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Vincent Anesi

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Karina Terry
Centre for Decision Research and Experimental Economics
School of Economics
University of Nottingham
University Park
Nottingham
NG7 2RD
Tel: +44 (0) 115 95 15620
Fax: +44 (0) 115 95 14159
karina.terry@nottingham.ac.uk

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Secessionism and Minority Protection in an Uncertain World

Vincent Anesi*
University of Nottingham

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Abstract

With the changing economic circumstances confronting their countries, regionally concentrated minorities have been facing a strategic problem, important aspects of which can be stylized as a situation in which a minority leader is uncertain about the costs of secession for her community. This paper shows that this uncertainty is a central cause of secession, using a model which incorporates both policies to appease secessionist aspirations and informational asymmetries. In a situation of asymmetric information, in which the policy-maker is better informed about the consequences of separation than the minority leader, signaling incentives make secession the unique equilibrium outcome, whether mutually advantageous compromises exist or not. We also show that the ruling majority may seek to maintain political unity by pre-committing to minority protection rules which prevent bluffing by the informed policy-maker. Additionally, the model generates comparative statics results on the question of which states are most likely to adopt constitutional rules protecting the minorities living within their borders.

Keywords: Constitutional commitment, secession, signaling, regional redistribution.

JEL Classification Numbers: D74, D82, H77.

*Address: School of Economics, Room B18, The Sir Clive Granger Building, University of Nottingham, University Park, Nottingham NG7 2RD, United Kingdom. Email: vincent.anesi@nottingham.ac.uk. I would like to thank Daniel Seidmann, and participants at various seminars for very helpful discussions.

1 Introduction

It is now well known that the evolution of the international system in terms of economic integration and defense requirements is conducive to secession in multicultural states (e.g., Polèse 1985, Alesina et al. 2000). By reducing the economic and security advantages of integration, changes in the international climate tend to make political independence an increasingly viable alternative for geographically concentrated minorities. In such a context, if disgruntled regional minorities possess the power to withdraw, central governments must preempt secession attempts by adopting compromise policies which satisfy, if only partially, their demands. The outcomes of these attempts to appease secessionist minorities are diverse. There is variation, first, in whether they result in continued integration in the existing state or in secession. If political integration is preserved, there is also variation in the nature of the policy compromises themselves, and some governments seem to do better than others in their efforts to maintain their political predominance without inducing secession (see, e.g., Bartkus 1999, and Pavković and Radan 2007).

What explains the outcomes of secession crises? What determines whether a secession crisis will end in compromise or in separation? And why do some governments, when faced with separatist threats, adopt policies that do little to assuage (and sometimes cultivate) separatist aspirations, whereas others implement institutional arrangements that grant regionally concentrated minorities special forms of political representation and protection (Lustick et al., 2004)? We address these questions by focusing on the strategic incentives created the lack of information that citizens often have about the economic benefits of integration and the consequences of separation. This uncertainty creates an informational asymmetry between governments and secessionist minorities: Governments have access to much better information on the economic benefits of unity than the citizenry at large (Persson et al. 1997, Besley 2006), and would very much like regional minorities to believe that political independence will be prohibitively costly.

A central result of the paper is that uncertainty about the consequences of secession and the signaling process it engenders are major determinants of the decision to secede. Our essential argument is outlined as follows. Consider a country with two economically

interdependent regions, one of which is populated by an ethnic minority with secession potential. In the initial stage, a governing policy-maker representing the majority proposes a policy compromise to the minority. A minority leader must then decide whether this compromise is acceptable, that is, whether she prefers the minority region to accept the new policy rather than secede. The acceptability of a policy depends on the relative economic strengths of the two regions, which determine their respective costs of separation. The policy-maker can ascertain these costs, while the regional leader cannot, but both understand that an economically stronger majority region implies that: (i) the policy-maker is less willing to compromise to avoid separation, and (ii) the minority's net cost of secession increases, as the majority region becomes a more valuable economic partner. The best strategy for the policy-maker is to signal high secession costs for the minority by demanding policy concessions from the minority too exacting to be acceptable if secession costs were in fact lower. This strategy is optimal for the following reason. Policy compromises are relatively more costly to an economically stronger majority region, and the policy-maker is more likely to make demanding proposals when the majority region is strong. Understanding this, the uninformed leader rationally infers higher costs of secession from more demanding policy proposals. Such beliefs lead the policy-maker to go too far, however, and to demand concessions that the minority leader has no intention of making. As a consequence, whether mutually advantageous compromises exist or not, secession is an inevitable outcome when citizens are uncertain about regions' capabilities. Conversely, if citizens are fully informed and mutually advantageous compromises exist, secession never occurs: The minority leader knows her reservation value, and likewise the policy-maker knows how much he must concede to avoid secession.

To prevent secession would require a technology in which the majority could commit not to set too demanding policies up front. Only by committing to this can signaling incentives be curbed. Another result of the paper is that (obdurate) constitutional laws protecting minorities against exploitative policies can prevent secession. Indeed, such constitutional arrangements place a limit on the policy concessions the policy-maker may try to extract. This suggests that majority groups — worried about the danger that their representative

policy-maker might become locked into a signaling process leading to secession — can find minority protection arrangements profitable from an ex ante point of view.[1]

To explore this possibility, we analyze the choice of constitution-maker representing the interests of the majority region, who ex ante must choose minority protection laws. The benefit of this analysis is a set of comparative statics results that provide insights into the questions of which states are most likely to adopt constitutional arrangements for protecting minorities living within their borders, and which minorities are most likely to secede. Unsurprisingly, we find that regardless of the other parameters, minorities more attached to political independence are always more likely to secede. The intuition is that the higher the intrinsic desire for independence, the higher the minority's opportunity cost of integration and then the more costly for the majority are the constitutional arrangements required to preserve unity.

