Selectorate Theory, the Democratic Peace, and Public Goods Provision[*]

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Abstract

We show that without a few peculiar modeling choices that are not justified by the core assumptions of the theory, selectorate theory neither unambiguously predicts the democratic peace nor that leaders of more inclusive regimes will rely upon the provision of public goods to remain in office, though they may be more likely to provide club goods. We illustrate these claims using relatively simple models that incorporate the core assumptions of their theory while avoiding modeling choices we believe to be less appropriate. We argue for a revised version of selectorate theory, one that continues to emphasize the importance of the size of the winning coalition, yet we believe provides a more realistic picture of democratic politics.

The claim that pairs of democracies are less likely to come into armed conflict with one another than the average pair of states is widely accepted in international relations. While there may be other explanations for the absence of conflict amongst Western states, such as the adoption of liberal economic policies and membership in international governmental organizations, most scholars believe that democracy itself is an important force for peace.[1][2] One reason that scholars remain skeptical of attempts to dispute the empirical association between democracy and peace is that the theoretical explanations for why democracies ought to be less conflict prone have proven quite fruitful, with many of their additional observable implications having been supported. For many, the democratic peace is no longer an isolated, if important, empirical finding, but the foundation of a mature research program.[3]

In many ways, selectorate theory lies at the heart of this research program. It not only accounts for many patterns with respect to international conflict (Bueno de Mesquita et al. 1999, Morrow et al. 2006), but also international cooperation (Bueno de Mesquita and Smith 2007, 2009),[4] the provision of public goods, institutional change, leadership tenure, and many other domestic level outcomes (Bueno de Mesquita et al. 2003). Until recently, it was also one of few explanations for the democratic peace that had been formalized.[5][6]

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[1]On the impact of economic policies and IGOs, see, inter alia, Anderson and Souva (2010), Dorussen and Ward (2008, 2010), Gartzke, Li, and Boehmer (2001) and, especially, Gartzke (2007). Oneal and Russett (1997), Oneal, Russett, and Berbaum (2003), Russett and Oneal (2001) view these factors as complementary.

[2]Note that Henderson (2009) provides evidence, using a research design similar to that of Russett and Oneal (2001), that the democratic peace does not hold in any region outside the West. Separate analysis (not reported) reveals that the evidentiary basis is even more narrow than that, disappearing once one omits the US, UK, France, Germany, Italy and Austria. Thus, we may be observing little more than the transformation of relations between the European great powers following WWII. See also Gibler (2007, 2012), who presents evidence that democracy is a consequence of the resolution of territorial disputes, and thus peace may cause democracy rather than *vice versa*.

[3]See Ray (1995, 2003) for such claims.

[4]McGillivray and Smith (2008) builds upon selectorate theory to explain still further important patterns of international cooperation. However, their argument is nonetheless distinct from selectorate theory.

[5]Some authors have suggested that audience costs might account for the democratic peace (Fearon 1994, Schultz 2001). However, such arguments identify strictly monadic effects of democracy. Moreover, some studies suggest that the relationship between regime type and the ability to generate audience costs is not linear (Slantchev 2006, Weeks 2008). Finally, since all regimes can employ military mobilization, it is not obvious why the ability to generate audience costs should afford democracies any particular advantage even if they were better able to generate them (Slantchev 2005).

[6]However, see Debs and Goemans (2010) and Fearon (N.d.), who provide alternative formal explanations of the democratic peace that yield additional observable implications. See also Patty and Weber (2006) and Jackson and Morelli (2007), who argue that democracies are less prone to bad decision making.

Recently, Clarke and Stone (2008) argued that the proxy variables used to measure the key variables of selectorate theory largely do not account for the relationship between democracy and the outcome variables the authors analyze. Yet, even if we accept their claim,[7] one might wonder whether this reflects an actual shortcoming of selectorate theory itself or just the crude nature of the measurement of the theory's key variables.

We seek to demonstrate that the theory itself is fundamentally flawed. Specifically, a few particular modeling choices in Bueno de Mesquita et al. (2003, 1999) prove critical for their primary conclusions with respect to democratic governance. These choices are neither required, nor justified, by the core assumptions of selectorate theory. They are also, we believe, difficult to defend substantively. That they appear necessary for some of the most celebrated results is therefore troubling.

To develop our claims, we analyze simple formal models that are designed to capture what the authors indicate are the critical assumptions of selectorate theory while avoiding some of what we believe to be more problematic features of their models.[8] The two features that we focus upon are: 1) though the model in Bueno de Mesquita et al. (1999) includes an outcome referred to as negotiations, the players do not negotiate over the issues in dispute in the sense most scholars use the term, as the terms are not chosen by the actors themselves, nor do negotiated agreements require consent from both parties, and 2) with respect to the selection of a leader, Bueno de Mesquita et al. (2003) assume that the outcome preferred by the selectorate collectively obtains, without requiring that aggregate outcomes result from choices made by self-interested individuals.

We begin by demonstrating that even if domestic politics operates as described by Bueno de Mesquita et al. (1999), it is still not clear that we should expect pairs of democracies to be less likely to come into conflict than other pairs of states. The model in Bueno de

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[7]See the response (Morrow et al. 2008).

[8]When discussing the provision of public goods, we primarily focus on the model outlined in the first three chapters of Bueno de Mesquita et al. (2003). When discussing the democratic peace, we focus primarily on Bueno de Mesquita et al. (1999). However, our critique of the decision rule for selecting leaders applies also to Bueno de Mesquita et al. (1999), and negotiations are modeled similarly in both Bueno de Mesquita et al. (1999) and chapter 6 of Bueno de Mesquita et al. (2003).

Mesquita et al. (1999) does not allow either side to have any control over the terms of a negotiated agreement. Further, it is not necessary for both sides to accept an agreement for it to enter into force. In essence, the model in Bueno de Mesquita et al. (1999) treats negotiations as randomly determined outcomes that one side can unilaterally impose upon the other against their will, despite a longstanding recognition in international relations that any state may choose to use force at any time (Waltz 1979).

Using a simpler model than the one analyzed by Bueno de Mesquita et al. (1999), we show that the democratic peace obtains if negotiations operate as they envision, but no coherent relationship between domestic politics and war follows from such a model once we allow for negotiations using the more flexible ultimatum bargaining protocol popularized by Fearon (1995). Even if we allow for incomplete information, the patterns anticipated by our model, which takes most of the conclusions of Bueno de Mesquita et al. (1999) as given, stands in stark contrast with the empirical record.

We next demonstrate that the core assumptions of selectorate theory do not unambiguously indicate that democracies will choose to provide public goods while in autocracies "good policy is bad politics", as Bueno de Mesquita et al. (2003) frequently claim. Bueno de Mesquita et al. (2003) assume that the *only* relevant calculation is whether members of the incumbent leader's current winning coalition would receive more goods if they retain the leader or if they replace the leader with some challenger. This, in effect, forces members of the selectorate to ignore the very defining feature of public goods—that they do not individually need to support the incumbent in order to enjoy any public goods she will provide if retained, though they must do so in order to receive private goods.

