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Stay, Split or Strike: Theory and Evidence on Secessionist vs Centrist Conflict*

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Abstract

This paper proposes an integrated simple theory of bargaining and conflict between ethnic groups, delivering novel predictions on secessionist versus centrist conflict, and confronting them to the data. We find that greater size of the opposition ethnic groups reduces the likelihood of peaceful union with respect to secessionist and centrist conflict, and that cultural preference similarity decreases the risk of secessionist conflict with respect to centrist conflict and with respect to union. Finally, we show that greater patience increases the likelihood of secessionist conflict with respect to centrist conflict.

Keywords: Secessions, Conflict, Group Sizes, Preference Similarities, Patience, Secessionist Conflict, Centrist Conflict.

JEL codes: C72, D74.

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1 Introduction

What explains conflicts followed by secessions? What characterizes such outcomes as equilibrium phenomena in spite of their 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 group identity, group size, group level productivity, discounting of future and costs of conflict vs economies of scale.

We consider a country with two groups that can differ in size, economic productivity, and strength. 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 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 where ethnic identity or alike determine the existence of a non-transferable utility of power.¹ We fully characterize the conditions under which the two types of inefficient equilibrium path obtain: a centrist conflict is one where the groups fight for power or control in the country; a secessionist conflict is one where one group simply wants to secede but the other doesn't want to let go.

In a one-shot static model it would be impossible to accommodate secessionist conflict incentives properly, because, conditional on winning, there is just one winning payoff. Thus, we introduce the simplest model in which the two types of conflict incentives can be disentangled, i.e., a two-period game with discounting. In this way the incentives of opposition groups may differ from context to context in terms of what they expect to do in the future conditional on victory in the first period conflict. We assume that in each period the group in power can make a proposal on how to distribute the divisible surplus in that period, with no commitment on the future, but we also allow the group in power to choose unilaterally to secede. Hence a secessionist conflict can only happen when it is the opposition group that would want secession while the group in power prefers to keep the union. Intuitively, this

¹See Benabou and Tirole (2009) for a similar reason for bargaining breakdown.

type of conflict can happen in equilibrium if the share of the divisible surplus that would appease the opposition is either not feasible or too high for the group in power to decide to offer it, and this bargaining failure is the more likely the greater is the non-transferable utility of power for the opposition. Given that the non-transferable utility of power cannot be “consumed” during a period of conflict, also the discount factor matters as a parameter, on top of the cost of conflict and the cost of running a new state.

Beside characterizing necessary and sufficient conditions for centrist and secessionist conflict to occur, we provide novel predictions on what makes the relative risk of secessionist conflict vs centrist conflict change. In particular, we show that the higher is the patience parameter and the identity value of power for the opposition group, the larger is the ratio of the two “risks” – i.e., the ratio of the space of the other parameters making secessionist conflict occur over the space of parameters under which centrist conflict can occur becomes larger. We then provide new evidence about these novel predictions, together with additional empirical correlations that are in line also with our predictions on the role of population size and relative productivity of groups.

For the empirics 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, 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. Second, 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 and union, finding indeed strong empirical support. Third, we also provide evidence in line with our setting’s implication that higher levels of patience are associated to more frequent secessionist conflict compared to centrist conflict. Finally, we discuss some policy recommendations inspired by our model’s predictions.

2 Related literature

Excellent reviews of the literature on secessionism are provided in Bolton et al. (1996), Alesina and Spolaore (2003), and Spolaore (2014). A 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.² 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

²See e.g., Friedman (1977), Buchanan and Faith (1987), Barro (1991) and Desmet et al. (2011).

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 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.³ 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.⁴ 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.⁵

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. 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. In contrast, our setup is dynamic, it includes the option of compensating transfers and allows for the groups having different productivities per capita.⁶ 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

³See also Flamand (2015).

⁴Related to this, Bordignon and Brusco (2001) analyze whether constitutions should include provisions for agreed potential secessions.

⁵Our 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).

⁶Flamand (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.

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

Our two-period model of bargaining generates novel predictions on secessionist vs centrist conflict that could not be obtained in a static setup, taking into account all endogenously feasible compensating transfers.⁷ 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 differential 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 Model

Consider a country with two ethnic groups, i and j , with population size N_i and N_j , $N_i + N_j = N$. Initially one group is in “power”, say j , while the other is in opposition. They produce in each Period a total surplus of value 1, with contributions respectively equal to s and $(1 - s)$, $s \in (0, 1)$. The group in power decides the allocation of the surplus with shares x and $1 - x$ respectively, $x \in (0, 1)$. In addition to this, the members of the group in power also benefit from a psychological payoff deriving from being in power. This is a non-transferable (public good) utility from the *peaceful* exercise of power, which relates for example to the group specific language, culture, legislation, government-favored religion. We shall denote by P this additional utility for group i members if group i obtains power, normalizing the power utility of j members to zero. In other words, we are assuming that the group in opposition has a stronger emotional motivation than the group in power, and we are interested in the effects of the differential utility P .

