When Dyadic Federations Fall Apart and When they Remain Together: a Qualitative Comparative Analysis of Bipolar Federalism around the World

Christoph Niessen[*], Min Reuchamps, Dejan Stjepanovic, Jérémy Dodeigne & Augustin Habra

[Work in progress. Please do not cite]

Abstract: This paper studies the survival and break-up of dyadic federations around the world in light of the high potential for centrifugal pressures that comes with their bipolar federal society and institutions. By mapping the factors that are crucial for the stability in dyadic federations, the research provides a comprehensive and updated account of their institutional, geographic and economic contexts. By systematically comparing these factors with a *fuzzy-set Qualitative Comparative Analysis* for all past and present dyadic federations around the world, it seeks to go beyond the existing single or low-n case scholarship. The results suggest that federalism is not *per se* a bad institutional arrangement for bipolar polities as some scholars suggested. A bipolar federal projects can succeed if geographical factors such as the territorial dispersion of the dominant groups play in its favor, and when the presence of institutional arrangements such as a proportional electoral system or a national party system either assure a fair political representation for each group or prevent polities to be conceived in exclusively sub-national terms. In turn, a bipolar federal project is likely to fail in the absence of stabilizing institutional factors like executive inclusiveness and a national party system, especially when economic resource are unequally distributed among groups and when the latter are territorially clearly separable.

Contents:

[*] Corresponding author: Christoph Niessen, FRESH Fellow of the F.R.S.-FNRS at Université de Namur & Université catholique de Louvain, Belgium. Contact: christoph.niessen@unamur.be.

Introduction

Within the 'genus of federalism' (Elazar, 1991), dyadic federations have always raised a peculiar interest because of their distinctive bipolar nature and the particular political dynamics that come with it. Thirty years ago, in the introduction to a special issue of *Publius*, Ivo Duchacek (1988, p. 5) defined dyadic federations as "societies and polities in which two distinct communities clearly dominate the political arena". While some conceived it as a polity made of exclusively two communities (Burgess, 2006, p. 110), we take a broader and dynamic (rather than sociopolitical) approach where the distinctive feature of a dyadic federation lies in the presence of two dominant societal groups with competing self-determination projects matched by institutional and political federal structures. While the former is sometimes referred to as 'dyadic' and the latter as 'bipolar' (Burgess, 2006, p. 117), we use these terms interchangeably because both dyadic and bipolar federations share a major political stake that lies at the heart of this paper: the survival of their federal state despite the high potential for centrifugal pressures in their bipolar federal society.

Ronald Watts (2008a, p. 184) identified 'two-unit federations' as one of the 'pathologies of federalism' and even argued that "the experience of bipolar or dyadic federal systems is not encouraging". The reasons for his concerns come with the social and political dualism of dyadic federalism and the absence of relations with multiple constituent units, which often result in institutional deadlock and societal confrontation. Despite this skepticism and the fact that several dyadic federations did indeed break-up, the empirical reality also shows us that, as of today, many dyadic federations survived and even attained some degree of political stability (some more, some less). One might hence wonder how it comes that some of them survived while others did not?

While existing research has provided interesting accounts on the topic through single or low-n case studies on the political dynamics of both succeeding and failing dyadic federations (e.g. Milne (1988), Innes (1997), Singh (2008)), there is hitherto but one comprehensive comparison of a large number of cases and political realities, that of Duchacek in 1988. Given the substantive political evolutions since then (only think of Czechoslovakia still being united and Bosnia-Herzegovina not even independent), this paper offers a reappraisal through the macro-level study of all past and present dyadic federations worldwide. By mapping institutional, geographical and economic realities for each of them, it aims at accounting for the constellational complexity in these federations and at understanding in the presence or absence of which factors dyadic federal projects succeeded, and under which they failed.

The paper is structured as follows. A first section provides the conceptual framework of the study and clarifies which cases will be studied, what success and failure mean in a dyadic federation and what factors are taken into account when explaining it. A second section provides the methodological framework by specifying the factors' operationalization and the rationale of the *fuzzy-set Qualitative Comparative Analysis* that is used to perform the systematic cross-case comparison. A third section details the results of the analysis and federalism is not *per se* a bad institutional arrangement for bipolar polities. A bipolar federal projects can succeed if geographical factors such as the territorial dispersion of the dominant groups play in its favor, and when the presence of institutional arrangements such as a proportional electoral system or a national party system either assure a fair political representation for each group or prevent polities to be conceived in exclusively sub-national terms. In turn, a bipolar federal project is likely to fail in the absence of stabilizing institutional factors like executive inclusiveness and a national party system, especially when economic

resource are unequally distributed among groups and when the latter are territorially clearly separable. A concluding section puts these results into perspective.

1. Conceptualizing Survival and Break-up of Dyadic Federations

When conceptualizing how survival and break-up of dyadic federations can be understood, three questions need to be addressed: (a) what cases can be considered as a dyadic federation and should hence be included in this study, (b) what exactly success and failure signify in a dyadic federation, and (c) what factors should be studied as potentially accounting for whether a dyadic federation survived. This section discusses each of them.

a) Studying dyadic federations around the world from the past and present

The distinctive feature of dyadic federations is their bipolarity – both when it comes to their institutions and their society. Concerning society, this means that a state's population is composed of two distinct major communities that are characterized by different linguistic, cultural, historic or religious specificities (or at least 'imagined' (Anderson, 1983)) as such by its members). This does not mean that these groups have to be the only ones on the state territory, they just have to be the politically clearly dominant groups and outnumber other's substantively. Concerning institutions, this means that the two dominant societal groups pursue different self-determination projects that are matched by institutionalized self- and/or shared-rule prerogatives, may it be in legislative, the executive, the judiciary or even in the administration. The concept referring to this state reality has received different names in the literature so far, i.e. 'dyadic', 'bipolar', 'bicommunal' or 'two-unit' federation (Duchacek, 1988; Watts, 2008b). We use them interchangeably in this paper. Based on this conceptualization, we retained three criteria to guide our case selection.

A *first criterion* is the existence of two dominant communities which are reflected in the institutional and socio-political structure of the state. It is worth remembering that nearly no configuration studied in this paper is made of exclusively two political communities. There are always minorities that are not considered as part of one or another camp, and that do yet not play a major role in the statewide political arena.

A *second criterion* is the presence of, at least, some stabilizing communitarian mechanisms within the common political organization. Thereby, we refer to federal state structures but do not conceive federalism as a dichotomous political reality. Instead, we approach it rather in terms of gradual and cumulative institutional aspects. While some of the cases selected hereunder were constitutionally federal, other polities were simply characterized by federal power-sharing mechanisms and therefore also qualified.