Finally, we consider an extension where leaders choose between private goods, public goods, and club goods—which are non-rivalrous in their consumption but are excludable.[9] We find that while the core assumptions of selectorate theory do not give us much reason to expect leaders of more inclusive regimes to provide public goods, they do indicate that such

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[9]We thank Erik Gartzke and an anonymous reviewer for suggesting this extension.

leaders are more likely to provide club goods. Thus, we argue that selectorate theory provides a compelling explanation for why leaders of more inclusive regimes implement policies that benefit large numbers of people while leaders of less inclusive regimes reward a small number of cronies, but we note that the core assumptions of selectorate theory do *not* give us reason to believe that *any* leader will serve the interest of their entire population. Put simply, we argue that while the relative proportion of winners to losers may be much greater in democracies than in other regimes, in politics, there are always both winners and losers.

We begin with a brief review of selectorate theory. We then present a simple model of crisis bargaining, followed by a simple model of leader selection. We then discuss the implications of our analysis before concluding.

Selectorate theory and the Democratic Peace

The literature on the democratic peace grew out of the empirical association between joint democracy and a reduced likelihood of conflict.[10] Two general approaches to explaining the finding have been offered: one focused on norms and one on institutions. Recently, scholars have mostly gravitated towards the institutional approach, for various reasons.[11] The institutional approach typically emphasizes accountability. All leaders are assumed to be self-interested, and to value retaining office first and foremost. Democrats are expected to behave differently than autocrats, irrespective of their commitment to normative values, simply because they rely upon a broader base of support and thus must satisfy larger segments of the populace in order to advance their personal goal of retaining power.

To date, the most prominent theoretical explanation of the democratic peace emphasizing the role of domestic institutions is selectorate theory (Bueno de Mesquita et al. 2003, 1999). Selectorate theory begins from the simple claim that much of the behavior of states can be characterized by the relative proportion of a society's population that falls into each of

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[10]Babst (1964), Bremer (1992), Maoz and Russett (1993).

[11]See Henderson (2002), Rosato (2003) and Reiter and Stam (2002) for critiques of the normative approach. However, see also Huth and Allee (2002) and Danilovic and Clare (2007).

two groups: the selectorate, denoted S, and the winning coalition, W. The selectorate is the subset of the population who directly influence the selection of a leader. In an electoral democracy, the selectorate is synonymous with the electorate, but the authors use the more general term because many leaders come to power through non-electoral paths. Even in a military junta, there are those whose support, or lack thereof, is critical—typically, the senior officers. The winning coalition is the minimal subset of the selectorate whose support is sufficient to allow one to take office.[12] In electoral democracies, W typically constitutes a large proportion of S.[13] In other regimes, W may be countably small.

The primary implication of selectorate theory, according to the authors, is that leaders who must satisfy larger minimum winning coalitions are more likely to rely on the distribution of public goods than private goods in order to remain in office, while the opposite is true of leaders of systems with smaller minimum winning coalitions. A secondary implication is that as the ratio of W, the minimum winning coalition, to S, the selectorate, increases, the leader retains fewer resources for herself. As democratic states typically have both a large W and a large ratio of W to S, they are expected to produce larger quantities of public goods, and their leaders are more likely to be removed from office following policy failures that constitute exogenous shocks to the leader's resource base. Extensive empirical analyses seemingly indicate that democracy is associated with many positive outcomes, and that leaders of democracies are more susceptible to removal from office following policy failure (Bueno de Mesquita et al. 2003).[14]

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[12]Note that this need not be the same as the subset of S who, in practice, actually do support a candidate, which Morrow et al. (2008) term the *supporting coalition*. Thus, selectorate theory suggests that even if a leader gathers the votes of 55% of the populace in an election, only some subset of those supporters belong to W and would thus be likely to receive private goods (or gain access to club goods, as we'll discuss below).

[13]However, W need not be half of S. In first-past-the-post systems, leaders require half of the votes in half of the districts. In proportional representation systems, minority governments are often formed.

[14]The authors argue that W and S capture independent information than measures of democracy versus autocracy, despite their prior claim that selectorate theory explains the empirical relationship between democracy and peace (Bueno de Mesquita et al. 1999). See Clarke and Stone (2008) for a critique of the empirical evidence that W and S explain the outcomes upon which the authors focus better than standard measures of democracy. However, since the empirical proxies for W and S are as crude as they are, it is difficult to know what we can infer from this. For example, simple cross-tabs reveal that W is larger than S, despite being a subset thereof, in nearly 10% of observations. We cannot know whether an analysis based on better measures of W and S would stand up to the critique of Clarke and Stone (2008).

Selectorate theory has been applied to a wide range of outcomes beyond the democratic peace, the provision of public goods, and the average duration of a leader's tenure. The authors have applied selectorate theory to explain tax rates, corruption, and other domestic level factors (Bueno de Mesquita et al. 2003). With respect to international relations, the authors offer novel claims about which states are more likely to pursue regime change as a war aim (Bueno de Mesquita et al. 2003, Morrow et al. 2006) and which states are most likely to provide foreign aid, how much they will give if they do, and to whom (Bueno de Mesquita and Smith 2007, 2009). McGillivray and Smith (2006, 2008) draw on selectorate theory in developing their theory of Leader-Specific Punishments, which explains patterns in sovereign debt, trade, economic sanctions, and other outcomes.

Put simply, few other theories have proven to be as rich, parsimonious, and influential. It is therefore important to highlight what we believe to be significant shortcomings.

Negotiation and the Democratic Peace

In this section, we demonstrate that the non-standard bargaining protocol in the model analyzed by Bueno de Mesquita et al. (1999) is critical to producing their results. Naturally, this would not itself be much of a concern if the authors provided strong theoretical justification for making the assumptions they have about their bargaining protocol. But they do not, and the bargaining protocol in their model is difficult to justify substantively. Specifically, while the authors treat the issue in dispute as divisible, the terms of a negotiated agreement are not chosen by the players but are instead treated as exogenous. Moreover, negotiated agreements can be unilaterally imposed by one side regardless of whether the other would prefer war to abiding by such terms. Though treating the good in dispute as divisible addresses one part of the argument presented in Fearon (1995), their approach does not address the more fundamental point Fearon raised: the costs of war are sufficient to ensure the existence of a range of agreements that both sides prefer to war.

We analyze a simpler model, one that *assumes* one of the key results that they *derive* from their model, thereby stacking the deck in favor of reproducing their argument. We show that the democratic peace is implied by our model under their bargaining protocol—which isn't really a *bargaining* protocol at all—but is not compatible with the ultimatum bargaining protocol, which has become one of the standard protocols in the literature. Put differently, we show that their claim to have explained the democratic peace critically hinges upon the assumption that would-be targets are passive victims who play no role in determining whether a war occurs or not—that war occurs if and only if one side finds the expected outcome of fighting to be more attractive than some exogenously given terms that were not, in any meaningful sense, reached via negotiation.