There are two Periods. In Period 1 the group in power j can either propose a union with share x or secede unilaterally, in which case the game ends. The opposition group i can either accept the proposal x or challenge it and onset conflict. If the opposition accepts, the transfer x is carried out and group j enters the second period holding power over the union. If group i decides to challenge the proposal, conflict ensues, groups face a stochastic outcome

⁷Morelli and Rohner (2015) allow for both centrist and secessionist conflict in a static model where concentration of resources and geographical group concentration matter, showing that the situations where most oil revenues accrue in minority regions are the ones with highest conflict risk. However, in that static model the two types of conflict played the role of multiple outside options in bargaining, but no characterization of parametric conditions for the two types of conflict to occur in equilibrium could be given.

with win probability q for player i , and both groups have to bare a cost of conflict d . At the end of Period 1 we shall have either j in power –because the proposal was accepted or because j was the winner in the conflict– or i in case there was conflict and i won. When facing Period 2, whichever group ends up being in power, can either: (i) propose to the opposition a distribution of surplus in the union, offering a share $x \in (0, 1)$, or (ii) secede unilaterally. If the opposition accepts the union surplus distribution proposal, this is implemented, and the game ends. In case group i made the proposal and that proposal is accepted, they in addition experience a utility of P from the public good. If the victorious group decides to secede, each group keeps the own produced surplus, s and $1 - s$, and both have to bear the cost of creating a new state, worth a in addition to the base cost (normalized to zero). This additional cost a is intended to capture the standard economies of scale motive for union. Finally, group i 's members also enjoy P under secession. In sum, this is a two-Period Stackelberg game in which in each period the group in power acts as the leader.

The timeline is as follows:

1. *Production*: The game starts with group j in power; output is produced, and surplus is obtained.
2. *Proposal*: In Period 1, the group in power makes one of two possible moves: [i] union, proposing a distribution of the surplus with x ; [ii] unilateral secession. In the latter case, there is no further interaction.
3. *Peace or conflict*: The opposition can either accept or challenge the proposal x . If it is accepted, it is carried out; if it is challenged, conflict follows and each group bears the associated cost d .
4. *Exercise of power*. Period 1: [i] If there is peace —and thus j remains in power— the announced distribution of the surplus x is carried out in Period 1. In Period 2, j faces the same choices as in Period 1. [ii] If there is conflict because x has been rejected the win probabilities are q and $1 - q$, each player has a loss of d , the winner grabs the entire surplus and enters Period 2 as the group in power. Finally, if j decides to secede, the union splits at cost a for each new (smaller) state, and each take their own produced surplus.

We follow the standard practice of solving backwards. We start by computing the per capita payoffs of Period 2 for each possible strategic choice: conflict C_h , secession S_h , and union U_h , $h = i, j$. The payoffs are

$$C_i = \frac{q - d}{N_i} \text{ and } C_j = \frac{1 - q - d}{N_j}. \quad (1)$$

$$S_i = \frac{s - a}{N_i} + P \text{ and } S_j = \frac{1 - s - a}{N_j}. \quad (2)$$

$$\text{If } j \text{ in power } U_i^j = \frac{q - d}{N_i} \text{ and } U_j^j = \frac{1 - q + d}{N_j} \text{ and} \quad (3)$$

$$\text{if } i \text{ in power } U_i^i = \frac{q + d}{N_i} + P \text{ and } U_j^i = \frac{1 - q - d}{N_j}.$$

Notice that U_i^j and U_j^i have been computed so as to be acceptable to the opposition (keeping them indifferent with respect to triggering conflict).

The following result on the chosen strategies in Period 2 immediately follows from inspection of the payoffs above.

Lemma 1 *1. In period 2 neither group will choose to play conflict because an acceptable union is strictly preferred to conflict by each group, $U_h^h > C_h$ and $U_k^h \geq C_k$ for $h, k = i, j$.*

2. Union vs Secession: Player j prefers union to secession if and only if $a + d + [(1 - q) - (1 - s)] = a + d + s - q \geq 0$ and Player i prefers union to secession if and only if $a + d + [q - s] \geq 0$.