The size of the minority (relative to that of the majority) has an ambiguous effect on minority protection and the risk of secession. The reason is that in choosing initially whether to prevent a secession or not, the constitution-maker will take into account the nature of the minimum arrangements that would dissuade the minority from seceding. For example, suppose these arrangements allow exploitative policies (i.e., the value of independence for the minority is small relative to its economic cost). Then an increase in the relative size of the minority increases the constitution-maker's willingness to protect the minority and reduce the risk of secession, for it raises the benefits from exploiting the minority. In contrast, if the constitutional arrangements really protect the minority, then an increase in the relative size of the minority increases the costs of protection and therefore the risk of secession.

Finally, the effect of citizens' initial beliefs about the relative strengths of the two regions hinges on the relative potency of two opposing effects. First, as the majority region

[1]This is reminiscent of Acemoglu and Robinson (2001). Using a complete-information stochastic game, they show how durable constitutional restrictions on taxation can be used by a poor majority to commit to low taxes in the future, and thus dissuade the rich elite from undertaking a coup against the prevailing democratic regime. In the present paper, however, it is not uncertainty itself that makes constitutional limitations attractive to the majority, but the informational asymmetries it creates.

is believed to be economically stronger, the expected cost of separation for the minority increases, thus reducing the cost of preserving unity for the majority. At the same time, separation is expected to be less damaging to the majority which is consequently less willing to compromise. The net effect depends on the shape of preferences.

The importance of asymmetric information in secessionism has already been recognized by Olofsgård (2004) who shows how signaling phenomena may drive moderate minorities to appoint extreme secessionist leaders. The model presented here is closely related to Olofsgård's, but differs in two important respects. Firstly, the focus is mainly on the dyadic interaction between the policy-maker and the minority leader and, in particular, there is no distinction between the latter and any other member of the minority. Secondly, the costs of separation for the two regions are negatively correlated: Owing to economic interdependence, if a region becomes economically stronger, then separation becomes less damaging to this region but more damaging to the other region which loses a more precious economic partner. Recent empirical work in political science, such as Walter (2006), has also emphasized the role of uncertainty and governments' incentives to misrepresent information in secession crises.[2]

The seminal contribution to the strategic theory of policy choice under the threat of secession is due to Buchanan and Faith (1987). More recent analytical work includes Bolton and Roland (1997), Fearon and van Houten (2002), and Olofsgård (2003, 2004), and Gradstein (2004), among others. With the exception of Olofsgård (2004), those papers analyze models of complete information, in which the consequences of secession are perfectly known to the citizens. More distantly related to this paper is the political economy literature on the size of nations; see Spolaore (2006) and the references therein for an exhaustive account. In particular, Le Breton and Weber (2003), and Haimanko et al. (2005) use the framework of Alesina and Spolaore (1997) — in which groups of individuals can unilaterally withdraw from an existing state and create their own country — to study how interregional transfers can prevent secession. Nevertheless, citizens do not anticipate

[2]The political science literature has also emphasized the role of incomplete information in civil wars (Fearon, 1995). In particular, Dal Bó and Powell (2009) study the effects of uncertainty and signaling on the probability of civil war in a model of "spoils politics."

the risk of secession in their model, for they assume that the political process within any country yields a policy that is the ideal point of the median voter of that country.

Our emphasis on commitment problems under uncertainty is not novel. Influential research demonstrates various ways in which commitment problems cause inefficiencies in models of civil wars and political transitions; see, for example, Fearon (1998, 2004), Powell (1999, 2004), and Acemoglu and Robinson (2000, 2001). This literature shows how uncertainty about the future causes complete-information bargaining to break down in the inefficient use of power (Powell, 1994). In contrast, we are interested situations where the source of the policy-maker's commitment problem is asymmetric information (footnote 1).

The paper is organized as follows. The basic model is presented in Section 2. In Sections 3 and 4 we describe the equilibria, discuss the substantive implications of the results, and provide two brief examples from Norway and Quebec to illustrate our arguments. Finally, Section 5 presents extensions of the model and concludes.

2 The Model

To simplify the notation and facilitate the exposition, a basic model is presented first, and then extensions are considered. We consider a country populated by two territorially concentrated and homogeneous groups of citizens, one of which holds a strict majority. Call the two groups (as well as the regions they live in) 'majority' (M) and 'minority' (m). Let n_M and n_m stand for the population proportions of the majority and the minority, respectively, and let $y_M = y$ and $y_m = 1$ be the per capita incomes of these two groups.

The political power is in the hands of the majority but the minority group, although smaller, can unilaterally secede if not satisfied. Every citizen's preferences depend on her available income, composed of income net of taxes/transfers under unity ($j = u$), and net of the secession cost under separation ($j = s$). The latter cost is the main reason why both the minority and the majority may value continued integration in the existing state. The economic losses associated with secession depend on the realization of a state variable $\theta \in [0, 1]$, whose c.d.f. G has a continuous and strictly positive density g over $[0, 1]$. This random variable may be interpreted as a fluctuation in the economic strength of the

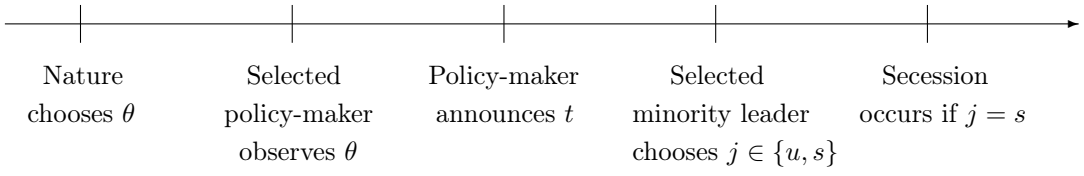

Figure 1: Timing

majority region, and therefore its ability to provide the minority region with economic advantages. The value of θ is known to the government but not to the citizens. Members of the minority also derive utility benefits from political independence, measured by the parameter $\beta \in (0, 1)$.

