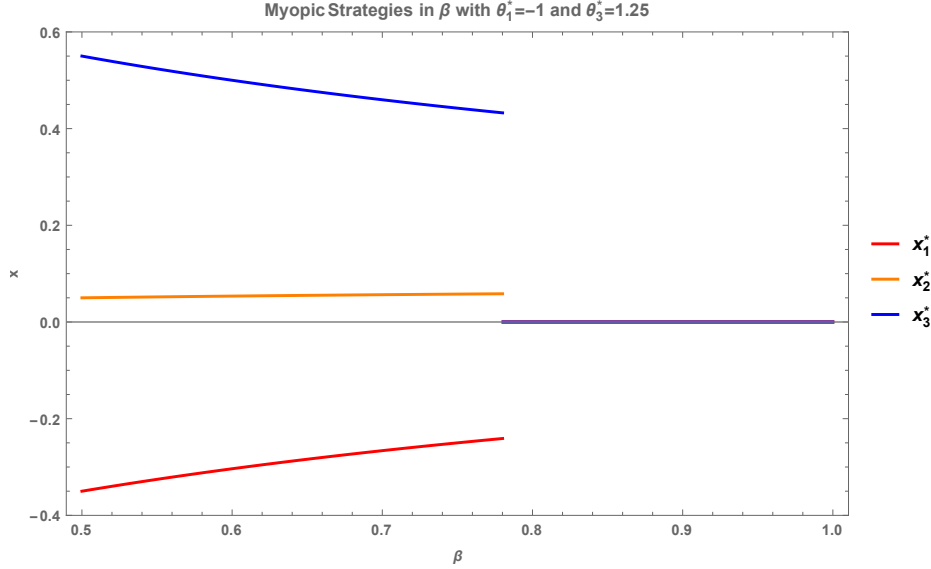
Solving for θ_i yields the condition on the state's support for centralization,

$$\begin{aligned} N\beta\bar{\theta}_1^* + \sqrt{\frac{N^2\beta^2\bar{\theta}_1^{*2}(2+N\beta) + N\beta\bar{\theta}_2^*}{1+N\beta}} &> -\theta_i^* > N\beta\bar{\theta}_1^* - \sqrt{\frac{N^2\beta^2\bar{\theta}_1^{*2}(2+N\beta) + N\beta\bar{\theta}_2^*}{1+N\beta}} \\ -N\beta \left(\bar{\theta}_1^* + \sqrt{\bar{\theta}_1^{*2} + \frac{N\beta\bar{\theta}_1^{*2} + \bar{\theta}_2^*}{N\beta(1+N\beta)}} \right) &< \theta_i^* < -N\beta \left(\bar{\theta}_1^* - \sqrt{\bar{\theta}_1^{*2} + \frac{N\beta\bar{\theta}_1^{*2} + \bar{\theta}_2^*}{N\beta(1+N\beta)}} \right) \end{aligned} \quad (22)$$

Applying the ideal points of the three states of the simple model yields

$$\begin{aligned} -\beta \left(\theta_1 + \theta_3 + \sqrt{(\theta_1 + \theta_3)^2 + \frac{\beta(\theta_1 + \theta_3)^2 + (\theta_1^2 + \theta_3^2)}{\beta(1+3\beta)}} \right) \\ < \theta_i^* < -\beta \left(\theta_1 + \theta_3 - \sqrt{(\theta_1 + \theta_3)^2 + \frac{\beta(\theta_1 + \theta_3)^2 + (\theta_1^2 + \theta_3^2)}{\beta(1+3\beta)}} \right) \end{aligned} \quad (23)$$

Figure 5: Equilibrium policies for three states with a first-moving legislature that is able to choose whether to commit to not preempting state policies.



Proposition 4. *For a first-moving legislature, there is no incentive for states to act strategically and the nation centralizes whenever the externality term, β , is greater than the pivotal state's critical threshold such that $\beta > \beta_p^*$.*

Proof. Suppose the legislature votes to centralize. Then the states can only affect the first-term payoff by choosing local policies. The value of this payoff does not depend directly on the voting outcome, so the states need only maximize the payoff from their local policy which is done by adapting $x_i = x_i^*$.

