

National Conflict in a Federal System

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Abstract

To explore the effect of federal institutions on national political conflict, we develop a model of two-level governance with interstate preference heterogeneity and cross-state externalities. Our analysis calls into question the conventional interpretation of federalism as a conflict-minimizing institution. We show that polarization over national policy may be higher in federal than unitary systems, even holding policy demand constant. We also show that the incentives for low- and high-demanders to engage in costly conflict are contingent on the status quo national policy, and identify conditions under which those incentives and the deadweight cost of political conflict are higher under federalism than unitary governance. The model helps account for a number of empirical regularities in U.S. politics and policymaking.

Introduction

The belief that in divided societies, decentralizing government authority might prove an attractive solution to persistent problems of political conflict and dysfunction is a longstanding one in political science, policy analysis, and political theory (e.g., Lijphart 1977; Elazar 1987; De Tocqueville 2003 [1835]; Acton 1907). Although statements of this view differ in the particulars, they reflect the more general idea that effective constitutions “lower the stakes” of political conflict by accommodating preference diversity in a political system. In the United States, recent political observers lamenting the dramatic increase in partisan polarization over the last several decades have echoed this view, arguing in favor of a revitalized federalism that empowers states to adopt policy solutions more closely aligned with the preferences of local electorates than those the national government is capable of delivering (Roy 2016; Somin 2017; Rosen 2017). While federalism’s advocates have generally come from the political right, recent developments have raised the profile of state and local policy solutions on the left as well: witness, for example, efforts to decriminalize marijuana; the debate over sanctuary cities; and the commitment by representatives from nine states and 150 cities to abide by the Paris Climate Accord in spite of President Donald J. Trump’s announced intention to withdraw from the agreement.¹

To what extent does the balance of authority between national and state governments mitigate or exacerbate political conflict? To answer this question, we develop a simple model of two-level governance in which some national presence in policymaking is motivated by the existence of cross-state spillovers.² In the model, a collection of representatives from state governments differing in their policy demand chooses a national policy, interpretable as a

¹For a general defense of “progressive federalism,” see Young 2003; Gerken 2004; and Freeman and Rogers 2010.

²Spillovers are, of course, not the only justification for national policymaking, though they are a primary one. Others include the relative efficiency of the national government and the need to protect local minorities. We return to local minority protection in the Discussion.

regulatory standard or a level of public good provision. Subsequently, states can adopt their own policies, either tightening the standard or increasing the level of (local) public good provision beyond the floor established at the national level. While our main substantive focus is the U.S., our results generalize to other political systems in which regional and national governments share overlapping policy responsibilities.

Incentives in the national policymaking process that we consider derive from two related but distinct mechanisms. First, a state's ability to compensate, via state-level remedies, for perceived deficiencies in the national policy is itself contingent on the scope of the national policy itself. When federal regulation is lax or provision low, states with a demand for more extensive policy may offset, albeit imperfectly, the perceived inadequacy via compensating state-level policies. A sufficiently extensive national policy, however, will crowd out states with low demand for spending or regulation. Those states will have a harder time adjusting state-level policy to meet local demand in response to what they would perceive as excessive national-level action. In other words, at a given level of national policy, states with still higher demand can "top up," but those with lower demand will not be able to "top down." The second mechanism concerns the ability of states with relatively low demand to free-ride on spillovers from topping up by their high-demanding counterparts. Free-riding will tend to inefficiently depress policy provision at the *state* level (e.g., Bednar 2005), but also depress demand for *national* policy solutions below what they would be in a unitary political system (cf., Hafer and Landa 2007). As we show below, each of these mechanisms contributes to what may be a surprisingly high potential for political conflict under federalism.

Our analysis suggests that the relationship between federal institutions and political conflict is considerably more subtle than previously appreciated. First, in contrast with the expectation that federalism will diffuse political tensions, we demonstrate that under a broad array of circumstances, political polarization will be *higher* under federalism than in a unitary system. Second, the structure of federalism creates an asymmetry between the incentives of high and low demand states to resist national policies they perceive as deficient. Third, for a

given national policy, states with low demand will always face stronger incentives to contest it under federalism than in a unitary system, *despite their preference for federal institutions*. Finally, we show how the realized deadweight cost of political conflict under federalism may increase in the scope of national policy, and, for sufficiently high levels of national policy, be higher under federalism than unitary governance. At the most basic level, then, we show that the prescriptions of those advocating a revitalized federalism in the United States must take into account of the contingent nature of federalism and decentralization as remedies to problems of pervasive national political conflict.

Our formal analysis sheds light on some empirical regularities in U.S. politics and policy-making that have been the subject of recent discussion and analysis: asymmetric, pervasive polarization at the national level, and the tendency of states that are net recipients of federal programs to be politically conservative. We show that these patterns conform to behavioral implications derived from our model.

Background

The model we present seeks to capture three key aspects of the federal structure of the U.S. political system, although it may be applied comparatively as well. The first is the existence of heterogeneity in demand for public policy. While of course not unique to federal systems, such heterogeneity is central to justifications of federalism (Riker 1964; De Figueiredo and Weingast 2005). The second is the existence of supermajoritarian institutions for lawmaking at the national level: e.g., bicameralism, provisions for overriding a presidential veto, the filibuster, and any legislative rules limiting proposal rights. The third critical aspect is the presence of *de facto* shared sovereignty between the national and state governments with permeable boundaries (Landau 1973; Rose-Ackerman 1981) and independent taxing authority. We follow much of the qualitative literature on federalism since Grodzins (1966) in adopting the view that these boundaries do not represent a clean partition, but are better described as a “marble cake” (Grodzins 1966; see also Riker 1975). The permeability of boundaries between national and state governance raises the possibility that the former may

crowd out the latter (Bradford and Oates 1971; Volden 2005). Our model of federalism may be thought of as one of “partial preemption” (the practice whereby the national government sets regulatory “floors” that the states are permitted to exceed but not fall below – see, e.g., O’Reilly 2006; Scicchitano and Hedge 1993) or “compensatory federalism” (a situation in which “governments at one level are able to compensate for weaknesses or defects at another level” – see Derthick 2010; Thompson 1998; and Pandey 2002).³ We compare partial preemption with the benchmark of complete preemption, a situation in which the national government’s policy framework supersedes that of the states entirely, thus constituting an effectively unitary policy domain.⁴

In addition to the literature on federalism as a conflict-minimizing institution cited above, our research relates to the literature on fiscal federalism dating to Oates (1972), an important branch of which focuses on the role of central government in mitigating distortions induced by local taxation in the presence of spillovers (e.g., Gordon 1983; Myers 1990; Krelove 1992; for reviews see Inman and Rubinfeld 1997 and Oates 1999). In a more political vein, scholars have analyzed the effects of spillovers and status quo policies at the state level on demand for, and feasibility of, national policies (Rose-Ackerman 1981); the relationship between fiscal externalities between the states, commitment problems at the national level, and the ability of federal systems to maintain fiscal discipline (Rodden 2006); and institutional features of federalism that minimize encroachments by one level of government on the prerogatives of another (Bednar 2009). Besley and Coate (2003) demonstrate that even without as-

³The distinction between these two concepts, immaterial at our model’s level of abstraction, hinges on whether the national government expressly rules out certain actions by the states but not others.

⁴Examples of complete preemption include the regulation of telecommunications, medical devices and nonprescription drugs, certain aspects of the financial sector, employment retirement income security, labor-management relations, and aviation and motor vehicle safety (O’Reilly 2006).

suming uniform national policy and in the presence of substantial spillovers and interstate heterogeneity, decentralized systems may nonetheless dominate centralized ones owing to misallocation, political uncertainty, and voters' incentives to elect high-demanders to the legislature (see also Inman and Rubinfeld 1997). Relatedly, Volden (2005) describes a model in which both national and subnational governments can provide public goods and services, but credit-claiming by politicians can yield inefficient overprovision.

Recent work on the political economy of federations has focused on the strategic analysis of the implications of interstate spillovers and multi-level policymaking. Closely related to the current research are papers by Alesina et al. (2005) and Hafer and Landa (2007), who analyze "dual provision" models of federalism in which public goods provision with spillovers across states takes place both at state and federal levels, focusing on the effects of externalities and redistributive tensions on the determinants of the composition of political unions, and the coalition formation and policy choice at the national level, respectively.

Crémer and Palfrey (2000, 2006) examine properties of majority rule in federal systems with partial preemption. In the first paper, the authors demonstrate that majoritarianism at the national level will yield inefficiently high federal floors as a consequence of high-demand citizens in low-demand states' not taking into account the deleterious effects of high national policy on the low-demanding majorities in their states. The inefficiency of majoritarian federal policymaking emerges in our model as well (see Proposition 6 in the Appendix), but it stems from the underlying structural asymmetries in states' abilities to adjust their state-level policies to mitigate departures of federal policy from their most preferred levels. Gordon and Landa (2015) identify a similar inefficiency in a model in which the *raison d'être* for federalism is economies of scale at the national level rather than interstate spillovers. Closer to the current study is Crémer and Palfrey (2006), which adds externalities, although the analysis in that paper is of conditions for majority rule equilibrium and the inefficient allocation of burdens induced by cross-state substitution effects. In contrast to these and the other political economy studies of federalism cited above, the focus of the current inquiry is

on the relationship between federal institutional structure and political conflict.

Model Setup

Primitives

We model policy making as corresponding to government choices taking place at the national and state levels. There is a continuum of states with measure one.⁵ Each state is characterized by a preference parameter whose support is a compact, convex subset of the positive real line, $\alpha \in [\underline{\alpha}, \bar{\alpha}] \subset \mathbb{R}_{++}$, with log-concave probability density function $p(\cdot)$ and cumulative distribution function $P(\cdot)$. Higher values of α correspond to higher valuations of the government program.

Policy made at the national level is denoted by $F \in \mathbb{R}_+$. Our primary analytical focus will be on explicitly *federal* systems, in which each state may select a policy over and above F , denoted by $S_\alpha \in \mathbb{R}_+$. When appropriate, we make comparisons to preferences, behavior, and outcomes under *unitary* systems, in which all states are constrained to set $S_\alpha = 0$.