We do not explicitly model reselection following the international crisis. Nor do we explicitly model the selection of war effort, an important component of Bueno de Mesquita et al. (1999). However, we take as given that patterns mirroring those derived by Bueno de Mesquita et al. (1999) obtain with respect to the relationship between domestic institutions and the optimal war effort chosen by each side. This allows us to focus attention strictly upon the importance of the author's choice of bargaining protocol. We stress that we have built the key results of Bueno de Mesquita et al. (1999) with respect to leader reselection and war effort directly into our model. Any differences in our conclusions about the relationship between regime type and the likelihood of war therefore *must* follow from differences in assumptions about the bargaining protocol—a point further emphasized by the fact that the democratic peace emerges from our streamlined model when we model negotiations the same way as Bueno de Mesquita et al. (1999).

In our model, the leader of state 1, denoted L_1, and the leader of state 2, L_2, contest the division of some good, whose value is normalized to 1. We assume that the good in dispute is of value because it can be used to increase each leader's resource base.[15]

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[15]Note Bueno de Mesquita et al. (1999) argue that control of the good in dispute is a public good. However, we need only assume that control of the good enables the leader to shore up domestic support, which would be true if it expands the resource base irrespective of whether the leader will then use the additional resources to provide more public goods or more private goods. As an anonymous reviewer points out, the notion that

We first assume the game begins with L_1 choosing between war and a negotiated agreement. We do not allow L_2 the opportunity to reject the agreement. Under such a negotiated agreement, L_1 receives $x \in [0, 1]$ while L_2 receives $1 - x$, where the value of x is exogenously determined. This mirrors the bargaining protocol in Bueno de Mesquita et al. (1999).

We then consider a version of the model with a more flexible bargaining protocol. In this version, L_1 is chooses the size of x and L_2 is decides whether to accept or reject L_1's terms. The payoffs for a negotiated settlement in this version are the same: L_1 receives x and L_2 receives $1 - x$. The difference is simply that in this version, the size of x is chosen by L_1 and the proposal is enacted if and only if L_2 accepts such a division of the good, whereas Bueno de Mesquita et al. (1999) allow L_1 to impose x on L_2.

Our primary reason for choosing the ultimatum bargaining protocol is that it has become standard in the study of crisis bargaining.[16] However, note that we have little reason to believe that models employing the ultimatum bargaining protocol yield different conclusions than those based on other genuine bargaining protocols, at with respect to the question of whether agreement is immediately reached.[17] If one wishes to model war duration, a more sophisticated protocol is necessary. But for our purposes, the ultimatum is not only the most natural choice, but is also going to produce the same substantive conclusions we'd arrive at if we adopted a more flexible protocol. The important question then isn't whether negotiation in the real world always involves one side issuing a take-it-or-leave-it proposal to the other, but whether one side can force the other to accept a set of exogenously given terms even when such terms are less attractive than war. We think the answer to that is clear.

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victory in war constitutes a public good is deeply at odds with longstanding views about war, going back to Kant (1983). That is, the authors effectively view war-fighting as a form of progressive taxation, as it uses resources that might otherwise be spent solely on elites to produce an outcome that is valued by all. For Kant, and many proponents of the democratic peace who have been heavily influenced by him, war is a process through which the sovereign forces citizens to pay for some private benefit, and this regressive quality of war is precisely why republics are less likely to engage in it.

[16]Though, as an anonymous reviewer notes, Bueno de Mesquita et al. (1999) are not alone in selecting a bargaining protocol that allows for little actual bargaining. Many studies of crisis bargaining, particularly those that incorporate elements of domestic politics, draw upon models where the actors themselves do not choose the terms of their agreements. Another prominent example would be Schultz (2001).

[17]See especially Fey and Ramsay (2011) and Fey, Meirowitz, and Ramsay (2013).

War itself is modeled identically in both versions of the model. L_1 wins the war with probability p and L_2 wins with probability $1 - p$. Winning is assumed to be worth $1 - c_i$ to each $i \in \{1, 2\}$ and losing $-c_i$, where $c_i \in [0, 1]$ reflects i's subjective loss of utility for incurring the costs of war. Let $p = \dfrac{e_1}{e_1 + e_2}$, where $e_i > 0$ is the amount of resources leader L_i devotes to the war effort. We assume that L_i selects e_i to ensure that p maximizes their probability of survival in office, subject to budget constraints. We further assume war outcomes influence survival, with the victorious being more likely to remain in office.[18]

More formally, let the optimal war effort be denoted by e_i^*, and let e_i^* increase as W_i increases or S_i decreases. Moreover, let the magnitude of this effect increase as W_j increases or S_j decreases $\forall\ i \neq j$. Thus $\dfrac{\partial e_i^*}{\partial W_i} > 0$, $\dfrac{\partial e_i^*}{\partial S_i} < 0$, $\dfrac{\partial^2 e_i^*}{\partial W_i \partial W_j} > 0$ and $\dfrac{\partial^2 e_i^*}{\partial S_i \partial S_j} < 0$.

Substantively, these assumptions indicate that leaders of more open regimes can be expected to try harder to win the wars they choose to fight, and leaders of all regimes are forced to try harder to ensure the same probability of victory when facing an opponent who also has domestic political incentives to try harder. These assumptions echo key results derived in Bueno de Mesquita et al. (1999).

Let us further assume that the cost L_i incurs under the optimal war effort is a strictly convex function of L_i's war effort. That is, we assume that the cost of war increases at an increasing rate, $\dfrac{\partial c_i}{\partial e_i} > 0$ and $\dfrac{\partial^2 c_i}{\partial^2 e_i} > 0$. This indicates that there are diminishing returns to scale, as we might expect given that p increases at a decreasing rate as e_1 increases and decreases at a decreasing rate as e_2 increases. Since c_i reflects the subjective loss of utility associated with war under a given level of effort, this should be uncontroversial.

Note that since we do not explicitly model reselection or the choice of war effort, the version of the model with the bargaining protocol equivalent to that in Bueno de Mesquita et al. (1999) is not game-theoretic, but decision-theoretic. But note also that whether war occurs in their model or not is entirely determined by one player.

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[18]However, recent studies suggest that the relationship between leadership survival, war outcomes, and domestic institutions may differ substantially from that envisioned by selectorate theory. See, for example, Goemans (2000), Chiozza and Goemans (2004), and Debs and Goemans (2010).

In the decision-theoretic version of our model, L_1 chooses negotiation if and only if $x \geq p - c_1 \equiv \hat{x}$. That is, war is avoid if and only if the would-be aggressor finds the exogenously given terms more attractive than the expected outcome of war. The would-be target has no say in the matter whatsoever, as in Bueno de Mesquita et al. (1999).

