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The economics of secession: theory and empirics

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Abstract

Secessionist movements are mainly fuelled by religious or historical determinants. Nevertheless, it is rare to find such movements that are also not propelled by economic factors. This paper deals with the economic factors influencing the probability of secession at national or sub-national level. First, the theoretical chapter presents the economic analysis of the formation and breaking up of countries based on the seminal model of Alesina and Spolaore (1997). I present several economic perspectives as boundaries in an ideal world where the number and size of states were determined to maximise total benefits minus total costs (efficient borders), boundaries determined by voters (democratic outcomes), boundaries with economic integration and boundaries in a world of Leviathans (rulers as monarchs or dictators). In addition, I expose some extensions where some of the main assumptions have been relaxed mainly the nature of borders and heterogeneity of jurisdiction. Secondly, the empirical chapter introduces some studies regarding the economic factors presented in the theoretical part. Indeed, I find strong result of the basic trade-off between heterogeneity and economies of scale. Moreover, the empirical results are mixed regarding the link between economic globalization and secession. Finally, I found that fiscal decentralisation increases the probability of ethnic conflict when there exists disparities in income between regions.

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Chapter 1

Introduction

“The entire map of Europe, from the Atlantic coast to the Urals, is being redrawn and issues of separation, unification, and the redrawing of borders are yet again at the forefront of European concerns. Many of the issues raised by this process are primarily of a political, cultural or linguistic nature. However, there are also economic considerations that bear on this problem” (Bolton and Roland, 1997).

During the last century, a striking increase in the number of new sovereign nations and the extent of separatism around the world have raised the interest in border rearrangement. Nowadays, we count on a global scale 194 member States of the United Nations (against 51 since its creation in June 1945). From a historical point of view, there were only forty-six sovereign states in 1900, while the rest were under colonial domination. The number of independent states, after the Second World War, rose dramatically, leading to seventy-four states in 1948. In the fifty years that followed the World War II, decolonization and the break-up of the Soviet Union vastly contributed to the increase in the number of states. Indeed, the first stage of decolonization, from 1945 to 1954, centred around the Asian continent and led several European colonies to become independent. Then, the second stage of decolonization, from 1955 to 1966, affected, principally, the African continent. Boniface (1998) asserts that the membership to the United Nations had tripled between 1945 and 1980.

An important case of secession was, of course, the break-up of the Soviet Union. The wish of the Slavic centre to separate from the states at the periphery was the consequence of the Soviet Union’s crisis. Indeed, Russia, Ukraine and the three Baltic states (states nearest to Western Europe and more industrialized and

prosperous, compared to other in the Union) were the most in favour of secession. Regarding the Muslim states (the poorest), they wanted to keep the Soviet state together, because they had an economic and financial advantage to preserve ties with Moscow. Moreover, Boris Yeltsin (elected president of the Supreme Soviet of Russia in 1990) asserted that the empire was too expensive for the Slavic states, who would have to, henceforth, keep the Muslim states away. In 1991, the Soviet Union separated into 15 independent states.

The former Yugoslavia, a multi-ethnic country of roughly 23 million individuals in 1989, was a notable case of economic growth, industrial development, and progressive trade liberalization. However, this federative country separated into several smaller states in the early 1990s. Trying to explain the break-up of Yugoslavia, only by historical, political or nationalist factors is not suitable. In parallel to the fall of communism in the Eastern Europe, socio-economic problems (external debt, foreign trade, labour market, self-management) make the breakup clear.

In addition, regions (Wallonia, Catalonia etc.) within states, sometime, desire more regional autonomy. Indeed, the case of attempted secession of Quebec from the Canada is unique. In 1980, le Parti Québécois (Quebec party) managed the provincial government of Quebec and attempted to initiate a referendum, in order to separate from Canada. The referendum did not receive enough support, only 40 per cent of the voters were in favour of secession. In 1994, the Quebec party was re-elected to lead the province of Quebec. In 1995, the party tried to initiate a second referendum, in order to decide a possible separation from Canada. A narrow majority of 51 per cent of voters were against secession. The debate is still relevant.

The most famous recent attempt of secession was Scotland's bid for independence from the United Kingdom. The partisan argument was that the cultural identity of Scotland, associated with its economic contribution and potential should incite voters to support the independence. According to a first survey by the YouGov

institute, a small majority (51 per cent) were in favour of secession. Nevertheless, the result of the referendum of 19 September 2014 leads to a rejection of the independence. Furthermore, other countries or regions can learn lessons from Scotland's bid of independence.