Define the *effective policy* in a state as $Z_\alpha = F + S_\alpha$, with $Z_\alpha \in [0, \bar{Z}]$, $\bar{Z} \in \mathbb{R}_{++}$. For reasons that will become immediate below, we will assume that $\bar{Z} > \bar{\alpha}$. A state's utility is, then, given by

$$\alpha(Z_\alpha + \beta\Psi(\mathbf{Z})) - \frac{Z_\alpha^2}{2}, \quad (1)$$

where $\Psi(\mathbf{Z}) = \int Z_\alpha dP(\alpha)$ represents the total spillovers from all states. The parameter $\beta > 0$ captures how much a state cares about policy in other states relative to policy within its own borders.

Let $B \in \mathbf{B}$ represent the federal bargaining protocol, which maps the states' preference profile and the (exogenously given) status quo national policy into a new policy F (which may or may not equal the status quo).⁶ Rather than assume a specific bargaining protocol, we will

⁵This is a mathematical convenience that does not affect the results' substantive flavor. See the discussion of a two-state version of the model below.

⁶Formally, let $F^\circ \in \mathbb{R}_+$ be the status quo national policy; $\mathcal{U}(p(\cdot|\underline{\alpha}, \bar{\alpha}))$ be the preference

assume that \mathbf{B} contains q-rules, as well as legislative bargaining institutions with gatekeepers or veto players such as Pivotal Politics (Krehbiel 1998) or Negative Agenda Control (Cox and McCubbins 2005). With the exception of simple majority rule, these institutions will often yield a (non-degenerate) compact and convex interval of policies that are *gridlocked*, that is, that cannot be beaten by another policy even if a majority favors policy change. Focusing our attention on bargaining protocols that induce gridlock in national policymaking will permit us to consider the effects of changes in equilibrium policies within the gridlock interval on the potential for political conflict under different forms of government.

The game unfolds as follows: (1) the federation decides on national policy F via protocol B ; (2) states simultaneously choose their own state policies, S_α ; (3) payoffs are realized.⁷

Interpreting the Setting

Before proceeding to a description of the equilibrium, we provide several interpretive comments. First, to focus on *across*-state preference heterogeneity, we abstract away from population differences between states and *within*-state preference heterogeneity. Consequently, we do not consider such issues as malapportionment or representation failure at the state level. These issues are clearly important, but beyond the scope of the current inquiry.⁸ For purposes of interpretation, we can think of decision makers at the national level as legislators drawn from the political elite of their respective states. For reasons of parsimony, however, we will refer to them as states.

Second, we model effective policy in a state in a federal system as the sum of a national component common to all states⁹ and a state-specific component. This formalization

profile within the federation given the distribution of the α s, $p(\cdot|\underline{\alpha}, \bar{\alpha})$, and \mathcal{U} be the set of all preference profiles. Then $B := \mathcal{U} \times [0, \bar{Z}] \rightarrow [0, \bar{Z}]$.

⁷One could envision a variant of the model in which states move first, followed by federal action, followed by state adjustment. This would produce equivalent results.

⁸That said, our model has implications for analyzing political effects of intrastate heterogeneity – see the Discussion below.

⁹The assumption of a uniform policy is also a reduced form representation of an ex-

is consistent with two interpretations. The first, “regulatory” interpretation is regulatory federalism with partial preemption: the national policy may be interpreted as a minimum standard that the states must comply with, though they are permitted to exceed that standard.¹⁰ The second, “dual provision” interpretation, is government spending on public goods in states, with the national government providing a floor level of expenditure for which each state contributes a *pro rata* share, and to which, within a given state, that state may choose to add with its own supplemental expenditure.

Third, we adopt the quadratic functional form in order to build in symmetry to states’ utilities, so that we may more easily isolate the asymmetries stemming from the institutional environment. That said, the mechanism we describe below holds under the standard model of public goods provision (utility maximization of a mix of public and private consumption subject to Inada conditions and a budget constraint).

Relatedly, we model the benefits that accrue to states from other states’ effective policies as linear-additive. An implication of this assumption (as well as the continuum of states assumption), is that states will not (directly) condition their state-level choices on expectations of what their counterparts will do. In consequence, our model does not manifest “race-to-the-bottom effects.” Setting aside the race to the bottom – a relatively well-understood phenomenon – sharpens our focus on identifying and studying the consequences of a different, novel source of political failure. That being said, a key substantive feature of a race to the bottom – a pressure toward inefficient underprovision – *does* enter into our model because the states will fail to internalize their (modeled) externalities when setting state policy. (As we note below, our model is consistent with other race-to-the-bottom incentives as well.)

pectation that a policy implemented exclusively by the national government will be *more* homogeneous than one arrived at if states implemented policy exclusively as if under autarky.

¹⁰In the absence of total remediation of the harms a regulatory regime seeks to address, modeling cross-state spillovers as positive and increasing in the intensity of regulation is equivalent to modeling them as negative and decreasing in the harms themselves.

Fourth, our formalization of cross-state externalities captures an important set of underlying incentives in a relatively simple form. But there are a number of different ways to model externalities, some of which have different implications for states' utilities and optimal actions. A formal assumption of the current model is that the benefit to a state of an increase in effective policy in another is positive. This assumption is plausible with respect to a range of policy issues, such as infrastructure investment, the regulation of industrial effluents, and the enforcement of laws governing financial improprieties. That said, it may not be realistic in all areas. For example, as California imposes more stringent vehicle emissions standards, the benefit to neighboring states of cleaner air may be offset by negative economic externalities in the form of higher prices for automobiles nationwide, and at a certain point, the negative effects may even come to outweigh the positive ones. The settings to which our model most immediately applies are those for which the net externalities remain positive in the range of politically relevant feasible policies.¹¹ That said, a permutation of our model that formalizes externalities as benefits that increase in the *difference* between other states' policies and one's own and allows for externalities flowing from some states to be negative, preserves the core relationships we describe in our analysis below.¹² An example of an externality that would fit such a formalization – creating race-to-the-bottom type of incentives –

¹¹Note that if the negative externalities from other states arose as a consequence of a high *national* policy, this would exacerbate the asymmetry in a state's induced utility over national policy we document below, which drives our results on resistance potential and equilibrium conflict on the path of play.

¹²Such externalities may be formalized in a state's utility function as $\beta \int (Z_{\alpha'} - Z_{\alpha}) dP(\alpha')$. In this environment, states would face incentives to lower their own policies to augment the externalities from other states. This will temper, though not eliminate, the incentives of high-demanding states to “top up” above the national policy via state-level policy. In this setting, the states' induced utilities would exhibit the same asymmetries at the core of our analysis of states' resistance potential, and the effects on states' preferred national policies that underlie our comparison of polarization across institutional regimes would, similarly,

would be an economic benefit to a state with a low minimum wage from the high minimum wage in a different state, insofar as the latter induced capital flight to the former; a similar type externality would also obtain from social insurance programs that help the indigent.

Finally, similar to Alesina et. al. (2005), we model states' demand for government-funded projects as primitive in order to focus on specific properties of collective choices in a federal setting. In practice, state demand is a function of a variety of economic antecedents (i.e., derived from comparisons of the marginal values of public project and private consumption in a redistributive setting [e.g., Hafer and Landa 2007]) and socio-cultural factors (e.g., prior immigrant group experiences with oppressive governments [Fischer 1989], or modernization-induced liberalism [Inglehart and Welzel 2005]; see also Elazar 1966). The relationship between a state's preference parameter α and, e.g., its average income must, thus, depend on an underlying preference-generating mechanism: for an economics-focused redistributive mechanism, high-demanders may be relatively poor states; for a socio-cultural mechanism, relatively rich ones.

Induced preferences over national policy

The equilibrium concept is subgame perfect Nash. We proceed by backward induction and begin by considering the state policymaking subgame.

State-level policymaking

At this stage of the game, national policy F has been set, and the states condition their choices on F . A state's utility is globally concave in S_α . Solving a state's first-order condition (and accounting for the non-negativity constraint on policy choices) yields the optimal state policy $S_\alpha^*(F) = \max\{0, \alpha - F\}$.

This expression shows that a state's own policy is weakly decreasing in the level of national policy – a crowding-out effect.¹³ Given each state's best response, for a given

remain intact. The intuitions exactly parallel those given for the main model.

¹³A prima facie interpretation of this effect is that the model rules out the possibility of “flypaper effects,” wherein program-specific state and local expenditures appear to increase

national policy F the states will be partitioned into two groups: those with $\alpha \leq F$ will implement $S_\alpha^* = 0$, making the effective policy in those states the federal floor, F . Those states with $\alpha > F$ will “top up” with $S_\alpha^* > 0$ to offset the perceived deficiency in the federal floor, thus achieving effective policy α . The effective policy in a state given federal policy F , $F + S_\alpha^*(F) = \max\{F, \alpha\}$, is represented by the thick black kinked line in Figure 1. When F is low, the state implements a non-zero policy, bringing its effective policy to α (the flat portion). For higher values of F , the national policy is the effective policy, as the state’s own policy has been fully crowded out (the diagonal portion).