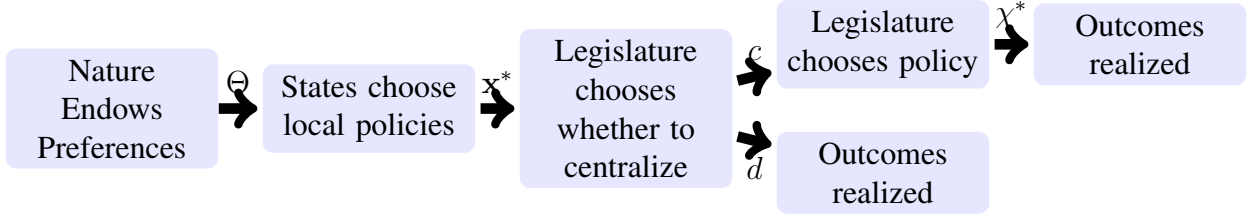
Suppose instead that the legislature votes to remain decentralized. Now the total payoff is simply twice the single period payoff, which again cannot be affected by any subsequent action. Again, the states optimal policy choices satisfy $x_i = x_i^*$. \square

First-Moving States

Now consider the full version of the game in which the states first choose policies, then the legislature convenes to determine whether to adopt a centralized policy and if so what that policy should be. This form is represented in Figure 6 and provides the most interesting results. In this case, once preferences are endowed, the states choose local policies. The legislature then observes the chosen policies and decides whether to centralize on the basis of those policies. If the legislature chooses to centralize, it democratically chooses a preemptive national standard and outcomes are realized. If the legislature declines to adopt a national standard, outcomes are realized on the basis of state policies. Such a scenario opens and indeed incentivizes the possibility of strategic action by the states in which states close to the median attempt to trigger the adoption of a national standard while extreme states attempt to divert such an outcome. I call this the *First-Moving States* or *Unconstrained equilibrium*

I consider the equilibrium that results when the legislature cannot bind itself to refrain from acting after the states. That is, the legislature moves after the states select their policies. If the

Figure 6: Game Form



states naively selected their optimal choices from the decentralized subgame above, the equilibrium would look exactly as the previous one with the first-moving legislature. However, by strategically adopting a more moderate policy—at a slight cost—under a decentralized regime, an extreme state or coalition of states may be able to ‘buy off’ the vote of those borderline states supporting centralization. Conversely, a moderate state can establish a more extreme policy than it otherwise would in an effort to induce a borderline state to vote in support of centralization where it otherwise would not.

To solve for the equilibria in this game, we will focus on one player at a time from out three-state country. Without loss of generality, let $\theta_1 \leq \theta_2 = 0 \leq -\theta_1 \leq \theta_3$. In this environment, state 2, the moderate state, will always weakly prefer a centralized equilibrium, since it would obtain its ideal point with zero coordination externalities in the second stage at such an equilibrium. On the other hand, whenever at least one state prefers to maintain a decentralized equilibrium, the more extreme state, 3, will prefer a decentralized equilibrium.

First, note that state 1, the less extreme state, will always choose to play its baseline best response, $x_1^\dagger = x_1^*$, and will vote for decentralization whenever this strategy yields a higher payoff than $\chi = 0$ in the second-stage payoff. This follows from the fact that they will always be pivotal when there is any state that prefers decentralization, and whenever a state is not pivotal, that state should play its baseline best response.

Now consider the optimal strategy of player 2, the moderate state. Since it always prefers a centralized regime that sets the nationwide policy, $\chi = 0$, it will choose, x_2^\dagger , the highest-paying local policy that induces a majority to support centralization where such a policy satisfies $V_2(x_2^\dagger | \mathbf{x}_{-2}) - V_2(x_2^+ | \mathbf{x}_{-2}) < V_2(\chi = 0) - V_2(x_2^+ | \mathbf{x}_{-2})$ or else it plays the baseline best response, x_2^+ . That is, the policy,

$$x_2^\dagger = \begin{cases} \arg \max_{x_2} \{V_2(\mathbf{x}) | v_1 = c\} & : V_2(x_2^\dagger | \mathbf{x}_{-2}) - V_2(x_2^+ | \mathbf{x}_{-2}) < V_2(\chi = 0) - V_2(x_2^+ | \mathbf{x}_{-2}) \\ x_2^+ & : \text{otherwise} \end{cases} \quad (24)$$

