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Joan Esteban, Sabine Flamand, Massimo Morelli and Dominic Rohner

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Centre for Economic Policy Research
33 Great Sutton Street, London EC1V 0DX, UK
Tel: +44 (0)20 7183 8801
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Abstract

This paper proposes an integrated dynamic theory of bargaining and conflict between ethnic groups, delivering novel predictions on secessionist versus centrist conflict. Ethnic identities, inequality and intertemporal preferences are predicted to impact the risk of secessionist conflict and the risk of centrist conflict in different directions. Beside obtaining a full characterization of equilibrium for every set of conditions, we also show empirical evidence that cultural similarity reduces the scope for secessionist conflict (compared to centrist conflict); that small ethnic groups stick more often to peaceful union; that higher patience and higher group inequality fuels secessionism.

JEL Classification: C7, D74

Keywords: Secessions, conflict, Surplus Sharing, Patience

Joan Esteban - joan.esteban@gmail.com
Institut d'Analisi Economica, CSIC and BGSE;

Sabine Flamand - sabine.flamand@urv.cat
Universitat Rovira i Virgili and CREIP

Massimo Morelli - massimo.morelli@unibocconi.it
Bocconi University and CEPR

Dominic Rohner - dominic.rohner@unil.ch
University of Lausanne and CEPR

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A Dynamic Theory of Secessionist vs Centrist Conflict*

Joan Esteban† Sabine Flamand‡
Massimo Morelli § Dominic Rohner¶

April 13, 2020

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This paper proposes an integrated dynamic theory of bargaining and conflict between ethnic groups, delivering novel predictions on secessionist versus centrist conflict. Ethnic identities, inequality and intertemporal preferences are predicted to impact the risk of secessionist conflict and the risk of centrist conflict in different directions. Beside obtaining a full characterization of equilibrium for every set of conditions, we also show empirical evidence that cultural similarity reduces the scope for secessionist conflict (compared to centrist conflict); that small ethnic groups stick more often to peaceful union; that higher patience and higher group inequality fuels secessionism.

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†Institut d'Anàlisi Econòmica, CSIC and BGSE; joan.esteban@gmail.com
‡Universitat Rovira i Virgili and CREIP; sabine.flamand@urv.cat
§Bocconi University, IGIER and CEPR; massimo.morelli@unibocconi.it
¶University of Lausanne and CEPR; dominic.rohner@unil.ch

1 Introduction

The literature on the size of nations has mostly focused on efficiency considerations, assessing under what conditions secessions would be efficient or, on the opposite side of the same medal, when would integration make sense. However, in reality we see a lot of conflicts involving secessionist movements, so that even cases where eventually secession is obtained experienced a series of inefficient destructions of surplus. What explains conflicts followed by secessions? What characterizes such outcomes as equilibrium phenomena in spite of their dynamic inefficiency? Are there clear distinctions between situations leading to centrist conflicts (i.e., conflict path where no one secedes) vs secessionist conflicts? This paper sheds light on these questions, providing in particular some important differential conditions in terms of ethnic identity, group size, group level productivity, discounting of future and costs of conflict vs economies of scale.

Historically, the collapses of the Soviet empire and Yugoslavia were accompanied by a series of bloody conflicts, with disagreements over whether to split or stay together. In both cases the sizes of the composing regions varied greatly, and while the richest and most productive regions were eager to secede (i.e., Russia, the Baltic states, resp. Slovenia and Croatia) other regions opposed secession.

We consider a country with two groups that can differ in size, economic productivity, and in ideological or ethnic identity preferences. Setting up or maintaining a State carries a cost. As long as a non-homogeneous State remains united (which we call the "union" case), the group in power determines how the surplus is shared. The group with no or less power can be appeased through credible surplus distribution (transferable utility component) but there often exist identity or ideological characteristics that may not be transferable or divisible. For example, if a group out of power endorses communism (ideology) or desires the imposition of religious norms or corresponding legal restrictions like Sharia (identity preferences), the group in power has a hard time accommodating such preferences, which leads to forms of indivisibility that could trigger conflict. While the literature on the size of nations has focused on the tradeoff between the economies of scale of larger states (as the fixed administrative costs are shouldered by a larger population) and the cost of preference heterogeneity (the opposition group cannot select its favored religion based norms), we consider this tradeoff in a model of bargaining with identity preferences and we can therefore offer a characterization of the types of inefficient equilibrium paths that can emerge, where neither peaceful union nor peaceful secession, the two potentially optimal outcomes, are initially chosen. In particular, we are able to distinguish the two cases of inefficient conflict, one where the groups keep fighting for power or control in the country and the one where one group simply wants to secede but the other doesn't want to let go.

We assume that the group in power can make a proposal (union or secession), which the group in opposition can either accept –in which case the proposal is implemented– or reject –inducing costly conflict. If there is a conflict, the game continues with the winning group acquiring full control of power, choosing between seceding or taking the surplus and becoming the new ruling group in the union. In the latter case, another period of the game starts, identical to the previous one, with the new (or reconfirmed) group in power having to make a new surplus sharing offer for that period. It is an infinite horizon game, with secession being an absorbing state (after secession no more strategic decisions are made).[1]

In our complete information sequential game there is a unique Subgame Perfect Equilibrium outcome for every set of parameters. Depending on the parameters, the equilibrium can be: union, peaceful secession, conflict followed by secession, or centrist conflict. When no importance is ascribed to the future (equivalent to a static game) and the ideological differences are small, the equilibrium is union or peaceful secession for all pairs of population and relative productivity, with union always prevailing for a sufficiently small size of the opposition group. When the ideological differences increase, the set of parameter values yielding an equilibrium with peaceful secession becomes larger and that of peaceful union becomes smaller, consistent with intuition and the simple comparison of efficient outcomes. However, with ideological or identity preferences a zone emerges where a relatively numerous opposition triggers conflict. Importantly, in the static setting conflict is never followed by secession, whereas we will show that conflict followed by an eventual secession can be an equilibrium path when dynamic considerations are added. The main reason for the greater scope for secession as the time discount factor increases, is that secession is an end state. With a high time discount factor the short-run costs of secession weigh less than the stream of future payoffs from independence. High inequality and high intensity of ideological preferences also increase the risk of secessionist conflict, whereas under some conditions they decrease the risk of centrist conflict.

The focal point of many papers is whether there are inter-group [inter-regional] transfers that would deter a group from secession and independence. The various contributions differ in the specification of the preference heterogeneity within and across groups and in the nature of the benefits of country size. Our paper has a different point of departure: remaining united implies that the public decisions will have to be negotiated every period by groups with different preferences and priorities, while secession entails a cost today but no need to bargain with the other group ever again. This inter-temporal argument, in our view, is an essential factor in the reasoning for or against secession and it generates a radically different

[1]Of course, in reality the subgame starting after a secession is not necessarily peaceful (see Tir, 2005), but in case the expected continuation subgame after secession were to be conflicted, this could in our model simply correspond to a higher secession cost in reduced form.

equilibrium characterization from the static game. Conflict of any kind can occur on the equilibrium path because the different ideological preferences create a sort of indivisibility problem.[2] In our dynamic model we show that the two types of conflict are however impacted differently by such identity preferences.

In order to bring to the data our novel predictions of the differential role of patience, identity preferences and inequality on the two types of conflict, we draw on fine-grained panel data at the ethnic group and year level, with a unit of observation being one of 892 ethnic groups in a given year between 1946 and 2017. First, building a new measure of linguistic similarity between the government and opposition groups, we are able to test the model's prediction that preference similarity deters secessionist conflict with respect to centrist conflict, finding indeed strong empirical support. Second, we confront to the data the model's result that small groups are more likely to stick to peaceful union, finding support for this prediction. Third, we also provide evidence in line with our setting's implication that higher levels of patience are associated to more frequent secessionist conflict. For further implications of the model for which already detailed evidence exists, we review in some detail the existing literature. This is the case for the prediction of our framework that inequality in relative economic productivity favors secessionist conflict. Finally, we will formulate a series of policy recommendations suggested by our model's predictions.

The remainder of the paper is organized as follows: Section 2 reviews the literature. Section 3 sets up the model. Section 4 characterizes the equilibrium outcomes. Section 5 contains our empirical analysis. Section 6 concludes.

2 Related literature

Excellent reviews of the literature on secessionism are provided in Bolton et al. (1996), Alesina and Spolaore (2003), and Spolaore (2014). One key point made by this strand of economic literature is that the size of countries results from the trade-off between economies of scale and the costs of differences in the preferences over public goods and government policies.[3] The literature distinguishes various potential determinants of the incentive for secession: region size (Goyal and Staal, 2004), international openness (Alesina, Spolaore and Wacziarg, 2000, 2005; Gancia, Ponzetto and Ventura, 2017); democratization (Alesina and Spolaore, 1997; Arzaghi and Henderson, 2005; Panizza, 1999); the optimal level of public spending (Le Breton and Weber, 2003; Le Breton et al., 2011); the presence of mobile

[2] If the group in power imposes a religion or culturally driven rules that are disliked by the opposition group, and that would indeed be changed in case of victory of the opposition, bargaining cannot fully eliminate the risk of conflict, even if there is complete information. See e.g., Fearon (1995).

[3] See e.g., Friedman (1977), Buchanan and Faith (1987), Barro (1991) and Desmet et al. (2011).

ethnic groups (Olofsgard, 2003); the presence of natural resources in potentially secessionist regions (Gehring and Schneider, 2017; Hunziker and Cederman, 2017); or external threats (Alesina and Spolaore, 2005, 2006; Wittman, 2000). Bolton and Roland (1996, 1997) focus on differing preferences for income tax policies owing to inter-regional differences in income distribution.

The literature on secessionism has also studied whether there exist mechanisms of inter-regional compensation such that potentially seceding regions are better off staying in the union. Haimanko et al. (2005) show that in an efficient union whose citizens' preferences are strongly polarized, the threat of secession cannot be eliminated without interregional transfers. Le Breton and Weber (2003) establish the principle of partial equalization: the gap between advantaged and disadvantaged regions must be narrowed, but should not be completely eliminated.[4] Alesina and Spolaore (2003) point out the problems for compensation transfers, such as feasibility issues and administrative costs, political credibility, or incompatibility with other social goals.[5] The recent paper by Gibilisco (2017) analyzes the potential effects of decentralization in a repeated game in which the periphery, when it is not repressed by the center, may initiate a secessionist mobilization whose probability of success depends on the amount of accumulated resentment.[6]

As far as the conflict consequences of secession incentives, there is a small literature: Fearon (2004) has a dynamic model of separatist conflict and secession in which the reason that transfers may not be adequate to prevent inefficient conflict (and secession) is a commitment problem created by shocks to the relative military capability of center versus regional rebels (commitment problem rather than indivisibility), and has secession as an absorbing state like us. Spolaore (2008) analyzes the choice of regional conflict when a peripheral (minority) region wishes to secede, focusing on the trade-off between economies of scale and heterogeneity of preferences where transfers are barred. Our setup is dynamic, it includes the option of compensating transfers and allows for the groups having different productivities per capita.[7] Anesi and De Donder (2013) construct a static model of secessionist conflict with an exogenous winning probability; they find the existence of a majority voting equilibrium with a government type biased in favor of the minority. Our contribution is complementary to theirs, in that our dynamic setting features general transfers conditioned by the credible

[4]See also Flamand (2015).

[5]Related to this, Bordignon and Brusco (2001) analyze whether constitutions should include provisions for agreed potential secessions.

[6]Our paper also speaks to the debate in political science on whether secessionism stems mostly from economic grievances or ethnic identity (see Laitin, 2007, and Toft, 2012), as we provide a simple model in which economic conditions and ethnic identity both enter the characterization results, with ethnic identity entering directly in the utility function (see Akerlof and Kranton, 2000).

[7]Flamand (2019) complements Spolaore's model by analyzing the effect of inequality on the conflict equilibrium, and considers the possibility of using partial decentralization as a way to prevent conflict.

thread of future conflict and no commitment assumption is possible for the future.

In the conflict literature only a handful of papers have explicitly modelled the incentives for secession. Morelli and Rohner (2015) allow both nationwide and secessionist conflict in a model where concentration of resources and geographical group concentration matter, showing (theoretically and empirically) that the situations where most oil revenues accrue in minority regions are the ones with highest conflict risk. Our dynamic model of bargaining generates novel predictions on secessionist vs centrist conflict that could not be obtained in that setup, taking into account all endogenously feasible compensating transfers.