Substituting $S_\alpha^*(F)$ into $\Psi(\mathbf{Z})$ and simplifying (see Appendix for details) gives the equilibrium value of Ψ as a function of F , which turns out to be

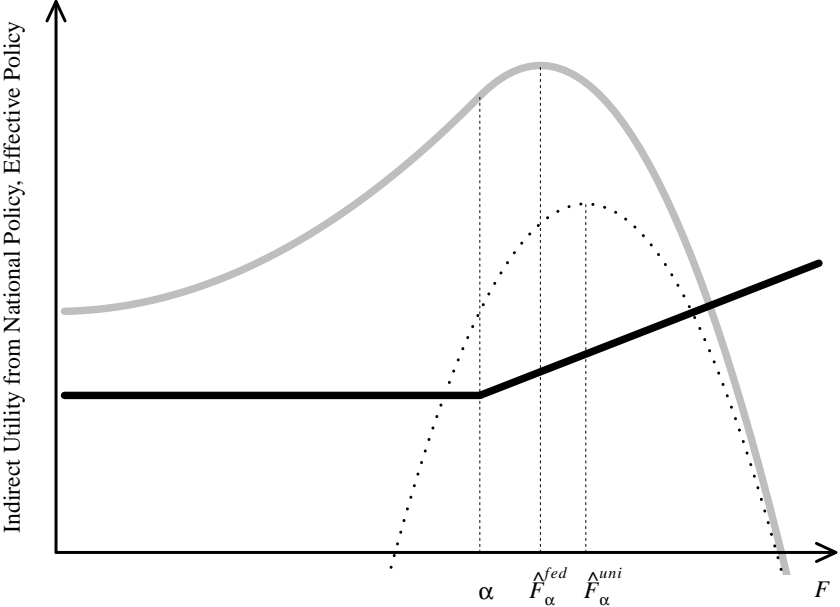
$$\Psi^*(F) = E[\alpha] + \hat{P}(F),$$

where $\hat{P}(\cdot)$ is the integral of the cdf of α (sometimes called the “super-cumulative” function).

National policymaking

Before proceeding further, it is valuable to delineate three different ranges of national policy. First, when $F \leq \underline{\alpha}$, the national policy will not bind on any state – each will choose state-level policy equal to its own α . We call such national policies *effectively autarkic*. Second, when $F \in (\underline{\alpha}, \bar{\alpha})$, states with $\alpha \in (F, \bar{\alpha})$, will top up, choosing state policies greater than zero, while states with $\alpha \in (\underline{\alpha}, F]$ will be fully crowded out. We call such policies *effectively federal*. Finally, when $F \geq \bar{\alpha}$, all states will be fully crowded out. We call these national policies *effectively centralized*. Of course, the latter policies – under which no topping up by in response to intergovernmental aid. A straightforward tweak of the model that would generate flypaper effects would be to introduce complementarities between F and S_α . To the extent that complementarities between federal and state policy do exist, they would affect our results only if those complementarities are sufficiently large to offset the crowding-out effect.

Figure 1: Effective Policy in a State with Preference Parameter α and That State's Induced Preferences over National Policy, Given Uniform $p(\cdot)$



Effective policy in a state under federalism (the thick black kinked line) is constrained by sufficiently high federal floors ($F > \alpha$). This constraint generates an asymmetry in the state's induced utility over national policy (the shaded gray curve). The dotted curve shows the state's induced utility in a unitary system. \hat{F}_{α}^{fed} and \hat{F}_{α}^{uni} are state's ideal national policies under federalism and under unitary government, respectively.

any state is an equilibrium – are distinct from policies in a unitary system, in which states cannot top up even if they prefer to. Likewise, the notion of an effectively federal policy is only meaningful under federalism. (Below, we will use the term only in that context.) Because effectively autarkic policies are weakly Pareto-dominated under federalism, we will restrict attention in what follows to effectively federal and centralized policies ($F > \underline{\alpha}$).

Under federalism, anticipating the state policies in the second stage, each state seeks to maximize

$$u(F; \alpha, \beta, P(\cdot)) = \begin{cases} \frac{\alpha^2}{2} + \alpha\beta(E[\alpha] + \hat{P}(F)) & \text{if } F < \alpha \\ \alpha F + \alpha\beta(E[\alpha] + \hat{P}(F)) - \frac{F^2}{2} & \text{otherwise.} \end{cases} \quad (2)$$

The first line represents the payoffs to states that will perceive the national policy to be too low, and implement a positive offsetting state policy. This portion of the state's utility is increasing and strictly convex in F . The second line represents payoffs to states that have been fully crowded out. The two components of (2) intersect at $F = \alpha$, implying continuity of states' induced utilities at that point (with continuity elsewhere implied by the functional forms). A state's preferences can be either single- or double-peaked. Lemma 1 in the Appendix provides necessary and sufficient conditions for single-peakedness. Roughly speaking, double-peakedness can emerge only for a state with relatively low-demand if $p(\alpha)$ has a particularly high mode. Because the conditions for double-peakedness are highly restrictive, to keep things simple, we assume in what follows the conditions that guarantee single-peaked preferences hold.

Let \hat{F}_α^{fed} denote the ideal point of a state with preference parameter α under federalism. (Below, we will denote the corresponding ideal point under unitary government as \hat{F}_α^{uni} .) Our first result establishes a fundamental asymmetry in a state's induced preferences over policy under federal institutions. This asymmetry will play a critical role in our analysis below.

Proposition 1 (Asymmetric Induced Preferences under Federalism) *Under feder-*

alism, a state loses weakly less from a marginal decrease in national policy away from any sufficiently low $F = \hat{F}_\alpha^{fed} - \Delta$ than it does from a marginal increase in national policy away from a corresponding sufficiently high $F = \hat{F}_\alpha^{fed} + \Delta$. (If \bar{Z} is not binding, the relationship is strict.)

(All proofs of formal results appear in the Appendix.)

To see the basic intuition for this result, recall from above that up to α , the state’s utility is increasing and convex in F , because the state can take compensating action to “top up” in the presence of a national policy perceived as too low. Above α , states have no such recourse – they cannot “top down.” For sufficiently high values of F , a state’s utility is decreasing and concave, as the effects of additional increases in national policy become increasingly onerous. Critically, this asymmetry arises solely through the federal structure, and *not* through other features of the model (e.g., cross-state externalities).¹⁴ The asymmetry is illustrated by the gray curve in Figure 1, which depicts induced preferences over national policy under federalism given uniform $p(\cdot)$.

The next result describes the contingent relationship between the institutional environment and a state’s ideal national policy in that environment.

Proposition 2 (Differences In Ideal Policies under Federal and Unitary Systems)

All states have weakly, and if $\hat{F}_\alpha^{fed} < \bar{\alpha}$ then strictly, lower ideal points in a federal than in a unitary system.

As long as a subset of high-demanding states is willing to top up from the national policy under federalism, relatively low-demanding states are, given positive externalities, in a position to free-ride on the former group’s policies. This reduces the marginal benefit of a higher

¹⁴As β goes to zero, a state’s utility below α approaches a constant, while its utility above \hat{F}_α^{fed} (which itself approaches α from the right) is strictly decreasing, consistent with the claim in the Proposition, but now in the absence of externalities. Given our assumptions, preferences under unitary government, $u^{uni}(F; \alpha, \beta)$, are given by $\alpha(1 + \beta)F - \frac{F^2}{2}$, i.e., they are quadratic and thus symmetric about \hat{F}_α^{uni} .

national policy when compared with a unitary system in which the benefits from free-riding on this topping up cannot be realized. The result, reflected in states' ideal points, is lower demand for national policy under federalism than under unitary institutions. States with sufficiently high demand, however, will prefer an effectively centralized national policy that fully crowds out all states. For these states, ideal policies under federal and unitary systems are identical.

The dashed parabola in Figure 1 depicts a state's utility over national policy under a unitary system, with \hat{F}_α^{uni} the corresponding ideal point. A comparison with the gray curve in the figure illustrates Proposition 2: $\hat{F}_\alpha^{uni} > \hat{F}_\alpha^{fed}$. Further, for any national policy that is effectively federal under federalism, the state's utility from that policy is strictly higher under federalism than it would be under unitary governance. This is immediate: if a state's α is higher than the national policy, then it would prefer to be able to top up and so would prefer federalism; and if lower than the national policy, then, at that policy, the state would prefer federalism because it permits it to enjoy topping up by other states.

Analyzing Conflict in National Politics

Polarization of Preferences

Having described key features of preferences over national policy under a plausible model of federalism, we shift our attention to the subject of political conflict. We begin by considering political polarization, a concept that has received extensive attention in the empirical literature on national politics in the United States over the last several decades. Of particular importance in this literature is *partisan* polarization, conventionally defined as the difference between the ideal points of mean members of the Republican and Democratic party caucuses (e.g., McCarty, Poole, and Rosenthal 2006). While our model does not explicitly consider parties, we can approximate the relevant notion of polarization by considering ideal point polarization between two states signifying generic quantiles of $p(\alpha)$: one with relatively high demand α_H and another with relatively low demand α_L . (One can think of these two states

as summary statistics reflecting the broader preferences of two distinct national coalitions.) Our adopted measure of polarization, then, is simply $\hat{F}_{\alpha_H} - \hat{F}_{\alpha_L}$.

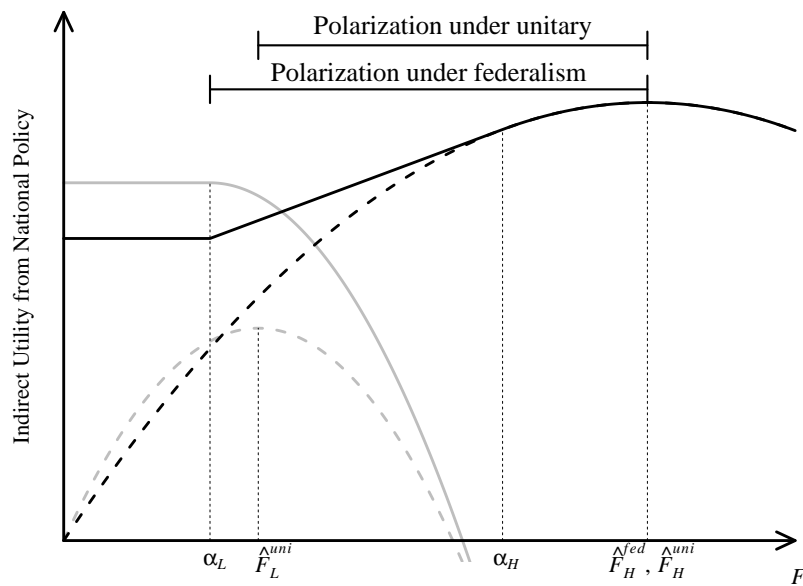
To develop the intuition for the main result in this section, we first consider a simplified version of the model in which the two states with demand α_L and α_H are the only two states in the political system.¹⁵ Figure 2 depicts the induced utilities of states L (gray) and H (black) under federal (solid) and unitary (dashed) policymaking, and captures some of the key intuitions underlying Propositions 1 and 2. The Figure shows the asymmetry in induced preferences over national policy under federalism. For state H , induced utility below α_H is flat (for effectively autarkic policies) and then linear-increasing (for effectively federal ones), as any F between α_L and α_H binds only on L and is thus all upside for H ; once national policy exceeds α_H , the costs begin to bind on H , and its utility becomes quadratic. For state L , induced utility is flat for effectively autarkic F s ($F < \alpha_L$), and strictly decreasing above α_L . With respect to ideal points, note that because national policy at H 's ideal point under federalism is effectively centralized, it coincides with its counterpart in a unitary system. L 's ideal point under a unitary system, by contrast, is strictly higher than its non-autarkic ideal policy under federalism, α_L .