Finally, turn to the optimal strategy of state 3, the extreme state. Recalling that this state always prefers a decentralized regime, the best response follows the logic mirroring that of state 2, yielding

$$x_3^\dagger = \begin{cases} \arg \max_{x_3} \{V_3(\mathbf{x}) | v_1 = c\} & : V_3(x_3^\dagger | \mathbf{x}_{-3}) - V_3(x_3^+ | \mathbf{x}_{-3}) < V_3(x_3^+ | \mathbf{x}_{-3}) - V_3(\chi = 0) \\ x_3^+ & \text{otherwise} \end{cases} \quad (25)$$

Proposition 5. *In a three-state model, there is no non-sincere pure-strategy equilibrium that results in a centralized regime. A pure strategy equilibrium in which states play \mathbf{x}^* exists if and only if $\beta > \beta_c$.*

Proof. Consider the optimal policies that are chosen in any equilibrium where $v_m = c$. Here the equilibrium strategies must satisfy

$$x_1^\dagger = x_1^+ \quad (26a)$$

$$x_2^\dagger = \arg \max_{x_2} \{V_2(\mathbf{x}) | v_1 = c\} \quad (26b)$$

$$x_3^\dagger = x_3^+ \quad (26c)$$

$$V_1(\mathbf{x}^\dagger) < V_1(\chi = 0) \quad (26d)$$

$$V_3(x_3^+ | \mathbf{x}_{-3}) - V_3(x_3^s | \mathbf{x}_{-3}) > V_3(x_3^s | \mathbf{x}_{-3}) - V_3(\chi = 0) \quad (26e)$$

Where x_3^s satisfies $V_1(x_1, x_2, x_3^s) = V_1(\chi = 0)$. First recall that whenever all three states are playing their best response for a decentralized equilibrium, state 3 always prefers decentralization. Thus, the fifth condition must be satisfied in order to make it infeasible for the extreme state to buy off the pivotal state by moderating its policy unilaterally. With this in mind, note that in order for the fifth condition to be satisfied, the fourth condition regarding the incentives of the pivotal state cannot be binding, as such a binding result would allow state 3 to choose a policy that is ϵ closer to x_1 and incentivize the latter state to vote in favor of decentralization. Note that this is guaranteed to be a profitable deviation since from Proposition 3, state 3 strictly prefers decentralization whenever the states have different ideal points.

However, in the case that the fifth condition is binding so that the first and third conditions are binding, the third condition can only be satisfied if either $x_2^\dagger = x_2^+$ or the fourth condition is binding exactly. In the latter case, a contradiction arises as a result of the first part of this proof. In the former case, the states simply play their one-shot Nash equilibrium strategies, \mathbf{x}^* and, provided β is sufficiently large, a pure-strategy equilibrium may arise if and only if there is no incentive for state 3 to strategically moderate its policy to placate state 2. That is, there is a pure strategy equilibrium in which all states play their Nash equilibrium strategies ad a majority supports centralization if and only if $\beta > \beta_c$.

When all states are playing their one-shot Nash equilibrium strategies, there is a profitable deviation for state 3 if and only if

$$V_3(x_3^+ | \mathbf{x}_{-3}) - V_3(x_3^s | \mathbf{x}_{-3}) \leq V_3(x_3^s | \mathbf{x}_{-3}) - V_3(\chi = 0) \quad (27)$$