These tendencies have created an extensive body of academic literature regarding border formation and break up, and raise important questions like why do states break up? How does size influence the benefits and costs of countries? What is the impact of the economic environment, on border redrawing? Do decentralisation and federalism increase the desire to secede? Indeed, historians, political scientists, philosophers and economists consecrate much time to study the formation and breaking up of countries, because the question related to secession is at the heart of the debate.

This paper aims to provide, from a theoretical and empirical point of view, a synthesis of the economic factors affecting the probability of secession at national or subnational level. In other words, my goal is to synthesise the economic determinants that contribute to the desire to secede. Although the majority of secessionist movements are mainly affected and stimulated by ethnic or religious issues, it is rare to find such movements that are also not propelled by economic factors. The definition of the term secession according to Bookman (1992) is "the act of withdrawing formally from membership in an organization, association, or alliance. In its application to international events, the term has come to be associated with the breaking of ties (political, economic) by one group of people and their territory from the larger political unit of which it was part". Moreover, in order to be consistent, I will use the terms nation, state, country and political jurisdiction as synonyms and interchangeably. The terms regions and subnational jurisdiction are synonyms and interchangeable as well.

First, I will show how authors model the secession and, more precisely, the formation and breaking up of states. Indeed, I will deal with the seminal model of Alesina and Spolaore (1997). In their analysis, they consider the boundaries of

national country as endogenous and, thus, boundaries are not a fixed characteristic of the landscape, but are the endogenous outcomes of decisions by individuals who interplay with each other. The starting point of their analysis is the trade-off between the size and heterogeneity of the jurisdictions, and how it influences the formation and breaking up of states. They investigate different possibilities as efficient borders, borders as democratic results, borders in a world of leviathans. Moreover, I will expose some limits because some assumptions are restrictive and some questions are left open. Then, I will present some extensions of the seminal model that reconsider the nature of the boundaries and the heterogeneity of the jurisdictions. Indeed, Bolton and Roland (1997) analyses the economic determinants of secession, taking boundaries as exogenous. In addition, they consider a different kind of heterogeneity that arises from income distribution.

Second, my goal is to highlight some empirical evidence of economic determinants that influence secessions. Indeed, I will deal with the basic trade-off between the heterogeneity and economies of scale using the analysis of Alesina, Baquair and Hoxby (2004). By running a cross-sectional and panel analysis on the school district in the US, the authors attempt to explain the causal link between the number of school districts and heterogeneity of the jurisdiction (mainly racial diversity). Then, I will explore the link between economic globalization and secession using the analysis of Sorens (2004). The author analyses the link between the growth of secessionist parties and economic globalization controlling other factors. Afterwards, I will present, with the help of a gravity model, the reverse link that is the impact of political fragmentation and separatist regions on international trade using the analysis of Daumal (2008). Finally, I will show an empirical analysis of Wakke and Wibbels (2006), where they focus on the link between decentralisation and ethnic conflict.

Chapter 2

The economics of secession: basic foundations and extensions

An economic analysis of secession examines some essential insights and results concerning efficiency and stability of national boundaries. Indeed, the second chapter of this thesis deals with models of formation and breaking up of countries. These models suggest different nature of borders and kinds of heterogeneity. The first section of this theoretical part deals with the seminal model of Alesina and Spolaore (1997). Their model distinguishes by the nature of borders. Indeed, it is characterised by endogenous borders. It means that the world has a symmetric division where each state has the same size, at equilibrium. Moreover, the heterogeneity of the population arises from preferences regarding the public good. The second section presents some extensions of the seminal model where some of the main assumptions have been relaxed. The model of Bolton and Roland (1997) is characterised by exogenous borders. A direct consequence is that the size of the state is fixed and not identical, at equilibrium. Moreover, they present a model where the heterogeneity of the population arises from difference in the income distribution. They concentrate on redistribution conflict and show the principal economic and political factors in a secession or unification process.

2.1 A model with endogenous borders

Alberto Alesina and Enrico Spolaore (1997) developed a politico-economic model to approach different questions regarding the number and size of countries. They study how big a country should be and how big a country will be. This model of country formation is based on the following trade-off: economies of scale (a benefit in large political jurisdictions) and heterogeneity of preference (a cost in large populations). As Barro (1991) said, “we can think of a country’s optimal

size as emerging from a trade-off: A large country can spread the cost of public goods, over many taxpayers, but a large country is also likely to have a diverse population that is difficult for the central government to satisfy”. Therefore, the authors think of the equilibrium size of countries as resulting from this trade-off. They focus on the comparison between the equilibrium number of countries with a world benevolent planner, in a democratic world, and with rent-maximising governments. In addition, they use their model to analyse the relation with compensation schemes and economic integration. First, I will describe the main assumptions and the context of the model. Then I will show how the authors compute the equilibrium number of states with a benevolent planner, in a democratic world, and in a world of Leviathans. In addition, I will show how the equilibrium depends on compensation scheme and the level of economic integration. Finally I will expose some limits of the model.

