

THE ART OF COMPROMISE*

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Abstract

Policy is modeled as the outcome of negotiations between two three-party parliamentary states. An election in jurisdiction A determines the composition of the legislature that selects a representative to negotiate an intergovernmental policy agreement with the representative from the legislature of jurisdiction B. Negotiations are modeled using Nash's (1950) bargaining framework, modified to account for a simultaneous legislative ratification vote. Though agreements favor the legislative representative least willing to compromise, agreements between the bargainers may *not* follow the ordering of the parties' ideal policies. An electoral outcome where support for the center party comes from extreme voters may emerge.

Keywords: Vote balancing, intergovernmental bargaining, legislative ratification, willingness to compromise.

JEL Classification: D72, C72, P16

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I. INTRODUCTION

Many policies are the outcome of negotiations between different centers of power¹ [Breton 1996]. Indeed, such balancing was a guiding principle in the framing of the US constitution. And even the most reform minded government member arriving newly elected in the capital finds an entrenched bureaucracy ready to skillfully channel, if not outright stymie, attempts to change the status quo. Intergovernmental negotiations between two jurisdictions may be explicitly negotiated or the link may be “strategic”, with policies chosen independently, but in reference to each other. With heterogeneous parties and voters’ preferences differing across jurisdictions, voters in one jurisdiction do not expect the ruling party of the other jurisdiction to represent their interest. Recognizing the interdependence of policy formation, voters should choose a government that will negotiate the best possible policy, rather than vote for the party closest to their own preferences.

We study voting decisions in a model where two three-party parliamentary legislatures jointly make policy decisions. In our model intergovernmental negotiations are carried out by the ruling parties/formateurs representing each jurisdiction with their agreement subject to a legislative ratification vote. With concurrent elections in two jurisdictions being rare, we focus on elections in one jurisdiction and take as given the formateur in the other and the existence of a status quo policy. Our model applies broadly to any two jurisdictions, but we refer to Federal and sub-national State legislatures in our analysis.

In the first of four stages, citizens vote in the State election. The State formateur—chosen according to vote shares—engages in policy negotiations with its Federal counterpart. Negotiations are carried out using Nash’s [1950] bargaining model where failure to reach an agreement leaves the status quo in place. Finally, the agreement must be simultaneously ratified and the status quo

¹ Negotiations between France first with Britain then with Germany lead to the 1986 Single European Act [Moravcsik 1991]. Negotiations between national and sub-national jurisdictions regularly occur in Canada [Simeon 1972], in the United Kingdom [Robbins 1998], and in the United States [Inman and Rubinfeld, 1997].

remains in force if ratification fails in any legislature².

We show that electoral outcomes are in general affected by a formateur's/party's willingness to compromise. The reason is simple. When choosing among the three State parties, policy-oriented voters must *rank-order* the agreements they anticipate will be reached by each pair of Federal and State formateurs³. Since the agreement lies between the ideal policies of the corresponding pair, the choice of State formateur determines the set of policies over which *actual* negotiation takes place. The location of the agreement depends on the formateurs' willingness to compromise, a property of their utility functions. In accordance with Cressman and Gallego [2005], we show the following. When parties have quadratic utility functions, the ordering of agreements and parties' ideal policies coincide. However, when one of the extreme parties is substantially more willing to compromise than the others, the orderings differ. The supporters of this extreme party are moderate rather than "extreme" voters.

Many political economy models use quadratic utilities to obtain explicit solutions to their problem. But in doing so—as Cressman and Gallego show—these models implicitly assume the rank-order of the parties' ideal policies, their agreements and the left-right ordering of parties coincide. However, Cressman and Gallego show that the ordering of ideal policies and agreements may *not* coincide. This suggests that voters should rank parties not by their ideal policies but instead by the policies they can deliver.

Our goal is to show that even under very strong simplifying assumptions—a single isolated election, complete information, a unidimensional policy, identical party systems in the two

² Failing a vote of confidence may lead to early elections. In our single-election model votes of confidence are irrelevant. But ratification plays the role of a confidence vote. On votes of confidence see e.g. Diermeier and Feddersen [1998].

³ Intergovernmental policy making has been studied in two-tier *two*-party systems. Alesina and Rosenthal [1995, 1996] and Dixit and Londregan [1998] model policy as an exogenous compromise between the policies of two governments. While this assumption is reasonable in their models, it is inappropriate when intergovernmental bargaining takes place between two *three*-party legislatures. Models that endogenize intergovernmental negotiations include Crémer and Palfrey [2000, 2002, 2003] on federal standards; Persson and Tabellini [1996] on risk sharing and redistribution between two regions of a Federation; and Mo [1995] on international bilateral agreements.

jurisdictions and formateurs selected by vote shares (proportional representation)—the requirement to negotiate makes predicting the rank-order of the intergovernmental agreements and the consequent electoral outcome a less than straight forward exercise. Under Nash bargaining the rank-order of agreements depend on the entire preference profile of *all* parties. Our set-up brings out the crucial role that two fundamental characteristic of the bargainers’ preferences play in negotiations: the party’s ideal policy and its willingness to compromise. The party’s ideal policy represents the policy the formateur wants to implement when there is *no* need for compromise. In bargaining situations, however, the formateurs’ willingness to compromise also influences their agreement. Consequently, even though policies are one dimensional, parties are not. Policy-oriented voters take these two “dimensions”—the ideal policy and the willingness to compromise—into account. We conclude that non-myopic voters understand the *art of compromise* among inter-jurisdictional formateurs and incorporate this into their voting decisions.

Since voters balance the tendencies of the formateur in the other jurisdiction instead of voting for the party with ideal policy closest to their own, on the surface, voters appear to misrepresent their preferences. But this differs fundamentally from the more widely discussed “strategic voting” in which voters attempt an implicit coalition to rally support behind an “electable” party or candidate. Here, proportional representation allows voters to support the party they truly most prefer to see elected—they simply do so recognizing that the party will not dictate policy, and so do not focus exclusively on a party’s ideal policy. Consequently, the dependence of final policy on the choice of formateur may change the voters’ *effective* left-right ordering of parties.