That wars are least likely to occur when both sides are democratic follows readily from the assumptions we made above. That is, $\frac{\partial e_1^*}{\partial W_1} > 0$, $\frac{\partial^2 e_1^*}{\partial W_1 \partial W_2} > 0$, $\frac{\partial c_1}{\partial e_1} > 0$ and $\frac{\partial^2 c_1}{\partial^2 e_1} > 0$ ensure that c_1 increases, and therefore $\hat{x}$ decreases, as W_1 increases, and that effect itself increases as W_2 increases. Therefore, the conditions under which war occurs become more difficult to satisfy as the size of the minimum winning coalitions in both states increase. When facing an opponent who will put up stiff resistance, as leaders of regimes with large winning coalitions do by assumption, would-be aggressors are forced to try harder, especially if they too have large winning coalitions. The cost of such war, then, will be considerable when both leaders prevail over regimes with large winning coalitions. If a large W is associated with democracy, then, war will be particularly unlikely between pairs of democracies because democratic leaders will find a wide range of agreements preferable to wars they will be forced to try very hard to win. Note that the impact of L_1's institutions on L_1's choice depends upon L_2's institutional arrangements, consistent with the longstanding claim that the democratic peace is an inherently dyadic phenomenon.

Now let us turn to the second version, where L_1 chooses the size of x and L_2 decides whether to accept L_1's proposed division of the good or reject it and go to war. L_2 accepts any $x \leq p + c_2$. Since $U_{L_1}(x = p + c_2) \geq EU_{L_1}(x > p + c_2)$ is equivalent to $p + c_2 \geq p - c_1 \Leftrightarrow c_1 + c_2 \geq 0$, L_1 must always prefer to set $x = p + c_2$, which L_2 is certain to accept. Since this model *always* predicts peace, it cannot predict any relationship between W_1, W_2 and peace.

This informal proof mirrors that of Fearon (1995), which illustrates our argument that Bueno de Mesquita et al. (1999) were able to claim that selectorate theory explains the democratic peace only because they sidestepped Fearon's argument about the inefficiency of war through their peculiar choice of bargaining protocol.

Naturally, even though Bueno de Mesquita et al. (1999) assumed complete information, one might reasonably wonder what the equilibria to this model look like if we assume incomplete information, the primary explanation for war offered by Fearon (1995).

Let us now assume that leaders vary in the extent to which they suffer a subjective loss of utility when devoting their optimal amount of resources towards the war effort. More formally, let $\rho_i = \dfrac{\partial c_i}{\partial e_i} \; \forall \; i \in \{1, 2\}$. For simplicity, assume that ρ_1 is known, while ρ_2 takes on one of two values, such that L_2 knows the value of ρ_2 but L_1 only knows the probability distribution from which it is drawn. That is, assume $\rho_2 = \bar{\rho}_2$ with probability q and $\rho_2 = \underline{\rho}_2$ with probability $1 - q$, where $\underline{\rho}_2 < \bar{\rho}_2$. Then L_1 knows that with probability q, L_2 suffers a greater loss of utility, denoted $c_2 = \bar{c}_2$, when selecting the level of war effort necessary to ensure the optimal probability of retaining office, and with probability $1 - q$, L_2's subjective loss of utility is not as great, and $c_2 = \underline{c}_2$, where $\underline{c}_2 < \bar{c}_2$.

There are two perfect Bayesian equilibria to this model, as we demonstrate in the appendix. In one, L_1 sets $x = p + \underline{c}_2 \equiv \underline{x}$, which L_2 accepts regardless of type and thus war never occurs. In the other, L_2 sets $x = p + \bar{c}_2 \equiv \bar{x}$, which L_2 accepts if and only if $c_2 = \bar{c}_2$ and therefore the *ex ante* probability of war is $1 - q$. The former equilibrium obtains when

$$q \leq \frac{c_1 + \underline{c}_2}{c_1 + \bar{c}_2} \equiv \hat{q}. \tag{1}$$

Simple comparative statics on 1 tell the rest of the story. Recall that $c_2 = \bar{c}_2$ when $\rho_2 = \bar{\rho}_2$, where $\rho_2 = \dfrac{\partial c_2}{\partial e_2}$. Since $\dfrac{\partial e_2^*}{\partial W_2} > 0$, c_2 increases as W_2 increases. Note that the difference between $\bar{c}_2$ and $\underline{c}_2$ must increase as W_2 increases.[19] Therefore, $\hat{q}$ decreases as W_2 increases, and the conditions sustaining an equilibrium in which there is a non-zero probability of war become easier to satisfy. This indicates that democracies make attractive targets, as others have argued (Schultz 2001). Finally, since $\dfrac{\partial c_1}{\partial e_1^*} > 0$ and $\dfrac{\partial e_1^*}{\partial W_1} > 0$, c_1 increases as W_1 increases. Since $\hat{q}$ increases as c_1 increases, the conditions sustaining the equilibrium with a positive probability of war become more difficult to satisfy as W_1 increases.

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[19]This is equivalent to the claim that if $f'(x) > g'(x)$, then $f(a) - g(a) > f(b) - g(b) \; \forall \; a > b$.

This leads to our first key result.

Proposition 1. *The equilibrium exhibiting a positive probability of war exists under conditions that are more difficult to satisfy as W_1 increases or W_2 decreases.*

This result provides little support for the democratic peace as it is conventionally understood. It suggests that we ought to observe a monadic peace in that leaders of democracies must be more confident that their opponent suffers large costs when mobilizing for war before they are willing to make demands that carry a risk of rejection than are leaders of other systems. As Bueno de Mesquita et al. (1999) observe, most studies conclude that there is little evidence of a monadic peace, and they consider the fact that their model does not anticipate such an effect to be a virtue. Further, since it indicates that the conditions under which a leader is willing to make a demand that carries some risk of war are more readily satisfied when the opponent is democratic, the incomplete information version of our model appears to indicate that war is *least* likely to occur when the challenger is democratic and the target autocratic. However, there is strong evidence that such dyads are amongst the most conflict-prone (Bennett 2006). Perhaps surprisingly, the model also indicates that the most war-prone dyads would consist of an autocratic challenger and a democratic target, which are also amongst the most conflict-prone. Thus, our model suggests that dyads consisting of one democratic and one autocratic state may exhibit either the highest or lowest risk of war, relative to all other combinations, depending upon which is the challenger.[20]

All models are simplifications. We do not take issue with the bargaining protocol in Bueno de Mesquita et al. (1999) purely because it is substantively implausible. If the choice of bargaining protocol made little difference to the substantive conclusion reached, there would be little reason to care. The important point here is that the democratic peace does not emerge once we allow for genuine bargaining.

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[20]Bennett (2006) finds a slight difference in the likelihood of conflict between these two pairings, with autocrats somewhat more likely to initiate disputes against democracies than democracies against autocracies. But note that this difference is modest. The combination of regime types matters much more, empirically, than the question of which side is the initiator.