In this environment, the range of national policies that maximize L 's utility under federalism is strictly below its ideal point under unitary government because of the unrealized free-riding effect described above. By contrast, H 's ideal points under the two institutions coincide given the absence of that effect for that state. Hence, polarization with two states is strictly *higher* under federalism than in a unitary system.

The extension of this conclusion to the more general model is immediate if national policy is effectively federal at L 's ideal point and effectively centralized at H 's. And if national policy at the ideal points of both L and H is effectively centralized, then polarization would be identical under both unitary and federal systems. Things get more complicated, however,

¹⁵Single-peakedness of both states is assured if and only if $\beta < \frac{\alpha_H - \alpha_L}{\alpha_L}$, i.e., if the states' underlying demand parameters are sufficiently far from each other.

Figure 2: Preferences and Polarization over National Policy in the Two-State Example



Gray curves depict induced utilities for state L, and black curves for state H. Solid curves denote induced utilities under federalism, and dashed curves under unitary governance.

if national policy is effectively federal at the ideal points of both L and H . This is because there may exist states, with α s above H 's ideal national policy, that would top up from that policy under federalism, thus creating a wedge between H 's ideal points under the two systems. If the measure of such states at H 's ideal point is low relative to the corresponding measure at L 's ideal point, the logic from the two-state example will govern. If not, the difference between H 's ideal points under unitary and federal governance will exceed the difference for L . In that case, the logic reverses, and polarization will be higher under a unitary than a federal governance structure. The following result formalizes this intuition by providing a condition for ordering the extent of polarization under federal and unitary governance.

Proposition 3 (Polarization under alternative national institutions) *Suppose L 's ideal policy under federalism is effectively federal. Polarization is strictly higher in a federal than in a unitary system if and only if $\frac{1-P(\hat{F}_{\alpha_H}^{fed})}{1-P(\hat{F}_{\alpha_L}^{fed})} < \frac{\alpha_L}{\alpha_H}$, and higher in a unitary system when the inequality is reversed.*

The Potential for Political Resistance

Polarization is an important and useful index of disagreement in a political system. However, polarization may not be a sufficient statistic for disagreement, as it omits both the policy options on the table and the tradeoffs among them (Gordon and Landa 2018). The latter point is particularly acute given our discussion of induced preferences under federal institutions: a measure of potential conflict based on ideal points alone will not capture the asymmetries in the shapes of those preferences detailed above.

We begin this section by considering a different set of measures that captures those asymmetries, with the following intuition. Conflict over national policy is embedded in a broader (unmodeled) political setting that incorporates electoral competition, advocacy, legal challenges, and executive discretion, among other things. Contestation in these domains may be relatively benign, as in the case of lobbying, or more sinister – and potentially even destabilizing of the political order – as in the case of undermining voting rights, refusal to

hold nomination hearings, or executive noncompliance with clearly articulated statutes. A political actor with a stake in the national policy might nonetheless be motivated to pursue policy change through these channels, the incentives for which we consider next.

Any policy F creates natural coalitions of high-demanders favoring higher F and low-demanders favoring lower F . We construct measures that capture the extent of dissatisfaction of these coalitions (and thus incentives to invest in conflict to change the status quo policy through any of the channels described above), while noting the particular relevance of the incentives of political “losers” – informally, the high-demanders when F is relatively low, and the low-demanders when it is relatively high. We will then be in a position to assess how this potential resistance to a national policy varies with that policy, and the effect of the federal structure on that relationship.

Specifically, the absolute value of the marginal utility of a state provides an index of its willingness to invest effort in incrementally shifting F in the direction of its ideal point: $\frac{\partial u(\alpha)}{\partial F}$ for high-demand states (those with $\hat{F}_\alpha > F$) and $-\frac{\partial u(\alpha)}{\partial F}$ for low-demanders (those with $\hat{F}_\alpha < F$). Following Gordon and Landa (2018), let $mRP^+(F) \equiv \int_{A(F)}^{\bar{\alpha}} \frac{\partial u(\alpha)}{\partial \alpha} p(\alpha) d\alpha$ be the *marginal resistance potential of high-demand states given policy F* and $mRP^-(F) \equiv -\int_{\underline{\alpha}}^{A(F)} \frac{\partial u(\alpha)}{\partial \alpha} p(\alpha) d\alpha$ the *marginal resistance potential of low-demand states given policy F* , where $A(F)$ denotes the α whose corresponding ideal point is F .¹⁶ Intuitively, the quantity $\max\{mRP^-(F), mRP^+(F)\}$, the *maximal mRP at F* , captures the potential upside to the biggest political “losers” of moving the status quo national policy F in their direction.

Note that because the set of states in our main model is a continuum, no state will actively resist in equilibrium given any finite cost of doing so. Unlike our resistance po-

¹⁶While the two measures are not equivalent, they are related. Consider a mean-preserving spread of $P(\cdot)$ (assuming that states L and H are on opposite sides of the mean) or, here equivalently, an increase in β . Holding constant F , either change would simultaneously increase polarization and, by increasing the absolute marginal utility of every state in the distribution associated with that policy, both mRP^+ and mRP^- .

tential measures, however, that conclusion is an artifact of the mathematically convenient assumption of a continuum. Consequently, we will focus the remainder of our analysis in this section on resistance potential, and, in the next section, explicitly consider an analysis of costly equilibrium resistance in the context of our two-state example.

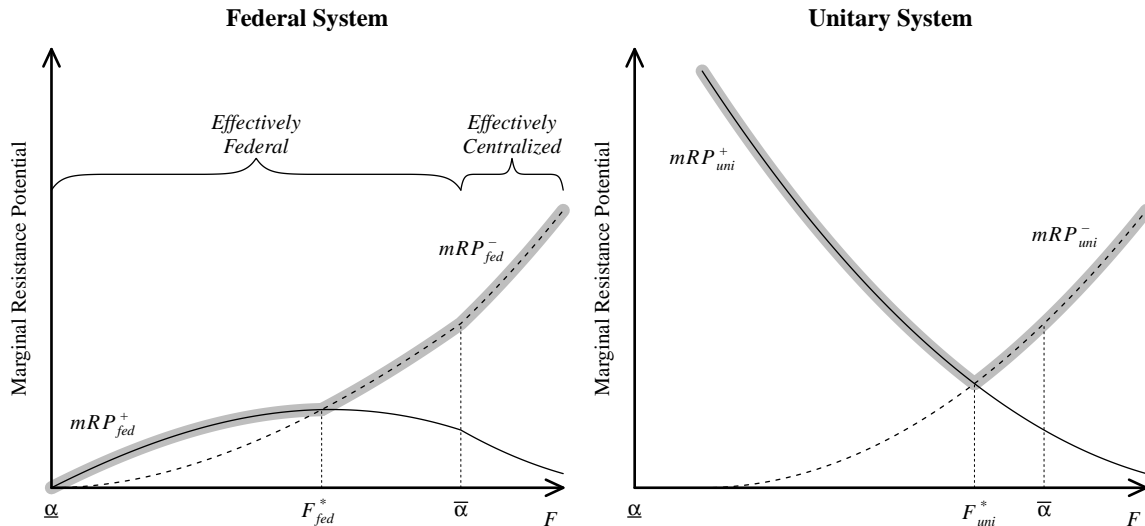
Our next two results will examine the relationship between the marginal resistance potential measures and national policy on the one hand, and between those measures and institutional structure on the other. Given our notation, let $\hat{F}_\alpha = \underline{\alpha}$ denote the most preferred national policy of a state with the lowest feasible demand for policy (which may not necessarily equal zero). Likewise, let $\hat{F}_{\bar{\alpha}} > \bar{\alpha}$ the most preferred national policy of a state with the highest feasible demand. Then:

Proposition 4 (Resistance potential under federalism) *Under federalism:*

1. $mRP^-(F)$ is strictly increasing in F ; and $mRP^+(F)$ is strictly increasing in F for sufficiently low values of F , and strictly decreasing otherwise.
2. There exists a pair of national policies $\{\underline{F}, \bar{F}\}$, with $\underline{F} > \hat{F}_\alpha$ and $\bar{F} < \hat{F}_{\bar{\alpha}}$, such that for all policies $F' < \underline{F}$ and policies $F'' > \bar{F}$, the maximal mRP at F' is strictly less than the maximal mRP at F'' .

To understand the first part of this result, note that fully crowded out low-demanders have no recourse to compensating state action. As F increases, so does the size of their coalition, with the lowest-demand states particularly hard hit and thus most willing to invest in incremental decreases in the policy. Both the size and intensity effects point in the same direction. The resistance potential of high-demanders is more nuanced. At low values of national policy, many states are in the high-demand coalition, but the marginal effect of an increase in cross-state spillovers is small, because it will bind a relatively small number of low-demand states; hence, high-demanders have little incentive to invest in increases to the policy. As policy increases, the marginal benefit of increasing the externalities increases, and so resistance potential increases concurrently. At high values of the policy, the reduction in the size of the

Figure 3: Marginal Resistance Potential for Different Levels of National Policy under Federal and Unitary Systems



The left panel shows how marginal resistance potential varies with national policy in a federal system, while the right panel shows this relationship in a unitary one. In both panels, the black solid line denotes mRP^+ , and the dashed line mRP^- . The shaded gray curves depict $\max\{mRP^-(F), mRP^+(F)\}$. F_{fed}^* and F_{uni}^* denote, respectively, the aggregate welfare maximizing national policies under federalism and unitary governance.

high-demand coalition outweighs the spillover-related benefits of further increases to those remaining in the coalition, driving down their resistance potential. The left panel of Figure 3 displays this intuition graphically. Note that by construction, $mRP^+(F)$ and $mRP^-(F)$ intersect at the national policy that maximizes aggregate welfare in the federation, labeled F_{fed}^* in the figure.

