ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

ARCHIVIO ISTITUZIONALE
DELLA RICERCA

Alma Mater Studiorum Università di Bologna
Archivio istituzionale della ricerca

How to design decentralisation to curb secessionist pressures? Top-down vs. bottom-up reforms

This is the final peer-reviewed author's accepted manuscript (postprint) of the following publication:

Published Version:

Availability:
This version is available at: https://hdl.handle.net/11585/865145 since: 2022-02-23

Published:
DOI: http://doi.org/10.1016/j.strueco.2021.06.010

Terms of use:

Some rights reserved. The terms and conditions for the reuse of this version of the manuscript are specified in the publishing policy. For all terms of use and more information see the publisher's website.

This item was downloaded from IRIS Università di Bologna (https://cris.unibo.it/).
When citing, please refer to the published version.

(Article begins on next page)

09 April 2024

This is the final peer-reviewed accepted manuscript of:

Cerniglia, F., Longaretti, R., & Zanardi, A. (2021). How to design decentralisation to curb secessionist pressures? Top-down vs. bottom-up reforms. *Structural change and economic dynamics*, *58*, 377-390.

The final published version is available online at:

https://doi.org/10.1016/j.strueco.2021.06.010

Terms of use:

Some rights reserved. The terms and conditions for the reuse of this version of the manuscript are specified in the publishing policy. For all terms of use and more information see the publisher's website.

This item was downloaded from IRIS Università di Bologna (https://cris.unibo.it/)

When citing, please refer to the published version.

How to design decentralisation to curb secessionist pressures? Top-down vs. bottom-up reforms

Floriana Cerniglia* Riccarda Longaretti† Alberto Zanardi‡

April 2021

Abstract

This paper looks at decentralisation as an institutional solution for curbing secessionist pressures by making potentially seceding regions strictly better off by staying in the union. We show that a bottom-up decentralisation reform, where single regions that can opt to assume or not stronger fiscal responsibilities or not on the basis of bilateral negotiations with the central government, may be more successful in avoiding instability and a secessionist conflict than more standard top-down decentralisation, where the central government assigns identical fiscal powers to all regions. The example of the decentralisation process in Spain over the last 40 years illustrates the relevance of the institutional pattern we analyse in the paper.

Keywords: Decentralisation, Secession, Institutional Patterns, Fiscal flows

JEL classification: H4, H7.

1 Introduction

Secessionist pressures involve a great number of countries, both in the developed and developing world, and do also arise at the supranational level, as in the case of Brexit. Historically, these movements stem from the cultural, ethnic and economic heterogeneity of group of citizens and regions that, for such reasons, may have different fiscal preferences regarding the public policies to be implemented at the central level. However, secessions may be well economically costly: after independence, smaller countries may bear higher costs in providing public goods given the existence of economies of scale. More generally, secessionism, even when it does not end in violent conflict, tends to exacerbate instability, pork barrel politics, to monopolise the public debate and to divert public resources. The Brexit case deserves further attention since it is a clear-cut example where the economic and

*DISEIS, Università Cattolica del Sacro Cuore, Milan

†Corresponding author. DEMS, University of Milan-Bicocca, riccarda.longaretti@unimib.it

‡Italian Parliamentary Budget Office, University of Bologna, Dondena Centre-Bocconi University

identity issues exacerbate each other in affecting social and political tensions. This is also a case in Italy, where in Veneto, differently from other regions, still asking for asymmetric decentralization, cultural and identity factors constitute the background for economic issues to work.

Decentralisation reforms have been carried out in many countries in order to deter secessionist tendencies. By allowing some degree of autonomy and fiscal responsibilities at the sub-national level, decentralisation brings the government closer to the people and allows public policies to reflect local preferences and demands. In addition, decentralisation may be the way to reduce the size of implicit inter-regional transfers in a union. Moreover, decentralisation can succeed in managing territorial cleavages, that is situations of conflict involving minorities which are geographically concentrated in specific areas. Giving voice to different groups, decentralisation may allow parts of the population that formerly felt excluded from the country to feel more integrated.

However, decentralisation can also be viewed as exacerbating and underpinning the secessionist pressures. Firstly, sub-national groups or entities which are granted greater autonomy might aim the financial resources thus gained at fostering separatist tendencies. Secondly, decentralisation may provide institutional legitimacy to separatist groups spurring them to fight for independence.

Indeed, decentralisation did better in curbing secessionism in some countries (such as Switzerland, or to a lesser extent Canada) than in others (such as Yugoslavia, Czechoslovakia or Indonesia). The ultimate result may depend on the nature of the source of secessionism. Where groups are differentiated, geographically concentrated, and highly mobilised against one another, it may be difficult to imagine continuing cohabitation within a union. But where groups are harder to distinguish, decentralisation may offer a relief valve for those who actually demand autonomy, and to hold the country together.

The ability of decentralisation to actually affect structural change in institutional patterns, deterring secessionist pressures, may depend, *inter alia*, on the forms it can take. In general, in unitary countries a reform towards decentralisation can be designed according to two different arrangements.

In the former, decentralisation follows a top-down approach: new competences (functional, administrative or even legislative) are assigned by the central government to all regions on a uniform basis (symmetrical decentralization) according to a rigid and closed model of competences allocation across different levels of government.

In the latter, decentralisation reform – less frequent in actual applications – follows a more flexible, bottom-up approach. The reform may provide that a set of additional competencies can be required by single regions and assigned to them on the basis of bilateral negotiations with the central government (Lluch (2012); Baldi (2020)). The level of autonomy therefore depends on what a region asks for and on what it manages to obtain from the central government at the end of a contractual process for which the region is individually mobilised. Hence, the typically asymmetric outcome of this form of decentralisation: not all regions are mobilised, not all have specificities to claim, not all ask for or manage to obtain the same level of autonomy and the

same public functions.[1] However, a potential symmetric (or quasi-symmetric) set-up may arise if *de facto* an analogous level of autonomy were negotiated by the most of sub-national jurisdictions.

The most accomplished example of this bottom-up decentralisation is the institutional arrangement stemming from the Constitution passed in Spain after the transition to democracy (Aja (2014); Flynn (2004)). The 1978 Constitution provided for the possibility of individual territories to take the initiative to agree with the central government to be assigned specific (administrative and sometimes legislative) competences. Initially only the so-called Historical Communities (Catalonia, the Basque Country, Navarra and Galicia) joined this autonomy 'on request' by setting special statutes which regionalised a vast but heterogeneous array of functions in fields including economic development, culture, health, education and sometimes taxing power. Afterwards, during the 80's and early 90's, other regions followed the same process, by negotiating a similar level of autonomy with the central government. However, this evolution toward uniformity has more recently pushed the Historical Communities to advance further claims for stronger autonomy in a process which culminated in the unilateral declaration of independence by Catalonia in October 2017.

Some other institutional systems contemplate bottom-up decentralisation arrangements. Since 1998 in the United Kingdom different degrees of autonomy have been granted to Scotland, Wales and Northern Ireland (even if in the latter case the scope and the ways autonomy was assumed were strongly affected by the serious internal divisions and the link to the Irish Republic) to the extent that the arrangement took on the features of true devolution (McGarry (2012)). In Canada, too, asymmetric decentralisation mainly stems from federal-provincial negotiations. The "opt-out" option is the arrangement for achieving differentiation: it allows the Provinces to choose to withdraw from a federal program and, in this case, to receive the financial resources necessary to manage it on their own. Thus far, only the Province of Quebec, where the national identity is stronger, has extensively resorted to the opt-out provision, covering many areas of public intervention (health services, education, welfare, pension plans, students loans and youth allowances) (Iacovino (2012)). Finally, in Italy, beginning with the 2001 constitutional reform, ordinary regions can assume, if they deem it convenient, additional legislative and administrative competences among those currently assigned to the central government (the most important is education). These decentralisation initiatives have to be agreed with the central government and to be confirmed by the national parliament. Up to now, just three regions (those with the highest per-capita GDP among ordinary regions) have opened separate negotiations for additional autonomy (Grazzini et al. (2020)).

As mentioned before, with bottom-up decentralisation we are primarily focusing on mostly results in asymmetrical set-ups across regions or local governments, that is when governments at the same sub-national tier have different political, administrative or fiscal powers. Asymmetric arrangements are becoming more

[1] Congleton et al. (2003) and Congleton (2006) refer this institutional set-up as "menu federalism" to emphasise the optional basis that distinguishes this solution.

common in recent decades especially among unitary countries.[2]
This paper provides a simple analytical framework aimed at clarifying the interplay across regions in shaping secessionist pressures and at identifying institutional reforms capable of preventing them. In particular, the ability of a top-down and symmetric decentralisation reform to curb secessionist pressures is compared to the case of a bottom-up reform where additional competences are assumed by single regions on an optional basis. We show that a bottom-up decentralisation reform may be more successful in avoiding instability and a secessionist conflict than a more standard top-down and symmetric decentralisation reform.
The paper is organized as follows. Section 2 briefly reviews the relevant literature. Section 3 outlines the set-up. Section 4 analyzes secessionist pressures. Section 4 focuses on the top-down decentralisation reform whereas Section 5 considers the case of a bottom-up reform. Section 6 concludes by looking at the capability of this framework to interpret real world episodes and by presenting possible future extensions of the paper.

2 Related literature

At least in Europe, secessionist pressures have traditionally involved mainly peripheral regions with weak economies: the demand of greater autonomy was motivated by the protection of specific linguistic and cultural identity and the concern of being marginalized by central government policies. However, more recently in many wealthy EU regions economic and fiscal factors seem to play a crucial role in fuelling secessionist demands: seceding is seen as the path to achieve a more equitable tax treatment through a government that is closer to the local electorate.
Pioneering studies in the economic literature on the break-up of countries and secession have been conducted by Alesina and Spoloare (1997) and Bolton and Roland (1997). They consider that both the size and the borders of nations results from the interplay of centripetal and centrifugal forces. Centripetal forces are mainly due to the benefits associated with the larger size of a union whereas centrifugal forces are mostly related to the fact that large countries are likely to be more heterogeneous. In other words, there is a trade-off between economies of scale and heterogeneity costs. On the one hand, the existence of economies of scale discourages regions from seceding and prompts them to take advantage of the economic benefits induced by the larger size of the union. On the other hand, cultural, ethnic, historical and economic heterogeneity across individuals living in different regions encourages territorial break-up as it is difficult for large and heterogeneous countries to match public policies with different regional demands. Therefore, economists predict secessions when economies of scale are relatively limited and the cost of population heterogeneity is high.
From the economic perspective, secession may answer citizens' heterogeneity in fiscal preferences regarding key public policies to be implemented. However, secessions may be well economically costly: after independence, smaller countries may bear

[2] In 1950 some 45 percent of the countries covered by the Regional Authority Index (Hooghe et al. (2016)) and organised in regions showed some kind of differentiated governance (autonomy, asymmetry, or dependency). In 2010, this figure had increased to 62 per cent (OECD (2019)).

higher costs in providing public goods given the existence of economies of scale. More generally, secessionism, even when it does not end in violent conflict, tends to exacerbate pork barrel politics, to monopolise the public debate and to divert public resources.