Individual Strategy and Public Good Provision

We turn now to the analysis of a few simple models of leader selection. In each, members of S may either retain the incumbent leader, L, or replace her with some challenger, C.

The only difference between the first two variants is the decision rule employed by members of S. We first discuss a decision rule that mirrors that used by Bueno de Mesquita et al. (2003), where L is retained if and only if W members of S expect to receive greater benefits from L than C. We then present the results obtained using an alternative decision rule, where L is retained if and only if W members of S find that it is in their individual self-interest to express support for L rather than C.

Each variant begins with L and C simultaneously stating their platforms. For now, a platform consists of two elements: a bundle of proposed expenditures on the provision of private goods, which we denote $\nu^j = \sum_i^S \nu_i^j \ \forall \ j \in \{L, C\}, i \in S$; and a budget for the provision of public goods, which we denote γ^j. The total amount of resources available is denoted R. Naturally, we require $\nu^j + \gamma^j \leq R$.

We assume that delivering ν_i^j to individual i requires candidate j to expend precisely ν_i^j resources. However, we assume a more complicated production technology for public goods. In allocating γ^j resources towards the production of public goods, candidate j produces only $\mu^j < \gamma^j$ units of public goods.[21] Note that assuming $\mu^j < \gamma^j$ does not rule out the possibility that $S\mu^j \geq \gamma^j$. That is, we assume that when candidate j allocates γ^j resources towards the production of public goods, no single member of S receives as much value as they would have if j allocated an equivalent amount of resources towards the provision of private goods for that selector, but it may nonetheless be true that more j satisfies more selectors in this manner than j could have through the provision of private goods. Had we instead assumed $\gamma^j > \mu^j$, there would be no reason for any leader to rely upon the provision of private goods.

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[21]We might assume the amount of public goods provided is increasing with the resources expended, i.e., $\dfrac{\partial \mu^j}{\partial \gamma^j} > 0$. We might further assume that the amount of goods produced is increasing at a decreasing rate, or $\dfrac{\partial^2 \mu^j}{\partial^2 \gamma^j} < 0 \ \forall \ j \in \{L, C\}$. However, none of the key results depend upon such restrictions.

After L and C state their platforms, the selectorate decides which candidate to support. Throughout, we will assume that platforms are both credible and common knowledge.[22] We also assume L's level of efficiency at generating public goods is common knowledge, though members of S must rely upon a common prior expectation with respect to C's ability to produce public goods, such that for a given γ^C, all i expect to receive $\hat{\mu}_{\gamma^C}^C$.[23]

Throughout, we assume that members of S care only about the amount of goods they receive. In the first two versions of our model, i's value for having j in office is $\nu_i^j + \mu^j$, or the amount of private goods they will receive individually plus the public goods everyone gets to enjoy. We assume candidate j receives $R - \nu^j - \gamma^j$ if they are selected to be leader, indicating that any resources not spent buying support are consumed by j, and 0 otherwise.

Let $W^j \subset S$ denote a set of size W whose members belong to the winning coalition of candidate j. We assume that members of W^L can expect to remain in L's coalition if and only if they support L. All those who support C have the same probability of being included in W^C, and thus expect to receive private goods from C only with probability $\dfrac{W}{S}$. Note that Bueno de Mesquita et al. (2003) identify this as a critical assumption of selectorate theory.

Our model is simpler than any of the models discussed in Bueno de Mesquita et al. (2003). We do not model the leader's choice of tax rates or individual decisions with respect to leisure versus labor decisions. However, this setup is sufficient to illustrate our argument.

When we require only that W members of S derive greater utility from having L remain in office, as in Bueno de Mesquita et al. (2003), without regard to whether individual selectors have an incentive to lend their personal support to the incumbent rather than the challenger, L retains office so long as the following inequality holds:

$$\nu_i^L + \mu^L \geq \frac{W}{S}\nu_i^C + \hat{\mu}_{\gamma^C}^C. \tag{2}$$

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[22]Naturally, one might argue that candidates can very easily choose to allocate fewer resources once in office than they had pledged beforehand. However, since Bueno de Mesquita et al. (2003) assume credible commitments, we will as well.

[23]We assume this because Bueno de Mesquita et al. (2003, 1999) make a similar assumption. It is not necessary for any of our results.

Suppose that C promises to allocate all of R in the form of private goods, giving $\frac{R}{W}$ to each member of W^C. Then L can secure office either by setting $\nu_i^L = \frac{R}{S} \; \forall \; i \in W^L$ or by allocating $\gamma^L(\frac{R}{S})$, which produces $\mu^L = \frac{R}{S}$.

So long as $W\frac{R}{S} > \gamma^L(\frac{R}{S})$, the former is less cost effective than the latter and L will prefer to secure the support necessary for retaining office by providing public goods rather than private goods. In other words, we can readily identify a perfect Bayesian equilibrium in which L sets $\gamma^L = \gamma^L(\frac{R}{S})$, which denotes the level of γ^L necessary to ensure that $\mu^L = \frac{R}{S}$, and $\nu^L = 0$, while C sets $\gamma^C = 0$ and $\nu_i^C = \frac{R}{W} \; \forall \; i \in W^C$ and $\nu_m^C = 0 \; \forall \; m \in S/W^C$. In this equilibrium, L retains office. In words, there exists an equilibrium in which L retains office by providing a level of public goods sufficient to match the quantity of private goods that members of the selectorate could expect to receive if C took office. Importantly, this equilibrium is more likely to obtain as W increases or S increases. Thus we have derived some of the most important results of selectorate theory from our model, simple though it is, having used the same decision rule as the authors.

We stress that this decision rule does not link individual strategies to aggregate outcomes. However, if the outcomes that maximize social utility could be assumed to obtain irrespective of the incentives facing individuals, there would be no dilemma to the one-shot Prisoner's Dilemma, one of the most famous applications of non-cooperative game theory. There would be no Tragedy of the Commons. No need for governments to provide public goods. In short, the world would be a very different place. Yet this is how Bueno de Mesquita et al. (2003) determine whether L retains office.

Of course, we acknowledge that a vibrant literature in political science similarly assumes that outcomes preferred by sufficiently large number of voters will obtain in equilibrium.[24] It is not our intention to question all such work. Again we stress that all models are simplifications, and even patently false assumptions are not worth criticizing if they do not distort the analysis. And in many of the models where candidates are assumed to take office if a

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[24]For overviews of the literature, see, inter alia, McCarty and Meirowitz (2007) and Mueller (2003).

plurality of voters receive greater utility from having them do so, the substantive conclusions do not change if we require that individual voters adopt strategies that maximize their individual expected utilities. However, they do here.