The maximum of $mRP^+(F)$ and $mRP^-(F)$ is depicted by the shaded gray curves in Figure 3. When national policy is low (high), mRP^+ (mRP^-) dominates. The second part of the Proposition describes an important asymmetry in the extent of resistance potential for high demanders when the national policy is low relative to that of low demanders when it is high. Specifically, two factors drive down the former relative to the latter: the fact that high-demanders can top up in response to a limited national policy, and that the benefit of incremental increases from a low policy is relatively small. However, when national policy is extensive, states with low demand will be highly incentivized to contest it because of their

inability to adjust at the state-level and the resultant large benefits of even incremental decreases to that policy.¹⁷

Whereas Proposition 4 makes within-institution comparisons, the next result provides comparisons across institutions:

Proposition 5 (Institutional comparison of resistance potentials) *For any given national policy F , the resistance potential of low-demand states is weakly higher, and of high-demand states weakly lower, under federalism than in a unitary system, with the relationships holding strictly if F is effectively federal.*

Under a unitary system, low-demand states cannot enjoy the externalities from topped-up provision in high-demand states. The inability to free-ride will induce them to prefer a higher F . The effect is to lower the marginal disutility to them of a higher policy, and so reduce their resistance potential compared to what it would be under federalism. In contrast, because high-demand states can, under federalism, top up from F , their incentives to resist a decrease or to push through an increase in F are weaker than they would be in a unitary system. A comparison of the two panels of Figure 3 conveys the intuition graphically; note that for the range of policies labeled “effectively centralized” under federalism, the mRP^+ and mRP^- measures converge to their counterparts under the unitary system.

Conflict on the Path of Play: a Two-State Example

Above, we described how asymmetries in the stakes to relatively low and high policy demanders of contesting a given status quo national policy can emerge as a direct consequence of a federal institutional structure. In this section, we provide an example of how actual conflict may play out in equilibrium. To do this, consider again our two-state example from above

¹⁷The logic behind this result turns on the induced preference asymmetries but not on the incentives to free-ride. As noted above (fn. 14), a states preferences remain asymmetric as β approaches zero (flat to the left of α , and decreasing and concave to the right). High demanders would never have an incentive to fight to raise the policy, while low demanders would still face incentives to lower it.

and now allow states to make direct investments in political resistance. The quantity of particular interest is the sum of these investments – that is, the deadweight cost of conflict. While we refrain from making general claims about the extent of this deadweight cost (which will be sensitive to functional form assumptions), the analysis below is suggestive of the ways in which it may be contingent on both the magnitude of the status quo national policy and institutional structure.

Specifically, suppose the status quo national policy is effectively federal, that is, $F^\circ \in (\alpha_L, \alpha_H)$. We assume that each state i may move policy F° a distance of c_i in its preferred direction, at a cost $\nu c_i^2/2$. The ultimate policy is $F = F^\circ + c_H - c_L$. The game proceeds as follows: first, Nature generates a status quo F° . Then, states L and R simultaneously choose their investments in moving policy, and the revised national policy is determined. Finally, each state decides whether to top up above the revised F .

State-level policy choice proceeds exactly as above: states with $\alpha_i \leq F$ (L in the two-state equilibrium) choose $S_i = 0$, while those with $\alpha_i > F$ (H in equilibrium) top up to α_i . In the Appendix, we derive equilibrium levels of c_L and c_H . Here, we offer two remarks respecting this specific environment. In order for us to stress the substantively relevant aspects of federalism and make pertinent institutional comparisons, we will assume that $\beta < \frac{\alpha_H - \alpha_L}{\alpha_H}$. This condition insures that L 's ideal policy under unitary governance, and the equilibrium federal policy under federalism, will both be effectively federal.

The first remark speaks to the relationship between the deadweight cost of conflict (proportional to the sum of squared c_i s) and the status quo level of policy F° under a federal system when the status quo is effectively federal.

Remark 1 (Status quo dependence of conflict under federalism) *In the equilibrium of the two-state game under federalism, the deadweight cost of conflict is strictly increasing in the status quo national policy if that policy is effectively federal.*

In general, investments by the two states may respond directly to the marginal benefits and costs of the investment as well as indirectly via strategic adjustment of the states to each

others' anticipated investments. In the present model, for an effectively federal F° under federalism, H 's utility is increasing and linear in F° and consequently, its direct marginal benefit from a rightward shift in that policy is constant and unresponsive to L 's investment.¹⁸ Given the inelasticity of H 's investment, L 's investment in decreasing the national policy responds to the direct marginal benefit of doing so, which is increasing in the extent of that policy, as well as H 's constant investment. Thus, the total deadweight loss from conflict will be increasing as well.

Our second remark compares the deadweight losses from conflict under federal and unitary institutions for given status quos.

Remark 2 (Conflict in Federal vs. Unitary Systems) *For sufficiently large β , there exists a critical value of F , \tilde{F} , such that if a status quo national policy F° is effectively federal and above \tilde{F} , then the equilibrium deadweight cost of conflict at that policy is higher under federalism than in a unitary system.*

To see the intuition, consider, first, H 's investment. As noted above, the willingness of state H to invest resources in national conflict under federalism is constant in F . Under unitary governance, by contrast, it is decreasing in F . The *direct* effect of an increase in the importance of spillovers β is to intensify the demand of both states for higher national policy under both institutions. At relatively high national policies, this magnifies H 's willingness to invest in conflict while reducing L 's. Under unitary governance, the *strategic* effect of L 's reduced willingness to fight is to dampen the increase in H 's investment. By contrast, there is no analogous dampening effect under federalism. For sufficiently high levels of β , this will lead to a higher investment in conflict by H under federalism.

Next, consider L 's investment, which, under both systems, is increasing in F when F is higher than L 's ideal points. As β increases, L 's demand for national policy under unitary governance increases, whereas – given topping up by H – its demand under federalism does

¹⁸Note that if the benefit to H were not linear but concave, the effect would be to reenforce H 's relative unwillingness to fight given a distant status quo.

not, because higher national policy would only bind L , not H . Correspondingly, L 's relative dissatisfaction with a given high national policy under federalism – and thus its willingness to invest resources contesting it – also increases with β . For sufficiently high values of F , L will fight harder under federalism for higher β . Thus, for sufficiently high values of β and high enough F , both states investment into conflict will be higher under federalism, and so, accordingly, will be the deadweight loss of conflict.

Discussion

Refining the Political Theory of Federalism: Conflict, Efficiency, and Institutional Legitimacy

The foregoing results serve as a counterpoint to the view of federalism as a live-and-let-live, conflict-minimizing institution. Importantly, as those results obtain even holding the preference profile of the polity constant, they cannot be dismissed as an artifact of endogenous institutional selection.¹⁹ Rather, they are driven by two features common to federal systems and highlighted by our model: the incentives to free-ride by states with relatively low demand for public goods and/or regulation, and the asymmetries in induced preferences for national policy brought about by the disjunction between the ability of high demander states to top up and the inability of low demander states to top down.

The importance of the first feature is underscored by Proposition 3, which describes a broad range of conditions under which political polarization should be expected to be higher under federalism than in a unitary system, even holding constant the underlying distribution of demand for the policy and the magnitude of cross-state externalities. The logic of our results in Propositions 4 and 5, concerning the marginal benefits of contesting a status quo policy, turns on asymmetries in induced preferences. Those results imply that under

¹⁹Christin and Hug (2012) point out that the mixed empirical record of federalism may owe much to selection: it is precisely those societies that are most conflict-prone that are most likely to experiment with federalist institutions.

federalism, for a broad range of policies, low demanders have a stronger incentive to contest a national policy they perceive as too extensive than high demanders have to contest one they perceive as too limited (see also our two-state example). Because federal institutions create an incentive for states to free-ride on other (higher-demanding) states, those institutions effectively increase the net marginal benefit of reducing a national policy more extensive than low-demand states' ideals.

Taken together, these results should serve to deepen skepticism over the conflict-minimizing potential of federalism. That being said, recall that for any national policy F , *all* states prefer to live with it under federal rather than unitary governance. This suggests a broader point about institutional legitimacy generally, and in particular, for how one ought to interpret institutional legitimacy in light of political conflict: caution is required before equating the doom and gloom of increased polarization and sharper policy conflict with broken institutions *per se*.

From a comparative institutional perspective, the logic of the preceding paragraph draws out a tension between institutions under which conflict over policy may be minimized and those under which efficiency of policy may be maximized. As such, it drives home an important distinction between political and market outcomes more generally. *A priori*, one might have expected no wedge between conflict-minimizing and efficiency-maximizing policies. In a world without coercion, given an efficient status-quo, no side would be willing to incur the cost of making an offer necessary to displace it. Because politics is inevitably coercive, however, we may anticipate the deadweight losses of conflict to arise even if the status quo is efficient in an economic sense.

Applications to U.S. Political Economy

Our model of federalism is deliberately parsimonious, omitting key political complexities to focus on the functioning and implications of a specific causal mechanism. That being said, it permits a straightforward broader framing in a more comprehensive political environment in which a number of its implications can be readily evaluated. In this section, we briefly

discuss several widely recognized empirical observations about U.S. politics and policymaking illuminated by our analysis and shed light on one of the central policy debates over federalism.

“Asymmetric” Policy Conflict and Bipartisan Lawmaking. One of the most robust observations of contemporary analysts of U.S. politics is the dramatic increase in partisan contentiousness since the early 1980s. Recently, scholars have concluded that the increasing gap between Democrats and Republicans is due primarily to a pronounced conservative shift among Republicans (Barber and McCarty 2015; Mann and Ornstein 2012), which cannot be wholly accounted for by the transition of southern conservatives to the Republican Party.