The resulting extensive game has a unique sequential Nash equilibrium which has a simple and intuitive structure. As usual, policy depends on the State election, the legislative (majority/minority) status of the formateurs, their preferences and the location of the status quo. In addition, we show vote balancing occurs as some change their ballot if the Federal formateur or the status quo changes.

At the ratification stage, the Federal and State formateurs/agenda setters [Romer and Rosenthal 1978] make a *joint* proposal to their corresponding legislatures in a "bicameral" setting⁴. We introduce a ratification stage and omit the legislative bargaining stage⁵ for two reasons. With final policy being the outcome of intergovernmental negotiations and ratification, bargaining within the legislature only determines the *range* of policies over which the formateurs negotiate. With complete information and no shocks, policies acceptable to a legislative majority at the legislative bargaining and ratification stages concur. In our model, it is ratification and not legislative bargaining that matters. In consequence, we opt for the simpler model. Moreover, ratification makes formateurs accountable to the legislatures. Without ratification in a single-election model the formateurs would implement their preferred agreement as there is no punishment for doing so.

In our model, each formateur has veto powers with the legislative ratification veto player depending on the identity of the formateur. This accords with Diermeier and Myerson's [1999] finding that in bicameral settings the best organizational structure includes each chamber delegating bargaining to a player with veto powers followed by a free vote on the proposal for each member in the legislature. In our model, it is parties and not individual members who vote in the legislature.

Once the parties have been rank ordered by their potential intergovernmental agreements, the electoral game is similar to that found in a single-level three-party legislature⁶. There are many three-party unicameral voting models (see Footnote 5). To simplify the analysis we adopt Austen-Smith's [2000] voting game and use his results to determine electoral outcomes in our model.

⁴ The following is well known for bicameral systems. Bicameralism introduces balancing into policy making [for an excellent review of this literature see Tsebelis and Money 1997]; diminishes the power of the agenda setter(s) as proposals acceptable to one chamber must survive alternatives in the other [Levmore 1992; Riker 1992a,b]; and prevents the tyranny of the majority [Buchanan and Tullock 1962]. In accordance with these authors, we show that for minority governments, the parties that are needed for ratification may force moderation in intergovernmental negotiations.

⁵ Unicameral legislative bargaining models include: Austen-Smith and Banks [1988], Austen-Smith [2000], Banks and Duggan [2000], Baron [1998], Baron and Diermeier [2001], Baron and Ferejohn [1989], Bloch and Rottier [2002], Diermeier and Merlo [2000] and Morelli [1999].

⁶ Introducing more than three parties in each legislature can be done at the expense of making the ratification vote more complex. Since this detracts from the main point of the paper, we use the simpler three-party model.

II. THE MODEL

Two governments represented by a (F)ederal and a (S)tate legislature must negotiate a policy agreement that they take to the legislatures for ratification. We assume there exists a “status quo”⁷ policy Q that will remain in force if either legislature fails to adopt a revised policy. We model this situation as a multistage game. Policy, denoted by θ , is unidimensional and assumed to lie on the interval $[0,1]$ (as does the status quo Q). The set of players consists of the (L)eft, (C)enter, and (R)ight parties acting in each legislature, and a large number of heterogeneous voters. The voters’ ideal policies are distributed on the policy space according to Γ . Preferences are assumed to be strictly concave over policy outcomes, $\theta \in [0,1]$. For a given policy θ that is implemented, player i whose ideal policy is $\hat{\theta}_i$ receives a payoff of

$$u_i(\theta) = u_i(\theta | \hat{\theta}_i).$$

We assume that voter preferences satisfy Greenberg and Weber’s [1985] *Consecutiveness Condition*

(CC): for any three voters j, k and m and any two policies $\theta^0 < \theta^1$

$$\begin{aligned} \text{(CC)} \quad & \text{if } u_j(\theta^1) > u_j(\theta^0) \text{ and } u_m(\theta^1) > u_m(\theta^0) \\ & \text{then } u_k(\theta^1) > u_k(\theta^0) \text{ for all } k \text{ such that } \hat{\theta}_j < \hat{\theta}_k < \hat{\theta}_m \end{aligned}$$

i.e., if voters j and k prefer θ^1 to θ^0 , so does every voter in between.

We assume the Federal and State levels have the same party system⁸ and no distinction is made between the party and its appointed negotiator⁹. Like voters, parties are characterized by ideal policies, $\hat{\theta}_j$ for $j \in \{L, C, R\}$. To bring out the role and importance of the party’s willingness to compromise on the electoral outcome we refrain from making assumptions that guarantee agreements follow the ranking of the parties’ ideal policies. Assuming party preferences satisfy a

⁷ Assuming a status quo is not restrictive since “no policy” can itself typically be represented as some specific point on the unit interval. The status quo may be the previous period’s agreement in a repeated game (not modeled here).

⁸ We consider the effect of relaxing this assumption in Section V.

single-crossing property such as the consecutiveness condition is tantamount to assuming the ranking of agreements and ideal policies coincide.

We believe parties are long-lived institutions so that in a single election model party preferences should be taken as given¹⁰. We assume parties have concave preferences (with different ideal policies where L's is to the left of C's to the left of R's, $0 \leq \hat{\theta}_L \leq \hat{\theta}_C \leq \hat{\theta}_R \leq 1$). We also assume that parties may differ in their willingness to compromise (a property of their utility functions). For example, when parties have quadratic preferences the ordering of their ideal policies extends to all policies since in this case preferences satisfy the consecutiveness condition (CC); and ensures R is as willing as L or C to agree to a rightward shift in policy for $\theta < \hat{\theta}_L$ (see example given in Figure I). As illustrated in Section IV, however, when we vary one party's preferences by changing its concavity equilibrium voting outcomes change¹¹.

Figure I about here

II.1 Timing

Four subgames comprise the policy revision process: the State election, the selection of negotiators, the intergovernmental policy negotiation, and finally the ratification vote in each legislature. All references to elections are implicitly those at the State level.

Given the status quo Q and knowing the identity (F) and degree of legislative control of the Federal government, in the first stage citizens simultaneously vote to elect a State government. Voters must anticipate each party's behavior in post-election negotiations and ratification vote, and

⁹ Not unreasonable as strong party discipline is exercised in parliamentary democracies [Laver and Shepsle 1996].