Suppose that we no longer assume that L retains office if and only if W members of S derive greater utility from having L remain in office, but instead require each $i \in S$ to adopt the individual strategy that maximizes their individual expected utility. More formally, we now assume that each $i \in S$ supports L if and only if $EU_i(support\ L) \geq EU_i(support\ C)$, or

$$\bar{p}(\nu_i^L + \mu^L) + (1 - \bar{p})\hat{\mu}_{\gamma C}^C \geq \underline{p}\mu^L + (1 - \underline{p})(\frac{W}{S}\nu_i^C + \hat{\mu}_{\gamma C}^C), \tag{3}$$

where $\bar{p}$ denotes the probability that L retains office with i's support, $\underline{p}$ denotes the probability that L retains office absent i's support. Given the nature of public goods, we argue that this is a more appropriate decision rule. If each i chooses whom to support by evaluating inequality 3, i will have assumed that she will receive any public goods provided by j regardless of whether she supports j, yet also assumed that she must support j in order to receive private goods from j in the event that j takes office.

This brings our to our next key result.

Proposition 2. *There exists a perfect Bayesian equilibrium to the leader selection game using the decision rule outlined by inequality 3, where L sets $\nu^L = \gamma^L = 0$.*

The intuition behind this result is that when members of S concern themselves solely with the amount of goods they expect to receive as a function of whom they individually choose to support, if L does not propose to allocate any resources to anyone, every member of S may nonetheless be indifferent between supporting L and supporting C. If we assume that members of S default to supporting L when indifferent, as we implicitly did above, then L wins despite not allocating any goods to anyone because no individual member of S can benefit by deviating and pledging their support to C. If they did so, C still would not win, and they would continue to expect to receive nothing.

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This equilibrium pretty clearly does not match reality, though its existence is telling theoretically. Of course, it rests critically upon an arbitrary assumption about how members of S behave when indifferent. So let us now allow members of S to receive arbitrarily small rewards or punishments for expressing support for the incumbent, irrespective of the outcome. These parameters will function primarily to break ties. More formally, let each $i \in S$ receive $\alpha_i^L \sim U[-\epsilon, \epsilon]$ when supporting L, where ϵ is some quantity arbitrarily close to 0. Let each α_i^L be known by i and only i. That is, no member of S can know how non-material considerations will influence the behavior of any other member of S, nor can the candidates. The primary effect of these terms is to make selector's decisions probabilistic, thereby preventing strange equilibria like the one just discussed.

We then obtain the next result.

Proposition 3. *In any perfect Bayesian equilibrium to the leader selection game with non-material incentives to support the incumbent, L's choice of γ^L is increasing in W, all else equal, but only takes on positive values if the difference between $\bar{p}$ and $\underline{p}$ is non-trivial.*

This appears to support the conclusions of Bueno de Mesquita et al. (2003). All else equal, L allocates greater resources towards the provision of public goods as W increases. If we associate large values of W with democracy, this would seem to indicate that democrats are more likely to provide public goods than are their authoritarian counterparts.

However, the restriction that L only sets $\gamma^L > 0$ when $\bar{p} - \underline{p}$ takes on non-trivial values is not a small caveat. Scholars have long recognized that it is highly implausible that a single voter's decision will influence the outcome of a national election in a modern electoral democracy.[25] Put simply, if the best explanation for the provision of public goods we can come up with is that voters are dissuaded from supporting the challenger out of fear that they will significantly decrease the prospects of the leader retaining office ins so doing, we do not have much of an explanation of public goods provision.

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[25]Riker and Ordeshook (1968) sought to resolve the paradox that voters do in fact vote in elections even though they cannot hope to influence the outcome. While many others have offered alternative explanations, very few have disputed the claim that voters are unlikely to believe that their vote has a non-trivial impact.

For this reason, we now consider an extension of the model.

Unlike above, we now allow L and C the choice of providing club goods in addition to (or instead of) private goods and public goods. Formally, let κ^j denote the resources j expends when providing ζ_B^j benefit to members of B in the form of club goods. As above, we assume $\zeta_B^j < \kappa^j$ so as to ensure that providing club goods is not a strictly dominant strategy for all j, irrespective of W and S. However, we do not rule out the possibility that $B\zeta_B^j > \kappa^j$, which would indicate that it is more economically efficient to satisfy B members of S through the provision of club goods than private goods.

We assume that there are returns to scale in the provision of club goods. Formally, $\frac{\partial \kappa^j}{\partial \zeta_B^j} > 0$ but $\frac{\partial^2 \kappa^j}{\partial^2 \zeta_B^j} < 0$, indicating that costs increase at a decreasing rate.

We need not assume that supporting j is a prerequisite for belonging to B^j, or the set of individuals granted access to the club goods provided by candidate j, but it makes sense to assume that the probability of being granted access to club goods is related to the choice of whom to support.

As with public goods, we assume that L's ability to produce club goods is known, whereas $\hat{\zeta}_B^C$ denotes the expected benefit to B^C when C allocates κ^C to the provision of club goods.

A proof of the following result can be found in the appendix.

Proposition 4. *There exists a perfect Bayesian equilibrium to the extended leader selection game where L sets $\nu^L = \gamma^L = 0$ and $\kappa^L > 0$.*

In this equilibrium, L provides a level of club goods that ensures W members of S derive greater expected utility from supporting L than C. Critically, this equilibrium is more likely to exist as W increases. Intuitively, the size of the winning coalition must exceed a certain threshold before it becomes more efficient to buy support through the provision of club goods than private goods. This is essentially the argument Bueno de Mesquita et al. (2003) make about public goods, but since club goods are excludable, L can create a material incentive to support her over C by promising to distribute them, whereas promises to provide public goods cannot create such an incentive.

Conclusion

Selectorate theory has proven to be very influential in the study of politics, not only because it claims to provide an explanation for the democratic peace, but also to yield important insights into patterns of international cooperation and a variety of domestic outcomes. Many also find the theory attractive due its relative parsimony. Seemingly, we need only assume that leaders enjoy wielding power and that their subjects prefer to receive more goods rather than less in order to explain a wide range of empirical regularities. Selectorate theory offers those who are reluctant to claim that democracy instills in its citizens greater virtues the ability to nonetheless believe that democratic institutions are critical for producing peace (at least amongst fellow democracies) and prosperity (which is assumed to be fostered by public goods). The appeal of such a theory is obvious. The implications are both surprising, given the nature of the assumptions, as well as normatively satisfying.

Yet, as we hope to have illustrated, this stylized interpretation is not warranted. Specifically, some of the most celebrated results reported in Bueno de Mesquita et al. (1999) and Bueno de Mesquita et al. (2003) depend critically upon modeling assumptions that neither are justified by the core logic of their theory nor substantively easy to defend.

With respect to the democratic peace, Bueno de Mesquita et al. (1999) implicitly assumed that when states negotiate with one another, neither of them has any influence on the distribution of benefits each would receive. Moreover, they assumed that peace requires the consent of only one party, in contrast to the traditional interpretation of anarchy. We analyzed a very simple model, one in which we assumed the very patterns Bueno de Mesquita et al. (1999) derived from their model with respect to the relationship between domestic institutions and optimal war effort. Despite this substantial simplification, we found that the democratic peace obtained under their bargaining protocol, but appears incompatible with the more flexible protocol found in Fearon (1995), which has subsequently become one of the standard ways of modeling crisis bargaining.