2.1.1 Main assumptions

The authors assume that larger countries prompt some benefits¹.

H1) The cost per capita of a non-rival public good diminishes according to the number of individuals in the country. In other words, in larger jurisdictions, we observe some economies of scale in the production of public goods.

H2) The size of the market is dependent of the size of the country. For example, in autarky, the two coincide. There will be benefits of increasing returns in the size of the countries when we observe some increasing returns in the size of the market.

The authors assume that larger countries prompt some cost as well.

H3) The population will be more heterogeneous as the political jurisdiction size increases. The heterogeneity of the preference implies that the government will have some problem to satisfy all the individuals.

¹ Alesina and Spolaore (1997) don't take into account two other benefits: uninsurable shocks are more expensive for a smaller country, and security parameters can be a factor of size.

² Several historical examples can illustrate the fact that the government is located at the centre.

H4) Every nation is characterised by one non-rival public good (fixed quantity) the government. The latter is considered as a collection of administrative, judicial, economic services and public policies.

H5) The sum total of the world population is equal to 1, distributed uniformly over the segment $\{0, 1\}$. In other words, the world can be represented by a line. The authors utilize the Hotelling location model and also apply the proximity principle, considering equivalence between geographical proximity and preferences proximity. Thus, the position of the individuals on the line corresponds to both geography and preferences.

H6) Each political jurisdiction necessitate a single government and the world needs at least one government. Consequently, $N \geq 1$, where N is the number of political jurisdictions in the entire world. Moreover, k represents the cost of each government, independent of the size of the countries.

H7) The location of the government is determined by majority rule (after a political jurisdiction is created). The authors apply the median voter theorem.

H8) The tax is proportional to income in every country, with an identical tax rate for each individual. The authors assume that every people have the same tax rate.

H9) The utility of individual $_i$ is

$$U_i = g(1 - al_i) + y - t_i \quad (2.1)$$

where y is the exogenous income, t_i is the tax and thus $(y - t_i)$ represents the private good. There is no saving, all the income is spent. The parameters g and a are positive and represent respectively the maximum utility of the public good (when distance between capital and individual is equal to zero) and the loss in utility that people bear when the government is at a great distance of their location (cost of distance). Furthermore, l_i is the distance between an individual $_i$ and his government. We remind that geographical and preferences dimensions coincide. Thus, l_i measures both distances.

H10) Individuals are immobile.

H11) The political jurisdictions borders are endogenous.

2.1.2 Results of the model

First, I will present how the authors compute the optimal number of states, by solving an optimization under constraints. In other words, a benevolent planner aims to reach the greatest level of utility, given the basic trade-off of economies of scale and heterogeneity in population. Then, in order to make a comparison with the optimal number of states, the authors compute the stable number of states. In other words, they describe the voting equilibrium where boundaries are decided by a democratic vote. Moreover, the model shows how the equilibrium depends on compensation scheme and the level of economic integration. Finally, they contrast the Leviathan equilibrium, built on the assumption that rent-maximizing governments try to maximize the rents, with the optimal solution.

The world benevolent planner solution

The authors suppose that a world benevolent planner maximizes the sum of individual utilities subject to the production cost of the public good. Thus, he solves this optimization under constraints:

$$\text{Max } \int_0^1 U_i d_i = \sum_{x=1}^N S_x \{g (1 - a\bar{l}_{ix}) + y - \bar{t}_{ix}\} \quad (2.2)$$

$$\text{Subject to } \int_{x=1}^N \bar{t}_i = Nk \quad (2.3)$$

Where U_i represents the utility of individual i , \bar{l}_{ix} and \bar{t}_{ix} are the average distance and average tax in country x and S_x is the size of country x and the constraint represents the production cost of the public good. In order to minimise the average distance (for given N), the social planner locates the government (public good) in the middle of the country².