¹⁰ We concentrate on how the party's willingness to compromise affects electoral outcomes and refrain from studying how parties chose their preferences. Snyder and Ting [2002] argue that party's preferences should be taken as given because they represent a brand name that voters can easily identify. In their model, candidates preferences may differ from the party they become affiliated with but they run under the party's brand name not their own preferences.

¹¹ Parties may differ in their willingness to compromise for many reasons that depend on the historical development of the party and on its membership. Given our assumption that parties are long-lived institutions we do not explain here how this characteristic of their utility function is determined but show instead that electoral outcomes depend on it.

these depend on the party's preferences over all outcomes. Since we assume complete information, the only credible platforms are the parties' true preferences, denoted $U = (u_L, u_C, u_R)$. The election determines the vote shares $V^j \in [0,1]$, $j \in \{L, C, R\}$, which, under proportional representation, represent the weight each party receives in the legislature.

After the election, the State formateur is selected according to party's vote shares. When party j wins a simple legislative majority, $V^j \geq 1/2$, it becomes formateur. When no party wins a simple majority, a formateur is randomly chosen according to vote shares¹². Next the Federal and State formateurs engage in intergovernmental negotiations, modeled as Nash [1950] bargaining, where failure to agree leaves the status quo in place. If an agreement is reached, to become policy it must be simultaneously ratified by both legislatures; otherwise the status quo prevails. Given final policy θ^* , payoffs are realized, and the game ends.

III. EQUILIBRIUM

The equilibrium involves a number of cases associated with the various combinations of the preset variables $F \in \{L, C, R\}$ and Q . However, many of these are qualitatively similar, and in particular, one half are simply “reflections” of the other, depending on the location of Q . To remove these reflections we assume $Q \in [0, \hat{\theta}_C]$. We find the subgame perfect equilibrium solving backwards through the stages of the game.

III.1 The Ratification Equilibrium

At the ratification stage, parties know Q , the election outcome, the formateurs and their legislative status. Let a^{FS} represent the policy agreement subject to ratification (where FS identifies the pair of Federal and State formateurs). With only two policy choices and parties having identical preferences

across jurisdictions, no party can gain by voting for different policies at the Federal and State levels¹³, so we need only consider a representative legislature, $h=F, S$. Each party $j \in L, C, R$ compares the payoff from ratifying and from vetoing the agreement a^{FS} . For any Q , let $\Phi_j(Q) = \{\theta \mid u_j(\theta) \geq u_j(Q)\}$ denote the (convex) upper contour sets of formateurs F and S , the set of policies that make party j no worse off than Q .

A ratification equilibrium is a triple of mutual best-response, weakly undominated legislative voting strategies. Let $\theta_h^* = \theta_h^*(a^{FS}, Q \mid U)$ be the equilibrium policy in legislature h . An agreement takes affect when ratified by both legislatures:

$$\theta^*(a^{FS}) = \theta^*(a^{FS}, Q \mid U) = \begin{cases} a^{FS} & \text{if and only if } \theta_h^* = a^{FS} \text{ for } h = F, S \\ Q & \text{otherwise} \end{cases}.$$

When a party holds a majority, it only ratifies policies it prefers to Q . When no party holds a majority, a legislative coalition is required. Thus, a viable policy must lie in the upper contour sets of formateur j and at least one of the other two parties. Summarizing:

Given the status quo $Q \in [0, \hat{\theta}_C]$ and the intergovernmental policy agreement a^{FS} , the equilibrium ratification function in legislature h , $\theta_h^(a^{FS}, Q \mid U)$ is as follows:*

(i) If party j holds a majority in legislature h ,

$$\theta_h^* = a^{FS} \text{ if and only if } a^{FS} \in \Phi_j(Q).$$

(ii) If no party holds a majority in legislature h ,

$$\theta_h^* = a^{FS} \text{ if and only if } a^{FS} \in \Phi_i(Q) \cap \Phi_j(Q) \text{ for } i \neq j.$$

III.2 The Intergovernmental Bargaining Equilibrium

When bargaining, each formateur knows the identity of its counterpart and the composition of both

¹² Diermeier and Merlo (2004) find strong empirical support for random rather than deterministic selection.

¹³ To see this note that given the vote of the other parties, j 's vote matters only when j is ratification pivotal, that is, if j 's vote determines whether a^{FS} is ratified in at least one legislature. Suppose that a^{FS} passes the vote in one legislature, and that j is pivotal in the other. When a^{FS} gives j a higher payoff than Q , j 's best response is to vote for a^{FS} in the legislature in which its vote is pivotal. Voting for a^{FS} at the other level does not change the ratification outcome since j was not pivotal in that legislature. Casting identical votes in both legislatures does not change the ratification outcome so that j votes in identical manner in both legislatures. When j is pivotal and j gets the same payoff from both policies, we assume j breaks the tie in favor of the formateur in that legislature.

legislatures. With complete information they rationally anticipate whether their agreement is ratified. Thus they only “agree” to a non-ratifiable policy if one or both prefer the status quo. Two cases can be distinguished.

Case 1. When the same party holds power in both jurisdictions, there is no disagreement on the best policy, so this is not a bargaining problem in the sense of Nash [1950]. However, the party must take account of the ratification round, so simply proposing its ideal policy may lead to rejection when some other compromise it prefers to the status quo would have been ratified. In such cases, the party proposes the policy it most prefers subject to that policy being ratifiable. If the party is L it can count on unanimous support for policy changes rightward from Q . If $\hat{\theta}_L > Q$, it can safely propose its ideal; otherwise, C and R ensure the status quo Q remain in force. If the party is C, it can count on R supporting a move to $\hat{\theta}_C$. If the party is R, it must attract either C or L. Which it chooses depends on which party is willing to move the greatest distance towards R’s ideal before rejecting a policy in favor of the status quo¹⁴. Define the upper bound of party j ’s acceptable set $\Phi_j(Q)$ as $\bar{\theta}_j$. Summarizing,

Given the status quo $Q \in [0, \hat{\theta}_C]$ and the rationally anticipated ratification function, θ^ if the same party j forms government in both legislatures then*

(i) when j holds a majority in each legislature, $\theta^(a^{FS*}) = \hat{\theta}_j$,*

(ii) when j must form a coalition in either house to ratify,

$$\theta^*(a^{FS*}) = \begin{cases} \max\{\hat{\theta}_L, Q\} & \text{if } j = L \\ \hat{\theta}_C & \text{if } j = C \\ \min\{\max\{\bar{\theta}_L, \bar{\theta}_C\}, \hat{\theta}_R\} & \text{if } j = R \end{cases} .$$

Case 2: When different parties become formateurs there is disagreement over which of the feasible policies is best. Since formateurs have equal “bargaining power”¹⁵ we will use jk to denote

¹⁴ We note that unless we assume party’s preferences satisfy a single-crossing property, R may form a ratification coalition in the legislature with L rather than C.