We acknowledge that the particular manner in which we chose to represent incomplete

information does not follow directly any of the assumptions in Bueno de Mesquita et al. (1999), who assumed complete information. Yet even if the democratic peace could be reconciled with our model using a different approach to modeling incomplete information, we would continue to argue that there is no unambiguous evidence that the core assumptions of selectorate theory point towards the democratic peace. We contend that if a theory can only account for a given finding under arbitrary specifications that are not informed by the core assumptions of the theory, that theory provides a poor explanation for said finding.

After replacing the non-standard bargaining protocol used by Bueno de Mesquita et al. (1999) with the ultimatum bargaining protocol, we derived rather puzzling results regarding the relationship between regime type and conflict. We are relatively untroubled by these results because we see the model we presented as being useful for illustrating the fragile nature of the results reported by Bueno de Mesquita et al. (1999) but not necessarily so for generating novel empirical implications. For the sake of argument, we found it useful to assume from the outset that certain patterns with respect to war effort. However, it is not obvious to us, given our subsequent arguments about public goods, that we would want to build a model on such assumptions if we wished to generate empirical implications.

With respect to public goods, though they are non-excludable by definition, in order to prove that leaders of large W systems are required to provide public goods if they wish to retain office, the authors assumed that members of S make decisions without regard for the relationship between their individual behavior and their individual access to goods. Members of S are fundamentally non-strategic in their models.

To illustrate this, we analyzed a very simple model, one that lacked many of the moving parts found in Bueno de Mesquita et al. (2003). Despite these differences, we first showed that if we employed the same decision rule as the authors, we could reproduce their key claims. However, once we adopted more appropriate decision rules, we no longer found evidence that democrats are likely to distribute public goods. We did, however, demonstrate with an extension of the model that democrats are more likely to provide club goods.

This is not a trivial difference. We argue that *all* leaders govern primarily with the interests of the members of their winning coalition in mind, whereas Bueno de Mesquita et al. (2003) argue that democrats are forced to serve the interests of their entire populations. We argue that the core assumptions of selectorate theory do not unambiguously support such a conclusion, though they do imply that leaders of more inclusive regimes implement policies that benefit a larger proportion of the population. We stress that in politics, there are always winners and losers. For many, the claim that democratic leaders have no choice but to rely on non-exclusionary policies might come as welcome news, or perhaps a grievous insult. Many of the world's democracies have all too rich a history of practicing the politics of exclusion, after all. There is also reason to doubt whether democracy helps the poor (Ross 2006). A system of governance that benefits roughly half the population is quite preferable to one that benefits 1%, but we ought to recognize that a half is not a whole.

Our criticism of the depiction of democratic politics in Bueno de Mesquita et al. (2003, 1999), where leaders are driven to make *everyone* happy, should not be taken to mean that we find no merit in selectorate theory. One of the central motivating puzzles discussed in Bueno de Mesquita et al. (2003) concerns the empirical observation that those leaders whose people suffer most appear to have the strongest hold on power. Their answer to this important puzzle is that, in authoritarian regimes, "good policy is bad politics." We see not reason to suggest that this is not a compelling, if unhappy, explanation. We just happen to believe that some of the most widely celebrated claims associated with selectorate theory, specifically with regards to the democratic peace and the provision of public goods, are problematic. And we think it important to acknowledge these limitations.

Appendix

Crisis Bargaining

Proposition 1. There are two pure strategy PBEs to the model with incomplete information. In the first, L_1 sets $x = \underline{x}$; the strong L_2 accepts if and only if $x \leq \underline{x}$; the weak L_2 accepts if and only if $x \leq \overline{x}$. In the second, L_1 sets $x = \overline{x}$; the strong L_2 accepts if and only if $x \leq \underline{x}$; the weak L_2 accepts if and only if $x \leq \overline{x}$.

L_1's optimal offer is straightforward. If L_1 sets $x > \overline{x}$, war results with certainty, which cannot be optimal since $\overline{x} \equiv p + \overline{c}_2 > p - c_1$. If L_1 sets $x < \underline{x}$, L_1 foregoes better terms of agreement than would have been available had L_1 set $x = \underline{x}$, which L_2 is certain to accept regardless of type. If L_1 sets $\underline{x} < x < \overline{x}$, L_1 receives the same payoff when L_2 is strong as L_1 would had received had L_1 set $x = \overline{x}$, and L_1's payoff from having the weak L_2 accept is strictly inferior to L_1's payoff from having the weak L_2 accept $x = \overline{x}$. Given the choice between $x = \underline{x}$ and $x = \overline{x}$, L_1's strategy follows immediately from inequality 1.

L_2's strategy follows readily from setting $u_{L_2}(acc) \geq EU_{L_2}(rej) \Leftrightarrow 1 - x \geq 1 - p - c_2$. When L_2 is strong, i.e. $\rho = \underline{\rho}$ and thus $c_2 = \underline{c}_2$, this simplifies to $x \leq p + \underline{c}_2 \equiv \underline{x}$. When L_2 is weak, i.e. $\rho = \overline{\rho}$ and thus $c_2 = \overline{c}_2$, this simplifies to $x \leq p + \overline{c}_2 \equiv \overline{x}$.

The probability of war in the equilibrium where L_1 sets $x = \underline{x}$ is 0. When L_1 sets $x = \overline{x}$, the *ex ante* probability of war is $1 - q$. The former equilibrium exists if and only if $q \leq \hat{q}$, the latter if and only if $q > \hat{q}$. Therefore, Proposition 1 follows from the comparative statics on inequality 1, which are discussed in the text. $\qquad \square$

Leader Selection

Proposition 2. The following beliefs and pure strategies constitute a perfect Bayesian equilibrium. L sets $\nu^L = 0$ and $\gamma^L = 0$; C sets $\nu_i^C = \dfrac{R}{W} \ \forall \ i \in W^C$, $\nu_m^C = 0 \ \forall \ m \in S/W^C$ and $\gamma^C = 0$; all $i \in S$ support L iff inequality 3 holds, supporting C otherwise, and believe $\hat{\mu}_{\gamma^C}^C > 0$ if $\gamma^C > 0$, $\hat{\mu}_{\gamma^C}^C = 0$ otherwise, and believe $\overline{p} = 1$, $\underline{p} = 1$.

Note that the appropriate solution concept is perfect Bayesian equilibrium since the actor's strategies depend upon their beliefs, $\hat{\mu}^C$, $\overline{p}$ and $\underline{p}$. However, note that since the behavior of the selectorate is deterministic, all $i \in S$ can update their beliefs $\overline{p}$ and $\underline{p}$ to certainty. Also note that the actors do not have the opportunity to learn about $\hat{\mu}^C$.

Specifically, since every member of S supports L in equilibrium, and L requires the support of only W members of S, then from the perspective of any given i, L wins either with or without i's support. Thus $\overline{p} = 1$ and $\underline{p} = 1$.