One citizen from the majority is selected to act as the 'policy-maker.' Since all citizens in the majority are the same, the identity of this representative agent is immaterial and hence the selection process can be ignored. Once in office, she observes the realization of θ and makes a proposal t for the redistribution of income from region M to region m (negative transfers being interpreted as exploitative behavior). This is the policy that takes effect if the minority region does not secede. The minority region responds to the policy-maker's proposal by selecting (at random) a 'minority leader.' The latter then takes a decision j from the set $\{u, s\}$, where $j = u$ denotes continued unity and s separation. A secession occurs if and only if $j = s$. The timing of events is summarized in Figure 1.

The (individual) payoff functions for the minority and the majority are respectively given by

$$v_m(t, j, \theta) \equiv \begin{cases} 1 - \theta + \beta & \text{if } j = s \\ 1 + \frac{t}{\gamma} & \text{if } j = u \ , \end{cases}$$

and

$$v_M(t, j, \theta) \equiv \begin{cases} y - \ell(\theta) & \text{if } j = s \\ y - t & \text{if } j = u \ , \end{cases}$$

where $\gamma \equiv n_m/n_M$, and $\ell \in \mathbf{C}^1[0, 1]$ is a strictly decreasing function with $\ell(1) = 0$ (i.e., the majority always prefers unity). Nothing of qualitative substance hinges on the linearity

of the minority's loss function. We also assume that $\ell(0) < \gamma\beta$. This assumption seems appropriate substantively (it ensures, as we might expect, there is no room for compromise when the minority derives no economic benefit from unity), and it eliminates cases in which the model has no equilibrium.

This framework describes a sequential game of incomplete information with two players: the policy-maker and the minority leader. The equilibrium concept we employ is that of a (pure strategy) perfect Bayesian equilibrium (PBE). As beliefs are unrestricted for off-the-equilibrium-path policy-maker proposals, a wide variety of equilibria exist. In order to eliminate equilibria which rely on implausible beliefs off the equilibrium path, we impose Cho and Kreps' (1987) criterion D1.[3] Roughly, it imposes that if the set of minority leader's responses that make the type-θ policy-maker willing to deviate to some t' is strictly smaller than the set of responses that make the type-θ' policy-maker willing to deviate, then the leader should believe that type θ' is infinitely more likely to deviate to t' than type θ is (Fudenberg and Tirole, 1991). Hereafter, we require any PBE to satisfy criterion D1. And to avoid repeatedly having to include the relevant qualification, we leave it as understood that any reference to an "equilibrium" is to a PBE consistent with criterion D1.[4]

3 Inevitable Secessions

Although the effect of minority uncertainty about the economic consequences of a secession is our primary interest, we start with the case without uncertainty which provides a useful benchmark. If the realization of the state is common knowledge, there is nothing for the policy-maker to bluff about. The choice for the policy-maker is to either propose a policy t that dissuades the minority from seceding, in which case she receives a payoff of $y - t$, or propose a policy that causes a secession and consequently receive $y - \ell(\theta)$. In the former case, the policy-maker optimally offers the minority just enough to make separation

[3] This is a strengthening of the Intuitive Criterion, the latter having no bite in this game. The formal definition of the criterion D1 is relegated to the Appendix.

[4] In order to limit the number of possible cases (without affecting the paper's message), we also assume that an indifferent player will choose to induce unity rather than separation.

unprofitable, i.e., it selects a policy $t = \gamma(\beta - \theta)$. Optimality of the policy-maker's policy choice therefore requires that for all $\theta \in [0, 1]$: (i) if the policy-maker prefers to maintain unity, i.e.,

$$y - \gamma(\beta - \theta) \geq y - \ell(\theta) \ ,$$

then it proposes $t = \gamma(\beta - \theta)$; and (ii) if the inequality is reversed, she proposes some policy $t > \gamma(\beta - \theta)$, thereby causing secession. Putting this discussion together, we have:

Observation 1. *In the absence of informational asymmetry about the realization of the state, secession occurs in state $\theta \in [0, 1]$ if and only if $\gamma(\beta - \theta) > \ell(\theta)$.*

Consider now the game with incomplete information. The realization of θ is known to the policy-maker but not the minority leader. Upon observing the proposal by the policy-maker, however, the leader updates her beliefs, with the distribution function $\widehat{G}(\cdot|t)$ representing updated beliefs conditional on any observed proposal t. Her equilibrium strategy is trivial: the leader chooses to maintain political unity if and only if proposal t generates a higher payoff for the minority than its expected payoff to seceding, i.e.,

$$t \geq \gamma \left(\beta - \int_{[0,1]} \theta d\widehat{G}(\theta|t) \right) \ . \tag{1}$$

In contrast to the complete-information benchmark, the minority leader's decision depends on updated beliefs, $\widehat{G}(\cdot|t)$, so that these beliefs also influence the optimal transfer t that the policy-maker proposes. Policy proposals are now used by the policy-maker as a signaling device. Our next result establishes that this signaling process makes secession an inevitable outcome in equilibrium. To understand the logic behind this result, it is useful to begin with some simple observations about equilibrium policy proposals. A first observation is that there is at most one equilibrium proposal in $T \equiv \{t : t \text{ satisfies } (1)\}$. To see this, note that the policy-maker's payoff to offering such a proposal, say t, is $y - t$ for all $t \in T$. As a consequence, an equilibrium proposal belonging to T (if there is one) must be equal to $t_0 \equiv \inf T$. A second observation is that if the policy-maker proposes t_0 in some state θ, then $\ell(\theta) \geq t_0$. This ensures that the policy-maker would not be better off deviating to proposals outside T.

With these two observations in place, a third observation can be established: If t_0 is proposed in equilibrium, then it must be proposed in several states. Suppose instead that there is a single state, say θ_0, in which the policy-maker offers t_0. Although the realization of the state is unobservable to the minority leader, the policy-maker's equilibrium proposal in state θ_0 reveals this information perfectly: the leader's posteriors $\widehat{G}(\cdot|t_0)$ attach probability one to the state being θ_0. From the previous observations, therefore, $\gamma(\beta - \theta_0) \leq t_0 \leq \ell(\theta_0)$, from which it follows that $\theta_0 > 0$ (recall that $\ell(0) < \gamma\beta$). But this in turn implies that, in any state $\theta < \theta_0$, the policy-maker would be better off to imitate the 'state-θ_0 policy-maker,' thus obtaining a payoff of $y - t_0 \geq y - \ell(\theta_0) > y - \ell(\theta)$; a contradiction. The key point here is that is impossible for higher-state policy-makers to escape mimicry by the lower-state policy-makers.