¹⁵ Unequal bargaining power, as in Roth [1979], would give the formateurs different weights in the Nash product below.

the pair of formateurs disregarding which jurisdiction they represent. The three jk , $j \neq k$, configurations are LC, LR or CR. We model negotiations using Nash's bargaining framework, where Q represents the "threat point" with disagreement outcome $D^{FS}(Q) = (u_S(Q), u_F(Q))$. The situation is not completely standard since negotiators are constrained by the ratification vote. Fortunately things are somewhat less complicated than they first appear. When both formateurs hold majorities, ratification is guaranteed, and we are in the standard model. But even when one or both do not hold a majority, if they find a policy that mutually improves on Q they form a legislative coalition that ensures its ratification¹⁶. Interestingly, ratification only constrains negotiators when they do not face "true" bargaining situations (i.e. in Case 1).

The bargaining set is the set of utilities pairs over which the formateurs negotiate, given by¹⁷

$$B^{jk}(Q) = \{u_j(a), u_k(a) \mid a \in \Phi_j(Q) \cap \Phi_k(Q)\}.$$

The bargaining set $B^{jk}(Q)$ and the disagreement point $D^{jk}(Q)$ define the bargaining problem. Among the many bargaining solutions¹⁸, we use that proposed by Nash [1950]. For any $a \in A^{jk}(Q)$, the Nash Bargaining Solution maximizes the product of the utility gains from the disagreement point, i.e. solves

$$\max_a NP_{kj}(a \mid Q) = [u_j(a) - u_j(Q)] [u_k(a) - u_k(Q)].$$

Under the assumptions on utilities there is a unique solution to the Nash Bargaining problem.

Since the Nash solution is Pareto optimal and Pareto dominates Q , not every point on the frontier of $B^{jk}(Q)$ is a candidate. First assume that $Q < \hat{\theta}_j$. For $a \in [Q, \hat{\theta}_j)$, both parties prefer rightward changes in policy (e.g., the lower upward sloping segments in Figure II). When $a \in [Q, \hat{\theta}_j)$

¹⁶ Again, this relies on the assumption parties are identical in both legislatures. See Section V.

¹⁷ With concave utilities, this set is convex, closed, and bounded.

¹⁸ The results are qualitatively similar if we use instead the Kalai-Smorodinsky [1975] solution. See Cressman and Gallego [2005]. For an excellent discussion on various solutions to Nash's bargaining problem see Thomson [1994].

and $\hat{\theta}_k \leq \bar{\theta}_j$, both prefer agreements to left of $\bar{\theta}_j$ (e.g., the top upward sloping segment in Figure 2(a)). In this case the set of potential agreements is $[\hat{\theta}_j, \hat{\theta}_k]$. When $a \in [Q, \hat{\theta}_j]$ and $\hat{\theta}_k > \bar{\theta}_j$ (e.g., Figure 2(b)), this set is smaller, restricted to $[\hat{\theta}_j, \bar{\theta}_j]$. Thus, the set of mutually acceptable policies is $A_{jk}(Q) = [\hat{\theta}_j, \min\{\bar{\theta}_j, \hat{\theta}_k\}]$. When instead $Q > \hat{\theta}_j$, no agreement is a Pareto improvement on the status quo¹⁹, and thus $A_{jk}(Q) = Q$.

Figure II about here

Below we describe the nature of the agreements reached under Cases 1 and 2 to examine the effect party preferences have on voters' behavior (we further illustrate our results in Section IV with examples). For now, we summarize with the observation that

Proposition 1: *Given the Federal formateur F and the status quo $Q \in [0, \hat{\theta}_C]$, intergovernmental negotiations lead to a unique ratifiable agreement.*

For Federal formateur F , let $\Theta^{F*} = \{\theta^*(a^{FL*}), \theta^*(a^{FC*}), \theta^*(a^{FR*})\}$ be the set of ratifiable agreements.

The results of Sections III.1 and III.2 are in the spirit of Romer and Rosenthal [1978] and Denzau and Mackay [1983]. In Romer and Rosenthal's seminal paper, the agenda setter's proposal must pass an electoral referendum. In Denzau and Mackay, a committee—a subset of the legislature—makes a proposal to its parent body. Both show, as we do, that under complete information and a closed rule²⁰, some alternatives to the status quo—including compromises the setter/committee accepts to gets its proposal approved—are viable but the status quo may also be difficult to change. Neither paper, however, explores the consequences of this on the initial choice of agenda setter or committee members.

¹⁹ This trivial case is also not a bargaining problem in the sense of Nash [1950].

III.3 Selection of the State Formateur

We assume that representation in the legislature and the selection of the State formateur is by vote share. When $V^j \geq 1/2$, j forms government with probability one. When no party wins a majority, j forms government with probability V^j . The probability of j becoming the State formateur is

$$\mu^j = \begin{cases} 1 & \text{if } V^j \geq 1/2 \\ 0 & \text{if } \max\{V^{-j}\} \geq 1/2 \\ V^j & \text{otherwise} \end{cases}$$

III.4 The State Election

At the electoral stage, voters know the preferences of each party, the identity and majority/minority status of the Federal formateur and the location of the status quo. Given complete information they can rationally anticipate the final policy resulting from any particular election outcome. Voters can then rank-order parties by their associated intergovernmental policy agreements (see additional discussion on policy rankings in Section IV).