Substituting the equilibrium platforms for L and C into inequality 3, we get

$$\overline{p} \cdot 0 + (1 - \overline{p}) \cdot 0 \geq \underline{p} \cdot 0 + (1 - \underline{p})(\frac{W}{S}\frac{R}{W}),$$

which, after substituting in $\overline{p} = 1$ and $\underline{p} = 1$, simplifies to

$$0 + 0 \geq 0 + 0(\frac{R}{S}),$$

or simply $0 \geq 0$. Thus, i's strategy is incentive compatible, as $0 \geq 0$ is true by definition.

Given that L expects to retain office, L has no incentive to set $\nu^L > 0$ or $\gamma^L > 0$. Thus, L's strategy is incentive compatible.

C has no incentive to deviate from the equilibrium strategy, since C cannot prevent L from winning by changing her platform, nor does C's payoff depend upon her platform in any equilibrium in which C does not take office. This completes the proof. $\square$

Proposition 3. In any perfect Bayesian equilibrium, each $i \in S$ supports L if and only if

$$\overline{p}(\nu_i^L + \mu^L) + (1 - \overline{p})\hat{\mu}_{\gamma^C}^C + \alpha_i^L \geq \underline{p}\mu^L + (1 - \underline{p})(\frac{W}{S}\nu_i^C + \hat{\mu}_{\gamma^C}^C), \tag{4}$$

where $\hat{\mu}_{\gamma^C}^C > 0$ if $\gamma^C > 0$ and $\hat{\mu}_{\gamma^C}^C = 0$ otherwise.

Solving inequality 4 for α_i^L, we can alternatively say that i supports L if $\alpha_i^L \geq \hat{\alpha}_i^L$, where $\hat{\alpha}_i^L \equiv (\hat{\mu}_{\gamma^C}^C - \mu^L)(\overline{p} - \underline{p}) + (1 - \underline{p})\frac{W}{S}\nu_i^C - \overline{p}\nu_i^L$. While candidate j cannot know whether

$m \in S, m \neq i$ will support L, given that i does not know the value of α_m^L, i knows that the probability that $m \in S, m \neq i$ supports L, which we'll denote S_m^L, is given by

$$S_m^L = \begin{cases} \dfrac{\epsilon - \hat{\alpha}_m^L}{2\epsilon} & \text{if } -\epsilon \leq \hat{\alpha}_m^L \leq \epsilon \\ 0 & \text{if } \hat{\alpha}_m^L > \epsilon \\ 1 & \text{if } \hat{\alpha}_m^L < -\epsilon \end{cases}$$

Then $\bar{p}$ is the probability that L's expected level of support is at least as large as W, where L's expected level of support is $1 + \sum_m S_m^L$. Similarly, $\underline{p}$ is the probability that L's expected level of support without i is at least as large as W, or $pr(\sum_m S_m^L) \geq W$.

From the perspective of L, the probability of retaining office is $pr(\sum_i^S S_i^L \geq W) \equiv \hat{p}$, and the optimal values of ν^L and γ^L depend upon L's expected utility, $\hat{p}(R - \nu^L - \gamma^L)$, subject to the constraint $\nu^L + \gamma^L \leq R$. The optimal allocations can be found by maximizing $\hat{p}(R - \nu^L - \gamma^L) - \lambda(\nu^L + \gamma^L - R)$ with respect to ν^L and γ^L, respectively.

We are particularly interested in L's choice of γ^L, which is given by

$$\lambda = \frac{\partial \hat{p}}{\partial \gamma^L}(R - \nu^L - \gamma^L) - \hat{p}. \tag{5}$$

Intuitively, this tells us that if R increased, L would increase γ^L in proportion to the impact of γ^L on her probability of retaining office, weighted by the rents L extracts from office upon victory, while decreasing γ^L as her expected probability of retaining office increases.

Clearly, $\hat{p}$ at least weakly decreases as W increases, since $\hat{p} = pr(\sum_i^S S_i^L \geq W)$. This indicates that, all else equal, L's optimal γ^L increases as W increases.

However, inspection of $\hat{\alpha}_i^L$ clearly indicates that the impact of γ^L on the probability that any given i supports L, or S_i^L, goes to 0 as $\bar{p} - \underline{p}$ goes to 0. In the limit, as $\bar{p} - \underline{p} \to 0$, $\frac{\partial \hat{p}}{\partial \gamma^L} \to 0$, and by 5, we can see that L's optimal allocation of resources towards the provision of public goods, which cannot take on negative values, must also go to 0. $\qquad \square$

Proposition 4. Let $\underline{s}^L$ be the probability that any given member of S belongs to B^L if they support C, $\underline{s}^C$ be the probability that they belong to B^C if they support L, $\overline{s}^L$ be the probability that they belong to B^L if they support L, and $\overline{s}^C L$ be the probability that they belong to B^C if they support C. We assume that $s^C < s^L$ due to the uncertainty about the makeup of B^C for the same reasons that Bueno de Mesquita et al. (2003) stress that no member of S can be sure that they will be part of C's winning coalition.

The more narrowly candidates can target club goods, the more closely $\overline{s}^L$ will approximate 1 and $\underline{s}^L$ will approximate 0, allowing L to avoid wasting resources. But we need not assume that it is possible for L to do so.

Again requiring each $i \in S$ to select a strategy that maximizes their individual expected utility, L retains office if and only if

$$\overline{p}(\nu_i^L + \mu^L + \overline{s}^L \zeta_B^L) + (1-\overline{p})(\hat{\mu}_{\gamma^C}^C + \underline{s}^C \hat{\zeta}_B^C) \geq \underline{p}(\mu^L + \underline{s}^L \zeta_B^L) + (1-\underline{p})(\frac{W}{S}\nu_i^C + \hat{\mu}_{\gamma^C}^C + \overline{s}^C \hat{\zeta}_B^C).$$

$$(6)$$

For all non-trivial values of S, the difference between $\overline{p}$ and $\underline{p}$ approaches 0 and the provision of public goods is a strictly dominated strategy. Consider then the choice between club goods and private goods.

Recall that we assume $\frac{\partial \kappa^j}{\partial \zeta_B^j} > 0$ and $\frac{\partial^2 \kappa^j}{\partial^2 \zeta_B^j} < 0$. We also assumed $\zeta_B^j < \kappa^j$. Finally, recall that the cost of providing private goods if equivalent to the amount of private goods distributed. This implies that the cost of satisfying 6 for one member of S through the provision of private goods must be lower than that of doing so through the provision of club goods. However, since the marginal cost of attracting support from each additional member of S through the provision of club goods is strictly less than that of the previous member, whereas the marginal cost of attracting support of another member of S through the provision of private goods never changes, at some point the lines must cross, making it cheaper to satisfy 6 for W members of S through the provision of club goods. The larger W, the more likely it is that L will find it economically efficient to distribute club goods. $\qquad \square$

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