This allows state 3 to strategically moderate its policy and induce a favorable vote from state 1. Plugging in the appropriate values and noting that the proposed equilibrium strategies are the one-shot Nash equilibrium strategies, this expression can be reduced to

$$\begin{aligned} & V_3(x_3^* | \mathbf{x}_{-3}) - 2V_3(x_3^s | \mathbf{x}_{-3}) + V_3(\chi = 0) \leq 0 \\ & (4\beta + 2)x_3^{s2} - 4(\theta_3 + \beta x_1^* + \beta x_2^*)x_3^s \\ & \quad - (2\beta + 1)x_3^{*2} + \beta(x_1^{*2} + 2x_3^*x_1^* + x_2^{*2} + 2x_2^*x_3^*) + 2\theta_3x_3^* \leq 0 \end{aligned} \quad (28)$$

Noting that only the lesser root is binding, this yields the solution,

$$\begin{aligned} x_3^s \geq & \frac{\theta_3 + \beta x_1^* + \beta x_2^*}{2\beta + 1} \\ & - \frac{1}{4(2\beta + 1)} \sqrt{16(\theta_3 + \beta x_1^* + \beta x_2^*)^2 + 8(2\beta + 1)^2 x_3^{*2} - 8(2\beta + 1)(\beta(x_1^{*2} + 2x_3^*x_1^* + x_2^{*2} + 2x_2^*x_3^*) + 2\theta_3x_3^*)} \end{aligned} \quad (29)$$

To determine whether there is any sufficient x_3^s , consider the solution to

$$\begin{aligned} V_1(x_1^*, x_2^*, x_3^s) - V_1(\chi = 0) &\geq 0 \\ -\beta x_3^{s2} + 2\beta x_1^* x_3^s - 2\beta x_1^{*2} + 2\beta x_2^* x_1^* - \beta x_2^{*2} + 2\theta_1 x_1^* + x_1^{*2} &\geq 0 \end{aligned} \quad (30)$$

subject to maximizing V_3 , which yields,

$$\begin{aligned} x_3^s &= x_1^* + \sqrt{\frac{1}{\beta}(2\theta_1 x_1^* - x_1^{*2}) - (x_1^* - x_2^*)^2} \\ &= \frac{1}{\beta(1+3\beta)} \left((1+\beta)\beta\theta_1 + \beta^2\theta_3 + \sqrt{\beta(1+5\beta+5\beta^2)\theta_1^2 + 4\beta^3\theta_1\theta_3 - \beta^3\theta_3^2} \right) \end{aligned} \quad (31)$$

This expression has a real solution if and only if $\frac{2\theta_1 x_1^*}{\beta}$ is sufficiently large or equivalently if

$$\beta \leq \frac{-5\theta_1^2 + \sqrt{5\theta_1^4 - 16\theta_3\theta_1^3 + 4\theta_3^2\theta_1^2}}{2(5\theta_1^2 + 4\theta_3\theta_1 - \theta_3^2)} \quad (32)$$

If and only if there is a real solution to

$$\begin{aligned} x_1^* + \sqrt{\frac{1}{\beta}(2\theta_1 x_1^* - x_1^{*2}) - (x_1^* - x_2^*)^2} \\ \geq \frac{\theta_3 + \beta x_1^* + \beta x_2^*}{2\beta + 1} + \frac{1}{4(2\beta + 1)} \\ \times \sqrt{16(\theta_3 + \beta x_1^* + \beta x_2^*)^2 + 8(2\beta + 1)^2 x_3^{*2} - 8(2\beta + 1)(\beta(x_1^{*2} + 2x_3^* x_1^* + x_2^{*2} + 2x_2^* x_3^*) + 2\theta_3 x_3^*)} \end{aligned} \quad (33)$$

□

Proposition 6. *In a three-state model, there is a pure-strategy equilibrium that results in a decentralized regime for sufficiently small β . There exists a β_d such that for $\beta > \beta_d$, there is no pure-strategy policy equilibrium that induces decentralization.*