This partisan asymmetry is consistent with our findings concerning resistance potential: specifically, a large federal presence – not only in public goods provision but also in the enforcement of civil rights – is likely to activate a high degree of opposition from conservatives relative to the degree of opposition from liberals to a small national presence.

A related point emerges from the comparison of contemporary political polarization with polarization during the Progressive Era (1900-1916). Although standard measures suggest comparably high degrees of legislative polarization in both periods (McCarty, Poole, and Rosenthal 2006), the incidence of successful bipartisan lawmaking could not be more different. The earlier period is remembered for landmark legislation expanding the national administrative state, much of which passed with large bipartisan majorities. By contrast, the contemporary era has seen few (if any) major legislative accomplishments passing in the absence of strenuous minority party opposition. If we accept polarization as a sufficient statistic for political discord, this difference in consequences is puzzling. Our analysis of resistance potential suggests an alternative measure of discord and points to a resolution of the puzzle. Larger resistance to marginal changes from extensive federal policies (such as those in the contemporary era) than from limited ones (such as those at the beginning of the Progressive Era) could account for the difference in politics and policymaking in the two eras, opening a new avenue for future empirical work on political conflict that leverages our

measure of discord.

A Paradox of Red and Blue States. As Lacy (2014) notes, citizens of states that are net beneficiaries of federal largesse (relative to taxes) tend to vote conservatively, a pattern that has led some critics to decry hypocritical “red state moochers” (e.g., Pearlstein 2016). Consider the public goods provision interpretation of our model. The incentives described in the model imply that even if we permitted the benefits of a national policy to fall asymmetrically on states, there would exist a range of benefit distributions such that low demand states receiving a high relative share of the benefits would nonetheless oppose the policy in the aggregate. This would occur because for some states that are crowded out, the marginal cost of contributing to financing the national policy would still exceed the marginal benefit, *even given the redistribution in their favor*. In effect, our model resolves this apparent paradox in terms of the shadow cost of crowding out.

Minority Rights and Intra-state Disagreement

In order to focus on interstate political conflict, our model has abstracted away from a significant aspect of debates on federalism, particularly in the United States: democratic failure within states, which may arise given intrastate preference heterogeneity and the subjugation of minority political rights within states. While not addressing these issues explicitly is a limitation of our analysis, it suggests a path for their future consideration. Variation in resistance potential over national policy arguably tracks the incentives on the part of powerful elites to suppress or champion voting rights of groups whose votes could shift policies within states, and the induced preferences of states’ representatives over national policies.

More specifically, consider elite behavior surrounding the politics of traditionally low-demand (i.e., “red”) states. Low-demanding elites in such states will be motivated to suppress the franchise of high-demanding minorities in their states, both to keep state policy low and also to keep that state’s national representatives conservative. By contrast, high-demanding elites (elites in high-demand states) will be motivated to invest in national efforts to do just the opposite in order to increase the “red” states’ demand for national policy.

While these conflict-generating incentives are always present, we should expect them to be particularly acute when a gridlocked status quo national policy is relatively low and so a shift of the lower bound of the gridlock interval upward appears within reach.

Contrast this now with elites' incentives when the status quo is at the high end of the gridlock interval. The motivation of high-demanding elites from "blue" states to fight for the voting rights of high-demand minorities from "red" states will now be weaker, but that of the low-demanding elites from "red" states to work on undermining the national representation of high-demand groups from previously "blue" states (in order to shift back the upper bound of the gridlock interval) will be particularly strong. Indeed, our results on the asymmetry of resistance potentials suggest that that fight to turn "blue" states "purple" may draw more commitment from "red" state elites than the fight to enfranchise high-demand groups within "red" states would from the "blue"-state elites.

Analyzing the net effects of those incentives in greater detail requires additional structure, including on the technology of conflict between state-level interests, that we have sought to avoid imposing in the present paper. We leave that analysis for future work.

Conclusion

Previous scholarship on federalism has delivered important insights into both political and economic aspects of the relationships between constituent units in federal systems. Yet, rigorous analysis of the incentives for and the nature of political conflict under federalism – both with respect to different policies within its institutional framework, and in relation to alternative institutional arrangements – has been scant. Our aim has been to fill this gap, spurred both by its importance in the context of a broader political theory of federalism, and by our desire to shed light on increasing political contentiousness in the U.S., one of the oldest and largest federal systems.

The analysis we have developed focuses on two critical features of federal structures that we connect with the potential for political conflict: the fundamental asymmetry in the abilities of states with different levels of demand for a policy to respond at the state level to

what they perceive as a suboptimal national one, and the incentives associated with policy outcome externalities across states.

The results we present paint a novel picture of the politics of federalism that provides an important counterpoint to the optimistic perspective on its effect on political conflict, and helps account for a number of empirical patterns in U.S. politics traceable, at least in part, to the effects of federalism. As we have sought to emphasize, the implication of these results is not so much to undermine the appeal of federalism, but rather to put federalism in its proper place, understanding the political conflicts it mitigates and brings to the fore against the background of institutional legitimacy and social welfare.

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1 Supplemental Appendix for “National Conflict in a Federal System”

Derivation of $\Psi^*(\cdot)$

From the text,

$$\begin{aligned}\Psi^*(F) &= \int_{\underline{\alpha}}^F Fp(\alpha)d\alpha + \int_F^{\bar{\alpha}} \alpha p(\alpha)d\alpha \\ &= FP(F) + \int_F^{\bar{\alpha}} \alpha p(\alpha)d\alpha\end{aligned}\tag{A.1}$$

Integrating the second expression in the second line of (A.1) by parts,

$$\begin{aligned}\int_F^{\bar{\alpha}} \alpha p(\alpha)d\alpha &= \left[\alpha P(\alpha) - \int P(\alpha)d\alpha \right]_F^{\bar{\alpha}} \\ &= \bar{\alpha}P(\bar{\alpha}) - \hat{P}(\bar{\alpha}) - FP(F) + \hat{P}(F),\end{aligned}$$

where $\hat{P}(x) = \int_{\underline{\alpha}}^x P(\alpha)d\alpha$, i.e., the integral of the cdf. Substituting into (A.1) and noting that $P(\bar{\alpha}) = 1$, we have

$$\Psi^*(F) = \bar{\alpha} - \hat{P}(\bar{\alpha}) + \hat{P}(F).\tag{A.2}$$

By definition, $E[\alpha] = \int_{\underline{\alpha}}^{\bar{\alpha}} \alpha p(\alpha)d\alpha$. Integrating by parts as above gives

$$\int_{\underline{\alpha}}^{\bar{\alpha}} \alpha p(\alpha)d\alpha = \bar{\alpha}P(\bar{\alpha}) - \hat{P}(\bar{\alpha}) - \underline{\alpha}P(\underline{\alpha}) + \hat{P}(\underline{\alpha}).$$

Noting that $P(\bar{\alpha}) = 1$, and $P(\underline{\alpha}) = \hat{P}(\underline{\alpha}) = 0$, we have $E[\alpha] = \bar{\alpha} - \hat{P}(\bar{\alpha})$. Substituting into (A.2), $\Psi^*(F) = E[\alpha] + \hat{P}(F)$.

Lemma 1 *Let $\tilde{\alpha}$ be the modal value of α . In a federal system, a state’s preferences are single-peaked on $F \in [0, \bar{Z}]$ if and only if one of the following four conditions holds:*

(a) $\tilde{\alpha} \geq \alpha$ and $p(F) \leq \frac{1}{\alpha\beta}$ for all $F > \alpha$;

(b) $\tilde{\alpha} \geq \alpha$ and $p(\alpha) \geq \frac{1}{\alpha\beta}$;

(c) $\tilde{\alpha} < \alpha$; or

(d) Conditions (a) through (c) are violated, but $\bar{Z} < \check{F}_\alpha$, where \check{F}_α is the value of F corresponding to a local minimum in $u(F)$ for $F > \alpha$.

Otherwise, state i has double-peaked preferences.

Proof. First, note that $\forall F < \alpha$, $u(F)$ is strictly increasing and convex. Second, note that for $F > \alpha$, $\frac{\partial u}{\partial F} = \alpha + \alpha\beta P(F) - F$. At $F = \alpha$, this quantity is equal to $\alpha\beta P(\alpha)$, which is strictly positive. For sufficiently large $F > \alpha$, this quantity is strictly negative. Next, observe that $\frac{\partial^2 u}{\partial F^2} = \alpha\beta p(F) - 1$. Rearranging, this quantity is negative if and only if

$$p(F) < \frac{1}{\alpha\beta}. \quad (\text{A.3})$$

(Necessity). Violation of (a), (b), and (c) imply $\tilde{\alpha} \geq \alpha$, $p(\alpha) < \frac{1}{\alpha\beta}$, and $p(\tilde{\alpha}) \geq \frac{1}{\alpha\beta}$; in this case, $u(F)$ is first concave, then convex, then concave in F for $F > \alpha$. Given $\frac{\partial u}{\partial F}|_{F=\alpha} > 0$ and $\lim_{F \rightarrow \infty} \frac{\partial u}{\partial F} < 0$, this implies double-peakedness if F is not constrained as it is in (d).

(Sufficiency).

(a) If inequality (A.3) holds for all $F > \alpha$, then $u(F)$ is strictly concave in that range.

Given $\frac{\partial u}{\partial F}|_{F=\alpha} > 0$ and $\lim_{F \rightarrow \infty} \frac{\partial u}{\partial F} < 0$, this implies single-peakedness.

(b) Log-concavity of $p(\cdot)$ implies unimodality. This condition therefore implies that $u(F)$ is

first convex, and then concave in F for $F > \alpha$. Given $\frac{\partial u}{\partial F}|_{F=\alpha} > 0$ and $\lim_{F \rightarrow \infty} \frac{\partial u}{\partial F} < 0$, this implies single-peakedness.

(c) If $\tilde{\alpha} < \alpha$, then unimodality implies $p(F)$ is either first convex and then concave in F for

$F > \alpha$, or concave for all $F > \alpha$. In either case, given $\frac{\partial u}{\partial F}|_{F=\alpha} > 0$ and $\lim_{F \rightarrow \infty} \frac{\partial u}{\partial F} < 0$, this implies single-peakedness.