Further important implications of our theory concern the role of patience. There exists only a very small literature so far linking conflict to patience and the shadow of the future (see Powell, 2006 and McBride and Skaperdas, 2014). In contrast with existing work, our framework generates the novel prediction of opposite effects of patience on different types of conflict, which we are able to investigate empirically as well, drawing on the new data from Dohmen et al. (2015).

3 The model

Consider a country with two ethnic groups, i and j, with population size N_i and N_j, $N_i+N_j = N$.

There is a total divisible surplus denoted by $S > 0$, and each group considers its contribution to the total surplus S_h, $h = i, j$, as an important indicator of what it would have in case of secession, $S_i + S_j = S$.[8] The total surplus S may be obtained from production as well as from non-produced rents. We denote by $A > 0$ the cost of running the State, so that the divisible surplus in a given period is $S - A$.

Assume WLOG that group j is in power at the beginning of the game. Taking equal per capita division of the surplus as a benchmark, we say that j makes the strategic choice of treating i with λ_i fairness if the share of surplus received by group i is $\lambda_i n$, where $n \equiv N_i/N$ denotes the population share of the opposition group. In addition to the divisible surplus, citizens' utility also reflects ideological or identity preferences. If group h is in power they obtain a utility equal to their share of the divisible surplus plus a positive ideological or

[8] In reality, in a country in which the two groups are geographically segregated in separate regions the assumption is realistic, but if they are much more integrated and production has various kinds of complementarities, a group's expected total output after secession could be lower, in the aftermath, say, of a collapse of domestic trade (see Suesse, 2018). For simplicity we ignore this complication (but we capture costs of secession through the parameter A, described below). Note also that adding the role of segregation or intermingled groups would be possible, by adding to the model a scalar $\alpha \in [0, 1]$ such that when group i splits it obtains αS_i, with α going to 1 in the case of perfect segregation. Hence, the effect of segregation is quite straightforward and can be taken out of the analysis for conciseness.

identity based utility level $P_h > 0$. If group h is not in power this additional component is absent, i.e., we normalize to zero the utility for group h related to non transferable and non divisible goods that is obtained when the other group is in power. In other words, P_h is a parameter of utility differential between being in power and not being in power that relates for example to language, culture, legislation, government-favored religion, but the idea could extend more generally to policies and their different utility implications for people with differing ideologies.

In the case of an ethnic secession, with groups i and j forming new states, each group would have to incur the cost of setting up or maintaining the state institutions and re-organizing production. For simplicity, we assume that the cost of running each new State is A, without differentiating between the cost of the original State and that of each new State. Therefore there are returns to scale in a union since the fixed cost A is divided up among a larger population.

The player in power j has two possible moves: (i) propose a distribution of surplus in the union, with fairness offer λ_i; and (ii) propose peaceful secession.

If a surplus sharing proposal or a peaceful secession proposal by the group in power is rejected by the opposition group, then a costly conflict begins. The probability of success for group i is given by q. With the victory, the effective resistance of the other group gets temporarily nullified until next period in which, established as the opposition to power, they can again challenge proposals. At the moment of victory, the winner can aim either to conquer power in the union and capture the entire surplus leaving nothing for the loser in that period,[9] or to secede and take away its own surplus forever, making the loser bear the cost of conflict D. We assume that $D < \min\{S_i, S_j\}$ and $A < \min\{S_i, S_j\}$.[10]

We use the following normalized notation: $n = \frac{N_i}{N}, s = \frac{S_i}{S}, a = \frac{A}{S}, d = \frac{D}{S}, \sigma = \frac{S}{N}$.

Notice that $\min\{S_i, S_j\} > A$ implies that $S > A + \min\{S_i, S_j\} > A + D$. The latter inequality, or its equivalent $1 - a - d > 0$, will appear at different stages of our analysis. It is immediate that in a one-shot game, in case of conflict, the winner always opts to maintain the union: since $\min\{S_i, S_j\} - D > 0$, there is more surplus to be obtained. Hence a violent conflict leading to secession can be an equilibrium solution only if the game has more than one period.

The per-period payoffs to the two players in the three possible scenarios are as follows:

[9]We could have left the distribution of the surplus to be determined by the winner. Yet, since the allocation in this period has no bearing on future strategic decisions, it is clear that the optimal distributional choice by the winner is to grab the entire surplus.

[10]The assumption $A < \min\{S_i, S_j\}$ is made for making the problem interesting. If it did not hold, secession would never be a viable option for at least one of the groups.

- Equilibrium union

$$U_i^U(\lambda_i) \equiv \lambda_i n \frac{S-A}{N_i} \text{ and} \tag{1}$$

$$U_j^U(\lambda_i) \equiv (1-\lambda_i n)\frac{S-A}{N_j} + P_j; \tag{2}$$

- Secession

$$U_i^S \equiv \frac{S_i - A}{N_i} + P_i \text{ and}$$

$$U_j^S \equiv \frac{S_j - A}{N_j} + P_j; \tag{3}$$

- Conflict

$$U_i^C \equiv q\left[\frac{S-A-D}{N_i} + P_i\right] \text{ and}$$

$$U_j^C \equiv (1-q)\left[\frac{S-A-D}{N_j} + P_j\right], \tag{4}$$

(when the winner takes the entire surplus of that period minus the conflict costs).

The timeline is as follows:

1. *Production:* Each period starts with a group in power, say j; output is produced, and surplus S is obtained.

2. *Proposal:* The group in power makes one of two possible proposals: [i] union, proposing a distribution of the surplus with λ_i fairness; [ii] peaceful secession.

3. *Peace or conflict:* The opposition can either accept or challenge the proposal. If it is accepted, it is carried out; if it is challenged, conflict follows.

4. *Exercise of power.* If there is peace, and hence j remains in power, the policies announced are carried out, these being either (i) the announced distribution of the surplus or (ii) secession. In case of conflict the winner has temporarily eliminated all resistance and can unrestrictedly choose between secession and union. In the first case, it splits the country and takes its own produced surplus (while placing the full cost of conflict, D, on the loser); in the second case it appropriates the entire remaining surplus leaving nothing for the losers and begins the next period in power. The loser begins next period as the organized opposition that can challenge unacceptable proposals.

5. *Consumption:* At the end of every period the entire remaining surplus is consumed.

The expected payoff of future periods is discounted by the usual discount factor $\delta \in [0,1]$. The only state variable is which group is in power. Note that decisions are sequential, and hence this is a complete information infinite horizon sequential game.

4 Equilibrium characterization

Given stationarity, any Subgame Perfect Equilibrium path ending with a peaceful agreement on distribution consists of an initial proposal by group j that is immediately accepted by group i. Accordingly, any equilibrium path that starts with a rejection ends either with permanent conflict or conflict with eventual secession.

The opposition can influence the initial offer by implicitly threatening conflict. But this threat is credible only if such a one-step deviation has a continuation that is itself subgame perfect.

The only way for conflict to last indefinitely is if the equilibrium consists of a strategy profile where each player rejects the other's proposal when in opposition and makes an unacceptably unfair proposal when in power (say, allocating zero surplus to the opposition). The following lemma characterizes the set $\mathbf{A}$ of parameters such that, conditional on an initial rejection by the opposition group, the centrist conflict path is a SPE continuation path. The proof is obtained by simply comparing the incentive compatibility constraints with the corresponding recursive computations.

Lemma 1 *Let the opposition player start by triggering conflict. Then the necessary and sufficient condition for the sequence of centrist conflicts to be a SPE is that*

$$s \leq (1-d) - \delta(1-q)\left(1 - a - d + n\frac{P_i}{\sigma}\right) \tag{5}$$

and

$$s \geq d + \delta q\left[1 - a - d + (1-n)\frac{P_j}{\sigma}\right]. \tag{6}$$

Therefore, the necessary and sufficient condition for the set $\mathbf{A}$ *to be non-empty is*

$$\delta < \frac{1-2d}{(1-q)\left[1-a-d+n\frac{P_i}{\sigma}\right] + q\left[1-a-d+(1-n)\frac{P_j}{\sigma}\right]} > 0. \tag{7}$$

Proof: see Appendix A.

Note that for a sufficiently small cost of conflict the set $\mathbf{A}$ is non-empty even for $\delta \to 1$, and there always exist values of δ low enough to guarantee non-emptiness of $\mathbf{A}$ for any

vector of values of the other parameters. The higher is P_i or P_j, i.e., the identity public good component of the utility of being in power, the stricter is the restriction on δ necessary to make centrist conflict a continuation equilibrium.

A second type of continuation equilibrium after an initial rejection by group i could be one in which group j after a victory would continue to hold on power (hence fighting in order to maintain power in the whole country) whereas group i would want to secede at their first victory time. The characterization of the set of parameters $\mathbf{B_i}$ under which this continuation equilibrium exists is given in the following lemma:

Lemma 2 *Let the opposition player start by triggering conflict. Then the continuation path with j playing conflict at every iteration and i seceding after the first victory is a SPE iff:*

$$s > d(1 + \delta q) \tag{8}$$

and (5) is violated.

The set $\mathbf{B_i}$ is always non-empty.

Proof: see Appendix A.

Symmetrically:

Lemma 3 *Let the opposition player start by triggering conflict. Then the continuation path with i playing conflict at every iteration and j seceding after the first victory is a SPE iff*

$$s < 1 - d - \delta(1 - q)d \tag{9}$$

and (6) is violated.

The set $\mathbf{B_j}$ is always non-empty.

Proof: omitted, since it is analogous to that of Lemma 2.

The three potential equilibrium paths characterized in the above three lemmas are an exhaustive list under the realistic assumption that $d < 1/3$, which we will maintain throughout.[11] Then, given that it is easy to inspect that $\mathbf{A} \cap \mathbf{B} = \emptyset$, $\mathbf{B} \equiv \mathbf{B_i} \cup \mathbf{B_j}$, it follows that in the set $\mathbf{A}$ of parameters, centrist conflict is the unique equilibrium continuation path after an initial conflict.

[11] For the sufficiency of the restriction $d < 1/3$ for the claim that the three possibilities highlighted in the text are an exhaustive list the proof is available upon request. Empirically, the costs of conflict have been found to correspond to a relatively small part of economic output (Collier, 2007).

On the other hand, $\mathbf{B_i} \cap \mathbf{B_j}$ may be non empty. However, it is easy to show that if j wins the conflict and we are in $\mathbf{B_i} \cap \mathbf{B_j}$, j strictly prefers to effectively select the continuation equilibrium without seceding (knowing that i will secede at the first victory). Hence the continuation path where j is the one seceding at first victory is the relevant one if and only if the parameter values are in $\mathbf{B} \setminus \mathbf{B_i}$.

Summing up, and using standard recursive methods, the continuation utility of going to conflict in the first period for group i, which we can denote by $V_i(war)$ can take the following three values:

$$V_i(war) = \left| \begin{array}{ll} V_i^{B_i} \equiv \frac{q[\sigma(s-a)+nP_i]}{(1-\delta)n[1-\delta(1-q)]} & if\ \mathbf{B_i}; \\ V_i^{B_j} \equiv \frac{1}{(1-\delta q)n}\left[q[(1-a)\sigma + nP_i] + (1-q)\frac{(s-a)\sigma+nP_i}{1-\delta} - d\sigma\right] & if\ \ \mathbf{B} \setminus \mathbf{B_i} \\ V_i^{A} \equiv \frac{q\sigma}{(1-\delta)n}\left(1-a-d+n\frac{P_i}{\sigma}\right) & if\ \ \mathbf{A}. \end{array} \right. \quad (10)$$

The corresponding continuation equilibrium utility for group j if it makes a proposal that is rejected by i is

$$V_j(war) = \left| \begin{array}{ll} V_j^{B_i} \equiv \frac{\sigma}{(1-n)[1-(1-q)\delta]}\left[q\frac{1-s-a+(1-n)\frac{P_j}{\sigma}}{1-\delta} + (1-q)\left[1-a+(1-n)\frac{P_j}{\sigma}\right] - d\right] & if\ \ \mathbf{B_i}; \\ V_j^{B_j} \equiv \frac{(1-q)\sigma\left[1-s-a+(1-n)\frac{P_j}{\sigma}\right]}{(1-n)(1-\delta)(1-q\delta)} & if\ \ \mathbf{B} \setminus \mathbf{B_i}; \\ V_j^{A} \equiv \frac{(1-q)\sigma}{(1-\delta)(1-n)}\left[1-a-d+(1-n)\frac{P_j}{\sigma}\right] & if\ \ \mathbf{A}. \end{array} \right. \quad (11)$$

In the next two subsections we characterize the set of parameters under which centrist conflict or secessionist conflict can emerge as SPE for the whole game, using the above characterization of the continuation paths in case of a rejection of the first offer. Let us start with centrist conflict, the most inefficient SPE.