Proof. For $v_m = d$, the policy equilibrium will satisfy

$$x_1^\dagger = x_1^+ \quad (34a)$$

$$x_2^\dagger = x_2^+ \quad (34b)$$

$$x_3^\dagger = \arg \max_{x_3} \{V_3(\mathbf{x}) | v_1 = d\} \quad (34c)$$

$$V_1(\mathbf{x}) \geq V_1(\chi = 0) \quad (34d)$$

$$V_2(x_2^+ | \mathbf{x}_{-2}) - V_2(x_2^s | \mathbf{x}_{-2}) \leq V_2(\chi = 0) - V_2(x_2^+ | \mathbf{x}_{-2}) \quad (34e)$$

where again, the fourth condition cannot be binding if the fifth is satisfied (using identical logic to the proof for the centralized equilibrium), and x_2^s is the value of x_2 which sets $V_1(\mathbf{x}) = V_1(\chi = 0)$ subject to $V_3(x_3^+ | \mathbf{x}_{-3}) - V_3(x_3^\dagger | \mathbf{x}_{-3}) < V_3(x_3^\dagger | \mathbf{x}_{-3}) - V_3(\chi = 0)$. However, if and only if $x_3^\dagger = x_3^+$ the third condition is satisfied when the fourth condition is not binding, resulting in an equilibrium. If $\mathbf{x}^\dagger \neq \mathbf{x}^*$, there cannot be a pure-strategy equilibrium. □

Applying this logic, for sufficiently low β , there is no incentive for the extreme state to moderate policy in order to buy the vote of the less-extreme opposing party, as the moderate state cannot profitably offer any counter bid that would induce the less-extreme state to vote for centralization. For higher values of β , the more extreme state will moderate its own policy unilaterally to a point that not only incentivizes the less-extreme state to support decentralization, but to a point that makes decentralization sufficiently attractive to prevent any strategic policy choices by the moderate state to disincentivize decentralization. At that point, the moderate state, state 2, is best-off simply playing its decentralized best response; however the extreme state, state 3, is in turn best-off reverting to the most extreme policy not more extreme than its own ideal policy that induces the pivotal state to vote in favor of decentralization. That reintroduces the incentive for the moderate state to strategically adopt more extreme policies and restarts the cycle.

Corollary 6.1. *In a three-state model, the moderate state can never strategically offer a pure strategy equilibrium policy in the first period that will incentivize the pivotal state to vote in favor of centralization.*

Proof. If there is such a policy, it implies that the extreme state is playing a policy which does not induce a decentralized voting equilibrium, contradicting Proposition 5. \square

Corollary 6.2. *Provided states have unique ideal points, in a three-state model the pivotal state is strictly better-off when the moderate state poses a strategic threat to the extreme state.*

Proof. The extreme state maximizes its utility by playing the most extreme strategy that induces a decentralized voting equilibrium. If this strategy merely makes the pivotal state indifferent between voting for decentralization and voting for centralization, the moderate state can profitably adopt a policy that is $\epsilon > 0$ more extreme than here period-maximizing strategy and induce the pivotal state to vote in favor of centralization. Thus, in order to ensure a decentralized equilibrium, the extreme state must adopt a policy that is sufficiently moderate as to make the moderate state indifferent between playing its decentralized best response and strategically adopting a policy to induce centralization. This induces both the extreme and moderate states to adopt policies that are closer to the ideal point of the pivotal state. \square

5 Discussion

This paper has developed a model of policy-making in a federal system in which local jurisdictions—states—may determine local policies independently of each other or they may democratically select a national policy that applies uniformly across all states. While states may have widely divergent policy preferences and thus prefer to set policy locally according to those preferences, policy variation across the federation leads to costly welfare losses and incentivizes the states to moderate their policies in two ways: First, it incentivizes them to move their policies slightly closer to the national mean, with more extreme states moderating their policies more. Second, where the states' preferred policies are too divergent, those states that are closest to the national median may vote to enact a national policy preempting state policies. To the extent that legislative institutions provide for it, such approaches are likely to lead to the implementation of more moderate policies than would be enacted by most states if allowed to act independently. Moreover, these national policies have the effect of completely eliminating costly policy variation across the states.

The paper discusses four different scenarios and their resulting equilibria. In the first case, the *Fully Decentralized* or *Weak Confederation* condition, states do not face a threat from the national legislature and so determine their policies solely on the basis of local preferences and the externalities that arise under nationwide policy variation. As a result, policies vary across the states proportionally to the heterogeneity in state preferences, but this variation is tempered proportionally to the cost of the externality so that when externalities are very costly, state policies converge toward the national mean—even if this mean differs from the national median. This environment is analogous to the early United States under the Articles of Confederation in which the federal government was severely restricted with respect to its legislative power and was left to rely on the states to handle externalities associated with policy variations across the states.