A *third criterion* requires the states under study to be democratic. While this criterion is external to the concept of 'dyadic federation' *per se*, it was included to assure the comparability of cases. I.e. to prevent inferences based on the factors under study to be compromised by external conditions related to a state's degree of democratization. To make this assessment, we used the Freedom House (2018) data based and only included countries that were considered at least partially free. Examples of dyadic federations that were excluded because of their insufficient level of democratization are Burundi, Rwanda and Yemen. In turn, some studied polities were not democratic enough a few years ago but qualified nevertheless in light of the recent positive democratic evolutions. An example of this are the Fiji Islands.

Based on these three criteria, fourteen cases were included as democratic dyadic federations in the present study. There are listed in Table 1 hereunder and situated vis-à-vis

each of the three criteria. One will notice that a temporal period is specified for each case. This means that they qualified within laps of time, that our observation its temporarily bounded by it and that they are considered as a single case within this period.

Table 1. The 14 democratic dyadic federations included in the study

Polity	Dominant socio-political groups		Federal mechanisms		Degree of democratization (Freedom House)
	Largest group	*2nd largest group*	*Federal constitution*	*Power-sharing*	
Belgium (1970-today)	French-speakers	Dutch-speakers	●	●	Free
Bosnia and Herzegovina (1995-today)	Bosniaks	Serbs	●	●	Partly free
Canada (1987-today)	English-speakers	French-speakers	●	●	Free
Cyprus (1960-1974)	Greek-Cypriots	Turk-Cypriots		●	Free
Czechoslovakia (1998-1992)	Czechs	Slovaks	●	●	Free
Federation of Malaysia (1963-1965)	Malays	Singaporeans	●	●	Partly free*
Fiji Islands (2014-today)	Melanesians	Indo-Fijians		●	Partly free
Guyana (1966-today)	Indo-Guyanese	Afro-Guyanese		●	Free
Nigeria (1999-today)	Christians	Muslims	●	●	Partly free
Northern Ireland (1998-today)	Protestants	Catholics		●	Free
Saint-Kitts and Nevis (1983-today)	Kittitians	Nevisians	●	●	Free
Serbia and Montenegro (2003-2006)	Serbs	Montenegrins	●	●	Free
Suriname (1991-today)	Hindustanis	Creoles		●	Free
Trinidad and Tobago (1976-today)	Indo-Trinidadian	Afro-Trinidadian		●	Free

● = present. * Not covered by the Freedom House index but considered partly free by the authors.
Source: compiled by the authors.

b) Assessing success and failure of a dyadic federal project

The objective of this study is to assess why some dyadic federal projects succeeded while others failed. By 'success', we mean the survival of a dyadic federation, i.e. the fact that the state continued existing in the presence of both dominant socio-political groups. By 'failure', we mean the break-up of a dyadic federation, i.e. the fact that the state ceased to exist in the presence of both dominant socio-political groups – may it be through a splitting up of the state or the secession of one of the dominant groups. Among the cases listed above, four broke up (Cyprus, Czechoslovakia, the Federation of Malaysia, and Serbia and Montenegro) and the ten continued existing.

While this conceptualization seems intuitive, two remarks are necessary. First, one should note that between the survival and the break-up of a state, there are multiple degrees of stability. Beside the fact that measuring such a fine-grained reality is a very difficult task, it is not the objective of this study to do so. Further research, in turn, might want to pick up on it. Secondly, speaking about the survival and breaking-up of a state contains some normativity. Traditionally, state-survival is positively connoted while the 'break-up' of a state has a negative undertone. However, state-survival can be very problematic in the presence of unresolvable ethnic tensions (even if it is the only possible solution), just as state break-up can have pacifying consequences for diverse populations. In this study, we do not want to attach any desirability *per se* to neither of these two outcomes. Instead, our research objective is primarily empirical. Where we become judgmental is when drawing conclusions from our empirical findings on the prospect of federalism (or particular aspects of it) to be an appropriate institutional arrangement for bipolar polities. The question is hence one of institutional suitability for a given outcome, while the desirability of this outcome is a different question.

c) Explaining success and failure of dyadic federations

The present studies aims at explaining the success and failure of dyadic federal projects by systematically comparing across all selected cases in the presence or absence of which factors dyadic federations fall-apart and when they remain together. Much scholarly attention has been devoted to the comparative study of conflict from an institutional (Hale 2004, Lijphart 2004) or a peace-building perspective (Lederach 1997, Paris 2004, Oberschall 2007) and on divided polities in general (Roeder and Rotchild 2005, Guelke 2013). Bipolar polities have hitherto received much less of such a systematic attention. In fact, existing research on dyadic federations either fails to compare a substantive amount of cases or is outdated. What is useful, however, are those single or low-n case studies that we can draw on to identify the factors that should be accounted for as potentially explaining the survival or break-up of a dyadic federation.[1] After a comprehensive review of these empirical works and further theoretical literature on the topic, we decided to include five factors in the present analysis:
  – the extent to which groups are territorially concentrated.
  – the degree of countrywide electoral proportionality.
  – the degree of nationalization of the party system.
  – the degree of inclusiveness in the state executive.
  – the extent to which economic resources are equally distributed across groups.

Territorial concentration

A first factor that was identified as potentially decisive for the survival of a dyadic federation is a geographical one: territorial concentration. In fact, a core question to be treated when performing a state splitting or secession is a secession is that of the borders between two groups (Coakley, 2012, pp. 234-239). If an intrastate border between two communities is accepted by them, it may become an inter-state border in case of splitting or secession. Conversely, if group populations are so intermingled that agreeing on a state border is impossible, splitting or secession may simple be just as impossible. Consequently, we expect territorial heterogeneity to contribute to the survival of dyadic federations, while we expect territorial homogeneity to do the opposite. By territorial concentration or homogeneity, we mean the extent to which it is possible to draw a clear territorial line between the two dominant groups of a state.