² Several historical examples can illustrate the fact that the government is located at the centre. Thus, the Brazilian government chose Brasilia as capital, in order to have an opening up and an unification of the country. Moreover, in 1998, Kazakhstan president Nursultan Nazarbayev

Therefore, the average distance in each political jurisdiction is $1/4 S_x$. It means that benevolent planner has to solve:

$$\text{Min } \frac{ga}{4} \sum_{x=1}^N S_x^2 + Nk \quad (2.4)$$

$$\text{Subject to } \sum_1^N S_x = 1 \quad (2.5)$$

We select countries of same size, $s = 1/N$, hence the number of countries in the world is a positive integer that resolve:

$$\text{Min } ga/4N + Nk \quad (2.6)$$

The first order condition, with respect to N , leads to:

$$N^* = \sqrt{ga/4k} \quad (2.7)$$

The result of the equation (2.7) depends on the parameters g , a , and the cost of governance, k , and, thus, represents the optimal number of political jurisdictions. Two important ideas can be derived.

- (i) *The optimal number of political jurisdictions positively depends on the cost of distance (parameter a) and the benefit of the public good (parameter g).*
- (ii) *The optimal number of political jurisdictions diminishes with the cost of the public good.*

decided on a new capital in the middle of the Kazak steppe (Alma-Ata to Astana), in order to avoid a possible secession in the northern region where six millions Russians live.

After getting the optimal number of nations according to a social planner, I will present how the authors analyse the number of nations at the equilibrium in a democratic world.

Equilibrium number of nations in a democratic world

Now, I can change from an optimal world and consider that decisions regarding public policy and political borders are taken by a democratic vote. Indeed, the authors compare the optimal number of states to one resulting from a democratic process. They considered a sequential game, where, in the first step, individuals determine the localisation of the public good, and, in the second step, individuals vote for or against secession. The authors solve the game by using backward induction, leading to a sub-game perfect equilibrium. Taking assumptions number seven (H7) and eight (H8) into account, Alesina and Spolaore (1997) consider three constitutional rules, in order to define the democratic process that governs the number and size of the states (border rearrangement). Indeed, they establish Rule A, Rule B and Rule C.

- Rule A means that each person at the border can freely decide which country to join.
- Rule B means that a new state can be created (or a existing state can be removed), if the approbation of the majority, in each of the existing state concerned by the borders rearrangement, is obtained. There is a B-equilibrium when no new state is created or removed.
- Rule C means that a set of individual, within an existing state, have the possibility to create a new state, by unanimously voting in support of a secession.

A configuration of N states is A-stable, if it is not affected by borders rearrangement under rule A.

The authors show that an arrangement of political jurisdictions is A-stable, only if all political jurisdictions have the same size (necessary condition for stability). They show that a configuration of N same sized countries is A-stable, if and only if

$$N < \sqrt{ga/2k} \quad (2.8)$$

It means that if all political jurisdictions are not equal, the equilibrium is not A-stable. Indeed, they prove it by perturbing the equilibrium (they increase or decrease the size of the political jurisdiction by a small positive number, ε), in order to have two bordering countries of different sizes, $s - \varepsilon$ and $s + \varepsilon$.

$$g \left(1 - a \frac{s-\varepsilon}{2}\right) - \frac{k}{s-\varepsilon} > g \left(1 - a \frac{s+\varepsilon}{2}\right) - \frac{k}{s+\varepsilon} \quad (2.9)$$

which means that

$$(s - \varepsilon)(s + \varepsilon) > 2k/ga \quad (2.10)$$

When calculating the limit for ε tending to zero

$$S^2 > 2k/ga \text{ or } N < \sqrt{ga/2k} \quad (2.11)$$

Then, a configuration of N states is B-stable if there is no majority vote for the creation (or the removal) of a new state, under rule B.

One explanation has to be made. Each vote on borders redrawing has to satisfy Rule A, and, thus, individuals vote only upon border changes that conduct to states of same size. It would be not logical that the result of a vote on a border change would not be an equilibrium because some people want to shift borders.

The authors propose that an arrangement of same-size countries is in B-equilibrium, if and only if N is the largest integer, smaller than

$$\sqrt{ga/2k} \tag{2.12}$$

and will be the unique B-equilibrium. The authors describe the last proposition by focusing on the move from N to $N + 1$ political jurisdictions. We can observe two consequences. First, the tax of each individual will augment (because the cost of producing public good will be spread over less people), since the new country is smaller and secondly, the average distance for each individual will be going down (they will be closer to the government). In addition, N to $N + 1$ has to be accepted by majority rule if the benefits (because of the smaller distance) are larger than the costs (due to increase in taxes). As the median voter theorem is applied, the pivotal voter is the individual with the median change in distance, when changing from N to $N + 1$, since the change in taxes is the same for everyone. In a similar way, the analysis holds for N to $N - 1$. In order to approve these facts, the authors try to find at least one political jurisdiction where a majority would vote in opposition to a move from $N + 1$ or $N - 1$. They affirm that in each of the current country, we observe a majority opposite to the formation of a new political jurisdiction if and only if