In the second case, the *Fully Centralized* or *Strong Federation* environment, the national legislature is constrained to preempt state policies. In this scenario, while the states still prefer the same policies as the first case, those policies are blocked in favor of the median state's most-preferred policy, regardless of any costs associated with the divergence of that policy from those preferred by extreme states. This scenario is analogous to the structure of many nations' governments in which the primary governing authority is the national government and local jurisdictions have relatively little authority on many matters.

The third case, that with the *First-Moving Legislature* or *Constitutional* structure, the legislature may choose whether or not to act, but must do so before seeing the policies chosen by the states. Where the externalities associated with policy variation are weak, the legislature will decline to act, allowing the states to select their own policies as in the first case. However, when the externalities are sufficiently costly, a coalition of moderate states may find it preferable to adopt a national policy at the median's ideal point rather than allow extreme states to retain their locally-preferred policies. In such a case, the moderate coalition will support action and subsequently see a national policy implemented. In this scenario, the legislature serves as a strategic actor determining whether or not to allow the states to act, and may be thought of in a manner similar to the Constitutional Convention that wrote the Constitution that ultimately replaced the Articles of Confederation. In writing the Constitution, the representatives of the states at the convention used their document to determine many policy areas that the national government was either expressly denied access to or solely authorized to set policy.

Finally, the last case, that of the *First-Moving States* or *Unconstrained* environment, allows the states to choose policies first and leaves it open to the legislature to decide whether to accept those policies or adopt a national standard to preempt them. Acting naively, the states would choose policies as in each of the preceding conditions and the legislature would act in the same scenarios with costly externalities that it did in the *Constitutional* condition. Under certain conditions, this incentivizes two groups to strategically choose policies that would be inefficient in the earlier case as part of an attempt to influence those legislators and states with semi-moderate preferences. These are the states that do not have the most extreme policy preferences, nor the most moderate preferences—neither the traditional extreme liberal and conservative states nor the swing states—and these states are pivotal in determining whether or not national preemption occurs.

Where these pivotal states are indifferent between adopting local preferences and eliminating externalities with a national policy, the most extreme states may choose to moderate their own policies in an attempt to reduce the costs borne by the pivotal states and thereby incentivize them to support decentralization. On the other hand, the most moderate states that would benefit greatly from national preemption but still obtain a policy near their ideal point will be incentivized in

turn to announce policies that are less-moderate—more extreme relative to the pivotal states—to push the pivotal state into supporting centralization. Moreover, these two efforts are likely to occur simultaneously, leading to a scenario where states setting their own policies must consider a tradeoff between adopting inefficient policies in the first period that yield lower than necessary payoffs against the possibility that such inefficiency will lead to a much greater payoff in the decision of the legislature in the second period.

It is this last environment which provides the richest level of complexity and the widest range of possible outcomes in equilibrium. This is the condition under which many new policy areas are born and developed and under which there is both room for states to explore and experiment with policies according to local preferences before such policies are captured by the national government. As a prime example, I consider the ongoing case of GMOs which is pitting environmental and natural food advocacy groups against scientists and corporations while leaving farmers split. The resulting tug-of-war has seen some variation develop among the states both in terms of polling support for GMOs and in terms of the policies that have been enacting regarding those policies. I focus on one specific niche of this policy regime—that of GMO labeling—and demonstrate how Vermont's actions in that realm induced legislative action. More to the point, my model explains how Vermont's action not only induced Congress to act, but did so despite continued widespread preference divergence over the nature of the national policy.