Electoral proportionality

A second identified factor relates to the voting system that is used for determining the candidates that are represented in the state legislature. Traditionally, the conflict literature is divided between consociationalists who argue in favor of a group-based representation (Lijphart, 1977, 2004) and centripetalists who argue in favor of electoral incentives for cross-

---

[1] For single case studies on Belgium, *cf.* Beaufays (1988), Billiet, Maddens and Frognier (2006), and Hooghe (2012). On Bosnia and Herzegovina, *cf.* Bieber (2002, 2003), Bojkov (2003), and Keil (2014). On Canada, *cf.* Leslie (1988), and Arban (2010). On Cyprus, *cf.* Bryant (2011), Trimikliniotis and Bozkurt (2012), Salih (2013), and Leonard (2014). On Czechoslovakia, *cf.* Innes (1997). On the Federation of Malaysia, *cf.* Josey (2013). On Fiji, *cf.* Dornan (2013), and Nair (2013). On Guyana, *cf.* Singh (2008). On Nigeria, *cf.* Joseph (2014). On Northern Ireland, *cf.* Geoghegan (2012), and Mitchell (2013). On Saint-Kitts and Nevis, *cf.* Nisbet (2004). On Serbia and Montenegro, *cf.* Fraser (2003), and Noutcheva (2004). On Suriname, *cf.* Verrest (2010). On Trinidad and Tobago, *cf.* Johnson and Kochel (2012). For low-n comparisons on Belgium and Canada, *cf.* Fournier and Reuchamps (2009), and Poirier (2004). On Belgium and Czechoslovakia, *cf.* Moravcik (2008). On Belgium and Bosnia and Herzegovina, *cf.* Stroschein (2003). On Bosnia and Herzegovina and Northern Ireland, *cf.* Magill and Hamber (2010). On Fiji, Guyana and Malaysia, *cf.* Milne (1988). On Guyana and Suriname, *cf.* Singh (2008).

group vote pooling (Horowitz, 1990, 1993; Reilly, 2001). Both agree, however, that an electoral system should be as proportional as possible to prevent groups from feeling underrepresented (or the other group as overrepresented). Consequently, we expect a proportional electoral system to contribute to the survival of dyadic federations, while we expect a non-proportional one to do the opposite. By proportional, one should understand the extent to which the share of votes for a party (often mirroring ethnic divisions) is mirrored by their share of seats in the statewide legislature, i.e. where both dominant groups are represented.

Nationalization of the party system

A third identified factor is concerned with the extent to which political parties are nationalized or regionalized, i.e. whether they seek support on a statewide basis and across the dominant groups or whether they address the electorate of a single (region and) group only. It is closely related to the centripetal argument according to which parties that are institutionally obliged (or at least incentivized) to address a cross-community electorate will moderate their ethno-regional claims and contribute to greater statewide stability (Horowitz, 1990, 1993; Reilly, 2001). Consequently, one should expect a nationwide party system to contribute to the survival of dyadic federations, while a regionalized party system can be expected to do the opposite. While the degree of nationalization of a party system is highly influenced by the electoral system and, in a divided society, by the territorial overlap of voting constituencies and the residing area of different societal groups, it is ultimately a party decision.

Executive inclusiveness

A fourth identified factor relates to the representation of societal groups in the statewide executive. It is related to the consociational argument that all groups divided by politically salient cleavages should have a guaranteed access to political power, especially when decision are taken on the behalf of all of them (Lijphart, 1977, 2004). While advocates recognize the risk for institutionally reinforcing existing societal divides, they argue that executive power-sharing will still have a pacifying effect thanks to the fact that all societal groups feel represented in the body that takes the country's major political decisions (Lijphart, 1995). Consequently, we expect the inclusion of the dominant groups in the statewide executive to contribute to the survival of dyadic federations, while we expect the absence thereof to do the opposite. One should note that executive inclusiveness may be a formal constitutional requirement in some cases, while it is a tacit historical, cultural or political arrangement in others (Reynolds & Reilly, 1999; Roeder & Rothchild, 2005).

Equally distributed economic resources

A fifth and final factor that we identified as potentially decisive for the survival of a dyadic federation is an economic one: the equal distribution of economic resources across groups. While the share of common wealth is an important issue in all divided (and even undivided) societies, it can be expected to be of even more importance in dyadic federations where economic advantages of one group have a high probability of constituting a disadvantage for the other (Elazar, 1988). More concretely, one can expect mutually enforcing phenomena of greed and grievance to create instability (Gurr, 1993, 2015). Of greed, when the advantaged societal group does not want to share resources with the disadvantaged. Of grievance, when the disadvantaged group feels deprived or dominated. Consequently, we expected an equal distribution of economic resources across groups to contribute to the survival of dyadic

federations, while we expected an unequal distribution to do the opposite. One should note that the distribution of economic resources involves both the *de facto* repartition of natural and economic wealth on the one hand, and national redistribution mechanisms on the other (Gordon and Cullen, 2012).

2. Mapping and Explaining Cross-Case Diversity in Degree and Kind: setting up a fuzzy-set Qualitative Comparative Analysis

The present paper has two objectives, one descriptive and one analytical. Descriptively, it aims at mapping the existing political, geographical and economic context of dyadic federations from the past and present around the world. Thereby, it updates existing accounts, prepares the analytical step of this paper and provides raw data for forthcoming research. Analytically, it aims at explaining in the presence or absence of which combinations of factors dyadic federations survived or fell-apart. Thereby, it seeks to inform the broader literature on federalism, national diversity and democracy regarding the prospect of federal arrangements in bipolar polities. In order to do so, we use a *fuzzy-set Qualitative Comparative Analysis*. This method could not be better suited to overcome the previously outlined shortcomings of existing research in that it allows for systematically mapping and comparing the identified factors across all fourteen cases. Two aspects of it need further clarification: (a) how factors have been translated into fuzzy-set conditions and how data have been collected for each of them, and (b) on which rationale the analysis is build.

a) Operationalization of the conditions and data collection

A Qualitative Comparative Analysis (QCA) is based on Boolean logics and systematically compares 'conditions' that are calibrated as 'crisp-sets' or 'fuzzy-sets' (Berg-Schlosser, De Meur, Rihoux, & Ragin, 2009). Conditions are assessments of the extent to which a phenomenon, in this case a factor, is present or absent in a given case (e.g. to which extent is electoral proportionality is present in Belgium). In set-theoretic terms, they assess the extent to which a case belongs to a given set that is defined vis-à-vis a concept (e.g. to which extent does Belgium belong to the set of electorally proportional countries) (Schneider & Wagemann, 2012). While crisp-sets assess conditions dichotomously and only allow for differentiations in kind (presence (1) vs. absence (0) of a condition), fuzzy-sets are fine-grained assessments of conditions (calibrated as ratios from 0.00 - 1.00) and allow for differentiations in both kind (0.50 being the discriminating point) and degree (e.g. 0.60 < 0.80).

As summarized in Table 2, the five previously identified factors have been translated into conditions and were calibrated as 4-point fuzzy-sets: 1.00 for the full presence of the factor in a case, 0.66 when it was rather present, 0.33 when it was rather not present and 0.00 when it was fully absent. An outcome condition accounting for whether a dyadic federation survived or broke-up was calibrated as crisp-set: 1 when the federation survived, 0 when it broke up.

The assessment of a case's territorial concentration was made qualitatively by the authors. A case was considered 'fully concentrated' when the dominant groups lived in territorially homogenous areas that could be separated by a clear line. It was considered 'rather concentrated' when there was some territorial heterogeneity among the groups, but when a clear line could still be drawn. They were considered as 'rather not concentrated' when this line could no clearly be drawn. They were considered as 'fully not concentrated' when groups were territorially highly dispersed and no clear line could be drawn.