$$N(N + 1) \geq ga/2k \tag{2.13}$$

This condition confirms that when, in every political jurisdiction, the median decrease in the distance from the public good, doesn't compensate the higher taxes due to the number of country augment. Analogously, at least one political jurisdiction will refuse the move to N to $N - 1$ nations, if and only if

$$N(N + 1) \leq ga/2k \tag{2.14}$$

This condition confirms that, in at least one nation, the decrease in taxes (due to the lower number of countries) doesn't compensate the increase distance from the public good.

Finally, a configuration of N states is C-stable if it not affected by borders rearrangement under rule C.

The authors determine that a political jurisdiction is C-stable, if and only if

$$s \leq (\sqrt{6} + 2)\sqrt{k/ga} \quad (2.15)$$

By deduction,

$$N \geq \frac{1}{\sqrt{6}+2} \sqrt{ga/k} \quad (2.16)$$

The main results in this under-section can be described as follows:

- i. *Without compensation transfers within states, efficient borders and borders voted democratically would not be disintegrated by unilateral secession (in technical terms, both are C-stable and thus are not affected by border rearrangement under rule C).*
- ii. *Without compensation transfers within states, efficient borders would lead to the creation of a new state with the approbation of the majority in each of the existing state concerned by the borders rearrangement (in technical terms, efficient borders is not B-stable and thus is affected by border rearrangement under rule B).*

Rule B is the most restrictive rule because it gives the possibility to individual at the periphery (apart from the public good) to vote for the creation of new state and, in consequence, the voting equilibrium number of states is greater than the optimal number. To sum up, in a voting equilibrium, where a majority of each

states' citizens has to approve on its boundaries and unilateral secession is possible, states are smaller and more numerous, compared to an ideal world. Moreover, secession leads to inefficiency (smaller sum of everybody's utilities).

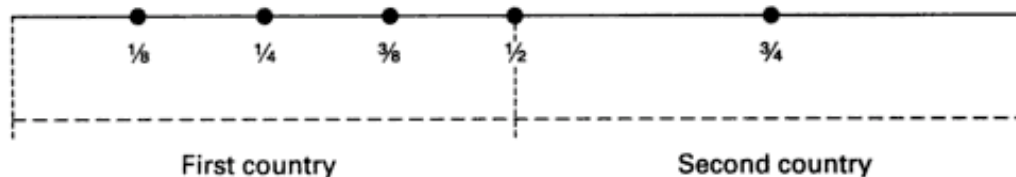
Alesina and Spolaore (1997) argue that with an adapted redistribution to the people at the periphery, a social planner could shift from the voting equilibrium to optimal one, without making anybody worse off. Then, I will show how the authors develop an analysis of possible compensatory schemes.

Compensation schemes

The authors explore the idea that people at the periphery of the country can be compensated (pay lower taxes or receive net positive transfers), in order to avoid a number of political jurisdictions bigger than the efficient one. Indeed, individuals far from the government (in other words, distant in preference and location compared to the individuals in the middle of the country) have to finance the public good in the same proportion as individuals are closer in terms of preference and geography to the government's policies. Thus, people at the periphery may have a motivation to fragment the actual configuration of political jurisdictions, even though it maximises the individual sum of utilities.

Alesina and Spolaore (1997) and (2003) examine the feasibility of compensation schemes from the centre to the periphery. First, the authors describe a compensation scheme with two parameters q and γ representing respectively the level of compensation and the cost of transfers. If borders are determined before compensation scheme, it can lead to a time inconsistency problem. Indeed, when a state is created, a majority may always alter tax policies. This leads to wonder if compensation scheme can be voted at the same time than the borders are determined with an irrevocable engagement. It implies considering multi-issue voting on borders, level of compensation, and public good location, at the same time.

Second, we know from the assumption, individuals are uniformly distributed over a line. The authors suppose two countries represented by the figure 2.1. The government of the first country and the second country are respectively located at $1/4$ and $3/4$.