Our fourth and final observation concerns equilibria in which t_0 is proposed by the policy-maker in several states. It is proved in the appendix (Lemma 2) that such equilibria do not exist. The central idea is that, in the highest state in which t_0 is proposed, say $\hat{\theta}$ the policy-maker can profitably distinguish herself from lower-state policy-makers with a deviation to a lower transfer $t_0 - \varepsilon$. The minority leader believes that the policy-maker is infinitely more likely to deviate to $t_0 - \varepsilon$ in state $\hat{\theta}$ than in any lower state, so that

$$t_0 \geq \gamma\left(\beta - \int_{[0,1]} \theta d\widehat{G}(\theta|t_0)\right) > \gamma\left(\beta - \int_{[0,1]} \theta d\widehat{G}(\theta|t_0 - \varepsilon)\right) . \tag{2}$$

It follows from the above inequalities that, for ε sufficiently small, the minority leader chooses not to secede when offered $t_0 - \varepsilon$, thus inducing the policy-maker to make such an offer in state $\hat{\theta}$.

Together, these four observations establish that a secession is the only possible equilibrium outcome in all states. The remaining issue in completing the proof of the result involves the existence of an equilibrium in which a secession occurs in all states. As shown in the Appendix, there is always a separating equilibrium in which the policy-maker's proposal fully reveals the value of the state and causes the minority to secede. Such an equilibrium can be supported by beliefs giving probability 1 that the state is 0 for out-of-equilibrium proposals. The formal proofs of this, and all other results, are contained in

the appendix.

Proposition 1. *In all equilibria of the game with asymmetric information, secession occurs in every state* $\theta \in [0, 1]$.

Proposition 1 demonstrates the effect of uncertainty about the state on the decision to secede. Uncertainty leads the minority leader to make inferences based on policy proposals. High-state policy-makers do not want to be confused with the low-state policy-makers, which are more likely to make concessions to maintain unity. Thus, they propose extremely low transfers to the minority to clearly distinguish themselves from the low-state policy-makers. If the minority leader accepts such proposals, mimicry is profitable to the low-state policy-makers which then try to pool with the high-state policy-makers. This in turn induces the latter to reduce their offers further, thus causing the minority to secede.

Before we proceed any further, it may be worth drawing out some normative implications of the equilibrium described in Proposition 1. A clear comparison can be made with the (efficient) equilibrium without uncertainty: Uncertainty and signaling lead to inefficient secessions in all states θ such that $\gamma(\beta - \theta) < \ell(\theta)$. In such states, imposing political unity under a policy $t \in (\gamma(\beta - \theta), \ell(\theta))$ would generate a Pareto-improvement.

4 Minority Protection

The key implication of the above analysis is that, absent any limitation on policy choices, the policy-maker faces a commitment problem: signaling incentives drive the policy-maker to try to extract too many policy concessions from the minority, thus triggering unwanted secessions. In view of the full-information equilibrium outcome, this suggests potential benefits from minority protection (or minimum transfer) legislation. In this section, we show that the majority group itself may have an incentive to encourage such legislation.[5]

Concrete examples may be useful at this point.[6] Norway's secession from Sweden

[5] In this paper, we ignore the fundamental problem of why constitutional rules can constitute obdurate commitment devices. We refer the reader to Ferejohn and Sager (2003) for an in-depth discussion of these issues.

[6] The two examples mentioned here are drawn from Bartkus (1999).

(1905) emerged from conflicting conceptions about the respective rights and duties of the two partners within the union and, arguably, was heavily influenced by Sweden's inability to credibly commit to equal privileges in diplomatic representation. After a decade of fruitless negotiations, a compromise was almost reached when Norwegian and Swedish leaders signed a general agreement in 1903. But the Swedish government reneged on its commitments in 1904, thus prompting new Norwegian protests which eventually lead to Norway's secession in 1905. This historical example fits the claim made by Proposition 1 that, in the absence of obdurate constitutional rules protecting the minority's rights, strategic incentives drive the policy-maker to implement policies which cause secession (even if this means reneging on previous agreements). Although the Norwegian example seems to support such a claim, the question remains of whether the ruling majority can find it optimal to adopt binding constitutional rules protecting the secessionist minority and preserve unity.

The example of Quebec suggests the answer to this question is positive. In the 1960s and 1970s, the Canadian government was confronted with escalating secessionist threats emanating from Quebec, whose citizens resented linguistic and political discrimination as well as social inequalities. Nevertheless, important constitutional and institutional reforms accommodating Quebecers' aspirations for greater political and cultural autonomy have served to preserve the unity of the country.

To establish these claims formally, consider first the possibility that the minority group's interests are protected by exogenous constitutional arrangements, which impose a lower bound T on the level of the transfers the policy-maker can set. To see the role of lower bound T from an intuitive viewpoint, let us return to our fourth observation in Section 3. If $t_0 = T$, then the deviation to $t_0 - \varepsilon$, although still profitable, is no longer feasible. The equilibrium can then be supported by 'pessimistic beliefs' off the equilibrium path — i.e., any deviation $t > t_0$ by the policy-maker is followed by the belief that $\theta = 0$ with probability 1. This broad intuition is confirmed and developed in:

Proposition 2. *Let T be an exogenous lower bound on the policy-maker's transfer, and*

let

$$\overline{T}(\gamma, \beta, G) \equiv \gamma \left(\beta - \int_{[0,1]} \theta dG(\theta) \right) \ . \tag{3}$$

(i) If $T \geq \overline{T}(\gamma, \beta, G)$*, then there exists a unique equilibrium in which policy* $t = T$ *is proposed and enacted in all states* $\theta \in [0, 1]$*;*

(ii) if $T < \overline{T}(\gamma, \beta, G)$*, then there is a unique equilibrium outcome: Secession occurs in all states* $\theta \in [0, 1]$*.*

Thus, the country remains united if and only if the lower bound on the policy-maker's policy is sufficiently large. The condition that "$T \geq \overline{T}(\gamma, \beta, G)$" has a straightforward interpretation: it means simply that the transfer to the minority is at least as much as the latter expects to get from seceding (as in condition (1)).