Table 2. Operationalization of the conditions as fuzzy-sets

Label	Conditions	Fuzzy scale	Operationalization
OUTCOME	Survival/Break-up of the dyadic federation	2-point (crisp-set)	Qualitative assessment: Survival = 1, break-up = 0.
TERR.CON	Territorial concentration	4-point	Qualitative assessment: Fully separable = 1, rather separable = 0.66, rather not separable = 0.33, fully not separable = 0.
ELEC.PROP	Electoral proportionality	4-point	Mean score on *Gallagher Index*: Anchors: 0-4 = 0, 5-9 = 0.33, 10-14 = 0.66, 15-20 = 1.
NAT.P.SYST	Nationalization of the party system	4-point	Qualitative assessment: Fully national = 1, rather national = 0.66, rather not national = 0.33, fully not national = 0.
EXEC.INCL	Executive inclusiveness	4-point	Qualitative assessment: Perfect cabinet share = 1, significant share = 0.66, ineffective share = 0.33, no share = 0.
EQ.ECO.DIS	Equal economic distribution	4-point	Quantitative (GDP) and qualitative assessment: Largely equal = 1, minor inequalities = 0.66, substantive inequalities = 0.33, major inequalities = 0.

The assessment of a case's electoral proportionality was made using the *Gallagher Index* (Gallagher, 2018).[2] More specifically, cases mean Gallagher score was taken for all lower house elections with available data.[3] During calibration, a Gallagher score of 0-4 was translated into 0.00, a score of 5-9 was translated into 0.33, a score of 10-14 was translated into 10-14, and a score from 15-20 was translated into 1.00.

The assessment of a case's degree of nationalization in the party system was made qualitatively by the authors. It was considered 'fully national' when the party system was exclusively national. It was considered 'rather national' when the system was predominantly national. It was considered 'rather not national when the system was predominantly regional. It was considered 'fully not national' when the system was exclusively regional.

The assessment of a case's executive inclusiveness was again made qualitatively by the authors. It was considered 'fully inclusive' in the presence of a(n) (almost) perfect cabinet share between the two dominant groups. It was considered 'rather inclusive' in the presence of a significant cabinet share. It was considered 'rather not inclusive' in the presence of inefficient cabinet shares (e.g. in Fiji where the party of one group often refuses to sit in cabinet with that of the other group, despite the constitution foresees it). It was considered 'fully not inclusive' in the absence of any cabinet share.

The assessment of a case's economic distribution, finally, was made both quantitatively and qualitatively by the authors. When available, the GDP per capita of both dominant groups was compared. In the absence of data, qualitative well-informed sources where used to classify each polity.[4] A case was considered 'fully equal' when both groups could be considered of

---

[2] The Gallagher Index or 'least squares index' calculates the degree of electoral proportionality by taking the square-root of the half of the sum of all parties' squared difference between their share of votes and share of seats for one election: $Lsq = \sqrt{\frac{1}{2}\sum_{i=1}^{n}(\% \, Votes_i - \% \, Seats_i)^2}$.

[3] For Belgium, Canada, Guyana, Saint-Kitts and Nevis, Serbia and Montenegro, Suriname, and Trinidad and Tobago, calculations were borrowed from Gallagher (2018). For Bosnia and Herzegovina, Czechoslovakia, Cyprus, Fiji, the Federation of Malaysia, Nigeria, and Northern Ireland, calculations were made by the authors.

[4] For Belgium, *cf.* Marfouk (2008). For Bosnia and Herzegovina, *cf.* Chaveneau-Lebrun (2001). For Canada, *cf.* Bernier (2010). For Cyprus, *cf.* Leonard (2014). For Czechoslovakia, *cf.* Innes (1997). For the Federation of Malaysia, *cf.* Josey (2013). For Fiji, *cf.* Sriskandarajah (2003). For Guyana, *cf.* Minority Rights Group International (2018). For Nigeria, *cf.* Joseph (2014). For Northern Ireland, *cf.* Mitchell (2013). For Saint-Kitts and Nevis, *cf.* Nisbet

largely equal wealth. It was considered 'rather equal' when a minor difference in wealth was observed. It was considered 'rather not equal' when a substantive difference in wealth was observed. It was considered 'fully not equal' when a major difference in wealth was observed.

When taking applying this operationalization and calibrating the collected data on all factors for the fourteen dyadic federation under study, one obtains the final data distribution that is used in the *fuzzy-set Qualitative Comparative Analysis* and displayed in Table 3.

Table 3. Data distribution on the five conditions and the outcome for all 14 dyadic federations

ID	Cases	TERR.CON	ELEC.PROP	NAT.P.SYST	EXEC.INCL	EQ.ECO.DIS	OUTCOME
BEL	Belgium (1970-today)	0.33	1.00	0.00	1.00	0.33	1
BAH	Bosnia and Herzegovina (1995-today)	0.33	0.66	0.00	0.66	0.33	1
CAN	Canada (1987-today)	0.66	0.33	0.66	0.66	0.33	1
CYP	Cyprus (1960-1974)s	0.00	0.00	0.00	0.66	0.00	0
CZE	Czechoslovakia (1998-1992)	1.00	0.66	0.00	0.00	0.00	0
MAL	Federation of Malaysia (1963-1965)	1.00	0.00	0.00	0.00	0.00	0
FIJ	Fiji Islands (2014-today)	0.00	1.00	0.33	0.33	0.33	1
GUY	Guyana (1966-today)	0.00	1.00	0.33	0.00	0.66	1
NIG	Nigeria (1999-today)	0.33	0.66	1.00	0.66	0.33	1
NOI	Northern Ireland (1998-today)	0.00	1.00	0.33	0.66	0.33	1
SKN	Saint-Kitts and Nevis (1983-today)	0.00	0.00	0.66	0.00	0.33	1
SAM	Serbia and Montenegro (2003-2006)	1.00	0.66	0.00	0.00	0.00	0
SUR	Suriname (1991-today)	0.00	1.00	0.33	0.00	0.66	1
TAT	Trinidad and Tobago (1976-today)	0.00	0.33	0.33	0.00	0.33	1

b) Rationale of the fuzzy-set Qualitative Comparative Analysis[5]

Qualitative Comparative Analysis (QCA) has an equifinal, asymmetrical and constellational view of causality. Equifinal, in that it conceives outcomes as being (potentially) produced by multiple distinct factors. Asymmetrical, in that it conceives factors that explain the presence of an outcome as not necessarily explaining its absence when they are negated. Constellational, in that it explicitly looks for the occurrence of outcomes in the presence or absence of multiple conditions that are linked by a logical AND or OR.