It is worth observing that the heterogeneity of citizens' demands regarding public policies may come from both differences in preferences or disparities in incomes. As in many contributions to this literature, we focus here on income heterogeneity across regions. Notice that income heterogeneity exacerbates the incentive to secede since in a union where public goods are provided uniformly across regions by the central government, public intervention implies inter-regional transfers (fiscal flows). Higher income inequality across regions therefore increases the size of the fiscal flows, making it more likely that a rich region has incentives to secede from the union, whilst a poor region wishes to preserve it.

The literature on secession points out that large regions display stronger secessionist tendencies than smaller ones. This is because a large region would still benefit from economies of scale, even as a separate country in the case of secession, and so centripetal forces are weaker. Moreover, as mentioned above, rich regions are more likely to be spurred to secede because, if they remain in the union, they will be required to fund burdensome inter-regional transfers towards the poorer regions whereas, in the case of secession, they can more easily support the fixed costs needed to run a new administrative apparatus.

As already said, secession is economically costly both for the secessionist region (in terms of administrative costs and unexploited economies of scale) and for the entire union (secessionist tensions monopolise the political debate, divert public resources, and strengthens the role of lobbies). If the break-up of a country reduces the well-being of the citizens as a whole, i.e. it is an inefficient outcome, then the government should look for an arrangement that prevents separations. The literature identifies different mechanisms that can deter potentially seceding regions from actually seceding.

One possible solution consists in a monetary transfers scheme among regions so that potentially secessionist regions are compensated to an extent that avoids inefficient secessions. In fact, if a region chooses to secede since benefits from secession exceed costs, and if secession is inefficient for the union, a central government could transfer resources from those who would loose from a break-up to those who would gain in such a way that, after the transfers, everybody would be better off and stability would be preserved. Transfers schemes as a means to prevent secessions have been studied by Alesina and Spolaore (1997, 2003), Le Breton and Weber (2003), Haimanko et al. (2005) and others.

Another mechanism detailed by the literature as a way to curb secessionist pressures is decentralisation. A number of theoretical contributions (Panizza (1999), Cerniglia (2003), Arzaghi and Henderson (2005), Spolaore (2008), Flamand (2019)) have investigated the relationship between secession and decentralisation following a common approach: provided that secession is socially to be avoided, the central government chooses an equilibrium level of decentralisation which makes

the potentially secessionist region prefer to remain in the union.[3] This literature demonstrates that the more heterogeneous the country is , the higher the optimal equilibrium level of decentralisation is.

All this theoretical literature refers to a case of partial decentralisation, that is when public goods are provided as a mixture of different components, some set by the central government and others in charge of sub-national governments (e.g. educational services). Once the optimal degree of decentralisation is derived, it is symmetrically adopted by all the regions, without any possibility of differentiation (what we referred before as a top-down decentralisation scheme). In this sense, all such literature focuses on the degree of decentralisation to be accomplished in order to deter secession.

However, theoretical literature has also provided arguments for decentralisation as being a force which exacerbates, and does not prevent, country instability. This effect can derive from different channels. Firstly, sub-national groups or entities, who are accorded granted greater autonomy, might use the additional resources they are assigned to foster separatist tendencies. Secondly, decentralisation may contribute to strengthening regional identities and the legitimacy of separatist demands. In other words, devolving power and resources may empower those who seek secession. As stressed by Spolaore (2008), "decentralization may reduce a peripheral region's willingness to secede while increasing its ability, with ambiguous net effects".

Which effect of decentralisation on the stability of the country eventually prevails depends on the source of separatist forces. Where groups are distinct, geographically concentrated and highly mobilised against one another through violence, cohabitation within a union may be difficult. On the contrary, where groups are harder to distinguish, decentralisation may offer the 'relief valve' to hold the country together. Given that the overall effect of decentralisation on secessionist pressures can on principle be ambiguous, this issue has been investigated on the empirical grounds.[4] To explore whether decentralisation prevents or mitigates ethnic conflict, empirical studies have employed two strategies. The first one is to treat ethnic groups as the unit of analysis and to estimate how decentralisation measured at the country-level influences conflicts (for example, Tranchant (2008)). The second strategy is to take countries as the level of analysis and pool information from all separatist groups in a country together. For example, Bakke and Wibbels (2006) use a panel of federal states to assess how federal structures interact with inter-regional inequalities to affect conflicts within a nation. Brancati (2006) focuses on the role of regional parties and claims that the net effect of decentralisation is to deter secessionist conflicts unless it generates a strong growth of regional political parties.

[3] In Panizza (1999) secession is not considered explicitly in the theoretical model, it being a positive model on the determinants of decentralisation. Nevertheless, the rationale is the following: a Leviathan central government decides the optimal level of (de)centralisation, aiming at maximising its budget. The more heterogeneous the union is, the lower the budget is, as centralisation increases. But, at the same time, higher centralisation implies higher share of the budget managed by the central government. Decentralisation arises because of the two opposite effects of centralisation on the budget. Following Arzaghi and Anderson (2005), that develop a model built on Panizza (1999), secession may explain the negative relationship between centralisation and the budget, and, by this token, decentralisation may be the response to secessionism.

[4] For a review of the empirical studies about decentralisation and conflict prevention see Madiès et al. (2018) and Tan (2020).

However, early empirical studies do not adequately account for the reverse causality issue between decentralisation and secessionist conflict (decentralisation may spur the conflict but the reverse could also be true). More recently, Christin and Hug (2012), Cederman et al. (2015) and Tranchant (2016) address this issue explicitly. In particular, Tranchant (2016) shows that the stability enhancing impact of autonomy and decentralisation is primarily manifest only when both variables are instrumented. This is consistent with Cederman et al. (2015) as they also point out that the peace-promoting effect of autonomy appears only when an instrumental variables approach is used. In conclusion we can claim that, even if empirical studies have shed light on some factors underlying the relationship between decentralisation and secessionist challenges, more research is needed to confirm or reject theoretical predictions.

This paper builds on this literature which suggests a potential link between decentralisation and secession but, instead of focusing the degree of decentralisation (central-local mix in the public provision), we focus on the possible institutional arrangements that decentralisation can assume. [5] As mentioned before, our paper compares the ability of a top-down vs. a bottom-up decentralisation reform to curb secessionist pressures. To our knowledge, this perspective of analysis is entirely new in the literature. We will show that a bottom-up decentralisation reform (where single regions can opt to assume stronger fiscal responsibilities or not) may be more successful in avoiding a secessionist conflict than a more standard top-down and symmetric decentralisation reform (where the central government assigns identical fiscal powers to all regions).

3 The set-up

We consider a country including three regions (indexed by subscript i). In the country public functions are accomplished by a national government and/or by regional governments (analogously indexed by i) according to the different institutional settings that prevail (see below). Two goods that are publicly provided: a pure public good Z and a private good G. The production of Z (but not of G) exhibits economies of scale, that is the marginal cost of producing Z at the national level is lower than the marginal cost of producing it at the regional level. For the sake of algebraic simplicity, we assume that prices of g (the per-capita consumption of G) and Z (if provided at the national level n) are normalised to one, that is $P_g = P_Z^n = 1$. Regions 1 and 2 are identical in terms of population ($N_1 = N_2 = N_{1,2}$) and per-capita income ($y_1 = y_2 = y_{1,2}$) but they differ from region 3 which is is richer than regions 1 and 2 in per-capita terms, that is $y_1 = y_2 < y_3$. Moreover, region 3 is characterised by a population N_3 that can be greater or lower than $N_{1,2}$.[6]

The public provision of G and Z is funded by means of an income tax (τ denotes the tax rate, see the Appendix) levied by the national and/or regional governments.

Individuals have identical preferences throughout the country, irrespective of the

[5] For a political economy approach on the optimal degree of decentralization see Fiorillo et Al. (2020)

[6] $2N_{1,2} + N_3 = N$

region in which they live.[7] Individual preferences depend on the level of all goods. For the sake of algebraic simplicity, in order to obtain explicit results, we assume that preferences are described by the following Cobb-Douglas utility function:

$$U_i = (g)^{1/2} \left(\frac{Z}{N}\right)^{1/2} \tag{1}$$

Notice that preferences are identical in functional terms throughout the economy, but, as it will become clear, the maximisation problem, for the representative individual of each region, will be subject to a budget constraint that depends on regional income. As a result, regional demand (and supply) of public goods, if regionally provided, will be dependent on regional income.

4 Centralisation and secessionist pressures

Let us first of all consider the case when the country is based (for example, by the constitution) on a centralised institutional framework, where the responsibility of the provision of Z and G is entirely assigned to the central government and regional governments have no power as for managing public services. We refer this institutional settlement as centralisation. Centralisation (indexed by superscript c) can be characterised as follows:

1. Z and G are provided by the central government to all regions. We assume that the central government offers uniform levels of g and Z to all citizens wherever they live (g^{c*} and $\frac{Z^{c*}}{N}$) , satisfying the average demand ($g^{c*} = E[(g^c)_i^{d*}]; Z^{n*} = E[(Z^c)_i^{n*}]$);

2. The central government manages an inter-regional equalising mechanism which gives rise to fiscal flows (FF) across regions to an extent that fills the gap between between public goods that a citizen in any region receives and the taxes it pays to the central government.
   Algebraically each i-th region pays (receives) fiscal flows in centralisation, according to the following equation:

$$FF_i^c = N_i g^c + P_Z^c \frac{N_i}{N} Z^c - \tau Y_i \tag{2}$$

In the case of centralisation (that is when public provision and inter-regional equalising mechanism are as described in 1) and 2)), the i-th region is in equilibrium, that is it maximises its utility, when g and Z are set as follow (see the Appendix eq. (A4)-(A5)):

$$g^{c*} = \frac{Z^{c*}}{N} = \frac{\overline{y}}{2} \tag{3}$$

[7] As it will become clear in the following section, this is an hypothesis that allows us to make the choice of the institutional setting as the result of differences in income and not, quite tautologically, of differences in preferences.

and

$$U_i^{c*} = \frac{\overline{y}}{2} \tag{4}$$

However, beginning with centralisation, each region always has the option of breaking the national constitutional pact by creating an independent region and taking on its own responsibility, through a newly established regional government, for public functions (the provision of g and Z). We refer to this institutional settlement as secession.[8] Secession (indexed by superscript s) can be described as follows:

1. Z and G are provided by each regional government at such a level that satisfies the demands of individuals living in the region. As a consequence the provision of G and Z are tailor-made to regional preferences. Each citizen gets g_i^{s*} and $\frac{Z_{s*N_i}}{}$;

2. The provision of Z and G are fully financed by taxes levied by each regional government on their own taxpayers, which means that no inter-regional equalisation is carried out.