Combined with Proposition 1, Proposition 2 suggests that the majority might, before the policy-maker observes the state and proposes a policy, advocate a constitutional rule that constrains the latter to set transfers above a certain level T. To explore this issue, we now modify the previous model by adding a constitution-maker who has the power to set T before the realization of the state. She is assumed to be a member of the majority.

The choice for the constitution-maker is to either select an arbitrary lower bound $T < \overline{T}(\gamma, \beta, G)$, which induces secession, or select $T = \overline{T}(\gamma, \beta, G)$ and thus maintain unity. Choosing any $T > \overline{T}(\gamma, \beta, G)$ is dominated by simply choosing $\overline{T}(\gamma, \beta, G)$. Therefore, she will optimally choose $T = \overline{T}(\gamma, \beta, G)$ if and only if

$$y - \overline{T}(\gamma, \beta, G) \geq y - \int_{[0,1]} \ell(\theta) dG(\theta) \ .$$

We record this as:

Proposition 3. *The constitution-maker optimally selects* $T = \overline{T}(\gamma, \beta, G)$ *if*

$$\gamma\beta \leq \int_{[0,1]} \left[\ell(\theta) + \gamma\theta \right] dG(\theta) \ , \tag{4}$$

and some arbitrary $T < \overline{T}(\gamma, \beta, G)$ *otherwise.*

Simple comparative statics analysis of the equilibrium yields insights into how the parameters affect the relative desirability of preventing or inducing secession. It is clear

from the discussion above that the desirability of maintaining unity decreases as $\overline{T}(\cdot)$, the minimum transfer needed to dissuade the minority from seceding, increases. Equation (3) shows that increasing β, the strength of the desire for independence, increases this transfer, thereby making political unity less valuable to the constitution-maker. A brief inspection of (3) also reveals that the transfer $\overline{T}(\cdot)$ is a monotonic function of γ, the relative size of the minority: an increasing function if the intrinsic benefit from independence β is greater than the expected economic loss — in which case, each member of the majority gives $\overline{T}(\cdot) > 0$ to the minority — and a decreasing function if the benefit from independence is smaller than the expected loss — in which case, each member of the majority receives $-\overline{T}(\cdot) > 0$ from the minority. An increase in γ, therefore, decreases [resp. increases] the attractiveness of maintaining unity in the former [resp. latter] case.

Equation (4) shows that two opposing effects shape the impact of citizens' prior beliefs about secession costs, G, on the attractiveness to the constitution-maker of setting $T = \overline{T}(\gamma, \beta, G)$. A first-order stochastic increase in the prior distribution of θ — i.e., higher realizations of the state are more likely — reduces $\overline{T}(\gamma, \beta, G)$ and leads the constitution-maker to seek political unity, but at the same time it also reduces the majority's expected loss from a secession and then dampens the willingness of the constitution-maker to maintain unity. The net impact of these two opposing effects depends on the shape of the loss function. For instance, the former effect dominates if the majority's secession loss is not too sensitive to variations in the state: $|\ell'| < \gamma$.

5 Extensions and Concluding Remarks

We have deliberately chosen the simplest model setting in which to describe an incomplete-information theory of secession crises, one that captures in a very simple way the crucial role of uncertainty about the consequences of secession. There doubtless are other factors at work in secession crises. The simplicity of the model notwithstanding, the overall picture that emerges is suggestive. It is one in which: (i) informational asymmetries between policy-makers and minority leaders and the signaling process they engender are conducive to secession; (ii) obdurate constitutional arrangements protecting the minority are nec-

essary to prevent secession when such signaling incentives exist; (iii) minority protection may emerge from the will of the majority group itself; and (iv) the occurrence and level of minority protection depend on the interaction between the minority's intrinsic desire for independence, the relative size of the minority, and citizens' beliefs about the potential costs of separation.

We conclude by briefly discussing three possible extensions of the model which assess the robustness of the results above and provide further insights.

Informed minority leader. We assumed that the minority leader cannot observe anything other than the policy-maker's proposal. Suppose now that when the state θ is realized, the minority leader receives a signal equal to $\theta + \epsilon$, where ϵ is a random noise distributed around a mean of zero with a variance σ_ϵ^2. It is readily checked that, as long as uncertainty is present (i.e., for any $\sigma_\epsilon^2 > 0$), all of our conclusions continue to hold. The reason for this is that it is the presence of uncertainty itself, and not its magnitude, which is the key in creating the policy-maker's signaling incentives: Whenever $\sigma_\epsilon^2 > 0$, the leader is unsure of the the precise value of θ and consequently tries to infer the policy-maker's information from her policy choices.