Drawing on Boolean logics,[6] QCA systematically compares cases' condition scores and their outcome. Thereby, the analysis is based the so-called 'truth table' which comprises all combinations of present or absent conditions that are observed in the cases, together with the respective outcome. When conditions are operationalized as fuzzy sets, cases have partial membership in truth table rows (equal to their lowest membership in one of the conditions) and eventually belong to the only row in which their membership is higher than 0.50. The truth-table is both a descriptive and analytical tool. Descriptive, in that it allows us to map all the existing constellations of conditions and the outcome with which they are associated based on the case data we collected. Analytical, in that it allows us to determine which (combination of) conditions appear to be necessary for an outcome to occur, which (combination of) appear to be sufficient for an outcome to occur, and how combinations of conditions can be minimized so that we obtain that the most parsimonious solution for explaining a given outcome (*cf. infra*).

(2004). For Serbia and Montenegro, *cf.* Noutcheva (2004). For Suriname, *cf.* Verrest (2010). For Trinidad and Tobago, *cf.* Johnson and Kochel (2012).

[5] This section draws on Ragin and Rihoux (2009) and Schneider and Wagemann (2012).

[6] The Boolean operators used in this paper are the logical AND (*), the logical OR (+), the logical negation (~) and the logical implication (→).

In an analysis of necessity, one determines to which extent a (combination of) conditions is consistently present when the outcome occurs. In crisp-set terms, for being necessary one always wants condition X to be present when outcome Y occurs. When using fuzzy-sets, one wants cases' membership in X to be higher than their membership in Y. The consistency of necessity is obtained by $\frac{\sum_{i=1}^{I} \min(X_i, Y_i)}{\sum_{i=1}^{I} Y_i}$. One also assesses how many cases are 'covered' by a necessary condition. The coverage of necessity is obtained by $\frac{\sum_{i=1}^{I} \min(X_i, Y_i)}{\sum_{i=1}^{I} X_i}$.

In an analysis of sufficiency, one determines to which extent an outcome is always present when a (combination of) condition is present. In crisp-set terms, for being sufficient one always wants outcome Y to occur when condition X is present. When using fuzzy-sets, one wants cases' membership in Y to be higher than their membership in X. The consistency of sufficiency is obtained by $\frac{\sum_{i=1}^{I} \min(X_i, Y_i)}{\sum_{i=1}^{I} X_i}$. One also assesses how many cases are 'covered' by a sufficient condition. The coverage of sufficiency is obtained by $\frac{\sum_{i=1}^{I} \min(X_i, Y_i)}{\sum_{i=1}^{I} Y_i}$.

When it comes to finding the most parsimonious solution that explains an outcome, the so-called 'minimization process' is involved. Based on the *Quine-McClusky algorithm*, 'similar conjunctions' are matched so that conditional specifications that logically lead to identical outcomes are excluded.[7] In addition, 'logically redundant prime implicants, i.e. terms that are logically implied twice in a formula, are equally excluded.[8] This reduction potential is limited when the number of possible configurations (i.e. combinations of conditions) exceeds the actual number of observed configurations. Non-observed configurations (so-called *logical remainders*) reduce the number of occurring similar conjunctions and hence the possibilities of minimization. Given that a *fcQCA* with five fuzzy-sets involves 32 possible configurations,[9] but that the present one only comprises 10 observed configurations (*cf. infra*), 'simplifying assumptions' about the outcome of non-observed cases will be made by combining observed data with theoretical reasoning. This allows for further and final minimization. One should note that since *QCA* has an asymmetric view of causality, the occurrence and non-occurrence of the outcome have to be analyzed separately.[10]

3. When Dyadic Federations Fall Apart and When They Remain Together

The results *fsQCA* analyses suggest that dyadic federations in the past and present usually survived when the dominant groups were territorially dispersed and had, at the same time, either a proportional electoral system or nationalized party systems. In turn, they suggest that dyadic federations usually fell apart when dominant groups were territorially concentrated and had, at the same time, non-nationalized party systems, non exclusive statewide executives and, most probably, unequally distributed economic resources. Table 4 hereunder displays the truth table on which these results are based. The two subsequent sections provide further details on how the findings were obtained.

---

[7] E.g. If, A*B*C → D and if, A*B*non-C → D, than A*B → D and the formula can be reduced.
[8] E.g. If, A*B*C + A*B*non-C + non-A*B*C + non-A*non-B*C → D, than A*B + non-A*C → D.
[9] For *n* fuzzy-sets, the total number of possible configurations is 2^n. In this case, $2^5 = 32$.
[10] The analysis was done in *R* 3.4.3 (R Core Team, 2017) using the *QCA* (Dusa, 2018) and *SetMethods* (Medzihorsky, Oana, Quaranta, & Schneider, 2018) software packages for calculations and the *ggplot2* software package (Wickham, 2018) for visualizations.

Table 4. Truth table for the *fsQCA* analysis

Row	TERR.CON	ELEC.PROP	NAT.P.SYST	EXEC.INCL	EQ.ECO.DIS	OUTCOME	Cons.	Cov.	Cases
1	0	0	1	0	0	1	1.00	0.07	SKN
2	0	1	0	0	0	1	1.00	0.07	FIJ
3	0	1	0	0	1	1	1.00	0.14	GUY, SUR
4	0	1	0	1	0	1	1.00	0.21	BEL, BAH, NOI
5	0	1	1	1	0	1	1.00	0.07	NIG
6	1	0	1	1	0	1	1.00	0.07	CAN
7	0	0	0	0	0	1	1.00	0.07	TAT
8	0	0	0	1	0	0	1.00	0.07	CYP
9	1	1	0	0	0	0	1.00	0.14	CZS, SAM
10	1	0	0	0	0	0	1.00	0.07	MAL

a) When dyadic federations remain together

The analysis of necessary and sufficient conditions for the presence of the outcome, summarized in Table 5 hereunder, suggests that the absence of territorial concentration among the dominant groups is of great importance for the survival of dyadic federations (not only in combination with other conditions but even on its own). Both its necessity and sufficiency for explaining the outcome are highly consistent and cover a substantial amount of cases. A similar conclusion can be drawn for the electoral proportionality, foremost as sufficient condition for explaining the outcome. While a national party system and an equal distribution of economic resources attain highly consistent sufficiency scores, they only explain the outcome in few cases on their own.