Source: Alesina and Spolaore (2003)

Fig 2.1 – A two-country world

Intuitively, for the first country, the utility of individuals between 0 and $1/8$ and between $3/8$ and $1/2$ are less than the utility of individuals between $1/8$ and $3/8$, since everyone has the same taxes. The same logic can be applied for the second country. Consequently, it would be feasible to transfer resources from people close to the government, to people less close to the government, in order to compensate them and to have the optimal size of the country at $1/2$. According to the Coase theorem, all people would agree if those transfers were without cost (no waste as well) and because of that, it would lead to an efficient arrangement of borders. In a more realistic view, these transfer schemes lead to distortionary taxation. Indeed, we know that “standard public finance theory shows that tax distortions grow more than proportionally with the tax rates” (Alesina and Spolaore 2003). Therefore, it implies that in sub-national jurisdiction close to the middle, the additional tax distortions would more than offset the decrease of tax distortions at the periphery. Moreover, tax-transfer schemes have to calculate how much to compensate the different individuals and, thus, the government will face some problem to know exactly how to compensate regions in a pertinent way. In consequence, the efficient size of state may not be sustainable with interregional transfers.

Economic integration

The authors examine the link between country size and economic integration, whether the country size has an importance for the economic prosperity and the influence of the equilibrium number of states when considering economic integration.

In autarky, the size of the country coincides with the size of the market. Thus, the productivity of the country (Alesina and Spolaore (1997) use the term of per capita income or growth) is determined by the size of the country. By contrast, in a total open economy, the size of the country does not coincide with the size of the market. In consequence, the size of political jurisdictions is impertinent for the productivity. This simple analysis highlights the main idea of the authors. Indeed, they argue that the stable and the efficient number of countries are rising when the economic integration or the degree of international openness increases. The intuition is that secession of states is more expensive if it involves smaller economies. Nevertheless, the advantages of remaining large are lower if small states have the possibility to freely trade and have interaction with other states. This implies that the basic trade-off between heterogeneity and size is influenced by the trade regime or the interaction with others agents or countries (with an open trade, is it more viable for small states to seek independence). Finally, the degree of economic integration among states, and their size, can go in the same direction. It means that greater economic integration involves smaller states, and smaller states will necessitate more economic integration. It is a reinforcing process.

The size of nations in a world of Leviathans

The authors deal with the relationship between democratization and secessions and determine whether both terms can go together. Thereby they determine how the borders are formed when dictators direct governments. A distinction is made between a social planner who maximises the utility of the individuals and Leviathans. The latter mean that every decision is taken by rent-maximising governments. Moreover, they are concerned only about their own welfare.

Following the example of Niskanen, Leviathans look for maximising the size of the state.

The central idea is that Leviathans governments prefer large countries (Alesina and Spolaore (1997), (2003) use the term empire), to small countries. On the one hand, they can take fiscal resources out from greater political jurisdictions. On the other hand, they are confronted to the trade-off between economies of scale due to the size and cost, due to heterogeneity. Indeed, the probability of an insurrection will increase when the size augments and the population become more heterogeneous. In consequence, when the world is ruled by Leviathans, what would be the arrangement of borders that make the Leviathans' rent as big as possible? They designate δ "the fraction of population that a dictator has to maintain above a certain minimum level of welfare to continue his rule" (Alesina and Spolaore, 2003), or in other words, the part of the population that the Leviathans care for. They assume that if δ is equal to zero, Leviathans are left without any constraint and would want to supply the least possible quantity of public service at a maximum tax level. If the parameter δ equals to one, Leviathans will have to assure a minimum level of welfare to all individuals, even the minorities (group without advantages), in order to retain sovereignty and avoid insurrection. In addition, the probability that a Leviathan government is insensitive to the welfare of its population, is low. Furthermore, a number much under δ equal to 1/2 signify that Leviathans are true dictators. For example, the high-ranked representative of the communist party in the erstwhile Soviet Bloc.

I will show the relationship between borders and δ in which extent borders rely upon δ . Indeed, the authors argue that the number of political jurisdictions when Leviathans rule is increasing in δ . The insight is the following: when the parameter δ is low, Leviathans face nearly no constraints and ignore the heterogeneous preferences. It desires to benefit of economies of scale. It means that rent-maximising governments prefer to govern larger political jurisdictions (empire), even though individuals are far away from the government and get low utility. In an opposite direction, the consequence of an increase in δ conducts

Leviathans to take more into account heterogeneity of preference, than economies of scale. Indeed, if they govern larger countries, they will lose some gain. Thus, they will approve secession of regions rather than face an insurrection or some expensive compromises, such as reducing taxes. Democratic Leviathans will govern smaller states than the optimal one. In order to be more precise, when Leviathans govern the world, for δ lower than $1/2$, the number of states is lower than the optimal number. On the other hand, when δ is higher than $1/2$, the number of states is bigger than the optimal number. By means of the intuition above, the size of states with Leviathans is bigger than in the democratic world. Indeed, Leviathan boundaries coincide with democratic boundaries, when δ is equal to one. In a nutshell, the worlds of dictators are more synonymous with inefficiently large states, whereas democratization is associated with fragmentation of empire and secessions.