4.1 Centrist conflict

For centrist conflict to be a SPE three conditions have to be met: [i] the threat of centrist conflict has to be credible and hence the parameter values have to belong to the set $\mathbf{A}$ characterized above; [ii] the group in power prefers centrist conflict over the most favorable peaceful union agreement acceptable to the opposition; and [iii] at least one of the two players prefers centrist conflict to peaceful secession, the alternative potential proposal.

We have already dealt with [i]. We now obtain the restrictions deriving from [ii]. Given that a share λ_i yields for i (if accepted) a present discounted value equal to $\lambda_i \frac{\sigma}{1-\delta}(1-a)$, the indifference condition between this and V_i^A (the relevant expression for the $V_i(war)$ in

A) yields

$$\lambda_i^A = \frac{(1-\delta)V_i^A}{\sigma(1-a)} = \frac{q\left(1-a-d+n\frac{P_i}{\sigma}\right)}{n(1-a)} \tag{12}$$

Thus, it follows that condition [ii] for centrist conflict to be the SPE of the whole game is that j does not like to have to concede λ_i^A:

$$V_j^U = \frac{(1-\lambda_i^A n)(1-a)\sigma + (1-n)P_j}{(1-\delta)(1-n)} < V_j^A \tag{13}$$

If (13) holds *and* in addition $V_h^S < V_h^A$ for at least one $h = i, j$ (condition [iii]), then conflict is unavoidable in equilibrium. In other words, centrist conflict is the unique SPE if the parameter values are in **A** and the two above conditions hold, as established in the proposition below.

Proposition 1 *Endless centrist conflict is the unique SPE of the game if the following conditions hold:*

- *The country parameters are in the set* **A** *(see Lemma 1);*
- *The group in power j prefers centrist conflict to a union with fairness level λ_i^A:*

$$n > \frac{d + q\frac{P_j}{\sigma}}{q\left(\frac{P_i}{\sigma} + \frac{P_j}{\sigma}\right)} \tag{14}$$

- *At least one of the two groups prefers centrist conflict to peaceful secession:*

  either

$$s < 1 - d - (1-q)\left(1 - a - d + n\frac{P_i}{\sigma}\right) \tag{15}$$

  or

$$s > d + q\left[1 - a - d + (1-n)\frac{P_j}{\sigma}\right] \tag{16}$$

Proof: See Appendix A.

From the conditions above we can obtain the role of the different parameters for whether centrist conflict is a SPE. The potentially testable implications of the model on centrist conflict are the following:

1. An increase in the time discount factor δ tightens the conditions for which centrist conflict is a credible threat by the opposition. Given that a fraction d of the surplus is destroyed in every period, greater patience makes centrist conflict less likely to be a SPE.

2. An increase in P_j shrinks the set $\mathbf{A}$ and makes j more likely to deviate from centrist conflict to peaceful secession. Therefore, a higher ideological value attached to being in power by the ruling group P_j reduces the likelihood that centrist conflict is a SPE.

3. An increase in P_i also shrinks the set $\mathbf{A}$ and makes group i more likely to prefer peaceful secession to centrist conflict, both reducing the likelihood of the latter. However, an increase in P_i makes it harder for the ruler to compensate the opposition for staying in the union, making centrist conflict more likely.

4. In order for centrist conflict to be the SPE, s cannot be too high nor too low, so that centrist conflict is a credible threat (we are in the set $\mathbf{A}$). Yet, within this set, s has to be either low enough, so that the opposition prefers conflict to peaceful secession, or high enough, so that the group in power prefers conflict to peaceful secession. All in all, because of the first effect, centrist conflict occurs for intermediate values of s.

5. An increase in the opposition's population size n makes it more likely that the group in power prefers centrist conflict to the union (since it is more expensive to compensate the opposition).

Observation 1 *Summing up, we should observe a greater incidence of* centrist *conflict in countries with: [i] a* low *level of patience; [ii] a* not too high *intensity of identity preferences by either group; [iii]* intermediate *inequality in economic power s;*[12] *and [iv] an opposition with large population size.*

Figure 1 illustrates the areas in which centrist conflict is a SPE in the (n, s) space, for two different levels of patience. We set the parameters to $d = a = 0.1$, $q = 0.4$, $P_i = 0.5$, $P_j = 0$, $\delta = 0.4$ (Panel a) and $\delta = 0.6$ (Panel b). Centrist conflict occurs when the size of the opposition group is sufficiently high, and for intermediate values of s. Indeed, a lower size of the opposition group would make the union sustainable, while more extreme values of s would imply that secession is more profitable for the richest group. Further, as can be seen by comparing the two panels, a higher degree of patience shrinks the set of parameter values for which centrist conflict is a SPE.

These corollary predictions will contrast somewhat with those derived below about secessionist conflict, and such distinct implications for the two types of conflict will be the main focus of the empirical section of the paper.

[12]The term inequality hereafter refers to the share of income of the group, independently of its size (i.e., not per capita).

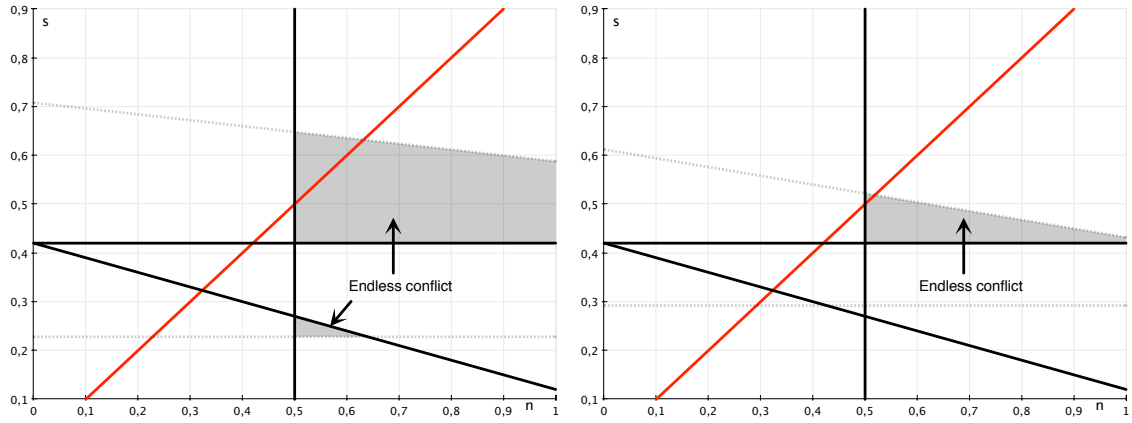

Figure 1: Centrist conflict with $\delta = 0.4$ (Panel a) and $\delta = 0.6$ (Panel b)

4.2 Conflict followed by secession

For the unique SPE to be one with conflict followed by secession the economy must be in $\mathbf{B}$. Beside this necessary condition, the characterization requires the consideration of incentive compatibility conditions for the group in power. Recall that the conflict path B_i is such that i secedes in case of victory, while j prefers to keep playing conflict. Given that a sharing offer λ_i yields for i a present discounted value equal to $\lambda_i \frac{\sigma}{1-\delta}(1-a)$, the indifference condition between this and $V_i^{B_i}$ (the relevant expression for the $V_i(war)$ in $\mathbf{B_i}$) yields

$$\lambda_i^{B_i} = \frac{q\left(s - a + n\frac{P_i}{\sigma}\right)}{n(1-a)\left[1-\delta(1-q)\right]} \tag{17}$$

It must then be the case that j is unwilling to offer such an appeasing share:

$$V_j^U = \frac{(1-\lambda_i^{B_i} n)(1-a) + (1-n)\frac{P_j}{\sigma}}{(1-\delta)(1-n)\sigma} < V_j^{B_i} \tag{18}$$

Finally, we know that in $\mathbf{B_i}$ i would accept a peaceful secession proposal. Therefore, for conflict followed by secession (by i) to be an equilibrium, it must hold that j is unwilling to make such a proposal:

$$V_j^S = \frac{(1-a-s) + (1-n)\frac{P_j}{\sigma}}{(1-\delta)(1-n)\sigma} < V_j^{B_i} \tag{19}$$

The other situation to consider is the one where the economy is in $\mathbf{B} \setminus \mathbf{B_i}$ and j prefers secession eventually to offering the corresponding necessary appeasing share:

$$\lambda_i^{B_j} = \frac{(1-\delta q)\left(1-a+n\frac{P_i}{\sigma}\right) - (1-q)(1-s) - (1-\delta)d}{(1-a)(1-\delta q)n} \tag{20}$$

It must then be the case that j is unwilling to offer such an appeasing share, which holds if $V_j^U < V_j^{B_j}$.

Finally, we know that in $\mathbf{B} \setminus \mathbf{B_i}$, j prefers a peaceful secession to conflict. Therefore, in order for conflict followed by secession (by j) to be an equilibrium, it must hold that i is unwilling to accept a peaceful secession proposal:

$$V_i^S = \frac{nP_i + \sigma(s-a)}{n(1-\delta)} < V_i^{B_j} \tag{21}$$

Proposition 2 *The unique equilibrium displays conflict followed by eventual secession if one of the two following situations hold:*

1. *There is conflict followed by secession by the opposition i whenever:*

   - *The country parameters are in the set $\mathbf{B_i}$ (see Lemma 2):*
   - *The group in power j prefers conflict of type B_i to a union with fairness level $\lambda_i^{B_i}$:*

$$n > \frac{d(1-\delta) + aq}{q\frac{P_i}{\sigma}} \tag{22}$$

   - *The group in power j prefers conflict of type B_i to peaceful secession:*

$$s > \frac{d}{1-q} \tag{23}$$

2. *There is conflict followed by secession by the group in power j whenever:*

   - *The country parameters are in the set $\mathbf{B} \setminus \mathbf{B_i}$.*
   - *The group in power j prefers conflict of type B_j to a union with fairness level $\lambda_i^{B_j}$:*

$$n > \frac{(1-q)a + (1-\delta)d + (1-\delta)q\frac{P_j}{\sigma}}{(1-\delta)q\frac{P_j}{\sigma} + (1-\delta q)\frac{P_i}{\sigma}} \tag{24}$$

   - *The opposition i prefers conflict of type B_j to peaceful secession:*

$$s < 1 - \frac{d}{q} \tag{25}$$

Proof: See Appendix A.

From Proposition 2 we can obtain the following potentially testable implications for the role of the different parameters on the likelihood of conflict followed by secession:

1. Higher patience δ expands the set $\mathbf{B}$, making either type of secessionist conflict more likely. Further, higher patience unequivocally increases the likelihood of secessionist conflict when the parameter values belong to the set $\mathbf{B_i}$, that is, when the opposition wants to eventually secede, since it makes it harder for the ruler to compensate the opposition for keeping in the union.

2. Higher intensity of ideological group preferences (higher P_i and/or P_j) expand the set $\mathbf{B}$, making either type of secessionist conflict more likely. An increase in P_i in particular increases the likelihood of either type of secessionist conflict by making it harder for the group in power to compensate the opposition. An increase in P_j increases the likelihood of secessionist conflict (where j secedes) when the population size of the opposition group n is large and/or the time discount factor δ is large.

3. Inequality in relative economic productivity favors secessionist conflict (and the rich group is the one seeking secession).

4. As for the case of centrist conflict, an increase in the population size of the opposition n makes either type of secessionist conflict more likely, since it makes it harder for the ruler to compensate the opposition for keeping in the union.