The fact that parties gain representation proportional to their vote shares and that voters are individually insignificant immensely simplifies the election process. Random selection eliminates “strategic voting” for the type of electoral coordination present in plurality rule elections where a voter’s perception of how likely a party is to garner the most votes affect their choice of whom to support. With random selection, an individual’s vote increases the likelihood of any party forming government by an equal amount, so there is no benefit to coordination. This rules out considerations that emanate from the electoral rather than the policy process. Given the rank-order of intergovernmental agreements, the underlying voting model here is very similar to Austen-Smith [2000], to which we refer the reader for a more formal demonstration of our key result.

A voting equilibrium is a symmetric probabilistic voting strategy, π^* such that for all $\hat{\theta}_i \in [0,1]$

²⁰ Under a closed rule, no legislative amendments to the proposal are allowed.

given Q , F , U , and the set of anticipated ratifiable equilibrium agreements Θ^{F*} , $\pi_i^*(\theta^*(a^{Fj*})|Q, F, U)$ for $j = L, C, R$, is weakly undominated and maximizes i 's expected payoff.

Proposition 2 (Lemma 4, Austen-Smith 2000) *Given the Federal formateur F , the status quo $Q \in [0, \hat{\theta}_C]$, and the set of anticipated ratifiable equilibrium agreements Θ^{F*} , if π^* is a voting equilibrium, voter of type i votes with positive probability **only** for the party that offers the highest payoff conditional on that party being selected as the State formateur.*

That is, voters act as “Nash random dictators”. They vote as if their ballot determines the electoral outcome, supporting the party whose selection as formateur leads to the ratification most preferred outcome among those obtainable. Of course, it is possible that this choice is not unique, in which case voters are assumed to vote for the party whose ideal policy most closely resembles their own.

The equilibrium is characterized by the existence of two unique marginal voter types (v^{LC*}, v^{CR*}) partitioning the space of preferences into supporters of the three parties. The strategies of the voters, together with the ratification strategies and negotiation stage equilibrium constitute the unique sequential equilibrium of the entire game.

IV. COMPARATIVE STATICS

From the previous section we know that voters must rank parties by their anticipated ratifiable agreements. The electoral equilibrium depends then crucially on this ranking. The usual assumption in the literature—either in the form of a single-crossing property or technical assumptions on the party's utility functions—guarantees the ranking of agreements and the party's ideal policies coincide. Below we show an example where this is the case. However, we also show an example where the ranking of agreements differs from that of the party's ideal policies. We emphasize that under Nash bargaining the willingness to compromise of *all* parties influences bargaining outcomes and the ranking of agreements, i.e., the party's willingness to compromise represents another

dimension along which voters distinguish parties and effectively determines their left-right ordering of parties. To illustrate the importance of the party's willingness to compromise on the electoral outcome we show the voting equilibrium when we change only one party's utility function. We begin by showing strategic voting – vote balancing – occurs in our model.

IV.1 Quadratic Party Preferences: Changes in the Status quo

The following examples illustrate that vote balancing occurs under complete information. This happens as changes in the status quo affect the set of feasible intergovernmental agreements which in turn affect electoral outcomes. We assume the ideal points of the voters are distributed to approximate a uniform distribution on the zero-one interval and that the ideal policies of the parties' preferences are $\hat{\theta}_L = 0$, $\hat{\theta}_C = 1/2$, and $\hat{\theta}_R = 1$. Given this, were voters to vote for the party whose ideal policy is closest to their own, the election would lead to the following partition of voters:

(0,0.25)	vote for party L
(0.25,0.75)	vote for party C .
(0.75,1)	vote for party R

To fix ideas, assume R holds a majority in the Federal house. This means that for each example below there are five State electoral outcomes: R wins a majority, R wins a minority, C wins a majority, L wins a majority, and L wins a minority. The remaining possibility that C wins a minority adds nothing, since an agreement acceptable to C will always attract the support of R.

Table I about here

Table I gives the equilibrium agreements for the State formateurs under majority and minority governments for $Q=0$ and $Q=0.25$ and the voting equilibrium. Notice that the agreements favor the left-most formateur²¹ and, because of the quadratic preferences, follow the ordering of the parties' ideal policies.

Example 1: $Q=0$. Since the status quo is at L's ideal policy, if L gains control of the State

legislature, L proposes the status quo. In contrast, C and R prefer changes to the status quo. Case (i) and (ii) have the same outcome since for $Q=0$, C is indifferent between the status quo and R's ideal policy. In case (iii) the agreement maximizes $NP_{CR}(a | Q)$ in the Pareto set $PO^{CR}(Q)$. For cases (iv) and (v) L ensures that its most preferred policy, the status quo, prevails.

In the Nash equilibrium, each citizen votes for the party that, conditional on being selected formateur, would negotiate the ratifiable outcome $\theta^*(a^{FP*})$ the voter most prefers. L gets 30.5% of the vote, C 49.5%, and R 20%. Comparing this to the outcome when everyone votes for the party whose ideal policy is closest to their own, it is clear that C still receives approximately the same vote share, and a substantial chance of forming government. But those supporters are drawn from a *more right-leaning* segment of the electorate. L's prospects improve and R's diminishes as voters balance the influence of R's control of the Federal house.

Example 2: $Q=0.25$. Again L only agrees to the status quo. However, C's "power" is now increased. If C becomes the State formateur it negotiates an agreement it prefers relative to that in Example 1. Also, if R fails to form a majority, C can use its veto power to restrain R from imposing its ideal policy $\hat{\theta}_R$. In contrast to Example 1, ratification binds when R gets a minority.

In equilibrium, L gets 41% of the vote, C 25%, and R 34%. So, both extreme parties benefit electorally at the expense of center party from the rightward movement of Q . Intuitively, with Q being less extreme, the influence of the ratification vote, forces State party R to credibly moderate the extreme tendencies of its colleague, the Federal formateur L. C's "right-wing" vote moves to support R. Simultaneously, voters hesitant to let extreme party L negotiate, are now less worried about the result of the (inevitable) deadlock.