Regional party formation. Fearon and van Houten (2002) also study a model in which a regional unit can decide to withdraw if not satisfied with the transfers offered by the policy-maker. However, they assume that the region can only use the secession threat if its inhabitants have 'appointed' (through majority voting) a regional party in a preliminary stage.[7] Suppose we modify our model by adding a prior stage in which the minority group decides whether or not to appoint a leader. Then the minority will always choose to appoint a leader in order to avoid the exploitative policies of an unconstrained policy-maker. Even when they anticipate that secession will not occur (i.e., when condition (4) holds), the members of the minority will appoint a secessionist leader so as to induce the constitution-maker to impose minority protection rules. Commenting on the separatist Parti Quebecois's succes in Quebec general election on November 30, 1998, Gilles Paquet

[7] In his study of secessionist parties in democratic countries, Sorens (2004) finds that central governments have offered autonomy more often to regions with secessionist parties than to regions without such parties.

said: "what you saw today is the rational vote by a group that feels it can do better in the Canadian federation by electing a separatist government."[8]

Repression and international hostility. In our model, the minority can unilaterally withdraw when dissatisfied with the policy-maker's choices. Although it is not always the case (e.g., Norway, Macedonia, Slovakia),[9] state resistance has been a common feature of secession attempts, often devolving into armed conflict and large-scale violence (e.g., South Sudan, Bangladesh, Chechnya, Kosovo).[10] Another obstacle to secession is the hostility of the international community toward secession — e.g. the Katangan crisis in Congo (1960-1961) and the Biafran crisis in Nigeria (1966-1970). How would such obstacles affect the risk of secession? A thorough answer to this question cannot be offered in a paper of this length, for conflicts themselves are immensely complex phenomena. But one can reasonably speculate that, in our model, adding an extra stage with state and/or international opposition to group m's secession attempts would essentially boil down to modifying secession costs in the initial signaling game. The new loss functions (induced from the extra stage), say $\tilde{\ell}_M(\theta)$ and $\tilde{\ell}_m(\theta)$, would basically have the same properties as the current loss functions and would not qualitatively change our results.

Appendix

Preliminaries: D1 Signaling Equilibria

Following Ramey (1996), we define a PBE of the baseline model described in Section 2 as a triple $\left(\sigma_M, \sigma_m, \widehat{G}\right)$ such that:

(i) $\sigma_M : [0,1] \to \mathbb{R}$ is the policy-maker's strategy. This function is a best response in that for each type θ, the policy-maker's proposal $\sigma_M(\theta)$ is optimal given the minority leader's strategy σ_m.

[8] *New York Times,* December 1, 1998. Gilles Paquet is Professor at the University of Ottawa and regular commentator on national affairs in the Canadian media.

[9] See Young (1994) for a comparative survey of peaceful secessions.

[10] See Collier and Hoeffler (2006) for a quantitative analysis.

(ii) The distribution function $\widehat{G}(\cdot|t)$ gives the minority leader's posterior beliefs conditional on any observed policy-maker proposals t. If $t \in \sigma_M([0,1])$ satisfies

$$\int_{\{\theta:\sigma_M(\theta)=t\}} dG(\theta) > 0 \ ,$$

then $\widehat{G}(\theta|t)$ is computed from the priors by Bayesian updating. If $t \in \sigma_M([0,1])$ but the above inequality is not satisfied, then the support of $\widehat{G}(\cdot|t)$ must be equal to the closure of $\{\theta : \sigma_M(\theta) = t\}$.

(iii) The minority leader's strategy σ_m gives the probability $\sigma_m(t)$ that the leader chooses unity after observing policy proposal t. Given the leader's posterior beliefs, σ_m is required to maximize the latter's expected utility.

In order to rule out PBEs supported by "unreasonable" beliefs off the equilibrium path, we concentrate on pure strategy equilibria that satisfy Cho' and Kreps' (1987) criterion D1 (see Fudenberg and Tirole, 1991, and Ramey, 1996). Fix an equilibrium, and let $v_M^*(\theta)$ be the payoff of the type-θ policy-maker in this equilibrium. Define $D(\theta, t)$ to be the set of mixed-strategy best responses to t that make type θ strictly prefer t to her equilibrium strategy, and $D^0(\theta, t)$ to be the set of mixed best responses that make type θ exactly indifferent. A policy-maker type $\theta \in [0,1]$ is deleted — i.e., the minority leader places zero posterior weight on type θ — for proposal t under criterion D1 if there is a $\theta' \in [0,1]$ such that $\left[D(\theta,t) \cup D^0(\theta,t)\right] \subset D(\theta', t)$.

Proof of Proposition 1

To prove that an equilibrium exists, consider a strategy profile $(\hat{\sigma}_M, \hat{\sigma}_m)$ satisfying the following conditions: (a) for all $\theta \in [0,1]$, $\hat{\sigma}_M(\theta) = \gamma(\beta - \theta) - \delta$ for some $\delta > 0$; (b) $\hat{\sigma}_m = 0$. In words: (a) In each state, the policy-maker proposes a transfer that reveals its type and that is lower than the payoff the minority get from seceding; and (b) the minority leader opts for a secesion whatever the transfer chosen by the policy-maker.

It is readily checked that the assessment $\left(\hat{\sigma}_M, \hat{\sigma}_m, \widehat{G}\right)$ is a PBE if the distribution function $\widehat{G}(\cdot|t)$ attaches probability one to type θ such that $\hat{\sigma}_M(\theta) = t$, and attaches probability one to type 0 for all $t \notin \hat{\sigma}_M([0,1])$. What remains to be proved, therefore, is

that this PBE satisfies D1.

Take an arbitrary type $\theta \in [0,1]$. Let $t' \notin \hat{\sigma}_M([0,1])$, and let α_m be a best response to t' that makes the type-θ policy-maker weakly prefer t' to its equilibrium announcement; that is

$$\alpha_m\left(y - t'\right) + (1 - \alpha_m)\left[y - \ell(\theta)\right] \geq y - \ell(\theta)$$

or, equivalently, $\alpha_m\left[\ell(\theta) - t'\right] \geq 0$. This implies that $\left[D\left(0,t'\right) \cup D^0\left(0,t'\right)\right] \supseteq D(\theta,t')$ for all $\theta > 0$: If $t' > \ell(0) = \max\{\ell(\theta) : \theta \in [0,1]\}$, then $D\left(\theta,t'\right) = \emptyset$ for all $\theta \in [0,1]$; if $t' \leq \ell(0)$, then $D\left(0,t'\right) \cup D^0\left(0,t'\right) = [0,1]$. This proves that $\widehat{G}$ is consistent with D1, thus establishing that $\left(\hat{\sigma}_M, \hat{\sigma}_m, \widehat{G}\right)$ is an equilibrium.

The rest of the proof consists of showing that, in any equilibrium, a secession occurs in every state.