In the lead-up to Vermont's action, there was very little policy variation on the question of GMO labeling. In particular, there was very little policy at all, if only because the default policy was one that did not require labeling, a position held by many states as evidenced by the defeat of numerous bills on the topic over the preceding decades. However, in the years leading up to Vermont's passage of Act 120 in 2014, several states had made small steps to suggest a coming divergence among local preferences and a corresponding shift in policies across states. While some states, such as Alaska, provided highly-limited labeling requirements, others, such as Connecticut and Maine established laws demanding much stricter labeling—subject only to the constraint that the laws would not be enforced until sufficiently many nearby states also enacted similar laws. These policies, in a nod to concerns about policy variation and the associated costs to manufacturers and food providers, did not significantly move the observed policies of the states, but they did offer a signal that those states had preferences that diverged significantly from more conservative states that were simultaneously pushing to block labeling requirements elsewhere in the country. In conjunction with expected legislative gains in coming congressional elections, these developments served as a signal to Vermont in two ways: First, they signaled the coming maturation of the policy area in the United States and corresponding divergence of both preferences and policies among the states. With this, Vermont saw the coming costs associated with manufacturers working around this myriad of regulations. Second, the developments signaled that there was likely to be a favorable legislative environment at the national level controlled by an allied President and at least one allied chamber of Congress that would be willing to pass legislation similar to Vermont's in the absence of organized opposition in the House. These signals together induced many supporters of strict labeling requirements to support Vermont in its attempt to trigger costly externalities on interstate commerce through the adoption of an extreme policy and thereby force Congress to preempt the states lagging behind with less-strict labeling requirements.

Notably, while the initial goal of forcing Congress to act did come to fruition with the passage of the National Bioengineered Food Disclosure Standard establishing a uniform national standard that preempted local state policies, the passage of time that occurred during the intervening period

shifted the resulting contents of the legislation away from the median sought by the activists driving the legislation in Vermont. Instead, a notably bipartisan coalition of 22 of 44 Democrats and 47 of 54 Republicans (along with zero of two Independents) in the Senate joined 205 of 246 Republicans and 101 of 187 Democrats in the House and a Democratic President to pass standalone legislation which offered some labeling concessions to activists while only demanding limited concessions from opponents of mandatory labeling. Nonetheless, the national policy was established by the congressional action triggered by Vermont's move, and, in requiring labeling of any measure, it did move the national policy closer to Vermont's ideal point than it otherwise would have been.

Of course, in the opposing direction it is not inconceivable that, given time, policy-makers in Vermont might well have recognized the prevailing congressional headwinds and attempted moderating its own policies again in an attempt to bring the region into more alignment and thereby reduce the costs of varying labeling requirements on manufacturers in the region. Alternatively, neighboring liberal states such as Maine and Connecticut might have passed legislation moderating their own policies and signaling support for limited heterogeneity among the states to reduce the burden of various labeling requirements. Such action, as demonstrated by the model, may well have slowed the need for legislative action at the national level and preserved the opportunity for Northeast states to maintain their strong stance against GMOs without interference. Such an action preempting preemption by Congress could then allow the states to maintain their unique preferences in the face of opposition from more conservative states elsewhere in the country.

This basic model also leaves several avenues for improvement that may be used to enrich the environment. While preferences here remain static across periods, lawmaking is a lengthy process fraught with roadblocks that slow down the introduction of new legislation. Individual states operate on different legislative schedules and do so in view of their neighbors, allowing those neighbors to anticipate policies that have not arrived yet and respond accordingly. Even where laws are successfully passed, legal challenges and practical roadblocks preventing immediate implementation may allow opportunities for other states to respond even where the national government does not. Incorporating these constraints into a more sophisticated model addressing the probability of a response. Moreover, these delays open the player to potential changes in state preferences as experienced by Vermont, when the United States Senate flipped to Republican control after the 2014 elections, eliminating an ideologically-aligned ally at the national level.

In the same vein, adding a temporal consideration to the model would allow for repeated games that are likely to support an eventual transition to federal control consistent with the predictions offered in Oates (1972). In the *Unconstrained* case, recall that whenever there is an incentive to act strategically, the states do so using mixed strategies which will probabilistically lead to centralization. Given that there is no mechanism in the model to reverse centralization, this would predict eventual centralization in a repeated game environment. Of course, allowing decentralization is a potential extension in its own right which can provide clarity on the trade-off between attempting to shift policy at the national level and removing national policies altogether.

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