IV.2 Changes in one party's willingness to compromise

This sub-section illustrates how changing the preferences of one party—changes in the party's

²¹ Typically, the closer a party's ideal is to the status quo, the closer will be the final agreement to the party's ideal.

willingness to compromise—affects intergovernmental agreements and electoral outcomes. In these examples, $Q=0$, R holds a majority in the Federal house, and parties' ideal policies are $\hat{\theta}_L = 0.25$, $\hat{\theta}_C = 0.33$, and $\hat{\theta}_R = 1$. While C and R retain their quadratic utility functions, L's changes to $u_L(a) = -(0.25 - a)^{2n}$ where $n = 1, 2, 3$.

We note that even though there is no risk in our model—we assume complete information and there are no shocks to any of the parameters of the model—as n increase so does the concavity of L's utility function. As Peters [1992] shows, this implies as n increases L's strength of preference weakens, i.e., L's willingness to compromise increases²². Using these utility functions, Table II shows that all parties prefer to change the status quo and that agreements favor the left-most formateur.

Table II about here

Example 3: $u_L(a) = -(0.25 - a)^2$. The equilibrium agreements between all pairs of formateurs follow the ordering of the parties' ideal policies.

Example 4: $u_L(a) = -(0.25 - a)^4$. With L more willing to compromise than in Example 3, in equilibrium, the agreement between L and R is more centered than when all parties have quadratic preferences and are equally willing to compromise. Voters are then less concerned with voting for L. With no change in the agreement between C and R, R maintains its vote share. Thus, L gains votes at C's expense.

Example 5: $u_L(a) = -(0.25 - a)^{12}$. L is now substantially more willing to compromise than the two other parties. The ordering of the agreements between pairs LR and CR is the *reverse* of that in Examples 3 and 4. L's greater willingness to compromise makes L less tough in negotiations.

²² Peters [1992] defines a *strength of preference relation* as follows. For a player facing four choices $\{a, b, c, d\} \in A$, let the binary relation $\succeq^*$ be a complete transitive binary relation on $A \times A$. If $(a, b) \succeq^* (c, d)$, then the player prefers the change from b to a to the change from d to c , i.e., for utility function u , $u(a) - u(b) > u(c) - u(d)$. Peters proves that for two players the utility function of the player with the weaker strength of preference relation is a concave transformation of the other player's utility. In our current example this means that L's strength of preference weakens as n increases.

Consequently, when L faces R rather than C, the agreement between L and R is closer to R's ideal policy than that between C and R. With complete information and voters caring only about final policy outcomes, C's supporters are those to the *left* of 0.427. Mid-range voters vote for L. L gets 12% of the vote, C 42.7% and R 45.3%.

Examples 4 and 5 show that rational policy-oriented voters take into account not only the ideal policies of the parties (the distance between their ideal policies to be precise) but also the party's willingness to compromise since these determine the ranking of agreements. The ranking of policies in Examples 1 to 5 can be explained using the results of Cressman and Gallego [2005]. They show that in Nash bargaining environments where a player's opponents are identical in every respect except for their ideal policies and their disagreement outcomes—as is in our model—the opponent's strength of preference as measured by the concavity of the player's utility function determines whether the ranking of agreements coincides (the opponent's utility function exhibits increasing absolute risk aversion) or is the *reverse* (opponent's utility exhibits decreasing absolute risk aversion) of the ranking of party's ideal policies. They argue that in this type of bargaining environment strength of preferences matters (the environment ceases to be one of ordinal domains) and that interpersonal comparisons are possible (Nash's [1950] scale invariance axiom no longer holds: Thomson [1994]). Moreover, Peters [1992, p. 1018] states "in a model without lotteries, it is incorrect to explain theoretical results by referring to the risk attitude(s) of the decision makers". We emphasize that our findings are related to L's willingness to compromise and not to L's aversion to risk since there is no risk in our model.²³

Our result on L's willingness to compromise is also related to the results of Kannai [1977], Kihlstrom et al. [1981] and Roth [1979] that in a riskless environment with risk-averse players, the

²³ Note that the party's wiliness to compromise also determines the location of the policy that keeps party L and C indifferent to the status quo, i.e., of $\bar{\theta}_L$ relative to $\bar{\theta}_C$, in Case 1, Section III.2 associated with Proposition 1 and determines ratification partners in each legislature.

Nash solution is characterized by the least “risk-averse” agent obtaining a larger share of the pie. As L’s willingness to compromise increases, L agrees to a policy that is further from its ideal policy.

V. EXTENSIONS

We have assumed throughout that there are only three parties, each represented in both jurisdictions. Suppose instead that Federal and State levels have *different* party systems. Then we must define upper contour sets more generally as $\Phi_{j^F}(Q)$ and $\Phi_{j^S}(Q)$. When only the formateur j in $h=F,S$ is in a minority position, policy is ratified iff $a^{FS} \in \Phi_{i^h}(Q) \cap \Phi_{j^h}(Q)$ for $i \neq j$. If both lack majorities, the agreement is ratified if four parties concur. To a large extent, this modification results merely in more cumbersome notation. It makes ratification constraints more likely to bind, but does not fundamentally alter the need for voters to consider parties’ willingness to compromise.

In an earlier version we modeled intergovernmental negotiations using Binmore, Rubinstein and Wolinsky’s [BRW 1986] extension of Rubinstein [1982] alternating offers game where negotiations may exogenously breakdown after any rejection²⁴. In this extension, if the time between periods and the risk of breakdown are *not small* there would be two policies associated with each formateur. More cases need then to be considered when ranking intergovernmental agreements, and ratification constraints are also more likely to bind. Voters, however, must still consider the parties’ willingness to compromise in their decisions, and our primary results would remain qualitatively unchanged.

If the two levels have different party systems, the results of our model are relevant even when there are *two* parties at each level. Effectively, such a system has four parties, and so no single party is likely to find itself able to dictate policy changes. Thus, the model captures the essence of the trade-off faced by voters in the US, where national and state parties, though bearing the same label,

²⁴ BRW demonstrate the direct correspondence between the limit of the subgame perfect equilibrium of the alternating offers game when the time between periods and the risk of breakdown become small and the associated Nash [1950]

typically differ in ideal policies and willingness to compromise, as do candidates in Congressional and Senate elections.