Lemma 1. *Let $\left(\sigma_M, \sigma_m, \widehat{G}\right)$ be an equilibrium. A secession occurs in every state $\theta \in [0,1]$ such that $\sigma_M(\theta) \neq \sigma_M(\theta')$ for all $\theta' \neq \theta$.*

Proof: Suppose that, contrary to statement of the lemma, there exist an equilibrium $\left(\sigma_M, \sigma_m, \widehat{G}\right)$ and a state $\theta_0 \in [0,1]$ such that: $t_0 \equiv \sigma_M\left(\theta_0\right) \neq \sigma_M(\theta')$ for all $\theta' \neq \theta_0$, and $\sigma_m\left(t_0\right) = 1$. Note first that there cannot be another transfer t in $\sigma_M\left([0,1]\right)$ such that $\sigma_m(t) = 1$. To see this, suppose another policy-maker type, θ_1, announces a transfer $t_1 \neq t_0$ such that $\sigma_m\left(t_1\right) = 1$. If $t_0 < t_1$, type θ_1 should then deviate to $t_0 < t_1 \leq \ell\left(\theta_1\right)$. Similarly, If $t_0 > t_1$, type θ_0 should then deviate to $t_1 < t_0 \leq \ell\left(\theta_0\right)$. This is a contradiction with $\left(\sigma_M, \sigma_m, \widehat{G}\right)$ being an equilibrium.

Thus, t_0 is the only transfer in $\sigma_M\left([0,1]\right)$ that does not cause a secession. Therefore, $\theta_0 = 0$ and $t_0 = \ell\left(0\right)$; otherwise, by continuity of ℓ, there would be a nonempty neighborhood of θ_0, $\Theta_0 \equiv \{\theta \in [0,1] : \ell(\theta) > t_0\}$, the members of which could profitably deviate to t_0. Since $\gamma\beta > \ell(0)$, this is impossible.

□

Lemma 2. *Let $\left(\sigma_M, \sigma_m, \widehat{G}\right)$ be an equilibrium. A secession occurs in every state $\theta \in [0,1]$ such that $\sigma_M(\theta) = \sigma_M(\theta')$ for some $\theta' \neq \theta$.*

Proof: Suppose that, contrary to the statement of the lemma, there exist an equilibrium $\left(\sigma_M, \sigma_m, \widehat{G}\right)$ and a state $\theta_0 \in [0,1]$ such that: $t_0 \equiv \sigma_M(\theta_0) = \sigma_M(\theta')$ for some $\theta' \neq \theta_0$, and $\sigma_m(t_0) = 1$. Let $\Theta_0 \equiv \{\theta \in [0,1] : \sigma_M(\theta) = t_0\}$, and let $\hat{\theta}$ be the supremum of Θ_0. By the same reasoning as in the proof of Lemma 1 (first paragraph), t_0 must be the only transfer that is not followed by a secession.

We now make two useful claims:

Claim 1: $\Theta_0 = \left[0, \hat{\theta}\right]$.

Proof: Suppose that, contrary to the statement of the claim, there exists a type $\theta < \hat{\theta}$ such that $\sigma_M(\theta) \neq t_0$. By definition of a PBE, $t_0 \leq \ell(\hat{\theta}) < \ell(\theta)$. Therefore, the type-$\theta$ policy-maker could profitably deviate by announcing t_0; a contradiction. This proves that $\Theta_0 \supseteq [0, \hat{\theta})$. Now, suppose that $\hat{\theta} \notin \Theta_0$. By definition of a PBE, this implies that $y - \ell(\hat{\theta}) \geq y - t_0$ or, equivalently, $\ell(\hat{\theta}) \leq t_0$. By continuity of ℓ, however, this in turn implies that $\ell(\hat{\theta}) = t_0$ (otherwise $\ell(\hat{\theta} - \varepsilon) < t_0$ for ε sufficiently small). This contradicts our assumption that an indifferent player always favors unity.

$\Diamond$

Claim 2: For every $t \in \left(\gamma(\beta - \hat{\theta}), t_0\right)$ *and every* $\theta < \hat{\theta}$, $\left[D(\theta, t) \cup D^0(\theta, t)\right] \subset D(\hat{\theta}, t)$.

Take an arbitrary $\theta \in \Theta_0 \setminus \{\hat{\theta}\}$. Suppose that the type-$\theta$ policy-maker weakly prefers t to t_0 for some best response α_m to t; that is:

$$\alpha_m(y - t) + (1 - \alpha_m)[y - \ell(\theta)] \geq y - t_0$$

or, equivalently,

$$\alpha_m \geq \frac{\ell(\theta) - t_0}{\ell(\theta) - t} \in (0,1) \ . \tag{5}$$

Since $t < t_0$, the function $\bar{\alpha}_m(x) \equiv (x - t_0)/(x - t)$ is strictly increasing. Combined with $\ell(\hat{\theta}) < \ell(\theta)$, (5) implies

$$\alpha_m > \frac{\ell(\hat{\theta}) - t_0}{\ell(\hat{\theta}) - t} \in (0,1) \ .$$

This proves that $\left[D(\theta, t) \cup D^0(\theta, t)\right] \subseteq D(\hat{\theta}, t)$.

To see that the inclusion is strict, note that any $\alpha_m \in [0,1]$ can be a best response for some appropriately chosen system of beliefs. Therefore any $\alpha_m \in \left(\bar{\alpha}_m\left(\ell(\hat{\theta})\right), \bar{\alpha}_m\left(\ell\left(\theta\right)\right)\right)$ is an element of $D(\hat{\theta},t) \setminus \left[D\left(\theta,t\right) \cup D^0\left(\theta,t\right)\right]$. This establishes the claim.

$\Diamond$

We now return to the proof of the main result. Consider a deviation by type $\hat{\theta}$ to some transfer t belonging to the open interval $\left(\gamma(\beta-\hat{\theta}), t_0\right)$ — which, by Claim 1, is nonempty. By Claim 2, the minority's equilibrium beliefs must attribute probability 1 to the policy-maker's type belonging to $\left[\hat{\theta}, 1\right]$ (criterion D1). Therefore, $\sigma_m(t) = 1$. Type $\hat{\theta}$'s deviation to $t < \ell(\hat{\theta})$ is consequently profitable; a contradiction. This completes the proof of lemma 2.