Observation 2 *Summing up, we should observe a greater incidence of* secessionist *conflict in countries with: [i] a* high *level of patience; [ii] a* high *intensity of identity preferences by either group, or both; [iii]* high *inequality in economic power s; and [iv] an opposition with large population size.*

Figure 2 illustrates the areas in which secessionist conflict is a SPE in the (n, s) space, for two different levels of patience. The parameter values are the same as in Figure 1. As in the case of centrist conflict, secessionist conflict is a SPE when the size of the opposition group is sufficiently high, so that union is not sustainable. However, secessionist conflict occurs for extreme values of s, as the richest group has a clear incentive to secede in case of victory. Further, as can be seen by comparing the two panels, a higher degree of patience enlarges the set of parameter values for which secessionist conflict is a SPE. Indeed, more patience means lower conflict cost relative to the stream of future benefits from secession, exacerbated by higher intensity of identity preferences.

Let us now examine the case for agreed secession

4.3 Agreed secession

For peaceful secession to be the equilibrium outcome, three conditions must be satisfied: [i] the opposition i must be willing to accept a peaceful secession proposal; [ii] the group

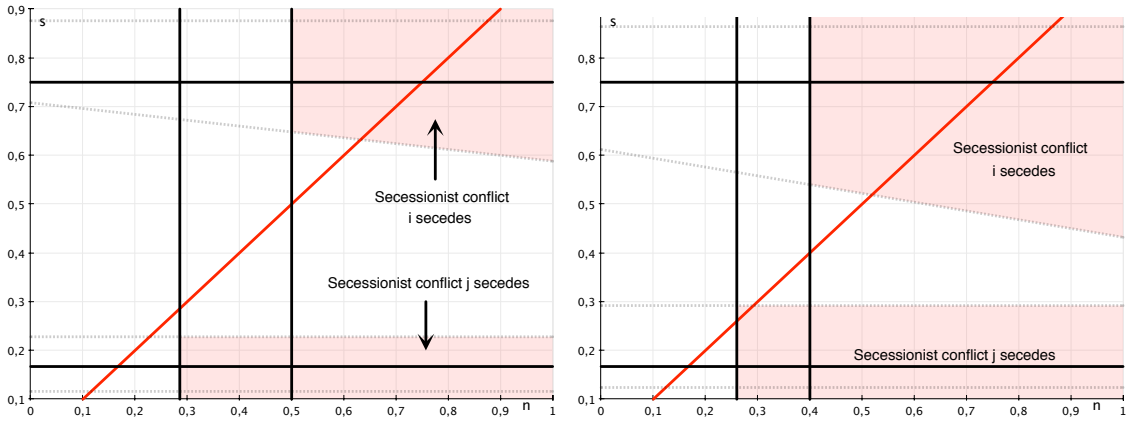

Figure 2: Secessionist conflict with $\delta = 0.4$ (Panel a) and $\delta = 0.6$ (Panel b)

in power j must prefer peaceful secession to conflict; [iii] the group in power j must prefer peaceful secession to a union with the lowest incentive compatible fairness level. Observe that peaceful secession may occur under any of the conflict paths A, B_i or B_j. Accordingly, we have to examine the above three conditions for each path separately.

Suppose we are in the set of parameters such that conflict path $X = A, B_i, B_j$ is SP. In such case, the opposition i would accept a peaceful secession proposal whenever $V_i^S > V_i^X$ (observe that the latter condition is always satisfied when the country parameters are in the set $\mathbf{B_i}$). Then, the group in power j prefers peaceful secession to the underlying conflict if and only if $V_j^S > V_j^X$ (observe that the latter condition is always satisfied when the country parameters are in the set $\mathbf{B} \setminus \mathbf{B_i}$). Finally, the group in power j prefers peaceful secession to a union with fairness level λ_i whenever $V_j^S > V_j^U(\lambda_i^X)$. The following proposition provides the precise conditions for each case:

Proposition 3 *The unique equilibrium displays agreed secession if one of the three following situations hold:*

1. *The country parameters are in the set* $\mathbf{A}$ *(see Lemma 1) and*

   - *The opposition i prefers peaceful secession to conflict of type A:*

$$s > (1-q)\left(a - n\frac{P_i}{\sigma}\right) + q(1-d) \tag{26}$$

   - *The group in power j prefers peaceful secession to conflict of type A:*

$$s < d + q\left[1 - a - d + (1-n)\frac{P_j}{\sigma}\right] \tag{27}$$

- *The group in power j prefers peaceful secession to a union with fairness level λ_i^A:*

$$s < q\left(1 - a - d + \frac{nP_i}{\sigma}\right) \tag{28}$$

2. *The country parameters are in the set $\mathbf{B_i}$ (see Lemma 2) and*

- *The group in power j prefers peaceful secession to conflict of type B_i:*

$$s < \frac{d}{1-q} \tag{29}$$

- *The group in power j prefers peaceful secession to a union with $\lambda_i^{B_i}$:*

$$s < \frac{q\left(n\frac{P_i}{\sigma} - a\right)}{(1-\delta)(1-q)} \tag{30}$$

3. *The country parameters are in the set $\mathbf{B} \setminus \mathbf{B_i}$ (see Lemma 3) and*

- *The opposition i prefers peaceful secession to conflict of type B_j:*

$$s > 1 - \frac{d}{q} \tag{31}$$

- *The group in power j prefers peaceful secession to a union with $\lambda_i^{B_j}$:*

$$s < 1 + \frac{(1-\delta q)\left(\frac{nP_i}{\sigma} - a\right) + \delta d}{(1-\delta)q} \tag{32}$$

Proof: See Appendix A.

From Proposition 3 we obtain the following implications for the role of the different parameters on the likelihood of agreed secession: Agreed secession requires a low degree of inequality in the share of surplus controlled by either group. All the bounds that we have obtained impose that the share s be neither too large nor too small. An increase in the opposition group size or the time discount factor δ have ambiguous effects on the likelihood of an agreed secession. Higher nationalism by either group (higher P_i and/or P_j) makes peaceful secession more likely.

Observation 3 *Summing up, we should observe peaceful secession with: [i] low inequality in economic power s; and [ii] a high level of identity pride by either group, or both.*

Obviously the space of parameters where the unique equilibrium is peaceful union is the residual of all the characterized areas above, as it can be seen in the following summary picture (Figure 3), for the same parameters as in Figure 1 and 2.

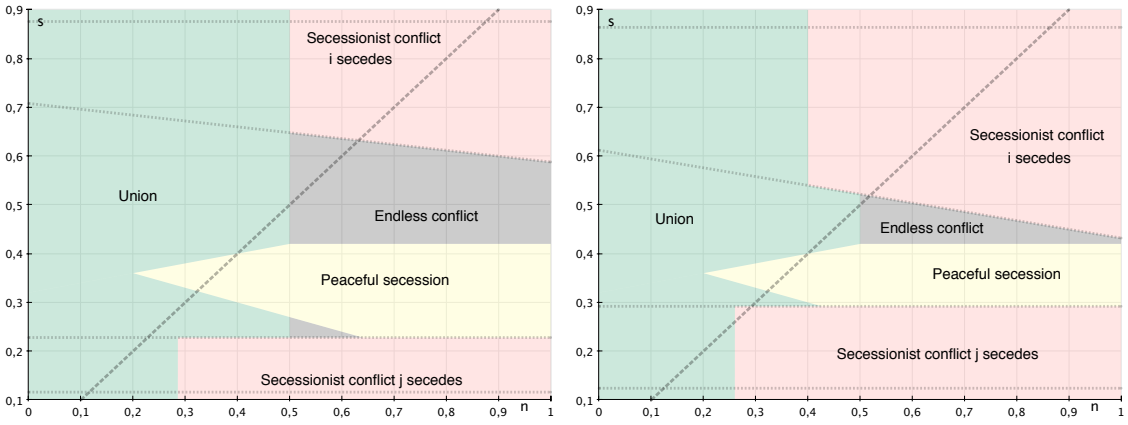

Figure 3: Equilibria with $\delta = 0.4$ (Panel a) and $\delta = 0.6$ (Panel b)

4.4 A discussion on the role of relative strength

One of the motivations for focusing for each type of equilibrium on the predictions in terms of the role of parameters n, s, δ, P_i, P_j is because on these parameters we can produce some evidence in the next section. On the contrary, any prediction that could be obtained on the role of q, the relative strength of the opposition group, would be hard to test, because there does not exist (yet) a reliable measure of the probability of winning for ethnic groups.[13] Moreover, the relative strength is highly endogenous, since an ethnic group that secretly decides to challenge the status quo in the near future certainly has an incentive to strategic militarization.

The conditions in the propositions above do however give us some indications about the role of relative strength for the two types of conflict. Given that we do not do any empirical testing below on this matter, we now report the most important effects, leaving for future work a more serious analysis, which will involve data collection for groups never involved in conflict and endogenous militarization.[14]

An increase in the opposition's win probability q makes secessionist conflict more likely when the opposition is sufficiently wealthy s. When the opposition is poor, a higher q makes

[13]Measures of relative availability of arms and/or mobilization exist only for groups that actually participated to some conflict, but very little is available about groups that never participated, and this selection problem is difficult to bypass.

[14]See e.g., Meirowitz et al (2020) for a model of conflict onset that takes into account endogenous militarization.

secession conflict more likely if their population size n is sufficiently large. The richer group fears that their surplus could be more easily captured by the poor group and hence they seek for secession.

As far as centrist conflict is concerned, when the win probability of the opposition q goes up, the bounds on s for belonging to **A** and for conditions (15) and (16) shift in the same direction. We can therefore assume that this change will not significantly modify the size of the set of parameter values satisfying these conditions. If anything, an increase in q makes centrist conflict more likely when the opposition is "rich" (since both thresholds shift upwards). Also, an increase in q makes the group in power prefer centrist conflict to union for a larger set of parameter values. Hence, an increase in conflict strength q makes centrist conflict more likely to be a SPE.

So for both types of conflict a group becoming stronger (ceteris paribus) seems harder to appease (intuitively) and the interaction with s seems to be relevant. Even from these preliminary observations it is evident that the effects of q are roughly going in the same direction for the two types of conflict; and hence, even if we could solve the methodological and data problems mentioned above, it is unlikely that a more detailed analysis of the effects of q could give us further substantive insights on the differentiation between secessionist and centrist conflicts, which is the main goal of the paper. The interaction effects with s are the most likely to diverge between the two types of conflict.

5 Empirics

In this section we confront the major predictions of the model to existing and novel empirical evidence. In particular, we shall focus on the following four results of our theoretical framework:

1. Cultural preference similarity (i.e., low P_i) decreases the risk of secessionist conflict and raises the risk of centrist conflict (with respect to peaceful union);

2. Low size of the opposition n reduces the likelihood of conflict with respect to union;

3. Patience deters centrist conflict with respect to secessionist conflict and other outcomes;

4. Inequality in relative economic productivity favors secessionist conflict relatively more (and the rich group, be in power or in opposition, is the one seeking secession).

In what follows, we shall examine these four predictions, before discussing at the end also additional auxiliary implications of our model. We shall start with investigating the first prediction.

5.1 Preference similarity decreasing the risk of secessionist conflict

Most if not all independentist movements present the need to save their own national identity as their key goal and motivation. However, the fact that most often the secessionist regions are the wealthiest has fueled the argument that the independentists simply seek for material benefits and the issues of preferences and identity are instrumental: a mere framing of very earthy true motives. Hence the need to know empirically if preferences and identity are indeed straw men, or if – as predicted by our model – preference similarity decreases the risk of secessionist conflict.