The model also can be reinterpreted by identifying F with an incumbent president during midterm elections or with an entrenched bureaucracy: in each case voters may choose representatives that they would hesitate to set up as dictators, but whom they anticipate will achieve beneficial compromises in negotiations with the powers that be.

VI. CONCLUSION

Even in the an otherwise simple environment—a single isolated election, complete information, a unidimensional policy, identical party systems in the two jurisdictions and formateurs selected by vote shares (proportional representation)—the requirement for governments to negotiate policy agreements means that knowledge of the ideal policies of parties do not provide voters with sufficient information to cast their ballots. More knowledge is necessary for voters to rank parties and so for observers to predict electoral outcomes: the parties' willingness to compromise, captured by the relative concavity of their utility functions, must also be understood.

The extensive form game we study has a unique sequential Nash equilibrium that has a simple and intuitive structure. In equilibrium, policy depends on the outcome of the State election, on majority/minority status of both formateurs, on the *concavity* of the party's preferences, on the distance between the party's ideal policies and on the location of the status quo. When the same party controls both houses, if at least one does not control a majority, the ratification vote imposes moderation on the formateurs. When the status quo is to the left of C 's ideal policy, if formateurs differ but L is one of them, either L gets its ideal policy ratified or the status quo remains in place. If the formateurs differ and parties have identical preferences at Federal and State levels, they control

bargaining solution. Here we use Nash's bargaining framework rather than BRW to simplify the analysis.

the majorities to ratify their agreement. However, if party's preferences differ across jurisdictions, ratification may constrain negotiations. Vote balancing occurs, as some voters change their ballot if a different Federal formateur or a different the status quo were in place.

Our analysis shows that legislative veto players, parties needed for legislative ratification, may exert a moderating effect on intergovernmental agreements. In our model it is voters and not the formateurs who choose the legislative veto player. This contrasts with Mo [1995] where one of the negotiators chooses a veto player to convey information to its opponent.

In accordance with Kannai [1977], Kihlstrom *et al.* [1981] and Roth [1979], we find that intergovernmental negotiations favor the formateur least willing to compromise. However, in a three party setting as the willingness to compromise of one of the extreme party's increases, the ordering of intergovernmental agreements may not follow the ordering of the parties' ideal policies. Non-standard voting patterns emerge where the center party's support comes mainly from voters who under normal orderings vote for one of the extreme parties.

Our model also provides some additional insight to those of Romer and Rosenthal [1978] and Denzau and Mackay [1983]. In our model, political competition forces voters to rank agreements. Since the ordering depends on the party's wiliness to compromise, so do electoral outcomes. Non-standard voting outcomes emerge; something that remains hidden under a single setter/committee. The assumption of quadratic preferences—widely used in political economy models because they guarantee the ranking of agreements and the party's ideal policies coincides—allows researchers to concentrate on other more salient issues in their models. However, as our paper shows in electoral outcomes with policy negotiations the outcome crucially depends on the bargainers' willingness to compromise. Thus, in this type of models adopting quadratic preferences can be misleading since a full analysis would show that non-standard legislative coalitions and electoral outcomes may emerge. There is no reason to impose on the model a given left-right partition of voters among parties. Our

model shows that the left-right ordering of parties even in unidimensional policy space depends on more than just the party's ideal policies.

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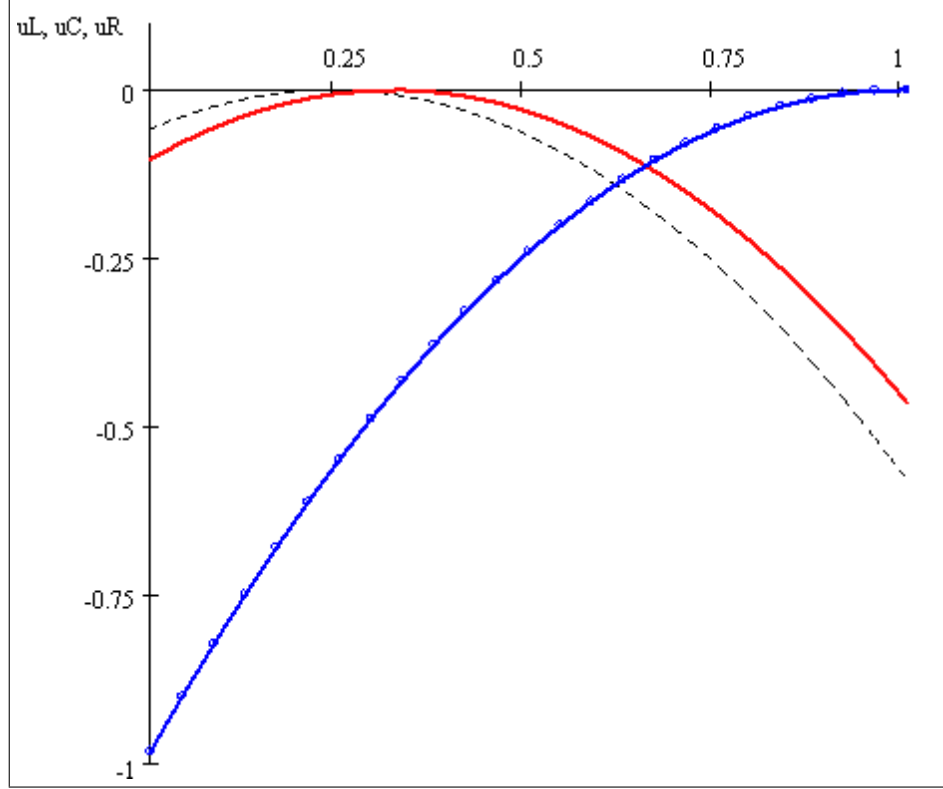


Figure I: The utility functions of Example 3 (Section IV): $u_L(\theta) = -(\theta - 0.25)^2$ (dash), $u_C(\theta) = -(\theta - 0.33)^2$ (solid), $u_R(\theta) = -(\theta - 1)^2$ (dot) for $\theta \in [0, 1]$.