$\square$

Combining Lemmas 1 and 2, we obtain Proposition 1.

Proof of Proposition 2

We begin with a useful lemma.

Lemma 3. *The following statements are true for any exogenous lower bound T on the policy-maker's transfer:*

(i) In any equilibrium, a secession occurs in either all or none of the states in $[0,1]$.

(ii) There exists an equilibrium in which the country remains united if and only if $T \geq \overline{T}(\gamma,\beta,G)$. In such an equilibrium, policy $t = T$ is proposed and enacted in all states $\theta \in [0,1]$.

Proof: Consider an equilibrium $\left(\sigma_M, \sigma_m, \widehat{G}\right)$ in which the country remains united in some state θ_0: $\sigma_m\left(t_0\right) = 1$ where $t_0 \equiv \sigma_M\left(\theta_0\right)$. Then t_0 must be the unique policy proposal in the range of σ_M that is not followed by a secession in equilibrium (see proof of Lemma 1).

Our next step is to prove that $t_0 = T$. Let Θ_0 be the set of types that propose t_0 in equilibrium, and let $\hat{\theta}$ be the highest type in Θ_0. Suppose that $t_0 > T$, and consider

a deviation to T by types $\theta < \hat{\theta}$. By the same argument as in the proof of Lemma 2, members of Θ_0 (except $\hat{\theta}$) must be deleted according to criterion D1. Consider then types $\theta < \hat{\theta}$ which are outside Θ_0. If, given some best response α_m, they weakly prefer proposal T to their equilibrium payoff, then they weakly prefer T to t_0, i.e.:

$$\alpha_m(y - T) + (1 - \alpha_m)\left[y - \ell(\theta)\right] \geq y - t_0 \ .$$

Since $\ell(\hat{\theta}) < \ell(\theta)$, this implies that type $\hat{\theta}$ must strictly prefer proposing T to its equilibrium payoff (which is $y - t_0$). This in turn implies that, upon observing T, the minority leader should attach zero probability to types $\theta < \hat{\theta}$. As a consequence, type $\hat{\theta}$ can profitably deviate to T; a contradiction.

An immediate consequence of $t_0 = T$ is that $\{\theta \in [0,1] : \ell(\theta) > T\} \subseteq \Theta_0$ — otherwise, any type θ with $\ell(\theta) > T$ could profitably deviate by proposing T instead of $\sigma_M(\theta)$. Consider now types in $[0,1] \setminus \Theta_0$. When the minority leader observes some proposal $t > T$ in equilibrium, she infers that the policy-maker's type is greater than $\hat{\theta}$. Since $1 + t > 1 + T \geq \gamma(\beta - \hat{\theta}) > \gamma\left(\beta - \theta\right)$ for all $\theta \notin \Theta_0$, she must optimally choose u; a contradiction.

We have thus established that if the country remains united in some state, then it remains united (and policy $t = T$ prevails) in all states. Evidently, $T \geq \overline{T}(\gamma, \beta, G)$ is a necessary condition for $\sigma_m\left(T\right) = 1$ to be a best response to σ_M. This establishes the necessity conditions stated in Proposition 2.

To see that $T \geq \overline{T}(\gamma, \beta, G)$ is also a sufficient condition for such an equilibrium to exist, consider the following beliefs (off the equilibrium path): for all $t > T$, $\widehat{G}(\theta|t) = 0$ for all $\theta < 1$. That is, the minority leader attaches probability one to type $\theta = 1$ whenever she observes a proposal greater than T. It is easily seen that, when $T \geq \overline{T}(\gamma, \beta, G)$, such beliefs support (σ_M, σ_m) as a PBE strategy profile. We must now check that $\widehat{G}$ is consistent with D1, i.e., that type 1 cannot be deleted. Take an arbitrary deviation $t > T$. As $D(\theta, t) = \emptyset$ whenever $\ell(\theta) \geq T$, we can restrict attention to types in $\widetilde{\Theta} \equiv \{\theta \in [0,1] : \ell(\theta) < T\}$. Suppose that type $\theta \in \widetilde{\Theta}$ weakly prefers t to T for some best response α_m to t; that is:

$$\alpha_m(y - t) + (1 - \alpha_m)\left[y - \ell(\theta)\right] \geq y - T \ .$$

Since $\ell' < 0$, this implies that type 1 strictly prefers t to T:

$$\alpha_m(y-t) + (1-\alpha_m)\left[y - \ell(1)\right] > y - T \ .$$

This proves that $\widehat{G}$ is consistent with criterion D1, thus ending the proof of the lemma.

□

Suppose first that $T \geq \overline{T}(\gamma, \beta, G)$. By Lemma 3(ii), there is a unique equilibrium in which the minority group never secedes. To prove part (i) in Proposition 2, we must then show that there is no equilibrium in which a secession may not occur. Suppose by contradiction that such an equilibrium, say $\left(\sigma_M, \sigma_m, \widehat{G}\right)$, exists. Lemma 3(i) then ensures that a secession occurs in all states. By definition of a PBE, therefore,

$$T \leq t < \gamma\left(\beta - \int_{\{\theta:\sigma_M(\theta)=t\}} \theta d\widehat{G}(\theta|t)\right)$$

for all $t \in \sigma_M\left([0,1]\right)$. But this is a contradiction with $T \geq \overline{T}(\gamma, \beta, G)$.

Suppose now that $T < \overline{T}(\gamma, \beta, G)$. Lemma 3(ii) tells us that there can only be equilibria in which a secession occurs in all states. It is readily checked that a situation in which policy $t = T$ is proposed and followed by a secession in all states can be supported as an equilibrium by beliefs giving probability 1 that the state is 0 for out-of-equilibrium proposals.

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