To the best of our knowledge, there is no existing empirical paper that provides large-scale global evidence exactly on the question at hand, and it is a novel prediction of our framework that large cultural goods differential utility between being in power and being in the opposition, captured by high P_i, is a cause of secessionist conflict rather than centrist conflict, while preference similarity (low P_i) is associated with a lower likelihood of secessionist conflict compared to centrist conflict. To address this gap in the literature, we present our own novel evidence on the matter. A variety of factors may affect cultural goods differential utility, some of which endogenous (e.g., an ethnic group fighting against other groups may endogenously develop a more distinct and stronger ethnic identity – see Rohner, Thoenig and Zilibotti, 2013b). In order to exploit historical potential cultural differences between groups, we will focus on how similar the languages of the ethnic groups are (as discussed in much more detail below).[15]

After a more general "tour d'horizon", in much of the analysis we will restrict the sample to conflicts, and focus on the predicted differential effect of a lower P_i on secessionist versus centrist conflict, because this outcome is very specific to our setting, and as a sample containing only conflicts may be somewhat less heterogenous than a sample also containing peace observations (i.e., comparing two countries at war, say, Yemen with Sudan, may suffer to a lower extent from unobserved heterogeneity than comparing Yemen with, say, peaceful Canada). While we filter out a series of confounding factors through demanding batteries of fixed effects, it is still important to keep in mind that we do not have a source of exogenous variation in language diversity. Hence the results can only be interpreted as associations, as

[15]Our approach follows the strategy of employing the linguistic distance between two groups as an indicator for their difference in preferences over cultural public goods, applied among others in Fearon and Laitin (1999), Desmet, Ortunho-Ortn, and Weber (2009), and Esteban, Mayoral and Ray (2012). The correlation between linguistic differences and other forms of ethnic or cultural differences is what matters, even if language policies per se are perhaps not the most important form of indivisibility. Similarly, the importance that people give to their ethnic identity directly is important, as we show, even if differences in cultural preferences does not have significant effects on the provision of material public goods – see Habyarimana et al (2007).

our data does not allow us to draw causal statements.

In what follows, we shall give a brief overview of the data used (a much more detailed discussion of all data sources is contained in the Empirical Appendix). We focus on panel data at the ethnic group level, drawing on data from GrowUP (Girardin et al., 2019). We start by defining the most powerful group in a given country in a given year, labelled l. The GrowUP data contains information on the power "status" of a given group and we naturally define as most powerful group the one with the highest power status. In the rare event of more than one ethnic group having the highest power status (e.g., with two "senior partner" groups), we define as most powerful the one with the largest size.[16]

Given that our theory contains predictions on the likelihood of the opposition group i to trigger secessionist conflict, we focus on all ethnic groups outside the most powerful one in a given country-year. Hence, our dataset consists of a panel at the ethnic group year level, with a unit of observation being one of 892 ethnic groups in a given year between 1946 and 2017.

The dependent variable is taken from GrowUP and is a dummy of incidence of secessionist conflict, varying for different ethnic groups over time.[17] The explanatory variable of interest is constructed using information on the main language spoken for each ethnic group (from GrowUP), combined with language trees from the Ethnologue (Lewis et al., 2019). In particular, we posit that language diversity proxies diversity in preferences for public goods. We first construct a variable on whether a given opposition group g speaks the same language as the main government group l. If for example this leading group speaks English then a given opposition group speaking English as well may have more similar preferences and may be less likely to want to split than some other opposition group speaking another language. Then, in a second step, we construct a more specific measure of preference similarity: We compute the number of joint nodes of the language tree. If two groups are in the same branch of the language tree but there is a slight bifurcation at the end, the number of different nodes is very small (e.g., German versus Swiss-German), while if two languages belong to completely different language families, then their distance in nodes is larger. The measure of joint number of language nodes ranges from 0 to 15, with 15 being identical languages while 0 referring to completely different ones. We posit that greater similarity in language may reflect more similar social norms and in term more similar preferences for public goods, as captured by a lower P_i when i is in the opposition.

[16]Groups with the highest power status but being of smaller size than their government partner –and hence not defined as the most powerful group l– amount to 7 percent of the sample.

[17]In particular, we use as measure of secessionist conflict the incidence of territorial conflict ("incidence terr flag").

Armed with these variables, we estimate the following equation:

$$SecessionistConflict_{git} = \alpha + \beta_1 \times LanguageSimilarity_{git} + FE_{it} + \epsilon_{git},$$

where the variable $SecessionistConflict_{git}$ is a dummy that takes a value of 1 if a given ethnic group g of a country i in a given year t is involved in "Secessionist conflict", and zero otherwise. Language similarity is measured as described above, and FE_{it} is a battery of fixed effects at the country-year level.

This specification allows to filter out all time-invariant country characteristics (i.e., ruggedness of terrain, latitude, elevation etc) as well as all shocks taking place in a given country-year (e.g., an election, or the government being involved in fighting outside or inside). The identifying variation amounts to comparing different opposition groups within the same country year. Given that in most countries there is relatively little time-variation in language diversity for a given ethnic group g, we focus on between group comparisons in a given country and year, but we shall show additional results when filtering out also time-invariant ethnic group characteristics.

Table 1 presents the baseline estimates linking preference similarity to secessionist conflict. In column 1 we start with the full sample, with the dummy for group g having the same language as leading group l and the simplest fixed effects structure (i.e., at the country level and at the year level). We find, as predicted, that having the same language –which means that P_i is small– reduces the risk of triggering secessionist conflict. The coefficient of -0.016 is sizeable compared to the baseline conflict risk of 0.02. In column 2 we adopt a more demanding fixed effects structure, focusing on country-year fixed effects. The results are very similar.

In columns 3 and 4 we run the analogous regressions but using the finer measure of language similarity. As this variable ranges no more from 0 to 1, but now from 0 to 15, we expect a coefficient that is an order of magnitude smaller, which is what we find. While this language similarity measure has the expected sign, it is imprecisely estimated and no longer statistically significant. Columns 5-8 replicate columns 1-4 but restricting the sample to conflicts only (i.e. including only observations with conflicts, secessionist and non-secessionist ones), which leads to a big drop in sample size. We find that in all of columns 5-8 language similarity significantly reduces the risk of secessionist conflict. In the empirical Appendix B we provide further results, controlling for the lagged dependent variable and including group fixed effects.[18]

[18]In our baseline specification we prefer to focus on conflict incidence, relegating specifications with a lagged dependent variable to the appendix. Our two underlying reasons for this are that i) the interpretation of this augmented specification is somewhat different (capturing onsets /endings instead of incidence) and

Table 1: Preference similarity and secessionist conflict

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Secessionist conflict							
Same language (t-1)	-0.0156*	-0.0161*			-0.5376***	-0.3024*		
	(0.0088)	(0.0090)			(0.1772)	(0.1739)		
Nr. joint lang. nod. (t-1)			-0.0006	-0.0006			-0.0376***	-0.0222**
			(0.0006)	(0.0006)			(0.0096)	(0.0096)
Sample	Full	Full	Full	Full	Confl.	Confl.	Confl.	Confl.
Country fixed effect	Yes	No	Yes	No	Yes	No	Yes	No
Year fixed effect	Yes	No	Yes	No	Yes	No	Yes	No
Country-year fixed eff.	No	Yes	No	Yes	No	Yes	No	Yes
Observations	38613	37495	38613	37495	1459	844	1459	844
R-squared	0.133	0.257	0.133	0.256	0.810	0.917	0.818	0.921

Note: Panel with an observation being the ethnic-group year, covering 892 ethnic groups and the years 1946-2017. All explanatory variables lagged by one year. OLS estimations in all columns. Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

5.2 Peaceful union and group size

A second major prediction of our theory is that peaceful union tends to prevail when minority groups are small. To the best of our knowledge also this implication has not yet been tested empirically for a global sample (and challenges a core inference made by Fearon and Laitin, 2003, namely that the number of people needed to keep an insurgency alive is very low and doesnt really need mass support to survive as an insurgency). So far only quite few related empirical results exist. In particular, many enduring states are characterised either by ethnic homogeneity or by extreme ethnic fractionalisation (which does not correlate much with civil conflict, as shown in Laitin, 2007); but ethnic polarization matters (Montalvo and Reynal-Querol, 2005; Esteban, Mayoral and Ray, 2012). As our model predicts, when potential separatist groups are absent (in the case of ethnic homogeneity) or very small in size (in the case of high ethnic fractionalization), forming a separate state would be very costly, so peaceful union is more easily sustained. In addition, anopposition of small size does not require a large part of the surplus to be transferred to appease them. Suesse (2017) also shows that during the collapse of the Soviet Union smaller regions were on average less likely to seek independence and more likely to favor maintaining the union.

ii) that having the lagged dependent variable in a panel regression can lead to Nickell-bias (Nickell, 1981). Still, it turns out that our explanatory variable of interest also remains of the expected sign and statistically significant when including as control the lagged dependent variable (see results in the empirical Appendix B).

While this existing evidence is suggestive, it does not provide large-scale evidence for a global sample and does not focus directly on our prediction. As in the previous subsection, we again focus on a global sample of all ethnic groups (excluding leading group l in the country), and the unit of observation is again the group-year. We define the outcome variable "peaceful union" as the absence of (any type of) conflict and the absence of accepted secession.[19] The information of ethnic group size is taken from GrowUP. We run the following specification:

$$Union_{git} = \alpha + \beta_1 \times GroupSize_{git} + FE_{it} + \epsilon_{git},$$

where the variable $Union_{git}$ is a dummy that takes a value of 1 if a given ethnic group g of a country i in a given year t selects remaining in "Union", and zero otherwise. $GroupSize_{git}$ is the share of a country's population belonging to group g, and FE_it is a battery of fixed effects at the country-year.

This specification –as above– filters out time-invariant country characteristics or current shocks hitting a country. As in the previous subsection, we do not have an exogenous source of variation in the explanatory variable of interest, which means that the results should be interpreted as associations and not as causal estimates.

Table 2 presents the results. In column 1 we start with the simplest structure of fixed effects, at the country level as well as at the year level. We find, as expected, that larger groups have a lower likelihood to remain in Union. Quantitatively, moving from a population share of 0 percent to 50 percent (0.5) would reduce the likelihood of Union by 5 percentage points (with the baseline likelihood of Union being at 97 percent of ethnic groups and years). We find virtually the same result when adopting the more demanding battery of fixed effects at the country-year level (column 2) and when replicating the findings of these first two columns for an alternative, more encompassing definition of union (columns 3-4).[20] In columns 5-6 we run the same specifications, but controlling for the lagged dependent variable, while in columns 7-8 we include ethnic group fixed effects. While in the first four columns the coefficient magnitude is very stable, in columns 5-8 it moves around considerably. This is not very surprising, as the identifying variation is very different (i.e., moving from total union incidence to onset /ending, and moving from comparing ethnic groups within the same country-year to restricting identifying variation to be within-ethnic group). In all columns we find the expected negative coefficient for group size.

[19] Conflict data is as previously taken from GrowUP, and we code as accepted secession the few least controversial splits not involving violence (i.e., the split of Czechs and Slovaks; the independence of Macedonians).

[20] Here we define union simply as a dummy taking a value of 1 when no conflict takes place. While union is confounded in this broad definition with the very rare cases of accepted secession, it has the advantage of avoiding to make case-by-case judgments on whether a given episode qualifies for accepted secession.

Table 2: Group size and peaceful union

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Peaceful union							
Group size (t-1)	-0.1020***	-0.0845**	-0.1016***	-0.0841**	-0.0241***	-0.0172**	-0.3897*	-0.7293**
	(0.0334)	(0.0365)	(0.0334)	(0.0365)	(0.0080)	(0.0085)	(0.2099)	(0.2813)
Specification	Baseline		Altern. Def. Union		Contr. lag Dep. Var.		Group FE	
Country fixed effects	Yes	No	Yes	No	Yes	No	No	No
Year fixed effects	Yes	No	Yes	No	Yes	No	Yes	No
Country-year fixed eff.	No	Yes	No	Yes	No	Yes	No	Yes
Group fixed effects	No	No	No	No	No	No	Yes	Yes
Observations	38752	35691	38752	35691	38752	35691	38739	35673
R-squared	0.140	0.288	0.140	0.288	0.643	0.725	0.369	0.520

Note: Panel with an observation being the ethnic-group year, covering 892 ethnic groups and the years 1946-2017. All explanatory variables lagged by one year. OLS estimations in all columns. Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

5.3 Patience deters centrist conflict and fosters secessionism

A novel prediction of the model is that in the case of low patience conflict not followed by secession is predicted, while other outcomes such as secessionist conflict are associated to higher patience levels. To the best of our knowledge, there does not exist yet a statistical investigation linking patience to the set of outcomes of our model. Some anecdotal evidence suggests that there may be a link though. Recently, The Economist has asked "Why Latin America has no serious separatist movement?" (23 November 2017). This is telling, given that Latin American patience levels are remarkably low (according to data of Dohmen et al., 2015). There is one exception: the secessionist movement in the Santa Cruz region in Bolivia. Conspicuously, Bolivia is the only Latin American country with above average patience scores, highlighting again the positive correlation between patience and secessionism. A similar pattern emerges beyond Latin America: According to the Dohmen et al. (2015) patience data, indeed the two countries with lowest patience are Nicaragua and Rwanda, both of which have experienced decades-long fighting without a secessionist component. In contrast, many secessionist movements occur in places with relatively high patience, such as for example in Quebec (Canada), Scotland (UK), Catalunya / Basque Country (Spain), Tibet / Taiwan (China), or Corsica (France), and also the formerly united Czech Republic and Slovakia are characterized by high patience levels (see again the recently collected data by Dohmen et al., 2015).