With the first observation that either player would prefer to play union rather than conflict, Lemma 1 implies that repeated conflict for the conquest of power is not an equilibrium strategy. As for the second union vs secession comparison in the lemma, observe that $[q - s]$ and $[(1 - q) - (1 - s)]$ are the difference between the surplus grabbed in conflict and the surplus obtained by secession by players i and j , respectively. Therefore, if the strength of the opposition q exactly matches the relative productivity of the opposition s , both players prefer union over secession. Consequently, in this case in the second period there could not be secession either. It follows that for anything other than accepted union to prevail in the second period there needs to be a sufficiently large mismatch between the relative strength and the relative productivity of the opposition group.⁸

We now address the strategic choices in Period 1. We have already shown that permanent conflict cannot be an equilibrium. We have the following potential equilibria: [i] secessionist conflict, [ii] centrist conflict, [iii] peaceful union both periods, [iv] unilateral secession by the group initially in power j , and [v] peaceful union followed by secession. Note that the initial “secession” by j could and should be interpreted as opting for a federal decentralized

⁸The intuition is the following. If q is large $1 - q$ is low and hence the compensation needed to appease player j would be small too, thus making union be preferable to secession. But if s is sufficiently large then player i prefers secession. A similar argument works for player j .

organization of the State, free of costly conflict. Further, regarding [v], it is easy to show that j is better off appeasing i with a transfer in the second period rather than seceding if and only if $q - s < a + d$. We will assume this condition holds throughout.

Let us be more precise on the types of conflict. We define a conflict strategy as *secessionist* if one of the players secedes in Period 2 in case of victory.⁹ We say that a conflict is *centrist* when the strategy played by the two groups consists of proposing union in Period 2. This is a case in which the union is not questioned and the conflict is on who exercises the central power.

3.1 Centrist conflict

We have established that centrist conflict can only consist in conflict in Period 1 followed by union in Period 2. We still need the following two conditions for conflict to be of the centrist type:

1. If i wins the conflict, i chooses to appease j with per capita transfer $\frac{1-q-d}{N_j}$ rather than seceding in the second period, which boils down to

$$q > s - a - d$$

2. If j wins the conflict, j chooses to appease i with per capita transfer $\frac{q-d}{N_i}$ rather than seceding in the second period. Since j can secede unilaterally in Period 1, it is easy to show that the threat of secession after victory by j is not credible. More precisely, it holds that if q is high enough so that j would secede after victory (i.e., $q - s > a + d$), then j is better off seceding unilaterally in Period 1. In any case, since we assume that $q - s < a + d$, j is better off appeasing i in the second period than seceding.

Therefore, we have:

Lemma 2 *A conflict triggered in Period 1 is of the centrist type if and only if $q > s - a - d$.*

The payoff from conflict for i and j are given respectively by

$$CC_i = q \left[\frac{1}{N_i} + \delta \left(P + \frac{1 - (1 - q) + d}{N_i} \right) \right] + (1 - q) \delta \left(\frac{q - d}{N_i} \right) - \frac{d}{N_i}$$

$$CC_j = (1 - q) \left[\frac{1}{N_j} + \delta \left(\frac{1 - q + d}{N_j} \right) \right] + q \delta \left(\frac{1 - q - d}{N_j} \right) - \frac{d}{N_j}$$

⁹Note that when the secessionist player is defeated by the group in power we shall have an aborted conflictual secession.

If j offers x to i and i accepts then i obtains

$$X_i = \frac{x}{N_i} + \delta \left(\frac{q-d}{N_i} \right).$$

Thus i can be appeased if the following transfer is feasible:

$$x_c = N_i C C_i - \delta(q-d)$$

i.e.,

$$x_c = q[1 + \delta(N_i P + 2d)] - d$$

The transfer x_c is feasible if and only if it is smaller than 1, hence we have:

Lemma 3 *A sufficient condition for centrist conflict when a is sufficiently large is*

$$P > \frac{1+d-q}{\delta N_i q} - \frac{2d}{N_i} \quad (4)$$

If a is sufficiently large so that secession is not a viable option, centrist conflict is the equilibrium whenever the transfer x_c is not feasible. Conversely, when (4) is violated and hence the appeasing transfer is feasible, then conflict occurs anyway when the group in power is worse off keeping the union with transfer x_c than playing conflict, that is, if C_j is greater than

$$X_j = \frac{1-x_c}{N_j} + \delta \left(\frac{1-q+d}{N_j} \right).$$

and we have that $C_j > X_j$ if and only if

$$P > P_C \equiv \frac{2d}{\delta N_i q} \quad (5)$$

Putting the above conditions together, we have the following proposition:

Proposition 1 *When a is sufficiently large so that secession is not a viable option, there is centrist conflict if and only if $P > \min \left\{ \frac{1+d-q}{\delta N_i q} - \frac{2d}{N_i}, \frac{2d}{\delta N_i q} \right\}$. Otherwise there is union.*

Figure 1 depicts the different equilibria when a is high enough so that secession is not a viable option, for $d = 0.1$, $N_i = 1$ and $\delta = 0.6$. As can be seen from the figure, conflict is more likely the greater both P and q , and the feasibility constraint is binding only for q close to 1. Further, both constraints move downwards as N_i increases, thereby increasing the centrist conflict equilibrium area. Indeed, as the transfer x_c is increasing in N_i , it makes union both

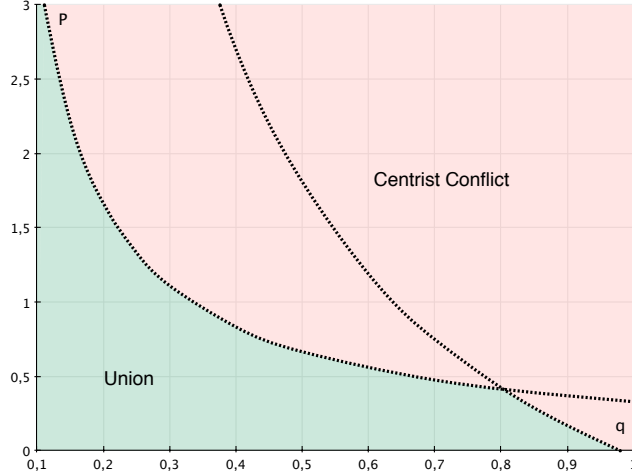


Figure 1: Equilibria when there can be no secession ($d = 0.1$, $\delta = 0.6$, $N_i = 1$)

less attractive and less likely to be feasible. Finally, observe that an increase in the discount factor δ also increases the likelihood of conflict by shifting both curves downwards, for the same reason. Indeed, a higher discount factor implies that i needs a greater compensation for what they could enjoy in the second period would they win the conflict (mainly P).

Suppose now that a falls within the range where j might contemplate unilateral secession in Period 1, under the threat of centrist conflict. j 's payoff from unilateral secession is given by

$$SS_j = \left(\frac{1 - s - a}{N_j} \right) (1 + \delta)$$

Consider first the situation where neither (4) nor (5) are satisfied, and so we know that conflict won't be triggered in Period 1. In this case, there is unilateral secession whenever j prefers secession to union, that is, if and only if

$$P > \frac{(1 + \delta)(s - q + d + a)}{\delta q N_i} - \frac{2d}{N_i} \quad (6)$$

Finally, if either (4) or (5) is satisfied, so that union is not possible, there is unilateral secession whenever j prefers secession to conflict, that is, if and only if

$$q > \frac{(1 + \delta)(a + s) - d(1 - \delta)}{1 + \delta(1 + 2d)} \quad (7)$$

Observe that the choice between unilateral secession and conflict from j 's perspective does not depend on either P or N_i . Indeed, the influence of those two variables on the final equilibrium comes from their effect on the transfer x_c , which is irrelevant in the comparison of j 's payoffs from unilateral secession and conflict.

Proposition 2 *Suppose that $q > s - a - d$ so that conflict is of the centrist type. Then we have:*

1. *Centrist conflict if $P > \min \left\{ \frac{1+d-q}{\delta N_i q} - \frac{2d}{N_i}, \frac{2d}{\delta N_i q} \right\}$, and $q < \frac{(1+\delta)(a+s)-d(1-\delta)}{1+\delta(1+2d)}$.*

2. *Unilateral secession if*

- *$P > \min \left\{ \frac{1+d-q}{\delta N_i q} - \frac{2d}{N_i}, \frac{2d}{\delta N_i q} \right\}$ and $q > \frac{(1+\delta)(a+s)-d(1-\delta)}{1+\delta(1+2d)}$, or*
- *$P < \min \left\{ \frac{1+d-q}{\delta N_i q} - \frac{2d}{N_i}, \frac{2d}{\delta N_i q} \right\}$ and $P > \frac{(1+\delta)(s-q+d+a)}{\delta q N_i} - \frac{2d}{N_i}$*