2.1.3 Limits of the model

I will now introduce some limits of the model of Alesina and Spolaore (1997). Indeed, we observe that the match of the model, with the reality, will greatly depend on the assumptions. It should be noted that some assumptions are particularly restrictive.

First, according to Graziosi (2004), a direct consequence of endogenous border is a symmetrical sharing out of the world where political jurisdictions have the same size at the equilibrium while exogenous borders set the size of the countries that are not identical at the equilibrium. In other words, sizes of the states are exogenous, considered as heritage of the past. In a real world, it is obvious that the different countries have different size. Moreover, endogenous borders affect the vote modality. Indeed, they coincide with the localisation of the individual that is indifferent between two adjacent political jurisdictions. Concerning exogenous borders, secession can be decided by a majority vote and, thus, the individuals in the political jurisdiction are split into the separatist and the partisan, for a unified country.

Second, in the utility function described above, the incomes are supposed to be exogenous. The authors don't take into account differences between individuals regarding the income. Therefore, this means that they disregard the question concerning the redistributive role of the government. Moreover, in order to establish the equilibrium number of nations, we saw that an important factor is the degree of heterogeneity in the population. Thus, if we consider change in income, the degree of heterogeneity might be modified.

Third, the individuals are supposed to be immobile. This supposes that tax competition and equalization does not make sense anymore even though these questions are at the heart of fiscal federalism. In addition, nowadays, in a world more and more globalised and integrated, individuals have the possibility to cross over to other the countries. However, According to Buchanan and Faith (1987), secession is an alternative to "vote with their feet", as soon as it is impossible or expensive to migrate (transport cost, linguistics barriers). Moreover, Drèze (1993) and Dion (1996) assert that regions concerned by secessionist movements have a strong identity slightly different compared to the national identity. It leads to a developed regionalism particularism (culture, language) that slow down the geographical migration. Then, others authors like Faini, Galli, Gennari and Rossi (1997) describe the lack of mobility as an inefficiency of the labour market and the high costs of the mobility. Moreover, due to the uniform density in the model, it is impossible to find a polarized society. In other terms, if we remove the correspondence between geographical and preferences dimensions, we leave the question of geographical mobility open. This leads to take into account the possibility of presence of ethnic or cultural minorities. Indeed, ethnic minorities (ethnic groups) are widely represented in the World. Fearon's list (2003) characterises 709 ethnic minorities.

Fourth, the central government does not supply all the different public goods and is not in charge of all policies. In reality, the central government transfers some responsibilities to the inferior level as subnational jurisdiction or regions.

However, the degree of power transferred is slightly different across regions. In their seminal paper, they consider only one level of government.

Finally, the spending regarding an eventual military force within the country, and military menace coming from an external sources is not considered in their model. It is obvious that this will affect the quantity of the public good.

2.2 A model with exogenous borders

This section proposes some extensions related to the groundbreaking model of Alesina and Spolaore (1997). I will reconsider some fundamental assumptions of the model. Indeed, while Alesina and Spolaore (1997) determined the endogenous formation of states, others economists focus on the secession of states, taking borders as exogenous, in order to avoid a purely symmetric world representation and matching the reality more closely. Thus, Bolton and Roland (1997) attempts to analyse the main economic and political factors of the processes of secession and unification of democratic nations, taking border as a heritage of the past. Moreover, the nature of the heterogeneity considers the difference in income among individuals, while Alesina and Spolaore (1997) consider that the heterogeneity comes from the preference in the public good. Thus, it implies some regional conflict regarding redistribution.

Their starting point is to argue that secession is never desirable. A unified nation can escape from duplication cost (defence, law) and free trade between sub-national jurisdictions is possible. However, the advantage of unification is not equally distributed among all individuals and, thus, there exists, in each democratic subnational jurisdiction, some winners as well as losers from secession. Their model deals with the conditions under which the majority of winners are in favour of secession or unification. The authors focus on “regional conflicts over fiscal policy arising from differences in income distribution across regions” (Bolton and Roland, 1997). In others words, the money collected and redistributed by the government is a source of conflict between citizens.