Table 5. Consistency and coverage scores for conditions' necessity and sufficiency for explaining the survival of dyadic federations (Outcome = 1)

Analysis	Condition(s)	Consistency	Coverage
Necessity	~TERR.CON + NAT.P.SYST	0.900	0.800
	~TERR.CON + EXEC.INCL	0.900	0.800
	~TERR.CON	0.835	0.893
	ELEC.PROP	0.698	0.841
Sufficiency	NAT.P.SYST	1.000	0.397
	EQ.ECO.DIS	1.000	0.397
	ELEC.PROP	0.841	0.698
	EXEC.INCL	0.857	0.397
	~TERR.CON	0.893	0.835

When looking more explicitly for the combination of conditions under which dyadic federations survived, it appears, as displayed in Table 6 hereunder, that the survival of 8 out of the 10 dyadic federations can be explained by the absence of territorial concentration among their dominant groups, combined either with a proportional electoral system or a nationalized party systems.[11] While this solution (1.1) is perfectly consistent with all observed cases, it does not explain the survival of two dyadic federations: that of Canada and that of Trinidad and Tobago. For Canada, an alternative solution (1.2) is proposed. It is equally sufficient than the first solution but only covers the Canadian case. More specifically, despite the territorial concentration of its dominant groups, we expect its survival to be due to its nationalized party system combined with its executive inclusiveness.[12] Trinidad and Tobago remains a very curious case. While the absence of territorial concentration among its dominant groups

---

[11] The minimization process for this solution relied on 7 simplifying assumptions, listed in Appendix 1.
[12] The minimization process for this solution relied on 3 simplifying assumptions, listed in Appendix 1.

confirms our expectations, none of the other four expectedly stabilizing factors was present. Further in-depth research would be useful to determine whether the territorial group separation was, on its own, sufficient for preventing the break-up or if other stabilizing mechanisms that we overlooked were at work.

Table 6. Minimized conjunctions explaining the survival of dyadic federations (Outcome = 1)

N°	Solution (conjunction)	Cons.Suf.	Cov.Suf	Contradictory cases	Uncovered cases
1.1	~TERR.CON * (ELEC.PROP + NAT.P.SYST)	1.00	0.831	None	CAN and TAT
1.2	TERR.CON * NAT.P.SYST * EXEC.INCL	1.00	0.099	None	All except CAN

Figure 1 hereunder provides some additional information on the situation of the cases vis-à-vis the main solution formula (1.1). Guyana, Fiji, Northern Ireland and Suriname are most typical cases in that they were full members of both the conjunction and the outcome. Belgium, Bosnia and Herzegovina, Nigeria, and Saint-Kitts and Nevis are still typical cases despite their slightly lower (but still positive) membership in the conjunction. Canada, and Trinidad and Tobago deviate in coverage because they are not member of the conjunction and can hence not be explained by the solution. Finally, Cyprus, Czechoslovakia, the Federation of Malaysia, and Serbia and Montenegro are negative cases in that they did not survive and can hence not provide relevant information except their presence as logical counterfactuals. They are analyzed in the next section.

Figure 1. XY-Plot of the main solution for the survival of dyadic federations
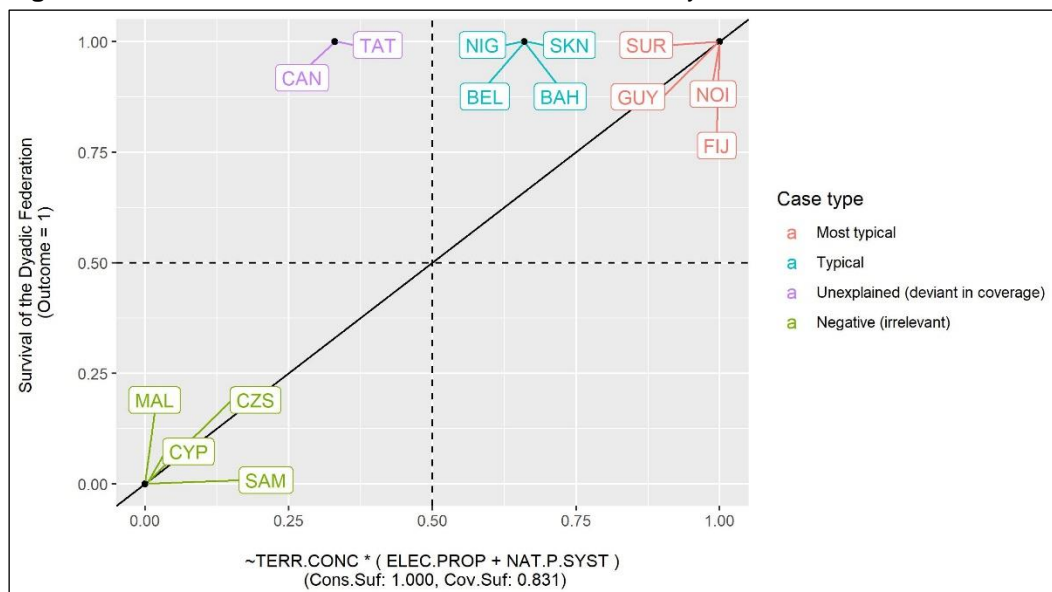
b) When dyadic federations fall apart

The analysis of necessary and sufficient conditions for the absence of the outcome, summarized in Table 7 hereunder, suggests that all five conditions are *a priori* important for explaining the break-up of dyadic federations in that they attain sufficient necessity scores. Yet, they all cover only a limited amount of cases. The presence of territorial concentration appears to be of modest but notably consistent and covering sufficiency.

12

Table 7. Consistency and coverage scores for conditions' necessity and sufficiency for explaining the break-up of dyadic federations (Outcome = 0)

Analysis	Condition(s)	Consistency	Coverage
Necessity	~NAT.P.SYST	1.000	0.399
	~EQ.ECO.DIS	1.000	0.398
	~ELEC.PROP + ~EXEC.INCL	1.000	0.386
	~EXEC.INCL	0.835	0.356
	TERR.CON * ~ELEC.PROP	0.750	0.645
Sufficiency	TERR.CON	0.645	0.750

When looking for the combination of conditions under which dyadic federations broke-up, it appears, as displayed in Table 8 hereunder, that the break-up of 3 out of the 4 dyadic federations can be explained by the presence of territorial concentration, combined with the absence of a nationalized party system, a non-inclusive executive, and unequally distributed economic resources.[13] While this solution (0.1) is largely consistent with the observed cases, it does not explain the break-up of Cyprus. For the latter, we were able to propose an alternative solution (0.2) but it comprises some inconsistency and only covers the Cypriot case. More specifically, we expect its break-up to be due amongst others to the absence of a nationalized party system, combined with a non-proportional electoral system and unequally distributed economic resources.[14] At the same time, one should note that the Cypriot case is somewhat particular insofar as its both dominant groups were kin-minorities of larger external states, Greece and Turkey, and that these states had a major responsibility in the escalation of tensions between Greek and Turkish Cypriots. The solution we propose here has hence to be read jointly with this external kin-state influence.