3. *Union otherwise.*

3.2 Secessionist conflict

Now consider that for a not too large it could be that i 's binding outside option is to fight in order to be able to secede. For this to be the case, it must be that conditional on winning i has a higher payoff from secession than from keeping power and offering per capita transfer $\frac{1-q-d}{N_j}$ to appease j . This inequality boils down to

$$q < s - a - d \tag{8}$$

Therefore, we have:¹⁰

Lemma 4 *A conflict triggered in Period 1 is of the secessionist type if and only if $q < s - a - d$.*

The conflict payoff of i is now given by

$$CS_i = q \left[\frac{1}{N_i} + \delta \left(\frac{s-a}{N_i} + P \right) \right] + (1-q)\delta \left(\frac{q-d}{N_i} \right) - \frac{d}{N_i}$$

If (8) holds, following the same steps as above, the transfer that j would have to give to i to appease her is

$$x_s = q[1 + \delta(s - a + N_i P - q + d)] - d$$

And thus the transfer is feasible if and only if

$$P < \frac{1 + d - q[1 + \delta(s - a - q + d)]}{q\delta N_i} \tag{9}$$

¹⁰Recall that we already established that (i) the best option in Period 2 for both players is to appease the other player rather than playing conflict, (ii) there can be no secession in Period 2 if there is union with x in Period 1, and (iii) player j never wants to secede after winning a conflict.

Thus, if (9) is violated but (8) holds, we have secessionist conflict or unilateral secession in Period 1, depending on the choice of j (and knowing that if there is a conflict, i would secede after victory).

The conflict payoff of j is given by

$$CS_j = (1 - q) \left[\frac{1}{N_j} + \delta \left(\frac{1 - q + d}{N_j} \right) \right] + q\delta \left(\frac{1 - s - a}{N_j} \right) - \frac{d}{N_j}$$

Therefore, we have that $CS_j > SS_j$ if and only if

$$\delta > \frac{s + a - d - q}{(1 - q)(q - a - d - s)} \quad (10)$$

which is always satisfied, and thus j always prefers conflict to unilateral secession.¹¹

Finally, if the transfer is feasible so that (9) holds, we have secessionist conflict in equilibrium whenever j prefers conflict to union, which simplifies to

$$P > P_S \equiv \frac{2d}{\delta q N_i} + \frac{2a}{N_i} \quad (11)$$

Putting the above conditions together, we have the following result:

Proposition 3 *Suppose that $q < s - a - d$ so that conflict risk is of the secessionist type. Then the equilibrium is conflict if and only if*

$$P > \min \left\{ \frac{1 + d - q[1 + \delta(s - a - q + d)]}{q\delta N_i}, \frac{2d}{\delta q N_i} + \frac{2a}{N_i} \right\}$$

Otherwise, the equilibrium is union.

Observe that the effect of the opposition group's size is the same as in the case of centrist conflict: as the transfer x_s necessary to appease group i is increasing in N_i , a more numerous opposition implies that union is relatively less attractive compared to secessionist conflict, and also less likely to be feasible. Therefore, the secessionist conflict equilibrium area increases accordingly.

Figure 2 depicts the different equilibria for $s = 0.8$, $d = 0.1$, $N_i = 1$ and $\delta = 0.6$, for $a = 0.1$ (panel a) and $a = 0.4$ (panel b). For $a = 0.1$, conflict is of the secessionist type for $q < 0.6$, and conflict occurs when (11) is satisfied (the feasibility constraint is not binding). $P < 1$ is enough to generate secessionist conflict when q is roughly greater than 0.4. As conflict is always chosen over unilateral secession in this area, the only two possible equilibria for $q < 0.6$ are secessionist conflict and union. For $q > 0.6$, we have union for P

¹¹This would still hold for small positive public good value of power also for j .

low enough (roughly 0.5). Above this value, there is centrist conflict for q on the left of the vertical bar (roughly 0.8) and unilateral secession on the right of the vertical bar.

As a increases to 0.4, the picture is significantly altered. First, unilateral secession as an equilibrium disappears. Second, the area of secessionist conflict is sharply reduced, for two reasons: (i) the threat is secessionist conflict for $q < 0.3$, and (ii), the threshold for P has increased (the feasibility constraint keeps being non-binding). Third, the area of centrist conflict has dramatically increased, and includes most of the parameter space for $q > 0.3$. Finally, as in panel (a), union is the equilibrium for P and q low enough.