In the case of secession, the i-th region is in equilibrium, that is it maximises its utility, when g and Z are set as follows (see Appendix eq. (A8)-(A10)):

$$g^{s*} = \frac{y_i}{2} \tag{5}$$

$$\frac{Z_i^{s*}}{N} = \frac{y_i}{2}\frac{1}{P_Z^s} \tag{6}$$

and

$$U_i^{s*} = \frac{y_i}{2}\frac{1}{(P_Z^s)^{\frac{1}{2}}} \tag{7}$$

A region may be spurred to secede if the utility level under secession (eq. 7) exceeds the utility level under centralisation (eq. 4). This may result from three different factors that concur in favour of one institutional setting or another:

1. The possibility in the case of secession of tailoring the provision of G to regional demands, which reflect regional per-capita income;

2. The inter-regional redistribution accomplished by the equalisation mechanism provided for in centralisation, which positively/negatively affects the utility of a region according to its position in the distribution of income across regions;

3. The full exploitation of the economies of scale in producing Z, which is possible when Z is provided on a national basis (that is when centralisation is implemented).

[8] Notice that we have neglected administrative costs related to secession. These (exogenous) costs, if included in the analysis, would have only re-scaled the results.

As a consequence the incentive of a region to separate from the national country and follow secession is greater the richer the region is compared to the average of the economy (through factors (1) and (2)) and the lower the economies of scale in the production of Z (through factor (3)).
Let us define $D_i = \frac{y_i}{\overline{y}}$ an index of 'inequality' for the i-th region.[9] In the Appendix we show that the comparison between eq. (7) and eq. (4) identifies a positively sloped threshold line in the space (D, P_Z^s) below which secession is preferred to centralisation (see figure 1). Therefore the i-th region has incentive to secede if $P_Z^s < \overline{P_Z^s}$, where

$$\overline{P_Z^s} = (D_i)^2 \tag{8}$$

that is, for a given level of D_i, the economies of scale (which do exist when $P_Z^s > 1$) are sufficiently strong.

Proposition 1 *Secessionist pressures come from the richest regions.*

The sole region that has incentive to secede in our framework is region 3. As a matter of fact, in the semi-space where economies of scale do exist ($P_Z^s > 1$)), $P_Z^s < \overline{P_Z^s}$ holds only if $D_i > 1$, that in in the ~~green~~ area in Figure 1. Regions 1 and 2 are instead characterised by $D_i < 1$ (~~blue~~ area in Figure 1), and therefore they do not have any incentive to secede.

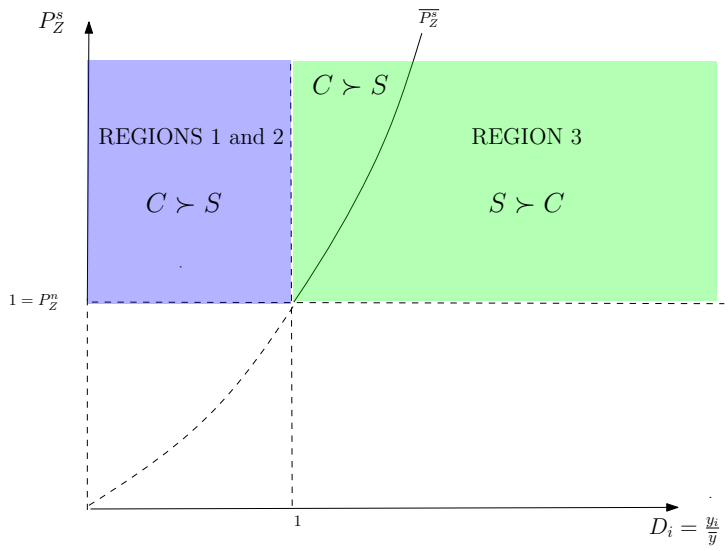


Figure 1: Centralisation Vs secession: the threshold curve

[9] This implies that for 'poor' regions 1 and 2 $D_i < 1$ whereas for the 'rich' region 3 $D_3 > 1$.

If region 3 secedes, the utility of regions 1 and 2 decreases.
In fact, in the Appendix (eq. (A12)) we demonstrate that:

$$U_{1,2}^{-s} = \frac{y_{1,2}}{2} \tag{9}$$

where the index $-s$ denotes regions 1 and 2 which do not secede when region 3 secedes. Comparing eq. (9) with eq. (4), it follows that the following equation always holds:

$$U_{1,2}^{-s} < U_{1,2}^{c} \tag{10}$$

Therefore we can derive the following proposition:

Proposition 2 *Starting from centralisation, the choice of the 'rich' region to secede harms the 'poor' regions, that is those regions which do not defect from the country and stay under the sovereignty of the central government.*

As a consequence, we can expect that the central government takes steps to avoid secession. Putting aside the possibility of a direct conflict against the secessionist region, the central government should device a new institutional setting (to be adopted, for example, as a constitutional reform) which preserves the well-being of 'poor' regions and, in the meantime, curbs the incentive of 'rich' regions to secede. In other terms, given the secession pressures of region 3, the central governments should look for a Pareto-improving reform. Algebraically, the problem faced by the central government is that:

$$\begin{gathered} Max(U_1 + U_2) \\ s.t. \\ U_3 > U_3^{s*} \end{gathered} \tag{11}$$

Under this setting, in the following paragraphs we investigate whether this Pareto-improving result may be accomplished by means of a decentralisation reform.

5 Top-down decentralisation

The response given by central governments in managing territorial cleavages and preventing secessions may be decentralisation. Historically, fiscal decentralisation generally stems from the central government decision of transferring a centrally determined package of spending and taxing powers to all single local units (say states, regions or municipalities) of a certain level of government. Then those units can autonomously exploits those powers (e.g. by setting tax rates, user fees and public services) within a general framework of limits set at the national level. Here, to clearly distinguish this case from other forms of decentralisation that are relevant in this paper, we refer to this solution as top-down decentralisation in order to underline precisely that fiscal powers are attributed symmetrically in the same extent to all local public bodies without any scope of flexibility.
More specifically, inside our framework, top-down decentralisation (indexed by

superscript sd[10]) can be featured as follows: 1) Z is still provided at the national level, whereas the provision of G is assigned to all single regional governments and, as a consequence, tailor-made to regional preferences; 2) similarly to the case of centralisation, central government manages an inter-regional equalizing mechanism which gives rise to fiscal flows across regions.[11] In top-down decentralisation each citizen gets g_i^{sd*} and $\frac{Z^{n(sd)*}}{N}$. In Appendix (eq. (A18)-(A20))we obtain the following equilibrium levels for top-down decentralisation:

$$g^{sd*} = \frac{y_i}{2} \tag{12}$$

$$\frac{Z^{n(sd)*}}{N} = \frac{\overline{y}}{2} \tag{13}$$

and

$$U_i^{sd*} = \frac{y_i}{2}\left(\frac{\overline{y}}{y_i}\right)^{\frac{1}{2}} \tag{14}$$

Proposition 3 *The top-down decentralisation reform promoted by the central government turns out to be a credible solution for accommodating the secessionist pressures of region 3, since, when successful, it constitutes a Pareto improvement.*

In Appendix (eq. (A22)), we in fact demonstrate that the potential secessionist region (region 3) would prefer top-down decentralisation to secession, that is $U_3^{sd*} > U_3^{sd*}$, if:

$$P_z^s > D_3 \tag{15}$$

that is if, for a given level of D_i, the economies of scale are sufficiently strong.
Regions 1 and 2 would always be better off if region 3 opts for top-down decentralisation compared to the case if region 3 secedes. Formally:

$$U_{1,2}^{sd} > U_{1,2}^{-s} \tag{16}$$

[10]Notice that sd stands for symmetric decentralisation. Actually top-down decentralisation is also characterised by symmetry, that is the relevant feature which determines our algebraic results.

[11]It is worth noting that this hypothesis is realistic. The empirical evidence in fact shows that asymmetric arrangements are also characterised by the existence of inter-regional equalising obligations.

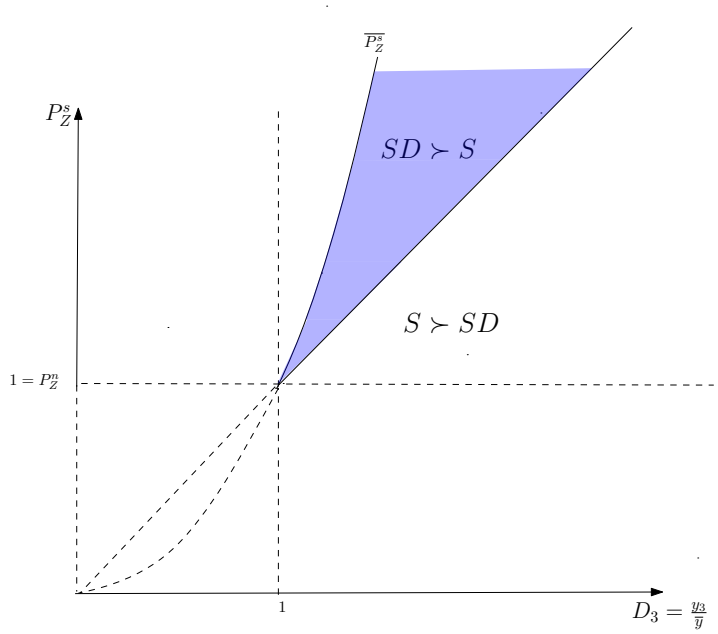


Figure 2: Top-down Decentralisation Vs secession: the threshold line and the successful top-down decentralisation reform area

Therefore, top-down decentralisation promoted by the central government ends up being a credible solution for accommodating the secessionist pressures of region 3 as long as condition (15) holds. The ~~blue~~ area in Figure 2 represents the space $(D_3; P_z^s)$ (that is the combinations of 'how rich the region 3 is' and 'how large the economies of scale are') corresponding to a top-down decentralisation reform which succeeds in curbing secession of the rich region.[12]
Notice that, in the area of successful top-down decentralisation reforms, the fact that all the three regions accept the reform implies it is a Pareto-improvement compared to the situation in which region 3 secedes.
Quite straightforwardly, it can be seen that, as the economies of scale become larger and larger (P_z^s increases), the set of D_3 which implies the success of the reform increases. In other words, as the economies of scale grow, the top-down decentralisation reform is more likely to discourage region 3 from seceding.
The options open to single regions and the results stemming from their interactions can be summarised in Figure 3.