(d) As noted above, when conditions (a) through (c) do not hold but (d) does, single-peakedness is established by construction.

■

Proof of Proposition 1

From equation (2),

$$\frac{\partial u(F; \alpha, \beta)}{\partial F} = \begin{cases} \alpha\beta P(F) & \text{if } F < \alpha \\ \alpha - F + \alpha\beta P(F) & \text{otherwise.} \end{cases} \quad (\text{A.4})$$

The statement in the proposition requires that

$$-\left. \frac{\partial u}{\partial F} \right|_{F=\hat{F}_\alpha - \Delta} > \left. \frac{\partial u}{\partial F} \right|_{F=\hat{F}_\alpha + \Delta} \quad (\text{A.5})$$

for Δ sufficiently large. For sufficiently large Δ , $\frac{\partial u}{\partial F}$ evaluated at $\hat{F}_\alpha - \Delta$ is given by the first line, and $\frac{\partial u}{\partial F}$ evaluated at $\hat{F}_\alpha + \Delta$ by the second line, of (A.4). Substituting, (A.5) is equivalent to

$$-\alpha\beta P(\hat{F}_\alpha - \Delta) > \alpha - (\hat{F}_\alpha + \Delta) + \alpha\beta P(\hat{F}_\alpha + \Delta).$$

From the first order condition for an interior optimum, $\hat{F}_\alpha = \alpha + \alpha\beta P(\hat{F}_\alpha)$. Substituting and rearranging yields

$$\Delta > \alpha\beta \left(P(\hat{F}_\alpha - \Delta) + P(\hat{F}_\alpha + \Delta) - P(\hat{F}_\alpha) \right).$$

The right side of this inequality is bounded between 0 and $\alpha\beta$. Thus for sufficiently large Δ the inequality holds. ■

Proof of Proposition 2

Under unitary government, a state's first order condition is given by $\hat{F}_\alpha^{uni} = \alpha(1 + \beta)$, while under federalism it is given by $\hat{F}_\alpha^{fed} = \alpha(1 + \beta P(\hat{F}_\alpha^{fed}))$. It is immediate that the first value is weakly higher than the second, and strictly if $P(\hat{F}_\alpha^{fed}) < 1$ (i.e., $\hat{F}_\alpha^{fed} < \bar{\alpha}$). ■

Proof of Proposition 3

There are two cases to consider. First, suppose $\hat{F}_{\alpha_L}^{fed}$ is effectively federal, and α_H is sufficiently high that $\hat{F}_{\alpha_H}^{fed}$ is effectively centralized. Then $\hat{F}_{\alpha_H}^{fed} = \hat{F}_{\alpha_H}^{uni}$ and, by Proposition 2, $\hat{F}_{\alpha_L}^{fed} < \hat{F}_{\alpha_L}^{uni}$. Therefore $\hat{F}_{\alpha_H}^{fed} - \hat{F}_{\alpha_L}^{fed} > \hat{F}_{\alpha_H}^{uni} - \hat{F}_{\alpha_L}^{uni}$.

Second, suppose both $\hat{F}_{\alpha_H}^{fed}$ and $\hat{F}_{\alpha_L}^{fed}$ are effectively federal. Then from the first order conditions for \hat{F}_{α}^{fed} and \hat{F}_{α}^{uni} , polarization under federalism is equal to $\alpha_H(1 + \beta P(\hat{F}_{\alpha_H}^{fed})) - \alpha_L(1 + \beta P(\hat{F}_{\alpha_L}^{fed}))$ and under unitary government is $(\alpha_H - \alpha_L)(1 + \beta)$. Comparing these expressions yields the necessary and sufficient condition given in the Proposition. ■

Proof of Proposition 4

Let $A(F; \beta, P(\cdot)) \equiv \frac{F}{1 + \beta P(F)}$ denote the value of α that would yield F as an ideal point.

From the expressions for states' marginal utilities in (A.4),

$$\begin{aligned} mRP^-(F; \beta, P(\cdot)) &\equiv \int_{\underline{\alpha}}^{A(F; \cdot)} (F - \alpha(1 + \beta P(F)))p(\alpha)d\alpha && \text{and} \\ mRP^+(F; \beta, P(\cdot)) &\equiv \int_{A(F; \cdot)}^F (\alpha(1 + \beta P(F)) - F)p(\alpha)d\alpha + \beta P(F) \int_F^{\bar{\alpha}} \alpha p(\alpha)d\alpha \end{aligned} \quad (\text{A.6})$$

Substituting for $A(F)$, integrating by parts (see derivation of $\Psi^*(\cdot)$ above for details) and rearranging yields

$$\begin{aligned} mRP^-(F; \beta, P(\cdot)) &= (1 + \beta P(F))\hat{P}(A(F; \cdot)) && \text{and} \\ mRP^+(F; \beta, P(\cdot)) &= (1 + \beta P(F))\hat{P}(A(F; \cdot)) + \beta P(F)E[\alpha] - \hat{P}(F). \end{aligned} \quad (\text{A.7})$$

1. $\frac{\partial mRP^-}{\partial F} = (1 + \beta P(F))P(A(F))\frac{\partial A(F)}{\partial F} + \beta p(F)\hat{P}(A(F)) > 0$ for all $F > \underline{\alpha}$ (noting that

$\frac{\partial A(F)}{\partial F} > 0$), and

$$\frac{\partial mRP^+}{\partial F} = \frac{\partial mRP^-}{\partial F} + \beta p(F)E[\alpha] - P(F).$$

Having established $\frac{\partial mRP^-}{\partial F} > 0$, it is sufficient to demonstrate that $\beta p(F)E[\alpha] - P(F) > 0$ for sufficiently small values of F . Rearranging, the sufficient condition is $\frac{p(F)}{P(F)} > (\beta E[\alpha])^{-1}$. From the definition of log-concavity, $\frac{p(F)}{P(F)}$ is strictly decreasing. Further, $\lim_{F \rightarrow \underline{\alpha}} \frac{p(F)}{P(F)} = \infty$. Therefore the condition holds for sufficiently small values of F .

2. We proceed by showing that there exists an \underline{F} such that the result holds for $\bar{F} = F^*$. Comparing the expressions from (A.7), $mRP^- > mRP^+$ if and only if $\delta(F) > \beta E[\alpha]$ (where, as above, $\delta(F) = \frac{\hat{P}(F)}{P(F)}$). From the proof of Proposition ??, at equality this statement defines F^* implicitly. Via monotonicity of $\delta(\cdot)$, therefore, $mRP^- > mRP^+$ if and only if $F > F^*$. Suppose $F > F^*$, so $mRP = mRP^-$. As mRP^- is strictly increasing, it is minimized at $mRP^-(F^*) > 0$. Suppose $F < F^*$, so $mRP = mRP^+$. From part (1), mRP^+ is increasing for sufficiently small values of F . From the second line of (A.7), $RP^+(\underline{\alpha}) = 0$. As mRP^+ is therefore increasing from zero, there must be some \underline{F} such that for all $F < \underline{F}$, $mRP^+(F) < mRP^-(F^*)$.

■

Proof of Proposition 5

Let $\tilde{A}(F; \beta) \equiv \frac{F}{1+\beta}$ denote the value of α that would yield F as an ideal point in a unitary system. Then

$$mRP_{uni}^-(F; \beta, P(\cdot)) = \int_{\underline{\alpha}}^{\tilde{A}(F; \cdot)} (F - \alpha(1 + \beta))p(\alpha)d\alpha. \quad (\text{A.8})$$

Comparing this expression to the first line of (A.6), it is immediate that both the upper bound of integration, and the integrand, of the expression for $mRP_{uni}^-(F)$ are smaller than for their counterparts under effective federalism. Therefore, mRP^- is strictly higher under federalism than in a unitary system for any F that is effectively federal under the former.

The corresponding expression for mRP^+ in a unitary system is

$$mRP_{uni}^+(F; \beta, P(\cdot)) = \int_{\tilde{A}(F; \cdot)}^{\bar{\alpha}} (\alpha(1 + \beta) - F)p(\alpha)d\alpha.$$

Noting that $\tilde{A}(F; \cdot) < A(F; \cdot)$ under effective federalism, mRP_{uni}^+ can be expressed as

$$\int_{\tilde{A}(F; \cdot)}^{A(F; \cdot)} (\alpha(1 + \beta) - F)p(\alpha)d\alpha + \int_{A(F; \cdot)}^F (\alpha(1 + \beta) - F)p(\alpha)d\alpha + \int_F^{\bar{\alpha}} (\alpha(1 + \beta) - F)p(\alpha)d\alpha.$$

Comparing this expression to the second line of (A.6), mRP^+ is strictly greater under the unitary than federal institutions if and only if

$$\int_{\tilde{A}(F; \cdot)}^{A(F; \cdot)} (\alpha(1 + \beta) - F)p(\alpha)d\alpha + \int_{A(F; \cdot)}^F \alpha\beta(1 - P(F))p(\alpha)d\alpha + \int_F^{\bar{\alpha}} (\alpha(1 + \beta(1 - P(F))) - F)p(\alpha)d\alpha > 0.$$

The first integral is strictly positive. Rearranging terms, the second and third integrals may be expressed as

$$\int_{A(F; \cdot)}^{\bar{\alpha}} \alpha\beta(1 - P(F))p(\alpha)d\alpha + \int_F^{\bar{\alpha}} (\alpha - F)p(\alpha)d\alpha.$$

Each of these terms is strictly positive under effective federalism. Therefore the inequality holds. ■

Proof of Remark 1

We proceed by conjecturing that the equilibrium national policy F^* is effectively federal, and then establishing the condition in which this is consistent with equilibrium play. From the text, $S_L^* = 0$ and $S_H^* = \alpha_H - F^*$. Substituting into the states' utility functions and differentiating with respect to c_H^{fed} and c_L^{fed} respectively yields the first-order conditions:

$$\begin{aligned} \beta\alpha_H - \nu c_H^{fed} &= 0 \\ F^\circ - \alpha_L + c_H^{fed} - (1 + \nu)c_L^{fed} &= 0 \end{aligned}$$

Solving this system of equations yields

$$c_H^{*fed} = \frac{\beta\alpha_H}{\nu}; \quad c_L^{*fed} = \frac{\beta\alpha_H + \nu(F^\circ - \alpha_L)}{\nu(\nu + 1)}. \quad (\text{A.9})$$

(Second-order conditions establish trivially that (c_H^{*fed}, c_L^{*fed}) is a global maximum.) c_H^{*fed} is independent of F° , while c_L^{*fed} is strictly increasing in F° . Therefore total deadweight loss, $\frac{\nu}{2}((c_H^{*fed})^2 + (c_L^{*fed})^2)$, is strictly increasing in F° .