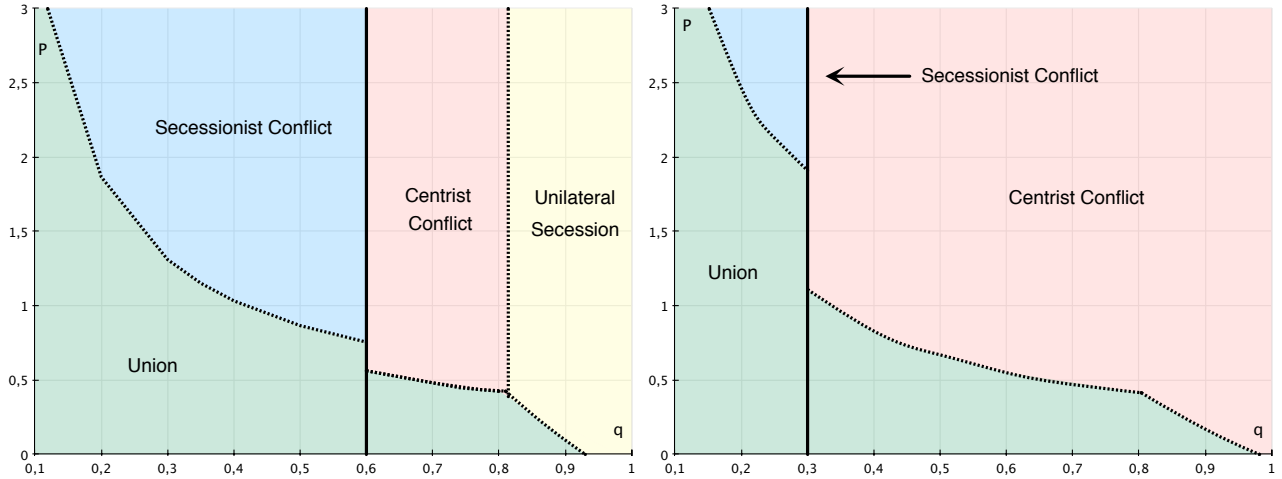


Figure 2: Equilibria ($s = 0.8$, $d = 0.1$, $\delta = 0.6$, $N_i = 1$, $a = 0.1$ (panel a) and $a = 0.4$ (panel b))

3.3 Centrist vs secessionist conflict

In this section, we determine the effect of the different parameters on the relative likelihood of centrist conflict with respect to secessionist conflict.

Consider the population size N_i . We know that an increase in the size of the opposition increases the required transfer to maintain the union, which makes both types of conflict more likely. Consider the two thresholds for P above which the group in power prefers conflict to union, for both types of conflict, P_C and P_S . For $a = 0$, we have that $P_C = P_S$, while for $a > 0$ we have that $P_S > P_C$. That means that for $a > 0$, the curve above which there is secessionist conflict (on the left of $q = s - a - d$) lies above the curve above which there is centrist conflict (on the right of $q = s - a - d$). Further, observe from the expression of P_S that for q sufficiently small, the equilibrium is always union. In turn, this means that if q is unknown, and provided that we start at a situation where $P > P_C$, an increase in

N_i should translate into a higher relative likelihood of secessionist conflict with respect to centrist conflict.

Second, consider now the power utility of the opposition P , an increase of which also makes both types of conflict more likely. Following the same reasoning as above, a higher P should translate into a higher relative likelihood of secessionist conflict with respect to centrist conflict.

Third, an increase in the discount factor δ also has different effects. On the one hand, it makes both centrist and secessionist conflict more likely, by shifting downwards both the feasibility constraints for x_s and x_c and the ones such that the group in power prefers conflict to union under such transfer. On the other hand, an increase in δ makes centrist conflict more attractive than unilateral secession for the group in power if and only if $1 - a + d - s > 0$. Following the same reasoning as above, a higher δ should translate into a higher relative likelihood of secessionist conflict with respect to centrist conflict. All the above can be summarized in the next proposition:

Proposition 4 *Let $P > P_C$ and the probability of victory of the opposition q be unknown. An increase in the discount factor δ or the power utility of the opposition P both increase the relative likelihood of secessionist conflict with respect to centrist conflict.*

The relative productivity of the opposition s has two main effects. On the one hand, it increases the area for which conflict is of the secessionist type, thereby increasing the relative likelihood of this type of conflict. On the other hand, it increases the relative attractiveness of centrist conflict with respect to unilateral secession from the perspective of j (condition (7)). That is, there are two effects going in opposite direction regarding the probability of centrist conflict. Finally, observe that an increase in s also make secessionist conflict more likely by shifting down the feasibility constraint for the transfer x_s .