[12]Remember that, to the left of the threshold $\overline{P_z^s}$, there is no secessionist pressure and therefore no need for any reform.

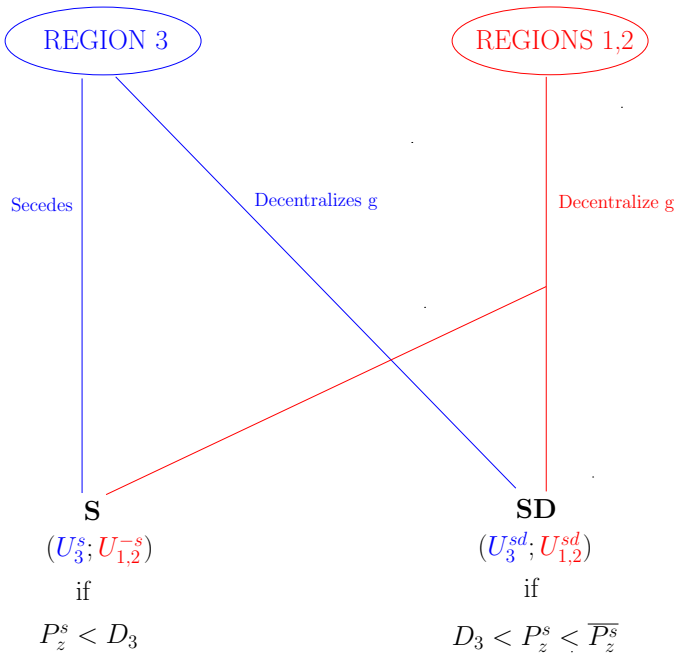


Figure 3: Is top-down decentralisation successful in curbing secessionist pressures?

Region 3 always has two possible strategies (to secede or not to secede and to embrace the top-down decentralisation reform), whereas regions 1 and 2 only are only compelled to assume new decentralised fiscal responsibilities. If region 3 does not secede the country ends up in a symmetric decentralisation setup and this occurs as said above and as demonstrated in Appendix, if and only if $D_3 < P_z^s < \overline{P_z^s}$. Otherwise, region 3 secedes and regions 1 and 2 would belong to the original country (now including just two regions) but endowed with stronger fiscal powers. As stressed above, top-down decentralisation, when successful, is a Pareto improvement compared to the secession of region 3.

6 Bottom-up decentralisation

6.1 Optimal regional payoffs

Another possible (and more original) response the central government can give to secessionist pressures once again consists in granting fiscal autonomous powers to subnational governments but this time on an optional basis. This means that each local government can opt to assume stronger fiscal responsibilities or not and which ones to assume. When the option of decentralisation is not exercised by the local government, fiscal decisions remain the prerogative of the central government.
Obviously, this optional regime may end up in a symmetric decentralisation institutional setting (again indexed by superscript *sd*) if all subnational entities

opt to undertake new and equal tax and expenditure responsibilities. Otherwise, if only a subset of subnational governments choose to decentralise, an asymmetric decentralisation institutional setting (indexed by superscript ad) would prevail.
Within our framework, bottom-up decentralisation is featured in exactly the same way as top-down decentralisation (Z and G are provided by respectively the central and the regional governments; the equalising transfer mechanism is still applied) with the substantial variation that the provision of G can be assumed or not by the regional government according to its convenience (in the latter case G continues to be provided in that region by the central government as in centralisation, this occurs as it did before the reform).
As previously indicated, if all regions decentralise G, bottom-up decentralisation is equivalent to top-down decentralisation, the conditions of which have already been presented. On the contrary, if a subset of regions decentralises G, bottom-up decentralisation takes an asymmetric configuration. The representative citizen of the region that decentralises gets g_i^{ad*} and $\frac{Z_i^{ad*}}{N}$.
As for asymmetric bottom-up decentralisation, in Appendix (eq. (A26)-A(28)) we derive the following equilibrium levels:

$$g^{ad*} = \frac{N + N_i}{N_i} \frac{\overline{y}}{4} \tag{17}$$

$$\frac{Z_i^{ad*}}{N} = \frac{N + N_i}{N} \frac{\overline{y}}{4} \tag{18}$$

and

$$U_i^{ad*} = \frac{N + N_i}{N_i} \frac{\overline{y}}{4} \left(\frac{N_i}{N} \right)^{1/2} \tag{19}$$

Regions that do not decentralise (indexed by the superscript $-ad$) (eq. A31) instead get:

$$U_{-i}^{-ad} = \frac{\overline{y}}{2\sqrt{2}} \left(\frac{N + N_{-i}}{N} \right)^{1/2} \tag{20}$$

Let us analyse the specific case where region 3 decentralises and regions 1 and 2 do not.
Region 3 would prefer this asymmetric bottom-up decentralisation to secession if $U_3^{ad*} > U_3^{s*}$. In Appendix (eq. ~~(A33))~~ we demonstrate that this happens if and only if:

$$P_z^s < \overline{\overline{P_z^s}} = (D_3)^2 \frac{4N_3 N}{(N + N_3)^2} \tag{21}$$

On the other hand, regions 1 and 2 would be better off with asymmetric bottom-up decentralisation compared to the case in which region 3 secedes if $U_{1,2}^{-ad} > U_{1,2}^{-s}$. In the Appendix (eq. ~~(A36))~~ we also demonstrate that this happens if and only if:

$$\frac{y_{1,2}}{\overline{y}} < \left(\frac{1 + \frac{N_3}{N}}{2} \right)^{1/2} = \overline{D}_{1,2} \tag{22}$$

Figure 4 shows the threshold lines between the combinations of economies of scale and inequality in the inter-regional distribution of income which make asymmetric bottom-up decentralisation preferred to secession distinctively for region 3 ($\overline{\overline{P_z^s}}$) and regions 1 and 2 ($\overline{D}_{1,2}$).

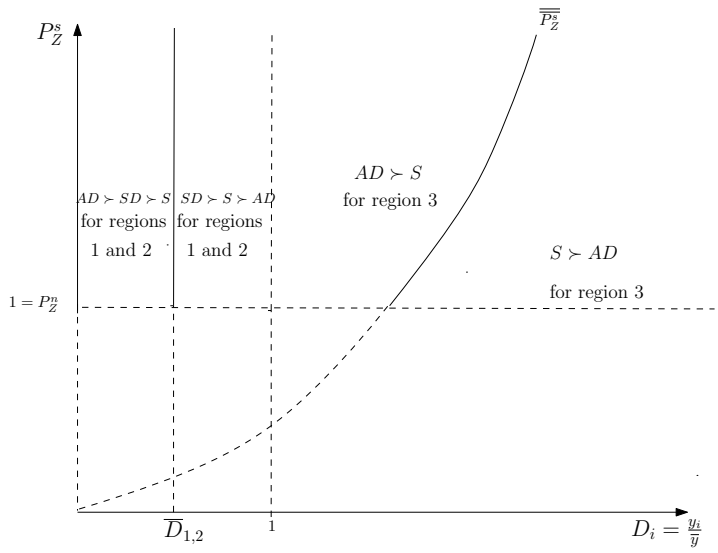


Figure 4: Asymmetric bottom-up decentralization vs. secession in the perspective of all regions: the threshold lines

Finally, region 3 would prefer asymmetric bottom-up decentralisation, being the only decentralising region, to top-down (symmetric) decentralisation if $U_i^{ad*} > U_i^{sd*}$. In the Appendix (eq. A37)) we demonstrate that this happens if and only if:

$$D_3 < \overline{D_3} = \frac{(N + N_3)^2}{4N_3N} \tag{23}$$

Figure 5 plots all the thresholds which we have derived up to now from the comparisons among the considered institutional settlements (centralisation, secession, top-down (symmetric) decentralisation, asymmetric bottom-up decentralisation) for all regions. This shows the fundamental result of our analysis, that can be summarised in the following proposition.[13]

[13]Note that the threshold between asymmetric bottom-up decentralisation and secession ($\overline{\overline{P_z^s}}$) always runs to the right of the threshold between centralisation and secession $\overline{P_z^s}$, and this means that a reform consistent with the bottom-up decentralization perspective shrinks the area of cases in which secession is the preferred strategy of region 3.

Proposition 4 *A bottom-up decentralisation reform, when accepted by all the regions, increases the chance of a successful reform in preventing secession by region 3.*

In fact, besides the ~~blue~~ area corresponding to the successful top-down (symmetric) decentralisation reform, in Figure 5, the ~~yellow~~ area of a successful asymmetric bottom-up decentralisation reform may be added, if eq. (22) holds. Numerical simulations of this statement will be carried out in paragraph 6.2.1.