If $F^* < \alpha_H$, it is effectively federal. In equilibrium, $F^* = F^\circ + c_H^{*fed} - c_L^{*fed}$. Substituting from (A.9) and simplifying, this condition holds for all effectively federal status quo policies ($F^\circ < \alpha_H$) if and only if

$$\beta < \frac{\alpha_H - \alpha_L}{\alpha_H}, \quad (\text{A.10})$$

establishing the initial conjecture.

■

Proof of Remark 2

First, note that L 's ideal policy under unitary governance would be effectively federal under federalism if and only if $\alpha_L(1 + \beta) < \alpha_H$, or $\beta < \frac{\alpha_H - \alpha_L}{\alpha_L}$, a condition that is always satisfied if (A.10) is met.

Substituting into the states' utility functions under unitary governance and differentiating with respect to c_H^{uni} and c_L^{uni} respectively yields the first-order conditions:

$$\begin{aligned} \alpha_H(\beta + 1) - F^\circ - (1 + \nu)c_H^{uni} + c_L^{uni} &= 0 \\ -\alpha_L(\beta + 1) + F^\circ + c_H^{uni} - (1 + \nu)c_L^{uni} &= 0. \end{aligned}$$

Solving this system of equations yields

$$c_H^{*uni} = \frac{(\beta + 1)((\nu + 1)\alpha_H - \alpha_L) - \nu F^\circ}{\nu(\nu + 2)}; \quad c_L^{*uni} = \frac{(\beta + 1)(\alpha_H - (\nu + 1)\alpha_L) + \nu F^\circ}{\nu(\nu + 2)} \quad (\text{A.11})$$

(Second-order conditions establish trivially that (c_H^{*uni}, c_L^{*uni}) is a global maximum.)

For a given status quo policy F° , total deadweight loss from conflict under federalism exceeds that under unitary governance if and only if

$$(c_L^{*fed})^2 + (c_H^{*fed})^2 > (c_L^{*uni})^2 + (c_H^{*uni})^2, \quad (\text{A.12})$$

which is equivalent to

$$(c_L^{*fed} - c_L^{*uni})(c_L^{*fed} + c_L^{*uni}) > (c_H^{*uni} - c_H^{*fed})(c_H^{*fed} + c_H^{*uni}) \quad (\text{A.13})$$

For this inequality to hold, it is sufficient that both $c_L^{*fed} > c_L^{*uni}$ and $c_H^{*fed} > c_H^{*uni}$. Evaluated at $F^\circ = \alpha_H$, these conditions are equivalent to

$$\begin{aligned} (\beta\nu^2 + 2\beta\nu + \beta + 1)\alpha_L + (\beta - 1)\alpha_H &> 0 \text{ and} \\ (\beta + 1)\alpha_L + (\beta - 1)\alpha_H &> 0. \end{aligned}$$

Note that the first condition is implied by the second, which holds if and only if

$$\beta > \frac{\alpha_H - \alpha_L}{\alpha_H + \alpha_L} \quad (\text{A.14})$$

By continuity, this condition will be met in an open ball around $F^\circ = \alpha_H$. The right side of (A.14) is strictly less than the right side of (A.10). Thus $\beta \in (\frac{\alpha_H - \alpha_L}{\alpha_H + \alpha_L}, \frac{\alpha_H - \alpha_L}{\alpha_H})$ is sufficient for the Proposition to hold.

2 Additional Analysis Not Presented in the Main Text

Lemma 2 (Majority Voting Equilibrium) *States' induced preferences over federal policies are single-crossing; thus, under simple majority rule, \hat{F}_{α_m} , the most preferred national policy of the state with the median preference parameter, $\alpha = \alpha_m$, is an equilibrium.*

Proof of Lemma 2

Differentiating (2) with respect to F and again with respect to α yields

$$\frac{\partial^2 u(F; \alpha, \cdot)}{\partial F \partial \alpha} = \begin{cases} \beta P(F) & \text{if } F < \alpha \\ 1 + \beta P(F) & \text{otherwise.} \end{cases} \quad (\text{A.15})$$

Both the first and second lines of (A.15) are strictly positive, implying increasing differences, which are sufficient for single-crossing. Given single-crossing preferences, a majority rule voting equilibrium exists, and the median state will be decisive (Gans and Smart 1996).

■

Proposition 6 (Equilibrium Versus Efficient National Policymaking) *Suppose $p(\cdot)$ is symmetric and \hat{F}_{α_m} is effectively federal. Then:*

1. *The national policy arrived at under simple majority rule is strictly higher than the aggregate welfare-maximizing national policy; and*
2. *If the bargaining protocol B is supermajoritarian, then the aggregate welfare-maximizing national policy is either below or within B 's associated gridlock interval.*

Proof of Proposition 6

Integrating (2) over $p(\alpha)$, aggregate welfare is given by

$$W \equiv \int_{\underline{\alpha}}^{\bar{\alpha}} \alpha \beta (E[\alpha] + \hat{P}(F)) p(\alpha) d\alpha + \int_{\underline{\alpha}}^F \left(\alpha F - \frac{F^2}{2} \right) p(\alpha) d\alpha + \int_F^{\bar{\alpha}} \frac{\alpha^2}{2} p(\alpha) d\alpha. \quad (\text{A.16})$$

Via the Leibniz integral rule, marginal aggregate welfare is

$$\frac{\partial W}{\partial F} = (\beta E[\alpha] - \delta(F)) P(F), \quad (\text{A.17})$$

where where $\delta(F) \equiv \frac{\hat{P}(F)}{P(F)} = F - E[\alpha | \alpha < F]$ is the *mean advantage over inferiors* function from reliability theory. Any $F < \underline{\alpha}$ is Pareto dominated. Lemma 1 of Bagnoli and Bergstrom

(2005) shows for log-concave $p(\cdot)$ that $\delta(F)$ is strictly increasing in F (from zero at $F = \underline{\alpha}$). Therefore F^* is unique and defined implicitly by the first order condition $\delta(F^*) = \beta E[\alpha]$ (or by the corner \bar{Z} when $\delta(\bar{Z}) < \beta E[\alpha]$).

1. Under symmetry, $E[\alpha] = \alpha_m$. Therefore, from above, $\delta(F^*) = \beta\alpha_m$. Since $\delta(\cdot)$ is monotone increasing for log-concave densities, its inverse exists and is also monotone increasing. Therefore $F^* = \delta^{-1}(\beta\alpha_m)$, and $F^* < \hat{F}_{\alpha_m}$ if and only if

$$\delta(\hat{F}_{\alpha_m}) > \beta\alpha_m. \quad (\text{A.18})$$

Recalling that $\delta(F) = \frac{\hat{P}(F)}{P(F)}$, substituting into (A.18) and rearranging yields

$$\hat{P}(\hat{F}_{\alpha_m}) > \alpha_m \beta P(\hat{F}_{\alpha_m}). \quad (\text{A.19})$$

\hat{F}_{α_m} is defined implicitly by the first order condition $\alpha_m \beta P(\hat{F}_{\alpha_m}) = \hat{F}_{\alpha_m} - \alpha_m$. Substituting into (A.19) yields the condition

$$\hat{P}(\hat{F}_{\alpha_m}) > \hat{F}_{\alpha_m} - \alpha_m. \quad (\text{A.20})$$

Note that at $\beta = 0$, $\hat{F}_{\alpha_m} = \alpha_m$ and (A.20) holds trivially. Recall from the derivation of $\Psi^*(F)$ above (and given symmetry) that $\alpha_m = \bar{\alpha} - \hat{P}(\bar{\alpha})$, or $\hat{P}(\bar{\alpha}) = \bar{\alpha} - \alpha_m$. Also note that for all $\hat{F}_{\alpha_m} > \bar{\alpha}$, $\frac{\partial \hat{P}(\hat{F}_{\alpha_m})}{\partial \hat{F}_{\alpha_m}} = P(\hat{F}_{\alpha_m}) = 1$. Therefore for all $\hat{F}_{\alpha_m} \geq \bar{\alpha}$, (A.20) holds at equality, which in turn implies $\hat{F}_{\alpha_m} = F^*$.

Next, assume $\hat{F}_{\alpha_m} < \bar{\alpha}$. Then the derivative of the left side of (A.20), $P(\hat{F}_{\alpha_m})$, is strictly less than one, while the derivative of the right side is equal to one. Suppose there exists some $\hat{F}'_{\alpha_m} < \bar{\alpha}$ such that (A.20) does not hold. Given convexity of $\hat{P}(\cdot)$, $\hat{P}(\alpha_m) > 0$, $\hat{F}_{\alpha_m} \geq \alpha_m$, and $\hat{P}(\bar{\alpha}) = \bar{\alpha} - \alpha_m$, it must then be the case that there exists some $\hat{F}''_{\alpha_m} \in (\hat{F}'_{\alpha_m}, \bar{\alpha}]$ such that $\left. \frac{\partial \hat{P}}{\partial \hat{F}_{\alpha_m}} \right|_{\hat{F}_{\alpha_m} = \hat{F}''_{\alpha_m}} > 1$, a contradiction. Therefore (A.20) holds for all $\hat{F}_{\alpha_m} < \bar{\alpha}$.

2. Follows immediately from part 1 and the assumption that \hat{F}_{α_m} lies within the gridlock interval.



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