4 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 three results of our theoretical framework:

1. Greater size of the opposition (N_i) reduces the likelihood of union with respect to secessionist and centrist conflict (Propositions 1, 2 and 3);
2. Cultural preference similarity (i.e., low P) decreases the risk of secessionist conflict with respect to centrist conflict and with respect to union (Propositions 3 and 4);

3. Patience (δ) increases secessionist conflict with respect to centrist conflict (Proposition 4).

In what follows, we shall examine these three predictions in turn.

4.1 Group size and peaceful union

A prediction of our theory is that an increase in the population size of the opposition N_i for a fixed N makes all types of conflict weakly more likely in expectation, as compared to peaceful union. To the best of our knowledge this implication has not yet been tested empirically for a global sample, with the exception of the pooled panel analysis Cederman et al (2009).¹² 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, and it has been found in the literature that ethnic polarization is a major driver of conflict (see Montalvo and Reynal-Querol, 2005; and Esteban, Mayoral and Ray, 2012, while the latter show that also ethnic fractionalization displays a statistically significant (albeit substantially smaller) association with conflict). Overall, 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 may be very costly, so peaceful union could be more easily sustained. In addition, an opposition 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.

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. In what follows, we perform a systematic investigation. We shall start with providing 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), and 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.¹³

¹²Cederman et al (2009) have results similar to ours on this matter. One main difference is that –contrary to them– we include country-year and group fixed effects in our estimation, which means that our statistical identification comes from within-country-year / within-group variation only.

¹³Groups 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.

Given that our theory contains predictions on the relative likelihood of the opposition group i to trigger secessionist conflict compared to other options, 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.

We define the outcome variable "peaceful union" as the absence of (any type of) conflict and the absence of accepted secession.¹⁴ 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 to remain 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 filters out time-invariant country characteristics or current shocks hitting a country. 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 1 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 opposition groups have a lower likelihood to remain in Union. Quantitatively, moving from an opposition 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).¹⁵ 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

¹⁴Conflict data is 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).

¹⁵Here 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.

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.

Table 1: Group size and peaceful union

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Peaceful union							
Group size (t-1)	-0.1020*** (0.0334)	-0.0845** (0.0365)	-0.1016*** (0.0334)	-0.0841** (0.0365)	-0.0241*** (0.0080)	-0.0172** (0.0085)	-0.3897* (0.2099)	-0.7293** (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 in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

4.2 Preference similarity decreasing the risk of secessionist conflict

Most if not all separatist movements present the need to save their own identity as their key goal and motivation. However, the fact that 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 (i.e. low P) decreases the risk of secessionist conflict, in general and specifically with respect to centrist civil war.

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 , is a cause of secessionist conflict rather than centrist conflict, while preference similarity (low P) 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).¹⁶

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 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 our data do not allow us to draw causal statements.

The dependant variable on secessionist conflict is from GrowUP (i.e. we use as measure of secessionist conflict the incidence of territorial conflict ("incidence terr flag")). To construct the explanatory variable of interest, we use 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 ethnic identity preferences more broadly. 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

¹⁶Our 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-Ortín 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 do not have significant effects on the provision of material public goods – see Habyarimana et al (2007).

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 when i is in the opposition.

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.¹⁷

Table 2 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 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 con-

¹⁷We have carried out a whole battery of further sensitivity checks, controlling for major potential confounders such as group concentration / dispersion measures, group distance from border and capital and regional autonomy. In all cases, the results remain very similar, and we continue to detect a statistically significant effect of preference similarity decreasing the risk of secessionist conflict with respect to centrist one (results available upon request). Note as well, as mentioned, that in Appendix we also display (even more demanding) estimation results that include ethnic group fixed effects which pick up any time-invariant ethnic group characteristics.

flicts 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 Appendix we provide further results, controlling for the lagged dependent variable and including group fixed effects.¹⁸

Table 2: 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.

4.3 Patience increases secessionist conflict with respect to centrist conflict

Given our model, we expect higher patience to be associated with more secessionist conflict as compared to centrist conflict. 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

¹⁸In 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 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 Appendix).

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 patience data to data on conflict outcomes. The data for the main explanatory variable of interest, patience, stems from Dohmen et al. (2015). It is time-invariant and only available for a cross-section of countries. This means that e.g. it cannot be linked to ethnic group identifiers, meaning that we need to carry out the analysis at the country level. The data on the dependent variable comes from GrowUP (Girardin et al., 2019) and is a dummy of incidence of secessionist conflict.¹⁹ We will restrict in all specifications of this subsection the sample to country years with secessionist or centrist conflict (also from GrowUP), in line with the third empirical prediction, which is specific to comparing different conflict types (see the list of testable predictions at the beginning of Section 4).²⁰

Due to the nature of the patience data, the unit of observation of our regressions in this subsection is the country-year level. Note that 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:

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

where the variable $SecessionistConflict_{it}$ is a dummy that takes a value of 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. In some specifications we shall focus on a more demanding specification including continent times year fixed effects.