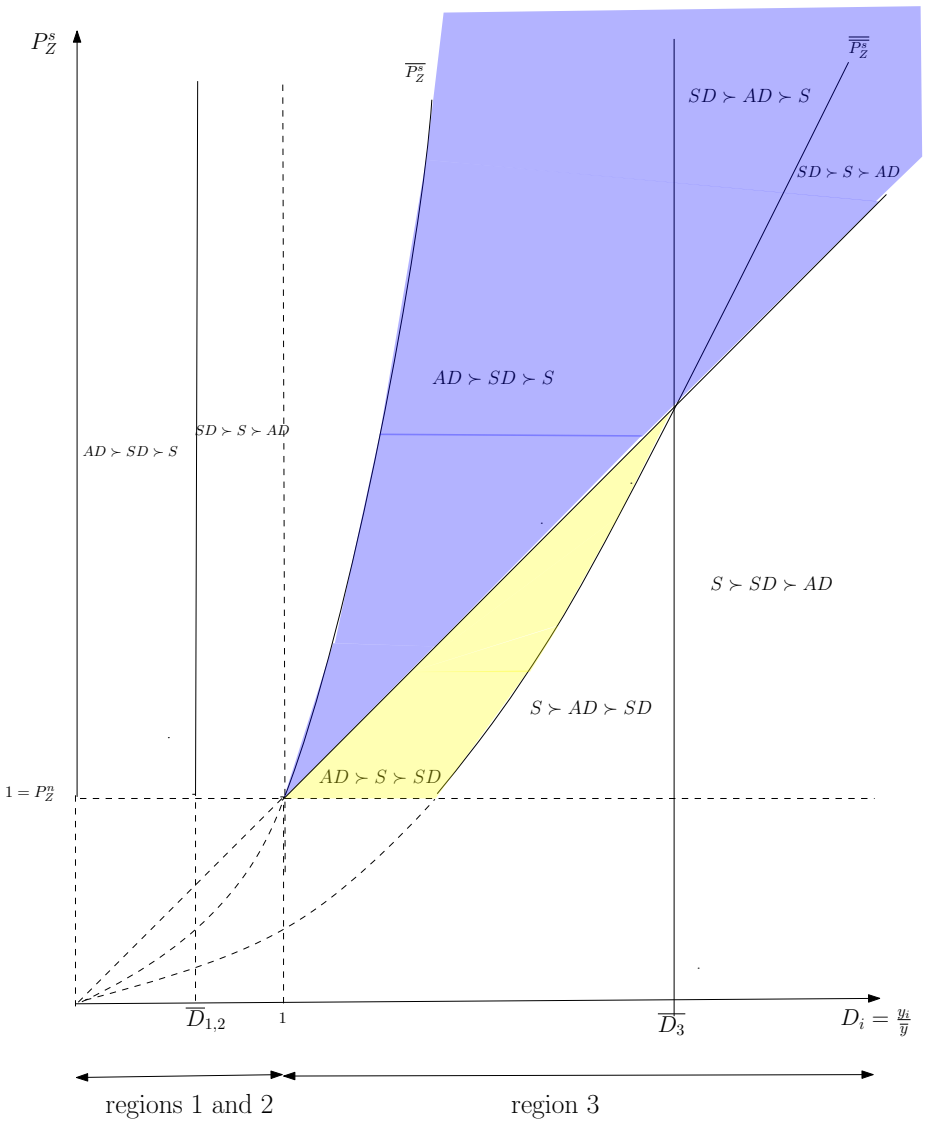


Figure 5: Areas of successful reforms in curbing secessionist pressures. The ~~yellow~~ area is successful as long as $D_{1,2} < \overline{D}_{1,2}$ (see eq. (22))

6.2 Interplay across regions and Nash equilibria

Differently from the institutional settings described above (centralisation and top-down decentralisation), where the final outcome depends uniquely on the decision of a potential secessionist region (region 3) to secede or not, in the case of bottom-up decentralisation the final configuration is also due to the choice of regions 1 and 2 to actually assume the stronger fiscal responsibilities that are offered

to them by the reform. The different outcomes that can emerge from bottom-up decentralisation, as resulting from the interaction between region 3, and regions 1 and 2, can be analysed as the game plotted in Figure 6. Beginning with a centralised institutional framework, where goods are provided by the central government, region 3 may be spurred to secede. In order to prevent secession, the central government introduces a bottom-up decentralisation reform that gives regions the option to locally provide G. Each of the three regions may opt to decentralise or not. If they all decentralise, the country would end-up in a symmetric decentralisation setting; if a subset decentralises, the country would end-up in an asymmetric decentralisation setting; if none of the regions decentralise, the country would remain centralised. Which of the three institutional arrangements will emerge, depends on the payoffs of each region in each arrangement, which in turn are affected by the magnitude of the economies of scale (P_z^s), the position of each region in the distribution of per-capita income (D_i) and the regional population (N_i). Let us examine three different scenarios.

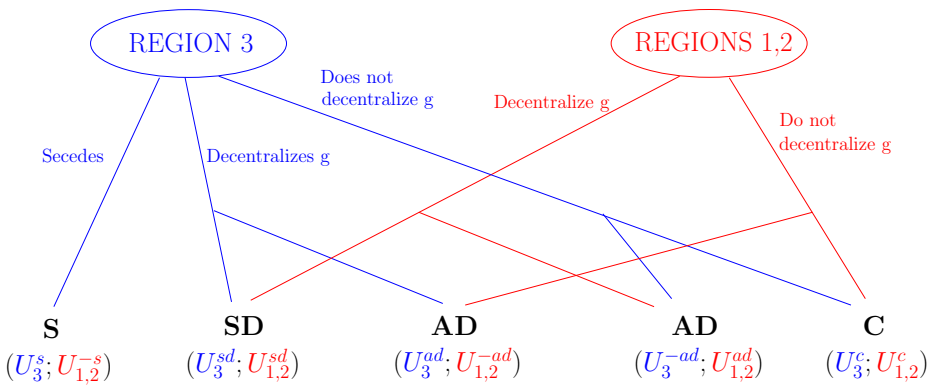


Figure 6: The bottom-up decentralisation game

6.2.1 Scenario 1

Let us start focusing on a scenario with region 3 in the area where $AD \succ S \succ SD$, like in figure 7.

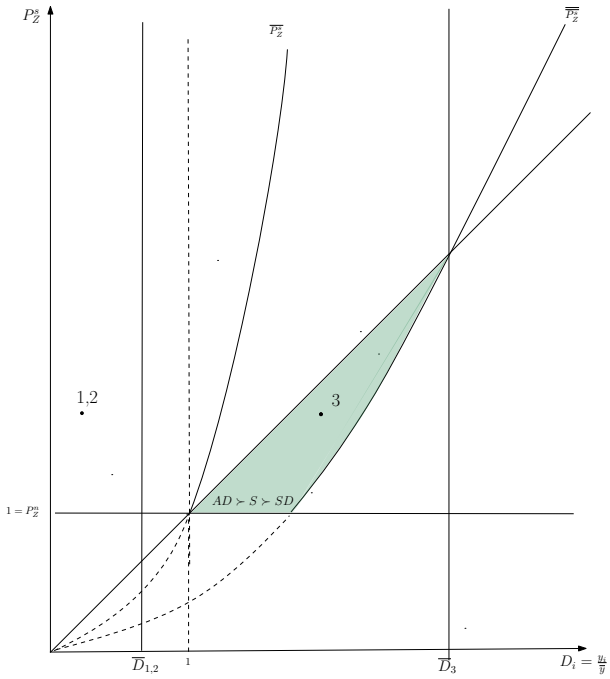
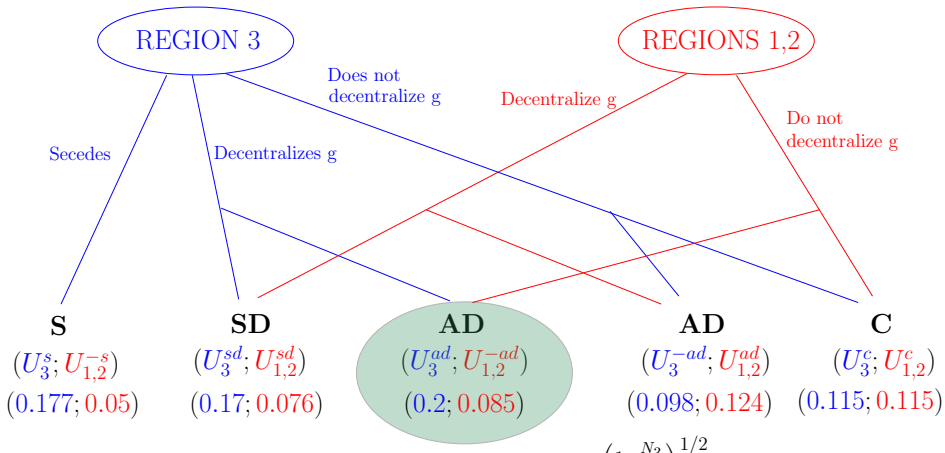


Figure 7: Scenario 1

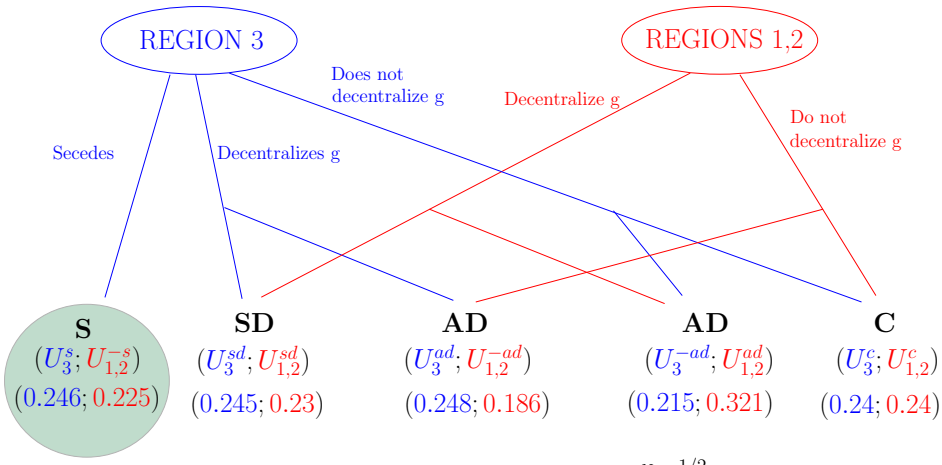
In this case, where condition (22) holds, regions 1 and 2, knowing that decentralisation would be the dominant strategy for region 3, would choose not to decentralise. As a consequence asymmetric decentralisation (region 3 decentralising and regions 1 and 2 not decentralising) would be the sub-game perfect equilibrium.[14] In this case therefore, the bottom-up decentralisation reform of allowing the decentralisation of g, would end-up in asymmetric decentralisation, that would be a Pareto-improvement compared to the secession of region 3.
It is interesting to note that, if condition (22) does not hold, there is no chance of avoiding the secession of region 3, and the only possible equilibrium is the secession of region 3.[15]

[14] We simulate this case, computing a numerical example with the following values: $N = 1; N_1 = N_2 = 0.45; N_3 = 0.1; y_1 = y_2 = \overline{y}_{1,2} = 0.1; y_3 = 0.5; P_z^s = 2$. Payoffs are reported in figure 8 (panel a).