While these examples are very useful, in what follows, we shall perform a systematic regression analysis linking the Dohmen et al. (2015) patience data to the data on peace

and conflict outcomes from GrowUP that we described above. The patience data is time-invariant and only available for a cross-section of countries; it cannot be linked to our ethnic group identifiers. Hence, the structure of the following regressions will be rather different from the ones above, with our unit of observation becoming the country-year level. Note that –as before– we do not have any exogenous variation in patience, and hence all the following results should be interpreted as associations and not as causal estimates. We run the following specification:

$$EndlessConflict_{it} = \alpha + \beta_1 \times Patience_i + FE_t + FE_c + Controls_{it} + \epsilon_{git},$$

where the variable $EndlessConflict_{it}$ is a dummy that takes value 1 if a given country i in a given year t experiences a centrist conflict, and zero otherwise. $Patience_i$ is the time-invariant patience score at the country level, FE_t is a battery of annual time effects, and FE_c refers to continent fixed effects.

Table 3 displays the baseline results. We have a panel of 77 countries over the 1946-2017 period and regress endless conflict as dependent variable on the patience score as main explanatory variable. The endless conflict variable is defined as above (i.e., drawing on "incidence gov flag" from GrowUP). We focus on centrist conflict, as our predictions are particularly stark with respect to the complete drop in incentives for centrist conflict in the presence of high patience (while the strength of the effect of patience on the relative comparison between union, peaceful secession and secessionist conflict depends very much on several parameters in the model). Importantly, we first compare centrist conflict with respect to all other outcomes, before restricting the sample to conflicts only, which amounts to comparing only secessionist versus centrist conflict (and which again has the advantage of a less heterogenous sample).

In column 1 we make use of the panel structure of the data and include as sole control a battery of annual time effects. We find that higher patience significantly reduces the scope for centrist conflict. Quantitatively, the coefficient of -0.13 means that one standard deviation in patience (0.37) results in a roughly 5 percentage point decline in the risk of centrist conflict, which corresponds to about half of the 10 percentage point baseline risk. The result is similar although of a somewhat smaller magnitude in column 2 when we include a battery of continent fixed effects and two major controls, i.e. population size (from Feenstra, Inklaar and Timmer, 2015) and ethnic fractionalization (from Alesina et al., 2003).[21] We continue to find a significant negative effect of patience when restricting the sample to conflicts only

[21] We restrict ourselves to a parsimonious set of controls, as (1) we want to avoid adding endogenous controls leading to a bad control problem, and as (2) all our identifying variation comes from the 77 data points of the patience variable, leading to only very few degrees of freedom.

(columns 3-4). Note that this very different sample results in a substantially different (i.e., larger) coefficient. Given that the patience data is time invariant, we also display in columns 5-8 the analogous analysis as in columns 1-4, but for the collapsed cross-section. The results are qualitatively similar, but less precisely estimated in the last 2 columns where we only have around 50 observations. The Empirical Appendix contains further results, showing that our findings go through when controlling for the lagged dependent variable, which amounts to focusing on conflict onsets and endings.

Table 3: Patience and peaceful union

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Endless conflict							
Patience	-0.134***	-0.076*	-0.486*	-0.302*	-0.134***	-0.075*	-0.108	-0.081
	(0.043)	(0.044)	(0.258)	(0.169)	(0.042)	(0.040)	(0.079)	(0.092)
Data structure	Panel				Cross-section			
Sample	All observations		Only conflicts		All observations		Only conflicts	
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE and Contr.	No	Yes	No	Yes	No	Yes	No	Yes
Observations	4510	3893	892	779	77	73	51	49
R-squared	0.051	0.084	0.144	0.413	0.067	0.165	0.022	0.129

Note: Panel with an observation being the country year, covering 77 countries and the years 1946-2017. Control variables include lagged population and ethnic fractionalization. OLS estimations in all columns. Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

5.4 High Inequality in productivity favors secessionist conflict

A further prediction of our model is that situations characterized by inequality in relative economic productivity or potential, fuel secessionist conflict. There is a substantial and convincing body of existing work on this (and hence no need for us to perform our own estimations). In particular, in the literature to date several studies have presented systematic evidence that natural resource-rich ethnic minorities have a relatively high propensity to engage in separatist conflict (see e.g., Sorens, 2012; Morelli and Rohner, 2015; Paine, 2019). In fact, there are many examples of conflicts in which (resource-)rich ethnic minority groups aim at secession.[22] Examples include the armed separatist movement in now independent Timor-Leste, the civil war in Nigeria's Biafra region and the recent fighting in the Niger Delta regions of Nigeria, Katanga's attempt to secede from the Congo in 1960-1963, the Basque country's armed struggle for independence from Spain, the rebellion of the Aceh

[22]This draws on the more detailed accounts of Ross (2004), Collier and Hoeffler (2006) and Morelli and Rohner (2015).

Freedom Movement in Indonesia starting in 1976, and the Sudan People's Liberation Army struggle beginning in 1983. Other ethnically divided countries with separatism linked to a wealth of local natural resources include Angola, Myanmar, Democratic Republic of Congo, Morocco and Papua New Guinea.

These cases just mentioned have often involved actual political violence, but the impact of resource spoils is also perceptible in less violent calls for secession. Gehring and Schneider (2017) find that the Scottish bid for independence has been systematically fuelled by the value of prospective oil fields, while Suesse (2017) shows that at the moment of the collapse of the Soviet Union popular support for the creation of new sovereign states was stronger in the oil rich republics.[23]

6 Policy implications

Welfare statements are generally hard to make and involve various measurement problems (e.g., P_i may be hard to measure). This being said, given that conflict is costly, a robust welfare statement to make is that in terms of aggregate welfare peaceful union dominates permanent conflict, and agreed peaceful secession dominates secession after conflict. Hence, in the discussion of potential policy implications below we shall focus on institutions or measures that reduce the likelihood of the two conflict outcomes. This way we do not make any judgment on whether union or peaceful secession is more desirable – which may very much depend on the particular context.

One obvious policy dimension that is natural to consider is federalism versus centralisation. What makes it difficult to assess the relative virtues of federalism is the fact that it bundles together a variety of characteristics – some of which may favor peaceful outcomes while others may favor conflict.[24] Hence, we shall below attempt to "unbundle" what is commonly understood under the term of federalism, and distinguish particular components.

[23] Although in these examples the prosperity of separatist regions is linked to natural resources, this is not indispensable. In fact, there are many more cases of prosperous regions aiming for secession even where the source of wealth is not natural resource spoils. Conflictual secessions by regions that were substantially richer than the country as a whole include Slovenia and Croatia's separation from Yugoslavia, and Eritrea's war of independence from Ethiopia. In 1993, when Eritrea won its independence, its GDP per capita (at constant 2005 US dollars) was 70 percent larger than Ethiopia's (World Bank, 2017) and in the next year the difference jumped to more than 100 percent. Further examples of separatist movements in relatively rich regions include the Basque country and Catalonia in Spain as well as Flanders in Belgium.

[24] See Cederman et al. (2015) on the potentially ambivalent effect of devolution. Gibilisco (2017) analyzes how the repression of regional values may delay conflict but increases resentment and hence the probability of conflict in future. See also Flamand (2019) for a theoretical analysis of the possibility of using partial decentralisation as a secessionist conflict mitigating strategy.

6.1 Pluralism of local culture (lowering P_i and P_j)

One policy typically associated with federalism is the permission for the local state to select its own language of instruction in school, religious ceremonies and cultural events. In terms of our model, this corresponds to a decrease in P_i and P_j, which increases the scope for union and reduces the likelihood of secessionist conflict. Intuitively, if within the same country local regions can select their own preferred policies over a wide range of matters they can up to some extent "have their cake and eat it" – they can benefit from the scale economies for the things that are centralized and where preference heterogeneity does not play a big role (e.g., national defense) while they can still select their own policies for a wide range of matters where preference heterogeneity is large (e.g., education, health, culture, social state).

There are three caveats. First, a lower P_i makes it also "cheaper" to keep the (now less unhappy) opposition group in the union, which leads to a lower level of monetary "fairness", i.e., a lower λ_i. Catalonia may illustrate this: While it has obtained the right to have Catalan as official language, it has been found that the level of net fiscal transfers to the central government is so high that in terms of public service provision Catalonia obtains less than several regions that were poorer before taxation.[25] Second, depending on the policy at stake, P_i and P_j may be more or less related or independent. There may be dimensions for which the government can reduce P_i at no cost (e.g., allowing the opposition group to perform their traditional folk songs may not affect P_j). We would typically expect that in most cases such uncontroversial policies would be enacted (the opposition would typically not oppose more autonomy, and the government could buy off the now less unhappy opposition more cheaply – with a lower λ_i). In contrast, in other policy dimensions there may be a trade-off, where increasing autonomy for the opposition could impose a cost on the incumbent group, e.g., allowing certain religious practices could lower P_i but may also reduce P_j. Endogenizing this trade-off could be an interesting extension to our setting which we plan to study in future work. Third, engineering P_i and P_j levels may involve commitment problems (as a powerful group may want to alter them again in the future).

6.2 Melting pot leading to converging tastes (lowering P_i and P_j)

Another policy that may reduce P_i and P_j is to encourage fostered interaction between groups. Members of different groups meeting more often may naturally lead to having more in common and tastes converging. Think of the United States with new arrivers starting to believe in the "American Dream" and traditional American culture starting to

[25] López-Casasnovas and Rosselló-Villalonga (2014) conclude that in terms of tax collection per capita Catalonia was ranked 3d among the Spanish regions, but only 10th in terms of total resources spent.

integrate elements of the new comers (e.g., food habits, like French Fries or Tex-Mex). While the centrally imposed banning of some cultural traits (say, some language) may lead to resentment and large P_i, the bottom-up convergence of tastes through free interaction may well reduce over time P_i and P_j, which implies greater scope for union. While to a large extent interaction may happen naturally and may be dictated by economic gains, the state of course can still put in place particular policies that encourage inter-group interaction such as subsidised student exchanges, language courses, TV formats celebrating the benefits of inter-group interaction.[26]

6.3 Guaranteeing more fair sharing of surplus (setting a minimum λ_i)

Given the aforementioned risk of low λ_i for the opposition in federalist states (which in our setting is simply due to the Stackelberg leader exploiting its first-mover-advantage), one may think that formulating guaranteed fair distributions (i.e., minimum λ_i, which we can label $\overline{\lambda}_i$) may help maintaining a peaceful and stable union – this idea may underlie several mechanisms in place in certain federal states trying to fix a given resource distribution.

Our model predicts that this policy may backfire. In fact, while guaranteeing a fair distribution, e.g., $\overline{\lambda}_i = 1$, may be desirable in terms of fairness, it may if anything reduce the bargaining range for which union can be maintained –well-intended rigid ramparts to exploitation may hinder bargaining.[27]

6.4 Fiscal federalism

Cederman et al. (2015) find a conflict-reducing effect of territorial autonomy. When segregation is high, this could amount to letting each group control S_i and S_j separately, perhaps sharing the cost of running the state equally. Clearly, a group $k = i, j$ faced with the option of keeping under union S_k and benefiting from lower administrative costs (say, $A/2$ instead of A) than under independence would never want to split unless it was in opposition with P_k being very large. Given that holding completely separate accounts would make it harder for j to impose the public good provision to i, we can at present consider the extreme case with each group k maintaining under union its full budgetary autonomy – keeping its S_k,

[26] See Paluck (2009), Paluck and Green (2009), and Rohner, Thoenig and Zilibotti (2013) on how belief targeting can foster peaceful interaction and cooperation. In particular, Paluck (2009) finds that exposure to the treatment of the "social reconciliation" radio soap opera in Rwanda has raised inter-ethnic empathy, compared to the control group exposed to the "health" radio soap opera.