¹⁹In particular, we use as measure of secessionist conflict the incidence of territorial conflict ("incidence terr flag").

²⁰Note that in some country years there can be both secessionist and centrist conflict taking place at the same time.

Table 3 displays the baseline results. We have a panel of 77 countries over the 1946-2017 period and regress secessionist conflict as dependent variable on the patience score as main explanatory variable. In column 1 we focus on the simplest specification without controls and with only annual time dummies, while in column 2 we include in addition continent fixed effects, and control for some variables that have been linked to conflict in the past (see e.g. Collier et al., 2009) and that can be seen as roughly exogenous. In particular, we control for population size (from Feenstra, Inklaar and Timmer, 2015), ethnic fractionalization (from Alesina et al., 2003), ethnic polarization (from Montalvo and Reynal-Querol, 2005), as well as land area and terrain ruggedness index (both from Nunn and Puga, 2012).²¹ In column 3 we replace the annual time dummies and continent fixed effects by the more demanding battery of continent times year fixed effects. Col. 4-6 are analogous to col. 1-3, but control in addition for the lagged dependent variable, which amounts to focusing on conflict onsets and endings. In five out of six columns we find that patience is statistically significantly associated, as expected, with secessionist conflict.

Table 3: Patience and peaceful union

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Secessionist conflict					
Patience	0.542**	0.403***	0.367***	0.077	0.095*	0.096*
	(0.266)	(0.120)	(0.128)	(0.071)	(0.052)	(0.055)
Sample	All country years with conflict					
Year fixed effect	Yes	Yes	No	Yes	Yes	No
Continent FE	No	Yes	No	No	Yes	No
Continent-Year FE	No	No	Yes	No	No	Yes
Controls	No	Yes	Yes	No	Yes	Yes
Lagged dependent variable	No	No	No	Yes	Yes	Yes
Observations	892	722	722	881	722	722
R-squared	0.148	0.668	0.720	0.750	0.824	0.855

Note: Panel with an observation being the country year, covering 77 countries and the years 1946-2017. Control variables include lagged population, ethnic fractionalization, land area, and terrain ruggedness index. 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.

4.4 Richer regions seek secession

Our model's predictions with respect to s are broadly in line with the existing literature, and no novel empirical investigation is needed. Several studies have presented systematic

²¹We 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. Note also that the correlation between ethnic fractionalization and polarization is not extremely high, i.e. 0.55.

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 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

5 Concluding remarks and policy implications

While most of the existing literature on secession has focused on economies of scale versus preference heterogeneity tradeoffs and has not considered all types of conflict in the same model or framework, our positive analysis, theory and empirics, has provided a number of new results on the interplay of identity, population sizes and intertemporal preferences for the determination of conflict risk of the different types. Besides the obvious advantage for future positive analysis from having an integrated model where to evaluate the different risks of conflict, and besides the empirical confirmation of the relevance of cultural similarity, patience and population sizes for the discerning of conflict risks, in this final section we want to point out a few potentially interesting normative implications.

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

²³Although 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.

Welfare statements are generally hard to make and involve various measurement problems (e.g., P 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 centrist 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.

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 , 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).

Another policy that may reduce P 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 integrate elements of the newcomers (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 , the bottom-up convergence of tastes through free interaction may well reduce over time P , 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,

²⁴See Cederman et al. (2015) on the effect of devolution. Gibilisco (2017) analyzes how the repression of regional values may delay conflict but increase 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.

language courses, or TV formats celebrating the benefits of inter-group interaction.²⁵

These are only examples, and more related research should be carried out in the future in order to exploit the results of this paper for normative purposes.

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²⁵See 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.

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Appendix

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”.²⁶ 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).

²⁶We downloaded the main original datasets on the 19 November 2019 through the GrowUp system.

The country level data is described in depth in the main text (in Section 4.3).

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 two robustness tables for the empirical analysis. In particular, Table 4 replicates baseline Table 2, but controlling for the lagged dependent variable. This yields very similar results. Table 5 below again replicates baseline Table 2, 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.

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

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	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 (0.0197)		0.0046 (0.0112)	
Nr. of joint language nodes (t-1)		-0.0011 (0.0010)		-0.0128** (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.