[15] We simulate this case, computing a numerical example with the following values: $N = 1; N_1 = N_2 = 0.2; N_3 = 0.6; y_1 = y_2 = \overline{y}_{1,2} = 0.45; y_3 = 0.5; P_z^s = 1.03$. Payoffs are reported in figure 8 (panel b).



Panel (a): SUBGAME PERFECT EQUILIBRIUM IF $\frac{y_{1,2}}{\bar{y}} < \left(\frac{1+\frac{N_3}{N}}{2}\right)^{1/2}$



Panel (b): UNIQUE NASH EQUILIBRIUM IF $\frac{y_{1,2}}{\bar{y}} > \left(\frac{1+\frac{N_3}{N}}{2}\right)^{1/2}$

Figure 8: Equilibria in scenario 1

6.2.2 Scenario 2

Let us now move forward to the scenario with region 3 in the area where $AD \succ SD \succ S$, like in Figure 9.

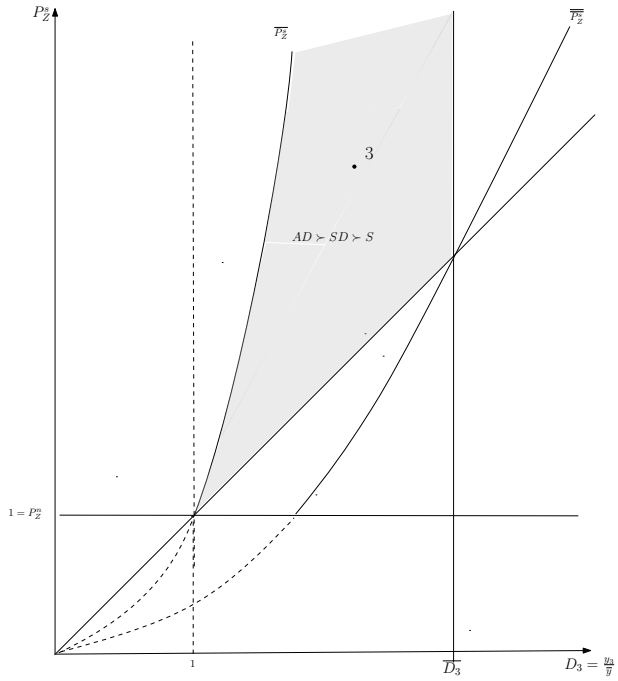
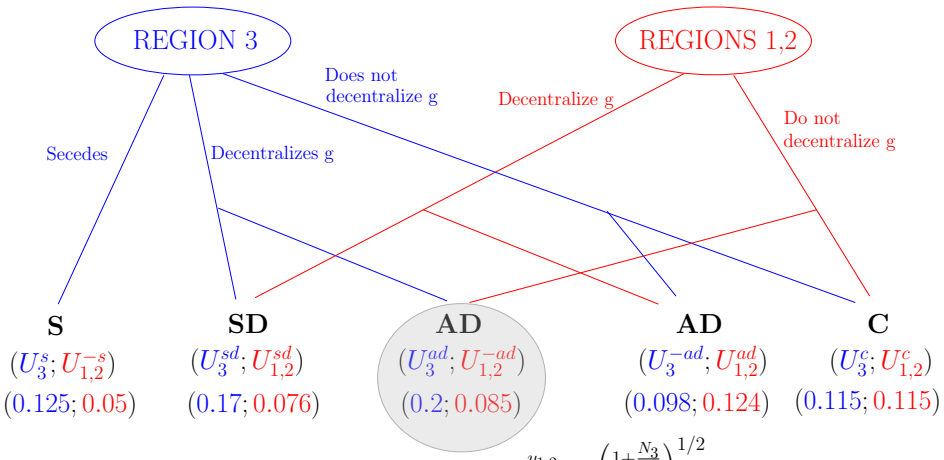


Figure 9: Scenario 2

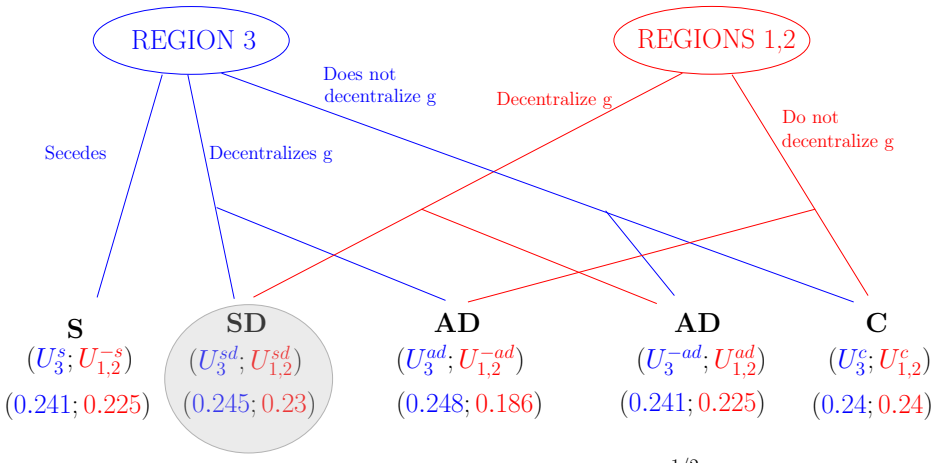
In this case, like in scenario 1, if condition (22) holds, bottom-up decentralisation reform would end up in asymmetric decentralisation, that would be a Pareto-improvement.[16] But, differently from scenario 1, if condition (22) does not hold, decentralisation would be the dominant strategy for all the regions, and symmetric decentralisation would be the perfect sub-game perfect equilibrium. In this case, symmetric decentralisation would be a Pareto-improving reform.[17]

[16] We simulate this case, computing a numerical example with the following values: $N = 1; N_1 = N_2 = 0.45; N_3 = 0.1; y_1 = y_2 = \overline{y}_{1,2} = 0.1; y_3 = 0.5; P_z^s = 4$. Payoffs are reported in figure 12 (panel a).

[17] We simulate this case, computing a numerical example with the following values: $N = 1; N_1 = N_2 = 0.2; N_3 = 0.6; y_1 = y_2 = \overline{y}_{1,2} = 0.45; y_3 = 0.5; P_z^s = 1.07$. Payoffs are reported in figure 12 (panel b).



Panel (a): SUBGAME PERFECT EQUILIBRIUM IF $\frac{y_{1,2}}{\overline{y}} < \left(\frac{1+\frac{N_3}{N}}{2}\right)^{1/2}$



Panel (b): UNIQUE NASH EQUILIBRIUM IF $\frac{y_{1,2}}{\overline{y}} > \left(\frac{1+\frac{N_3}{N}}{2}\right)^{1/2}$

Figure 10: Equilibria in scenario 2

6.2.3 Scenario 3

Let us finally focus now on a scenario with region 3 in the area where $SD \succ S \succ AD$, like in figure 11.[18]

[18]Notice that it stands to reason that the same results would hold if region 3 belonged to the area where $SD \succ AD \succ S$

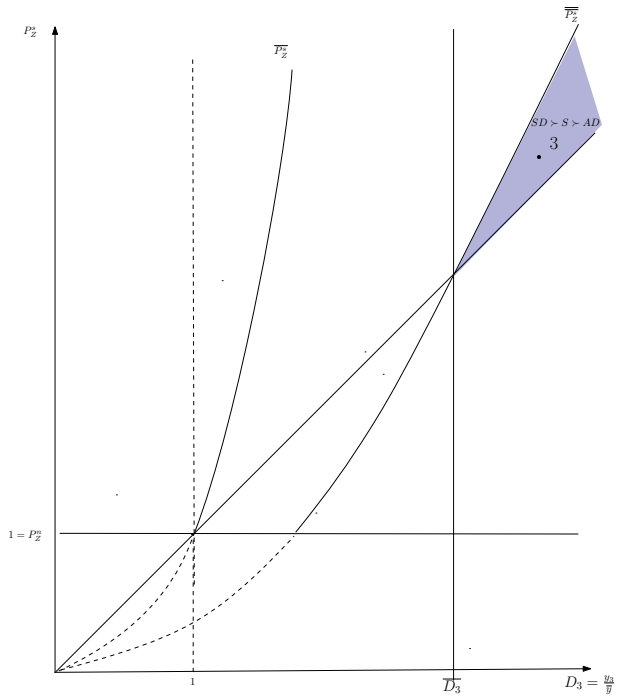


Figure 11: Scenario 3

In this scenario, decentralisation would be the dominant strategy for all the regions, and the sub-game perfect equilibrium would be symmetric decentralisation. Therefore, symmetric decentralisation would be a Pareto-improving reform.[19]

[19] We simulate this case, computing a numerical example with the following values: $N = 1; N_1 = N_2 = 0.45; N_3 = 0.1; y_1 = y_2 = \overline{y}_{1,2} = 0.1; y_3 = 0.7; P_z^s = 5$. Payoffs are reported in figure 14.