**Table 8.** Minimized conjunctions explaining the break-up of dyadic federations (Outcome = 0)

N°	Solution (conjunction)	Cons.Suf.	Cov.Suf	Contradictory cases	Uncovered cases
0.1	TERR.CON * ~NAT.P.SYST * ~EXEC.INCL * ~EQ.ECO.DIS	0.817	0.750	(CAN, BAH)	CYP
0.2	~ELEC.PROP * ~NAT.P.SYST * ~EQ.ECO.DIS	0.613	0.670	TAT	CZS, SAM, MAL

Figure 2 hereunder provides some additional information on the situation of the cases vis-à-vis the main solution formula (0.1). Czechoslovakia, the Federation of Malaysia, and Serbia and Montenegro are most typical cases in that they are both full member of the conjunction and the outcome. Cyprus is deviant in coverage in that it is not member of the conjunction and hence not explained by the solution. Canada and Bosnia and Herzegovina are negative cases because they are not member of the outcome. However, they slightly deviate in consistency because they had partial (but negative) membership in the conjunction. Finally, the remaining cases are negative and not relevant for explaining the absence of the outcome because they are neither a member of it, nor of the conjunction.

---

[13] The minimization process for this solution did not rely on simplifying assumptions.
[14] The minimization process for this solution relied on 2 simplifying assumptions, listed in Appendix 1.

Figure 2. XY-Plot of the main solution for the break-up of dyadic federations
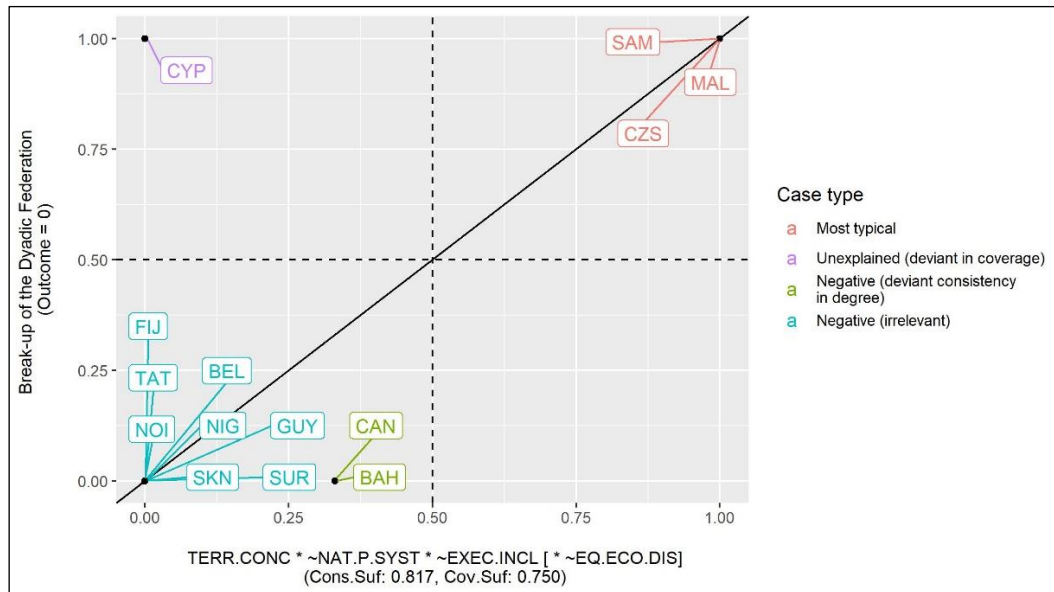
Conclusion

This paper studied the survival and break-up of dyadic federations around the world in light of the high potential for centrifugal pressures that comes with their bipolar federal society and institutions. By mapping the factors that are crucial for the stability in dyadic federations, the research provided a comprehensive and updated account of their institutional, geographic and economic contexts. By systematically comparing these factors with a *fuzzy-set Qualitative Comparative Analysis* for all past and present dyadic federations around the world, it went beyond the existing single or low-n case study research that exists on the topic.

More specifically, it informs the broader literature on federalism, national diversity and democracy in that it showed that federalism is not *per se* a bad institutional arrangement for bipolar polities as some scholars suggested (Watts, 2008a, p. 184). A bipolar federal projects can succeed if geographical factors such as the territorial dispersion of the dominant groups play in its favor, and when the presence of institutional arrangements such as a proportional electoral system or a national party system either assure a fair political representation for each group or prevent polities to be conceived in exclusively sub-national terms. In turn, a bipolar federal project is likely to fail in the absence of stabilizing institutional factors like executive inclusiveness and a national party system, especially when economic resource are unequally distributed among groups and when the latter are territorially clearly separable. With these findings, we do not imply that the survival of a dyadic federation is necessarily a good thing. What we argue is that, under the aforementioned conditions, federalism can be a successful institutional arrangement for a bipolar polity when its survival as a state is desired.

That being said, two nuances are necessary. First, the present findings rely on the study of fourteen dyadic federations among which ten survived and four broke-up. While the explanation of why dyadic federations survive relied on a rather solid set of cases that was well distributed on the different conditions, the number of cases explaining why dyadic federations broke-up is somewhat limited. Some counterfactual reasoning was therefore not possible for the latter and the conclusions drawn based on it should be interpreted accordingly. Secondly, the cases under study are obviously not immovable realities and even if political engineering solutions are path-dependent (Pierson, 2000), the world can be surprised by some polity

evolving extremely fast and deeply. After all, between Duchacek's study in 1988 and today, quite a few cases evolved and some of them in particularly unattended ways. Needless to say that cases might equally evolve in the future.

One does not have to wait for these future evolutions before having ground for further research though. On the one hand, studies to come might want to dig further into certain particular dyadic federations in light of the present findings. An in-depth case study of Trinidad and Tobago would be useful for example to explain why the federation did not break up despite one would have expected so from a comparative perspective. One the other hand, studies to come might want to compare the present findings to those of non-dyadic federations or bipolar polities without federal power-sharing agreements. The objective would be to compare federal arrangements in different societal environment from a broader perspective and to assess the prospects of dyadic federalism vis-à-vis alternative institutional arrangements in bipolar polities.

References

Anderson, B. (1983). *Imagined Communities: Reflections on the Origin and Spread of Nationalism*. London & New York: Verso.

Berg-Schlosser, D., De Meur, G., Rihoux, B., & Ragin, C. C. (2009). Qualitative Comparative Analysis (QCA) as an Approach. In B. Rihoux & C. C. Ragin (Eds.), *Configurational Comparative Methods. Qualitative Comparative Analysis (QCA) and Related Techniques* (pp. 1-18). Thousand Oaks: Sage Publications.