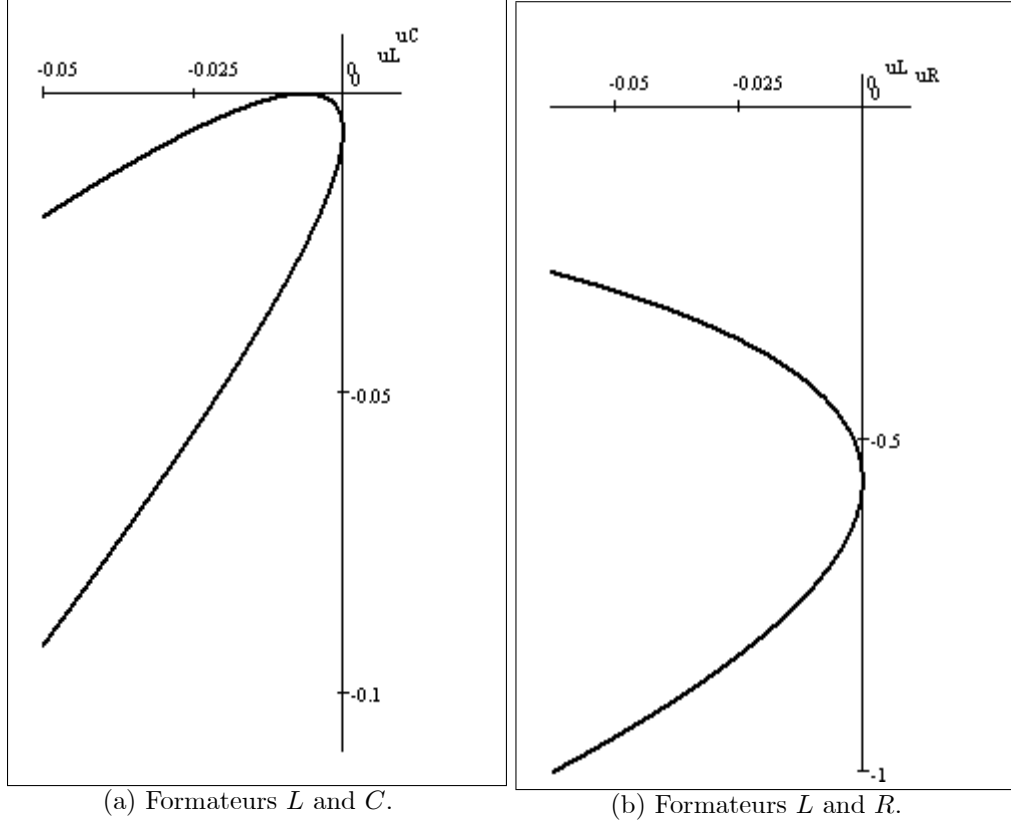


Figure II. The bargaining sets between L (horizontal axis) and C (IIa) and R (IIb) (vertical axis). In (a) the policy that keeps L indifferent to the status quo $Q = 0$, $\bar{\theta}_L$ does not constrain negotiations since $\hat{\theta}_C = \bar{\theta}_L = 0.5$. There are two upward sloping segments in the bargaining set. The bottom ones are for policies in $[Q, \hat{\theta}_L)$, both formateurs prefer rightward policy changes that increase their payoffs. The top one in (b) is for policies in $(\hat{\theta}_R, \bar{\theta}_L]$, both formateurs prefer leftward policy changes that increase their payoffs. In (b) $\bar{\theta}_L = 1$, the point where it constrains negotiations, i.e., $\bar{\theta}_L = \hat{\theta}_R$. The downward sloping portion represents the Pareto set.

Table I Changes in Q for quadratic preferences and ideal policies at $\hat{\theta}_L = 0$, $\hat{\theta}_C = 1/2$, $\hat{\theta}_R = 1$		
State Formateur	Example 1: Q=0	Example 2: Q=0.25
(i) R Majority	$a^{RR} = \hat{\theta}_R = 1$	$a^{RR} = \hat{\theta}_R = 1$
(ii) R Minority	$a^{RR} = \bar{\theta}_C = 1$	$a^{RR} = \bar{\theta}_C = 0.75$
(iii) C Majority/minority	$a^{RC} = 0.61$	$a^{RC} = 0.57$
(iv) L Majority	$a^{RL} = \hat{\theta}_L = Q = 0$	$a^{RL} = Q = 0.25$
(v) L Minority	$a^{RL} = \hat{\theta}_L = Q = 0$	$a^{RL} = Q = 0.25$
	Voting equilibrium	Voting equilibrium
	(0,0.305) vote for L (0.305,0.80) vote for C (0.80,1) vote for R	(0,0.41) vote for L (0.41,0.66) vote for C (0.66,1) vote for R

Table II Changing L's Willingness to Compromise C and R with quadratic preferences and $\hat{\theta}_L = 0.25$, $\hat{\theta}_C = 0.33$, $\hat{\theta}_R = 1$ and $Q = 0 < \hat{\theta}_L$			
State Formateur	Example 3: $u_L(a) = -(0.25 - a)^2$	Example 4: $u_L(a) = -(0.25 - a)^4$	Example 5: $u_L(a) = -(0.25 - a)^{12}$
(i) R M ¹	$a^{RR} = \hat{\theta}_R = 1$	$a^{RR} = \hat{\theta}_R = 1$	$a^{RR} = \hat{\theta}_R = 1$
(ii) R m ¹	$a^{RR} = \bar{\theta}_C = 0.66$	$a^{RR} = \bar{\theta}_C = 0.66$	$a^{RR} = \bar{\theta}_C = 0.66$
(iii) C M/m	$a^{RC} = 0.419$	$a^{RC} = 0.419$	$a^{RC} = 0.419$
(iv-v) L M/m	$a^{RL} = 0.322$	$a^{RL} = 0.374$	$a^{RL} = 0.434$
	Voting equilibrium	Voting equilibrium	Voting equilibrium
	(0,0.37) vote for L (0.37,0.54) vote for C (0.54,1) vote for R	(0,0.4) vote for L (0.4,0.54) vote for C (0.54,1) vote for R	(0,0.427) vote for C * (0.427,0.547) vote for L * (0.547,1) vote for R

¹ M = Majority; m=minority.