[27] This problem is also discussed in Esteban, Morelli and Rohner (2015), where democratic exploitation limits may lead a government to substitute exploitation with elimination, hence triggering mass killings.

and selecting its preferred public good, resulting in $P_k = 0$. The scope for accepted secession would in such a situation be completely eliminated (staying together does not entail any costs relative to splitting, but permits to save administrative costs). This simple policy is of course unfeasible when groups have overlapping territorial claims and/or are not segregated, and when some cultural public goods give much higher utility when provided to the whole nation (for example even defense budget itself can be used very differently depending on who controls it and on the alliances of the two groups).

6.5 Power-sharing

Recent empirical evidence has shown power-sharing to reduce conflict in multi-ethnic countries (see Cederman et al., 2013; Mueller and Rohner, 2018). In our context, power-sharing could have two effects: First, turning our sequential Stackelberg game into a simultaneous game where at the beginning the two groups bargain over λ. The absence of first-mover advantage would mean that the opposition group may receive more than λ_i and the peace dividend may be shared among both groups. While this may indeed increase fairness, it does not alter whether there exists such a peace dividend. Power-sharing may entail a joint selection of the public good, hence also lowering P_i and P_j and increasing the scope for peaceful union.

6.6 Cost increasing policies

When d increases, this lowers the scope for conflict. A factor that can raise destruction costs is the integration of production of different ethnic groups in the country.[28] Groups that depend on each other for business relations may not only have more similar tastes, but will also typically find conflict more disruptive. There is substantial empirical evidence showing that more business links among ethnic groups in society lead to higher destruction costs of conflict and hence less conflict in equilibrium.[29]

[28]Incidentally, also general economic prosperity matters, as it may make conflict less attractive by raising the opportunity cost of destruction and lost production. Collier (1999) has found that the destruction potential is larger in higher value added, more complex sectors that are intense in capital and transactions, while the destruction potential is lower in less complex activities such as subsistence farming. Hence, when a country becomes richer, the relative destruction cost of conflict d raises, hence reducing conflict.

[29]See the discussion in Rohner, Thoenig, Zilibotti (2013), as well as Horowitz (1985) on protected middleman minorities in Indonesia, Myanmar, Malaysia and India; Bardhan (1997), Varshney (2001, 2002) and Jha (2013) on inter-ethnic business as rampart against riots in India; and Olsson (2010) and Porter *et al.* (2010) on inter-ethnic trade lowering tensions in Africa.

7 Conclusion

Previous work on secession has focused largely on the trade-off between economies of scale and heterogeneity of preferences, and none has considered simultaneously the scope of conflict and long-run incentives. We link the literature on secession with that on conflict and build a dynamic model that highlights the effect of inter-temporal incentives. The model generates a novel picture that features some interesting predictions: When an opposition group is of comparatively small size, peaceful union is a stable outcome. When the opposition group is large and about as productive as the group in power, conflict can also be avoided – albeit at the cost of dismantling the original union, via peaceful secession. However, we identify a number of important parameters that affect the probability of centrist vs secessionist conflict in different directions: higher patience increases secessionist pressures, while depressing centrist war incentives; high levels of inequality are more likely to induce secessionism than centrist conflict; cultural similarity helps reduce the probability of secessionist conflict but not necessarily centrist conflict.

Some components of federalism (pluralism of local culture, fiscal decentralization) are expected to ease tensions, others (financial equalization) tend to make peaceful union harder to sustain. Our results also suggest that we should expect promising effects of policies encouraging melting pot societies, economic integration, as well as power-sharing. Further research on these issues is encouraged.

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Appendix A: Proofs

Proof of lemma 1:

In order to determine whether or not permanent conflict is an SP continuation path we need to check whether the winner will prefer to deviate from continued conflict and opt for secession. We now compute the value for i of being a winner and continuing with conflict, $\overline{V}_i^{cc}$, and compare it with the value of being a winner in the conflict and deviating by choosing secession, $\overline{V}_i^{cs}$. The value of being the loser is denoted by $\underline{V}_i^{cc}$.

$$\overline{V}_i^{cc} = \frac{S + N_i P_i - D - A}{N_i} + \delta \left\{ q\overline{V}_i^{cc} + (1-q)\underline{V}_i^{cc} \right\}, \text{ and}$$

$$\underline{V}_i^{cc} = 0 + \delta \left\{ q\overline{V}_i^{cc} + (1-q)\underline{V}_i^{cc} \right\}.$$

Solving, we obtain

$$\underline{V}_i^{cc} = \frac{\delta q}{1 - \delta(1-q)} \overline{V}_i^{cc},$$

and hence

$$\overline{V}_i^{cc} = \frac{1 - \delta(1-q)}{1-\delta} \left[\frac{S - D + N_i P_i - A}{N_i} \right]. \tag{33}$$

Now compute the value of being the winner and seceding $\overline{V}_i^{cs}$:

$$\overline{V}_i^{cs} = \frac{1}{1-\delta} \left(\frac{S_i + N_i P_i - A}{N_i} \right). \tag{34}$$

Therefore, i will prefer to continue the conflict rather than deviate and secede if

$$S_j - D \geq \delta(1-q)(S - D + N_i P_i - A). \tag{35}$$

Mutatis mutandis, the condition for j to continue conflict rather than deviate and secede is:

$$S_i - D \geq \delta q(S - D + N_j P_j - A). \tag{36}$$

Clearly, permanent conflict is an SP path following i's rejection of a proposal by j whenever (35) and (36) are both satisfied. The conditions in the lemma are a rewriting of these two conditions in more compact form, recalling also that our assumption that $D < \min\{S_i, S_j\}$ and $A < \min\{S_i, S_j\}$ implies that $1-a-d > 0$ and $1-2d > 0$. The non emptiness condition follows trivially.

QED.

Proof of lemma 2:

For player i the payoff from secession is exactly what we computed in (34), and should be larger than continuing conflict as in (33). In fact, player i triggers conflict and secedes after the first victory, knowing that j will always play conflict when inequality (5) is violated, that is, if

$$s > (1-d) - \delta(1-q)\left(1 - a - d + n\frac{P_i}{\sigma}\right).$$

We must now check the conditions under which player j will continue to play conflict even knowing that i will eventually secede. After a victory, the value of continuing conflict is

$$\overline{V}_j^{cc} = \frac{S - D + N_j P_j - A}{N_j} + \delta\left[(1-q)\overline{V}_j^{cc} + q\left(\frac{1}{1-\delta}\frac{S_j + N_j P_j - A}{N_j} - \frac{D}{N_j}\right)\right].$$

Therefore

$$\overline{V}_j^{cc} = \frac{1}{1-\delta(1-q)}\left[\frac{S - D + N_j P_j - A}{N_j} + \frac{\delta}{1-\delta}q\frac{S_j + N_j P_j - A - (1-\delta)D}{N_j}\right].$$

The value $\overline{V}_j^{cc}$ has to be greater than that of opting for secession after the first victory. That is

$$\overline{V}_j^{cc} \geq \overline{V}_j^{cs} = \frac{1}{1-\delta}\frac{S_j + N_j P_j - A}{N_j}.$$

This inequality simplifies to

$$S_i \geq D\,(1 + \delta q)\,. \tag{37}$$

That is

$$s > d(1 + \delta q).$$

QED.

Proof of Proposition 1:

In order for centrist conflict to be the unique SPE of the game, it must hold that the country parameters belong to the set **A**, where centrist conflict is subgame perfect after an initial conflict. Therefore, the following two conditions must be satisfied:

$$s \leq (1 - d) - \delta(1 - q)\left(1 - a - d + n\frac{P_i}{\sigma}\right)$$

and

$$s \geq d + \delta q\left[1 - a - d + (1 - n)\frac{P_j}{\sigma}\right]$$

Further, a necessary condition is that j is unwilling to compensate the opposition with fairness level λ_i^A, where λ_i^A is such that i is indifferent between the union and centrist conflict. That is, a necessary condition is that

$$V_j^U = \frac{(1 - \lambda_i^A n)(1 - a)\sigma + (1 - n)P_j}{(1 - \delta)(1 - n)} < V_j^A = \frac{(1 - q)\sigma}{(1 - \delta)(1 - n)}\left[1 - a - d + (1 - n)\frac{P_j}{\sigma}\right] \tag{38}$$

where

$$\lambda_i^A = \frac{q\left(1 - a - d + n\frac{P_i}{\sigma}\right)}{(1 - a)n}.$$

Substituting in, this necessary condition can be rewritten as

$$\frac{\sigma(1 - a) - (1 - a - d)q\sigma - qnP_i + (1 - n)P_j}{(1 - \delta)(1 - n)} < \frac{(1 - q)\sigma}{(1 - \delta)(1 - n)}\left[1 - a - d + (1 - n)\frac{P_j}{\sigma}\right]$$

which simplifies to

$$n > \frac{d + q\frac{P_j}{\sigma}}{q\left(\frac{P_i}{\sigma} + \frac{P_j}{\sigma}\right)}$$

Finally, we still need to check whether j would be willing to make a peaceful secession proposal, knowing that i would accept it. In such case, centrist conflict cannot be the SPE. In other words, if either i or j is better off under centrist conflict than under peaceful secession, it follows that centrist conflict is the unique SPE. Comparing the payoffs of both groups under peaceful secession and centrist conflict, we get:

$$V_i^S = \frac{nP_i + \sigma(s-a)}{n(1-\delta)} < V_i^A = \frac{q\sigma}{(1-\delta)n}\left(1-a-d+n\frac{P_i}{\sigma}\right)$$

which simplifies to

$$s < (1-q)\left(a - n\frac{P_i}{\sigma}\right) + q(1-d)$$

and

$$V_j^S = \frac{P_j(1-n) + (1-a-s)\sigma}{(1-\delta)(1-n)} < V_j^A = \frac{(1-q)\sigma}{(1-\delta)(1-n)}\left[1-a-d+(1-n)\frac{P_j}{\sigma}\right]$$

which simplifies to

$$s > d + q\left[1-a-d+(1-n)\frac{P_j}{\sigma}\right]$$

QED.

Proof of Proposition 3:

For the unique SPE to be one with conflict followed by secession the economy must be in **B**. Beside this necessary condition, the characterization requires the consideration of incentive compatibility conditions for the group in power. Recall that the conflict path B_i is such that i secedes in case of victory, while j prefers to keep playing conflict. This is the case whenever the two following conditions are satisfied:

$$s > (1-d) - \delta(1-q)\left(1-a-d+n\frac{P_i}{\sigma}\right) \text{ and}$$

$$s > d(1+\delta q).$$

Given that a sharing offer λ_i yields for i a present discounted value equal to $\lambda_i \frac{\sigma}{1-\delta}(1-a)$, the indifference condition between this and $V_i^{B_i}$ (the relevant expression for the $V_i(war)$ in $\mathbf{B_i}$) yields

$$\lambda_i^{B_i} = \frac{q\left(s-a+n\frac{P_i}{\sigma}\right)}{n(1-a)\left[1-\delta(1-q)\right]}$$

It must then be the case that j is unwilling to offer such an appeasing share:

$$V_j^U = \frac{(1-\lambda_i^{B_i}n)(1-a)\sigma + (1-n)P_j}{(1-\delta)(1-n)} < V_j^{B_i}$$

where

$$V_j^{B_i} = \frac{\sigma}{(1-n)[1-(1-q)\delta]}\left[q\frac{1-s-a+(1-n)\frac{P_j}{\sigma}}{1-\delta}+(1-q)\left[1-a+(1-n)\frac{P_j}{\sigma}\right]-d\right]$$