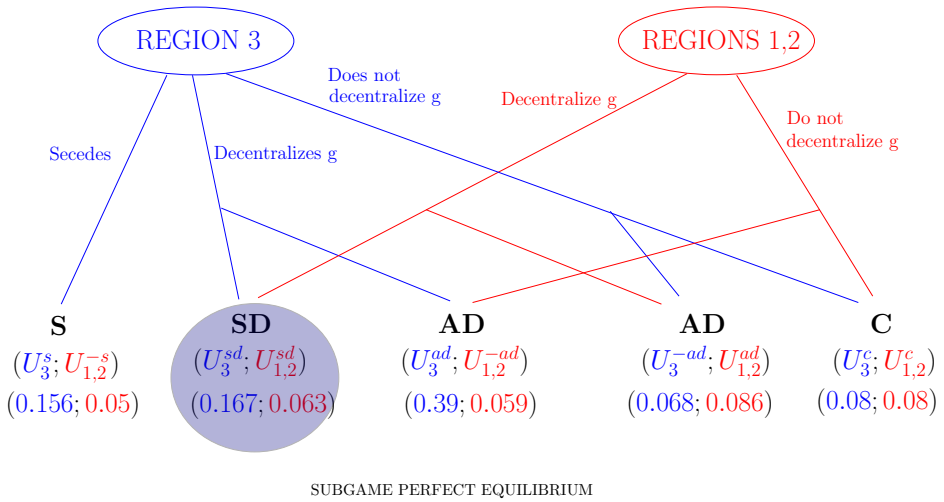


Figure 12: Equilibria in scenario 3

7 Stylised facts and conclusions

A clear trend in the evolution of the political landscape around the world since the mid-20th century is the proliferation of states, so much so that it has been said that we are truly living in an age of secession (Griffiths, 2016). Since World War II, the number of new sovereign states has dramatically increased from 51 in 1945 to 99 in 1960 and to 195 in 2017 mainly due to the decolonization process of the 1960s and the breakup of the Soviet Union and Yugoslavia in the 1990s. The expectancy for a future referendum about Scottish independence after that in September 2014, and the ongoing struggle in Catalunia after the unilateral declaration of independence in October 2017 are just the latest episodes of the secessionist tensions sweeping many European countries. But secessionism is obviously not only a threat to European states but is also a concern in a great number of developing and ethnically fragmented countries, frequently the result of the decolonization process, where secession often takes a violent form. At the supranational level, in legal terms Brexit is a process that bears significant resemblance with secession to the extent that it marks the withdrawal of the UK from the EU community of law. [20] This paper aims at contributing to the literature looking at decentralisation as an institutional solution to curbing secessionist pressures by making potentially seceding regions strictly better off by staying in the union. In particular, we focus on two different modalities: one which is top-down, compulsory and symmetric vs a bottom-up, optional and possibly asymmetric one. We have shown that a bottom-up decentralisation reform may be more successful in avoiding a secessionist conflict than a more standard top-down and symmetric decentralisation set-up.

The theoretical framework we worked out can be useful for shedding light on the

[20] https://blogs.lse.ac.uk/brexit/2019/05/02/brexit-is-a-form-of-secession/

decentralisation reforms which have been recently adopted by different countries to curb regional secessionist tensions. The case which our model seems to be able to represent the most faithfully is the evolution of decentralisation in Spain over the last 40 years. This evolution can be divided into three phases, each of which can be traced back to different scenarios envisaged by our model.

In the first phase, between 1979 and 1981, after the 1978 Constitution (which dictates two paths for the process of achieving autonomy which are different for the so-called Historical regions and for standard regions), an asymmetric decentralisation set-up emerged. As a result of bilateral negotiations with the central government, a group of regions (the Historical regions: Catalonia, the Basque Country, Navarre and Galicia) were assigned strong autonomous powers over a wide array of competences, albeit differentiated (in particular, regarding public finance the Basque Country and Navarre were accorded a special fiscal status, known as the Foral regime). In 1980, the Regional Authority Index (RAI) (Hooghe et al., 2016) ranked Catalonia, the Basque Country and Navarre with a score of 19.5, 17.5 and 11 out of 30 respectively.[21] On the contrary, the other regions (Comunidades autónomas-standard regions) were not yet established as institutions endowed with autonomous powers and therefore were completely dependent on the central government. In addition, the Historical regions, with the exception of Galicia, were by far the most economically advanced areas in Spain (as summarised by the distribution of per-capita income). Therefore, the overall picture of decentralisation across regions was strongly asymmetrical across the rich regions (Historical regions) and the poor ones (standard regions). As a whole, when the (autonomous and rich) Historical regions are identified as 'region 3' and the (centralised and poor) standard regions as 'regions 1 and 2', this picture is quite accurately depicted by the equilibrium in Scenario 2 of our model if condition (22) holds (that is when the per-capita income difference between poor and rich regions is vast; see Figure 10, Panel (a)): the asymmetric decentralisation set-up which emerges is a Pareto efficient outcome.

In the second phase of the decentralisation process in Spain, which occurred during the 80's and early 90's, the aforementioned asymmetric set-up gave way to more symmetric arrangements which have reduced asymmetries across Spanish jurisdictions: standard regions start the complex procedure detailed by the Constitution to acquire new competences without following the preferential path reserved for Historical regions and agree with the central government on expanding regional powers. As a result of this process, at the beginning of the 90's, the RAI index ranked the degree of autonomy in standard regions (21.5 out of 30) equal to Catalonia and just a bit lower than in Navarre (24.5). This sort of progressive dilution of the original asymmetric setting can be rationalised in terms of our model as the transition from the equilibrium in Figure 10, Panel (a) to the one in Figure 10, Panel (b). As a result of a process of convergence between the economies of different regions which strengthened in the '80s[22], decentralisation ends up being the dominant strategy for

[21] In spite of the Foral regime, the Basque Country ranks low for tax autonomy in the RAI ranking, since the autonomous taxing powers were actually assigned to Basque Provinces (Bizkaia/Vizcaya, Araba/Álava, Gipuzkoa/Guipúzcoa) included in the Basque Country.

[22] From 1980 to 1988 the divide in per-capita GDP among Historical regions and standard regions (excluding Madrid Community) fell from 35.7 to 28.5 percentage points.

all regions and therefore the symmetric set-up emerges as a Pareto-improving reform. The final stage of the Spanish decentralisation process is the Catalan crisis, which culminated in the unilateral declaration of independence in October 2017 and the harsh reaction of the central government, which led to the suspension of Catalan autonomy and the incarceration of pro-independence exponents of the regional institutions. Certainly, the radicalisation of the secessionist strategy in Catalonia is the outcome of a number of different factors (specifically the non-recognition of a special tax autonomy akin to the Foral regime accorded to the Basque Country and Navarre) but some elements which may help to explain the Catalan crisis can be also drawn from our theoretical framework. As a matter of fact, over the last decade Catalonia experienced higher economic development[23] than in most other Spanish regions. This, in terms of our model, can read as a possible shift of 'region 3' (here identified as Catalonia) from the ~~blue~~ area of Figure 5, where symmetric decentralisation is preferred to secession, to the right towards an area where, failing a new asymmetric agreement with the central government on a stronger level of autonomy, secession is the dominant strategy for Catalonia.

Lastly, we can outline some possible extensions of the model presented in this paper. First of all, our model can be further developed in order to consider different equalising mechanisms and the effects they can have on the incentives of regions to opt for asymmetric federalism. In the model presented here equalising transfers are such to fully fill the gap between the standard expenditure level set by the central government and the tax capacity of each region. But of course partial equalising arrangements can also be considered, as actually shown in different countries.

Moreover, the model could be extended in order to take into account all costs the secession can imply, not only the administrative and transaction costs of creating a new nation, but also, and most importantly, the costs of failure in cases where a region does not succeed in concluding the separation from the union.

Finally, an interesting further extension of the model would be to endogenise the regional growth process. This would make the model dynamic and endogenous switches across scenarios could be considered. Following a rich theoretical and empirical literature[24], the rate of regional economic growth may be also endogenously dependent (either monotonically or even non-monotonically) on the degree of decentralisation itself. There, in this perspective, decentralisation, and the institutional setting that may result, would be both the cause and the effect of economic growth.

Acknowledgments

We would like to thank all the participants to the international conferences where previous versions of this paper have been presented (1st CefES International Conference on European Studies; 20th annual meeting of the Association of Public Economic Theory; XXXI and XXXII Annual Congress of the Italian Society of Public

[23] GDP grew in Catalonia by 0.6, 0.2, 0.7 percentage points more than Spain in 2014, 2015 and 2016 respectively.

[24] For a review of this literature see Carniti et al. (2019).

Economics; NESPUTT 2019), for their insightful comments and hints.

References

[1] Aja E. (2014), El Estado Autonomico y Reforma Federal, Madrid, Alianza Editorial

[2] Alesina, A. and Spolaore, E. (1997). On the number and size of nations. The Quarterly Journal of Economics, 112(4), 1027-1056.

[3] Alesina, A., and Spolaore, E. (2003). The size of nations. Cambridge, MA: Mit Press.

[4] Arzaghi, M., and Henderson, J.V., 2005. Why countries are fiscally decentralizing. J. Publ. Econ. 89 (7), 1157–1189.

[5] Baldi, B. (2020), Exploring Autonomism: Asymmetry and New Developments in Italian Regionalism, in Revista d'Estudis Autonòmics i Federals - Journal of Self-Government, numero 32, dicembre, forthcoming

[6] Bakke, K., and Wibbels, E., (2006). Diversity, disparity, and civil conflict in federal states. World Polit. 59 (1), 1–50.

[7] Bolton, P., and Ronald, G. (1997), The Breakup of Nations: A Political Economy Analysis, The Quarterly Journal of Economics, 112:4, 1057-1090.

[8] Brancati, D., (2006). Decentralization: fueling the fire or dampening the flames of ethnic conflict and secessionism? Int. Organ. 60 (3), 651–685.

[9] Carniti, E., Cerniglia, F., Longaretti, R., and Michelangeli, A. (2019). Decentralization and Economic Growth in Europe: For Whom the Bell Tolls, Regional Studies, 53(6), 775-789.

[10] Cederman, L.-E., Hug, S., Schadel, A., Wucherpfennig, J., 2015. Territorial autonomy in the shadow of conflict: too little, too late? Am. Pol. Sci. Rev. 109 (2), 354–370.

[11] Cerniglia, F. (2003) Decentralization in the public sector: quantitative aspects in federal and unitary countries, Journal of Policy Modeling, vol. 25, issue n. 8.

[12] Christin, T., and Hug, S., (2012). Federalism, the Geographic Location of Groups, and Conflict. Conflict Manag. Peace Sci. 29 (1), 92–121.

[13] Congleton, R.D. (2006). Asymmetric federalism and the political economy of decentralization. Handbook of fiscal federalism, 131-153.

[14] Congleton, R.D., Kyriacou, A., and Bacaria, J. (2003), A Theory of Menu Federalism: Decentralization by Political Agreement, Constitutional Political Economy, 14, 167-190.

[15] Flamand, S. (2019), Partial decentralization as a way to prevent secessionist conflict, European Journal of Political Economy 59 (2019) 159–178

[16] Flynn M.K. (2004), Between Autonomy and Federalism – Spain, in Ulrich Schneckener and Stefan Wolff, Managing and Settling Ethnic Conflicts, Springer, p. 139-160.