Burgess, M. (2006). *Comparative Federalism: Theory and practice*. London ; New York: Routledge.

Coakley, J. (2012). *Nationalism, Ethnicity and the State: Making and Breaking Nations*. London & Thousand Oaks: Sage.

Duchacek, I. D. (1988). Dyadic Federations and Confederations. *Publius: The Journal of Federalism, 18*(2), 5-31.

Dusa, A. (2018). QCA: A Package for Qualitative Comparative Analysis. R package version 3.3. Retrieved from https://CRAN.R-project.org/package=QCA

Elazar, D. J. (1988). Introduction. *Publius: the Journal of Federalism, 18*(2), 1-3.

Elazar, D. J. (1991). *Federal Systems of the World: a Handbook of Federal, Confederal and Autonomy Arrangements*. Harlow Longman.

Freedom House. (2018). Freedom in the World 2018. Democracy in Crisis. Retrieved from https://freedomhouse.org/report/freedom-world/freedom-world-2018

Gallagher, M. (2018). Least Squares Index. Retrieved from https://www.tcd.ie/Political_Science/people/michael_gallagher/ElSystems/Docts/lsq.php

Gurr, T. R. (1993). Why Minorities Rebel: A Global Analysis of Communal Mobilization and Conflict since 1945. *International Political Science Review, 14*(2), 161-201.

Gurr, T. R. (2015). *Why Men Rebel*. New York: Routledge.

Horowitz, D. L. (1990). Making Moderation Pay: The Comparative Politics of Ethnic Conflict Management. In J. V. Montville (Ed.), *Conflict and peacemaking in multiethnic societies* (pp. 451-475). Lexington: Lexington Books.

Horowitz, D. L. (1993). Democracy in Divided Societies. *Journal of Democracy, 4*(4), 18-38.

Innes, A. (1997). The Breakup of Czechoslovakia: The Impact of Party Development on the Separation of the State. *East European Politics and Societies, 11*(3), 393-435.

Lijphart, A. (1977). *Democracies in Plural Societies. A Comparative Exploration*. New Haven & London: Yale University Press.

Lijphart, A. (1995). Self-Determination versus Pre-Determination of Ethnic Minorities in Power-Sharing Systems. In W. Kymlicka (Ed.), *The rights of minority cultures* (pp. 275-287). New York: Oxford University Press.

Lijphart, A. (2004). Constitutional Design for Divided Societies. *Journal of Democracy, 15*(2), 96-109.

Medzihorsky, J., Oana, I.-E., Quaranta, M., & Schneider, C. Q. (2018). SetMethods: Functions for Set-Theoretic Multi-Method Research and Advanced QCA. R package version 2.3.1. Retrieved from https://cran.r-project.org/package=SetMethods

Milne, R. S. (1988). Bicommunal Systems: Guyana, Malaysia, Fiji. *Publius: the Journal of Federalism, 18*(2), 101-113.

Pierson, P. (2000). Increasing Returns, Path Dependence, and the Study of Politics. *American Political Science Review, 94*(2), 251-267.

R Core Team. (2017). R: A language and environment for statistical computing. Retrieved from https://www.R-project.org/

Ragin, C., & Rihoux, B. (Eds.). (2009). *Configurational Comparative Methods: Qualitative Comparative Analysis (QCA) and Related Techniques*. Thousand Oaks: Sage.

Reilly, B. (2001). *Democracy in Divided Societies: Electoral Engineering for Conflict Management*. Cambridge: Cambridge University Press.

Reynolds, A., & Reilly, B. (1999). *Electoral Systems and Conflict in Divided Societies*. Washington: National Academies Press.

Roeder, P. G., & Rothchild, D. S. (Eds.). (2005). *Sustainable Peace: Power and Democracy after Civil Wars.* Ithaca & London: Cornell University Press.

Schneider, C. Q., & Wagemann, C. (2012). *Set-Theoretic Methods for the Social Sciences. A Guide to Qualitative Comparative Analysis*. Cambridge: Cambridge University Press.

Singh, C. (2008). Re-democratization in Guyana and Suriname: Critical Comparisons. *European Review of Latin American and Caribbean Studies, 84*, 71-85.

Watts, R. L. (2008a). *Comparing Federal Systems* (3d ed.). Montreal: McGill-Queen's University Press.

Watts, R. L. (2008b). *Comparing Federal Systems* (3rd ed.). Montreal ; Kingston: McGill-Queen's University Press.

Wickham, H. (2018). ggplot2: Create Elegant Data Visualisations Using the Grammar of Graphics. R package version 3.0.0. Retrieved from https://CRAN.R-project.org/package=ggplot2

Appendices

Appendix 1. Simplifying assumptions for the minimization of solutions 1.1, 1.2 and 0.2

For	ID	TERR.CON	ELEC.PROP	NAT.P.SYST	EXEC.INCL	EQ.ECO.DIS	Assumed outcome	Justification
1.1	a	0	1	1	1	1	1	If row 2 is sufficient without EQ.ECO.DIS, its presence would not have prevented the outcome from occuring.
1.1	b	0	1	1	0	1	1	If row 4 is sufficient without EXEC.INCL, its presence would not have prevented the outcome from occuring.
1.1	c	0	1	1	0	0	1	If row 5 is sufficient without NAT.P.SYST, its presence would not have prevented the outcome from occuring.
1.1	d	0	1	0	1	1	1	If row 5 is sufficient without EXEC.INCL, its presence would not have prevented the outcome from occuring.
1.1	e	0	0	1	1	1	1	If row 6 is sufficient without EXEC.INCL and EQ.ECO.DIS, their presence would not have prevented the outcome from occuring.
1.1	f	0	0	1	1	0	1	If row 6 is sufficient without EXEC.INCL, its presence would not have prevented the outcome from occuring.
1.1	g	0	0	1	0	1	1	If row 6 is sufficient without EQ.ECO.DIS, its presence would not have prevented the outcome from occuring.
1.2	h	1	1	1	1	1	1	If row 1 is sufficient without ELEC.PROP and EQ.ECO.DIS, its presence would not have prevented the outcome from occuring.
1.2	i	1	1	1	1	0	1	If row 1 is sufficient without ELEC.PROP, its presence would not have prevented the outcome from occuring.
1.2	j	1	0	1	1	1	1	If row 1 is sufficient without EQ.ECO.DIS, its presence would not have prevented the outcome from occuring.
0.2	k	1	0	0	1	0	0	If row 8 is sufficient without TERR.CON, its presence would not have prevented the outcome from occuring.
0.2	l	0	0	0	0	0	0	If row 8 is sufficient in the presence of EXEC.INCL, its absence would not have prevented the outcome from occuring.