This condition simplifies to

$$n > \frac{[d(1-\delta)+aq]\,\sigma}{qP_i}$$

Finally, we know that in $\mathbf{B_i}$, i would accept a peaceful secession proposal. Therefore, for conflict followed by secession (by i) to be an equilibrium, it must hold that j is unwilling to make such a proposal:

$$V_j^S = \frac{P_j(1-n)+(1-a-s)\sigma}{(1-\delta)(1-n)} < V_j^{B_i}$$

which simplifies to

$$s > \frac{d}{1-q}$$

The other situation to consider is the one where the economy is in $\mathbf{B}\setminus\mathbf{B_i}$ where j secedes in case of victory, while i prefers to keep playing conflict. This is the case whenever the two following conditions are satisfied:

$$s < d+\delta q\left[1-a-d+(1-n)\frac{P_j}{\sigma}\right]$$

and

$$s < 1-d-\delta(1-q)d.$$

Given that a sharing offer λ_i yields for i a present discounted value equal to $\lambda_i\frac{\sigma}{1-\delta}(1-a)$, the indifference condition between this and $V_i^{B_j}$ (the relevant expression for the $V_i(war)$ in $\mathbf{B}\setminus\mathbf{B_i}$) yields

$$\lambda_i^{B_j} = \frac{(1-\delta q)\left(1-a+n\frac{P_i}{\sigma}\right)-(1-q)(1-s)-(1-\delta)d}{(1-a)(1-\delta q)n}$$

It must then be the case that j is unwilling to offer such an appeasing share:

$$V_j^U = \frac{(1-\lambda_i^{B_j}n)(1-a)\sigma+(1-n)P_j}{(1-\delta)(1-n)} < V_j^{B_j} = \frac{(1-q)\sigma\left[1-s-a+(1-n)\frac{P_j}{\sigma}\right]}{(1-n)(1-\delta)(1-q\delta)}$$

which simplifies to

$$n > \frac{(1-q)a + (1-\delta)d + (1-\delta)q\frac{P_j}{\sigma}}{(1-\delta)q\frac{P_j}{\sigma} + (1-\delta q)\frac{P_i}{\sigma}}$$

Finally, we know that in $\mathbf{B} \setminus \mathbf{B_i}$, j prefers a peaceful secession to conflict. Therefore, in order for conflict followed by secession (by j) to be an equilibrium, it must hold that i is unwilling to accept a peaceful secession proposal:

$$V_i^S = \frac{nP_i + \sigma(s-a)}{n(1-\delta)} < V_i^{B_j}$$

where

$$V_i^{B_j} = \frac{1}{(1-\delta q)n}\left[q[(1-a)\sigma + nP_i] + (1-q)\frac{(s-a)\sigma + nP_i}{1-\delta} - d\sigma\right]$$

This condition simplifies to

$$s < 1 - \frac{d}{q}$$

QED.

Proof of Proposition 5:

For peaceful secession to be the equilibrium outcome, three conditions must be satisfied: [i] the opposition i must be willing to accept a peaceful secession proposal; [ii] the group in power j must prefer peaceful secession to conflict; [iii] the group in power j must prefer peaceful secession to a union with the lowest incentive compatible fairness level. Observe that peaceful secession may occur under any of the conflict paths A, B_i or B_j. Accordingly, we have to examine the above three conditions for each path separately.

Suppose we are in the set of parameters such that conflict path $X = A, B_i, B_j$ is SP. In such case, the opposition i would accept a peaceful secession proposal whenever $V_i^S > V_i^X$ (observe that the latter condition is always satisfied when the country parameters are in the set $\mathbf{B_i}$). Then, the group in power j prefers peaceful secession to the underlying conflict if and only if $V_j^S > V_j^X$ (observe that the latter condition is always satisfied when the country parameters are in the set $\mathbf{B} \setminus \mathbf{B_i}$). Finally, the group in power j prefers peaceful secession to a union with fairness level λ_i whenever $V_j^S > V_j^U(\lambda_i^X)$.

Suppose we are in set $\mathbf{A}$, which holds when the two following conditions are satisfied:

$$s \leq (1-d) - \delta(1-q)\left(1 - a - d + n\frac{P_i}{\sigma}\right)$$

and

$$s \geq d + \delta q \left[1 - a - d + (1-n)\frac{P_j}{\sigma}\right]$$

For peaceful secession to be the SPE, it must hold that the opposition i would accept a peaceful secession proposal:

$$V_i^S = \frac{nP_i + \sigma(s-a)}{n(1-\delta)} > V_i^A = \frac{q\sigma}{(1-\delta)n}\left(1 - a - d + n\frac{P_i}{\sigma}\right)$$

This condition simplifies to

$$s > (1-q)\left(a - n\frac{P_i}{\sigma}\right) + q(1-d)$$

Then, it must hold that the group in power j prefers peaceful secession to conflict of type A:

$$V_j^S = \frac{P_j(1-n) + (1-a-s)\sigma}{(1-\delta)(1-n)} > V_j^A = \frac{(1-q)\sigma}{(1-\delta)(1-n)}\left[1 - a - d + (1-n)\frac{P_j}{\sigma}\right]$$

which simplifies to

$$s < d + q\left[1 - a - d + (1-n)\frac{P_j}{\sigma}\right]$$

Finally, the group in power j must prefer peaceful secession to a union with fairness level λ_i^A:

$$V_j^S = \frac{P_j(1-n) + (1-a-s)\sigma}{(1-\delta)(1-n)} > V_j^U = \frac{(1-\lambda_i^A n)(1-a)\sigma + (1-n)P_j}{(1-\delta)(1-n)}$$

which simplifies to

$$s < q\left(1 - a - d + \frac{nP_i}{\sigma}\right)$$

Suppose we are in set $\mathbf{B_i}$, which holds when the two following conditions are satisfied:

$$s > (1-d) - \delta(1-q)\left(1 - a - d + n\frac{P_i}{\sigma}\right) \text{ and}$$
$$s > d(1 + \delta q).$$

For peaceful secession to be the SPE, it must hold that the group in power j prefers peaceful secession to conflict of type B_i:

$$V_j^S = \frac{P_j(1-n) + (1-a-s)\sigma}{(1-\delta)(1-n)} > V_j^{B_i}$$

which simplifies to

$$s < \frac{d}{1-q}$$

Finally, the group in power j must prefer peaceful secession to a union with fairness level $\lambda_i^{B_i}$:

$$V_j^S = \frac{P_j(1-n) + (1-a-s)\sigma}{(1-\delta)(1-n)} > V_j^U = \frac{(1-\lambda_i^{B_i} n)(1-a)\sigma + (1-n)P_j}{(1-\delta)(1-n)}$$

which simplifies to

$$s < \frac{q\left(n\frac{P_i}{\sigma} - a\right)}{(1-\delta)(1-q)}$$

The last situation to consider is the one where the economy is in $\mathbf{B} \setminus \mathbf{B_i}$. This is the case whenever the two following conditions are satisfied:

$$s < d + \delta q \left[1 - a - d + (1-n)\frac{P_j}{\sigma}\right]$$

and

$$s < 1 - d - \delta(1-q)d.$$

For peaceful secession to be the SPE, it must hold that the opposition i prefers peaceful secession to conflict of type B_j:

$$V_i^S = \frac{nP_i + \sigma(s-a)}{n(1-\delta)} > V_i^{B_j}$$

which simplifies to

$$s > 1 - \frac{d}{q}$$

Finally, the group in power j must prefer peaceful secession to a union with fairness level $\lambda_i^{B_j}$:

$$V_j^S = \frac{P_j(1-n) + (1-a-s)\sigma}{(1-\delta)(1-n)} > V_j^U = \frac{(1-\lambda_i^{B_j} n)(1-a)\sigma + (1-n)P_j}{(1-\delta)(1-n)}$$

$$s < 1 + \frac{(1-\delta q)\left(\frac{nP_i}{\sigma} - a\right) + \delta d}{(1-\delta)q}$$

QED.

Appendix B: Empirics

Data

For our empirical investigation we draw on a series of existing datasets at the ethnic group level, i.e. the unit of observation is an ethnic group g, in a country i and a year t. We follow the overall inclusion criteria of the "GrowUp" dataset (Girardin et al., 2019), which "covers the ethnic groups from all countries in the period 1946 - 2017 that meet the following criteria: (i) Administered by an intact sovereign state, i.e. overseas colonies and failed states are not included; (ii) Population in 1990 is greater than or equal to 500'000 inhabitants".[30] We include all ethnic groups that are not the leading, most powerful group, labelled l, in a given country and year. We draw on the information in GrowUP data on the "status" of a given group and define as most powerful group the one with the highest power status (i.e. as measured by the variable "status pwrrank"). When more than one ethnic group has the highest power status (e.g. with two "senior partner" groups), we define as most powerful the one with the largest size (note that groups with the highest power status but being of smaller size than their government partner –and hence not defined as the most powerful group l– correspond to 7 percent of the sample.

To measure secessionist and non-secessionist group-level conflict (i.e. the centrist conflict in our model that never ends in secession) we rely on the dummy variables "incidence terr flag" and "incidence gov flag", respectively (data also available in GrowUP).

As far as the main explanatory variables of interest are concerned, we draw on language tree data from the Ethnologue (Lewis et al., 2019) to construct proxies for preference similarity (as discussed in depth in the main text). Further, our model's variable n is given by the variable "groupsize" which is defined as "this group's population size as a fraction of the country's total population", which again is available in GrowUP.

Additional Tables

Below we shall include several robustness tables for the empirical analysis. In particular, Table 4 replicates baseline Table 1, but controlling for the lagged dependent variable. This

[30] We download the main original datasets on the 19 November 2019 through the GrowUp system.

yields very similar results. Table 5 below again replicates baseline Table 1, but controlling for group fixed effects combined with year fixed effects. Due to the very limited time variation in our explanatory variable of interest, we expect much weaker results in the presence of group fixed effects, which is indeed what we find.

Finally, Table 6 replicates the main results on patience from Table 3 when controlling for the lagged dependent variable. We still find that patience reduces the risk of centrist conflict.

Table 4: Preference similarity and secessionist conflict – lagged dependent variable

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Secessionist conflict							
Same language (t-1)	-0.0033*	-0.0031*			-0.4116***	-0.2477*		
	(0.0019)	(0.0018)			(0.1320)	(0.1381)		
Nr. joint lang. nod. (t-1)			-0.0001	-0.0001			-0.0308***	-0.0202***
			(0.0001)	(0.0001)			(0.0064)	(0.0071)
Sample	Full	Full	Full	Full	Confl.	Confl.	Confl.	Confl.
Country fixed effect	Yes	No	Yes	No	Yes	No	Yes	No
Year fixed effect	Yes	No	Yes	No	Yes	No	Yes	No
Country-year fixed eff.	No	Yes	No	Yes	No	Yes	No	Yes
Observations	38613	37495	38613	37495	1459	844	1459	844
R-squared	0.664	0.724	0.664	0.724	0.855	0.931	0.862	0.935

Note: Panel with an observation being the ethnic-group year, covering 892 ethnic groups and the years 1946-2017. All explanatory variables lagged by one year. OLS estimations in all columns. In all columns we control for the lagged dependent variable at t-1. Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

Table 5: Preference similarity and secessionist conflict – group fixed effects

Dependent variable:	(1)	(2)	(3)	(4)
	Secessionist conflict			
Same language (t-1)	-0.0197		0.0046	
	(0.0197)		(0.0112)	
Nr. of joint language nodes (t-1)		-0.0011		-0.0128**
		(0.0010)		(0.0061)
Sample	Full	Full	Conflicts	Conflicts
Group fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Observations	38611	38611	1443	1443
R-squared	0.369	0.369	0.919	0.919

Note: Panel with an observation being the ethnic-group year, covering 892 ethnic groups and the years 1946-2017. All explanatory variables lagged by one year. OLS estimations in all columns. Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

Table 6: Patience and centrist conflict – lagged dependent variable

Dependent variable:	(1)	(2)	(3)	(4)
	Endless conflict			
Patience	-0.027***	-0.014	-0.225**	-0.164**
	(0.010)	(0.011)	(0.101)	(0.081)
Data structure	Panel			
Sample	All observations		Only conflicts	
Year fixed effect	Yes	Yes	Yes	Yes
Continent FE and Controls	No	Yes	No	Yes
Observations	4433	3893	881	779
R-squared	0.659	0.649	0.636	0.687

Note: Panel with an observation being the country year, covering 77 countries and the years 1946-2017. Control variables include lagged population and ethnic fractionalization. Lagged dependent variable include on the right hand side in all columns. OLS estimations in all columns. Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.