[17] Haimanko, O., Le Breton, M., and Weber, S., (2005). Transfers in a polarized country: bridging the gap between efficiency and stability. J. Publ. Econ. 89 (7), 1277–1303.

[18] Fiorillo, F., Giuranno, M.G., and Sacchi, A, (2020). Asymmetric decentralization: distortions and opportunities. Economia Politica. https://doi.org/10.1007/s40888-020-00211-7

[19] Grazzini L., Lattarulo P., Macchi M., and Petretto A. (2020), Asymmetric Decentralization: Some Insights for the Italian Case, Politica economica/Journal of Economic Policy, 1/2020, pp. 63-99.

[20] Griffiths, R.D. (2016), Age of secession. The international and domestic determinants of State birth, CUB

[21] Hooghe, L., Marks, G., Schakel, A. H., Osterkatz, S. C., Niedzwiecki, S., and Shair-Rosenfield, S. (2016). Measuring regional authority: A postfunctionalist theory of governance, Volume I. Oxford University Press.

[22] Iacovino R. (2012), Partial Asymmetry and Federal Construction: Accommodating Diversity in the Canadian Constitution, in Marc Weller and Katherine Nobbs (eds.), Asymmetric Autonomy and the Settlement of Ethnic Conflicts, 2012, pp. 75-96.

[23] Le Breton, M., and Weber, S., (2003). The art of making everybody happy: how to prevent a secession? IMF Staff Pap. 50 (3), 403–435.

[24] Lluch J. (2012). Autonomism and Federalism. Publius: The Journal of Federalism, 42(1): 134-161. Doi: 10.1093/publius/pjr016

[25] Madiès, T., Rota-Grasiozi, G., Tranchant, J., and Trépier, C. (2018) The economics of secession: a review of legal, theoretical, and empirical aspects, Swiss Journal of Economics and Statistics, 154:19.

[26] McGarry J. (2012), Asymmetric Autonomy in the United Kingdom, in Marc Weller and Katherine Nobbs (eds.), Asymmetric Autonomy and the Settlement of Ethnic Conflicts, 2012, pp. 148-179.

[27] OECD (2019), Making Decentralisation Work: A Handbook for Policy-Makers, OECD Multi-level Governance Studies, OECD Publishing, Paris. https://doi.org/10.1787/g2g9faa7-en

[28] Panizza, U., (1999). On the determinants of fiscal centralization: theory and evidence. J. Publ. Econ. 74 (1), 97–139.

[29] Spolaore, E., (2008). Federalism, Regional Redistribution, and Country Stability, Studies in Fiscal Federalism and State-Local Finance. Edward Elgar Publishing.

[30] Tan E. (2020). Decentralization and Conflict Prevention. In: Richmond O., Visoka G. (eds) The Palgrave Encyclopedia of Peace and Conflict Studies. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-11795-5_106-1.

[31] Tranchant, JP, (2008). Fiscal Decentralization, Institutional Quality and Ethnic Conflict: A Panel Data Analysis, 1985-2001, Conflict, Security and Development 8(4):491–514

[32] Tranchant, JP, (2016). Decentralisation, Regional Autonomy and Ethnic Civil Wars: A Dynamic Panel Data Analysis, 1950-2010, MPRA Paper 72750, University Library of Munich, Germany.

Appendix

Recalling the set-up of the model, let us analyse the maximisation problem faced by the representative agent of region i (indexing other regions with j and k respectively) in each institutional arrangement.

- Centralisation

In centralisation, the problem faced by the representative agent of he i-th region is the following:

$$MaxU_i = (g^n)^{1/2} \left(\frac{Z^n}{N}\right)^{1/2} \tag{A1}$$

s.t. the individual budget constraint

$$g^n + \frac{Z^n}{N} = y_i - \frac{\sum_{-i} FF^c_{-i}}{N_i} \tag{A2}$$

where $\sum_{-i} FF^c_{-i}$ are fiscal flows of regions j and k:

$$\sum_{-i} FF^c_{-i} = (N_j + N_k)\, g^n + P^n_Z \frac{(N_j + N_k)}{N} Z^n - \tau\,(Y_j + Y_k) \tag{A3}$$

The maximisation problem gives the following results:

$$g^{c*} = \frac{Z^{c*}}{N} = \frac{\overline{y}}{2} \tag{A4}$$

and

$$U^{c*}_i = \frac{\overline{y}}{2} \tag{A5}$$

- Secession

In secession, the maximisation problem for the representative agent of the i-th secessionist region becomes:

$$MaxU_i = (g_i^s)^{1/2} \left(\frac{Z_i^s}{N_i}\right)^{1/2} \tag{A6}$$

s.t. the individual budget constraint

$$g_i^s + P_Z^s \frac{Z_i^s}{N_i} = y_i \tag{A7}$$

The maximisation problem gives the following results:

$$g^{s*} = \frac{y_i}{2} \tag{A8}$$

$$\frac{Z^{s*}}{N_i} = \frac{y_i}{2} \frac{1}{P_Z^s} \tag{A9}$$

and

$$U_i^{s*} = \frac{y_i}{2} \frac{1}{(P_Z^s)^{1/2}} \tag{A10}$$

As for the regions that do not secede, the following equilibrium levels hold:

$$g^{-s*} = \frac{Z_{-i}^{-s*}}{N} = \frac{\overline{y_{-i}}}{2} \tag{A11}$$

and

$$U_{-i}^{-s*} = \frac{\overline{y_{-i}}}{2} \tag{A12}$$

Comparing eq. (A5) with eq. (A10), **centralisation is preferred to secession by the secessionist region, if and only if**

$$U_i^{c*} > U_i^{s*} \tag{A13}$$

that is if and only if

$$P_Z^s > \left(\frac{y_i}{\overline{y}}\right)^2 = (D_i)^2 = \overline{P_Z^s} \tag{A14}$$

Comparing eq. (A5) with eq. (A12), since $\overline{y_{j,k}} \underset{<}{} \frac{\overline{y}}{2}$, it is easy to verify that **centralisation is always preferred to the secession of region i, by regions that do not secede**.

- Symmetric decentralization

In symmetric decentralization (either top-down or bottom-up), the maximisation problem for the representative agent of the i-th region is:

$$MaxU_i = \left(g_i^{sd}\right)^{1/2} \left(\frac{Z^{n(sd)}}{N}\right)^{1/2} \tag{A15}$$

s.t.

1. the individual budget constraint

$$g_i^{sd} = y_i(1-\tau) \tag{A16}$$

2. the central government budget constraint

$$\tau(Y_1 + Y_2 + Y_3) = Z^{n(sd)} \tag{A17}$$

The maximisation problem gives the following results:

$$g^{sd*} = \frac{y_i}{2} \tag{A18}$$

$$\frac{Z^{n(sd)*}}{N} = \frac{\overline{y}}{2} \tag{A19}$$

and

$$U_i^{sd*} = \frac{y_i}{2}\left(\frac{\overline{y}}{y_i}\right)^{\frac{1}{2}} \tag{A20}$$

Comparing eq. (A20) with eq. (A10), **symmetric decentralisation is preferred to secession by the potential secessionist region if and only if**

$$U_i^{sd*} > U_i^{s*} \tag{A21}$$

that is if and only if

$$P_Z^s > \frac{y_i}{\overline{y}} = D_i \tag{A22}$$

Comparing eq. (A20) with eq. (A12), since $\overline{y} > \overline{y_{-i}}$, it is possible to verify that **symmetric decentralization is always preferred to the secession of region i by the regions that would not secede**

- Asymmetric decentralization

In asymmetric decentralization, the maximisation problem for the representative agent of the i-th region is:

$$MaxU_i = \left(g_i^{ad}\right)^{1/2}\left(\frac{Z^{n(ad)}}{N}\right)^{1/2} \tag{A23}$$

s.t.

1. the individual budget constraint

$$g_i^{sd} = y_i(1-\tau) \tag{A24}$$

2. the central government budget constraint

$$\tau Y_i + Y_j + Y_k = (N_j + N_k)\, g^{c*} + Z^{n(ad)} \tag{A25}$$

The maximisation problem gives the following results for the region that decentralises:

$$g^{ad*} = \frac{N + N_i}{N_i} \frac{\overline{y}}{4} \tag{A26}$$

$$\frac{Z_i^{ad*}}{N} = \frac{N + N_i}{N} \frac{\overline{y}}{4} \tag{A27}$$

and

$$U_i^{ad*} = \frac{N + N_i}{N_i} \frac{\overline{y}}{4} \left(\frac{N_i}{N}\right)^{1/2} \tag{A28}$$

As for the regions that do not decentralises, the following equilibrium levels hold:

$$g_{-i}^{-ad*} = \frac{\overline{y}}{2} \tag{A29}$$

$$\frac{Z_{-i}^{-ad*}}{N} = \frac{N + N_i}{N} \frac{\overline{y}}{4} \tag{A30}$$

and

$$U_{-i}^{-ad*} = \left(\frac{\overline{y}}{2}\right)^{1/2} \left(\frac{N + N_{-i}}{N} \frac{\overline{y}}{4}\right)^{1/2} \tag{A31}$$

Comparing eq. (A28) with eq. (10), **asymmetric decentralisation is preferred to secession by the region that decentralises if and only if**

$$P_Z^s > 4(D_i)^2 \frac{N_i N}{(N + N_i)^2} = \overline{\overline{P_Z^s}} \tag{~~A33~~}$$

Notice that $4(D_i)^2 \frac{N_i N}{(N+N_i)^2} < 1$ therefore $\overline{\overline{P_Z^s}}$ lays below $\overline{P_Z^s}$. Comparing eq. (A28) with eq. (10), **asymmetric decentralisation is preferred to secession by the region that do not decentralise if and only if**

$$U_{-i}^{-ad*} > U_i^{s*} \tag{~~A35~~}$$

that is if and only if

$$\frac{\overline{y_{-i}}}{\overline{y}} = D_{-i} < \left(\frac{1 + \frac{N_i}{N}}{2}\right)^{1/2} = \overline{D_{-i}} \tag{~~A36~~}$$

Finally, comparing eq. (A28) with eq. (A20), **asymmetric decentralisation is preferred to symmetric decentralisation by the region that decentralises, if and only if**

$$D_i < \frac{(N + N_i)^2}{4 N_i N} = \overline{D_i} \tag{~~A37~~}$$

Notice that $\overline{D_i} > 1$