2.2.1 The main assumptions and results of the model

I will present the main assumptions and results of the model of Bolton and Roland (1997) and draw parallels with the model of Alesina and Spolaore (1997). First, the authors consider two regions A and B with exogenous borders while Alesina and Spolaore (1997) determined the borders as endogenous. Moreover, individuals differ in income, but not in preferences over types of governments (as in Alesina and Spolaore (1997)). Second, the government has to provide the public good (lump sum transfer) or is characterised by a role of redistribution of income financed by linear income tax schedules determined through voting. Thus, the aim of taxation is pure redistribution. Third, Equilibrium tax rate with a majority vote represents the median income voter's favourite tax rate. Fourth, the income distribution is not the same in each region. A median income voter in region A has a different favourite tax rate compared to a median income voter in region B. Moreover, the equilibrium in a unified state does not correspond with the equilibrium in each region. Fifth, the trade-off is the following: efficiency advantage of a unified state against the advantage of having an income redistribution policy closer for a majority in the region. Finally, there is factor mobility inside the regions (not across regions) and secession arises when a majority of voters support the separation in at least one region.

The authors considered a sequential game, where, in the first step, individuals determine the redistribution policy (tax rate), and, in the second step, individuals vote for or against secession. The authors solve the game by using backward induction, leading to a sub-game perfect equilibrium. In order to determine when secession arises at the equilibrium, the authors compare the outcome of the median voter under secession and under unification. If the outcome under secession of at least one median voter is greater than the outcome under unification, secession will happen. Thus, the authors show three important effects defining the choice of secession of the regions.

- (i) The political effect is the difference in the preferred fiscal policy between median voter in region i and the median voter of the rest of the country (in the unified state).
- (ii) The efficiency effect represents the impact of efficiency loss. The greater the efficiency loss from secession, the lower the advantage from secession to the median voter in region i .
- (iii) The tax-base effect is the difference between the mean income in the region and the unified state. When the mean income is smaller in the region than in the unified state, this leads to a supplementary cost of secession for region i due to smaller tax base. Inversely, it leads to a tax advantage from secession.

Bolton and Roland (1997) define a first simple result representing the concept of government closer, in term of redistributive policy, to the individuals. Indeed, with a similar per capita income in both region and no efficiency losses, secession would always arise at the equilibrium in a democracy. In other words, the political effect is centrifugal because, *ceteris paribus*, any regions opt for secession in order to realize the preferred fiscal policy.

Consequently, the existence of a political effect explains the situation where poorer regions desire to secede, as well as richer regions. They both want to be closer to the favourite policy. Indeed, the majority in poorer regions are in support of secession, in order to establish a higher tax rate and thus having more redistribution. Inversely, the majority in richer regions are in support of secession in order to reduce the tax rate and thus having less redistribution. Moreover, when considering a small efficiency loss, the authors argue that it is conceivable that a majority in at least one subnational jurisdiction may benefit from secession in spite of an efficiency loss for each secessionist subnational jurisdiction.

Finally, the authors assume the perfect factor mobility (capital and labour). It means that each person can decide the location of their capital or labour (factor endowments), wherever they want. They consider that two regions have a different tax rates and observe, in the new game, how perfect factor mobility acts on the final outcomes. Assume, for example, that tax rate in region A is lower than in region B. This leads individuals who earn the highest income in region B want to move in region A. Thus, tax revenues in region B are lower and there is a decrease in redistribution. This implies that individuals who earn low income in region B also want to move to A, and so on. In consequence, the authors propose a second result as follows. Any equilibrium under perfect factor mobility leads to the same tax rate in region A and B, and, therefore, there is a harmonization of the tax rates and the union is always preferred to secession.

To conclude, the economics of secession is often presented in term of cost-benefit analysis. In the theoretical cases described above, the heterogeneity of the country (in term of preferences over public goods or in term of income redistribution) is an important factor of secession.

Bolton and Roland (1997) emphasise on the redistributive and tax aspect. They consider the borders of national country as given, as a heritage of the past. Two regions having the same income per head and same disparity level would have the same tax preferences and thus no encouragement to secede. Inversely, difference in term of income per head or in redistributive policy would lead to secession.

Others economists as Alesina and Spalore (1997) emphasize more on spatial heterogeneity where the physical distance between periphery and the centre who decide the location of the public good and the quantity. A public good is assimilated to a government. His location satisfies the closest individual and dissatisfies the most apart. They consider the borders as endogenous outcomes of choices by individuals who interact with each other while pursuing their goals under constraints. These authors argue that borders are not fixed characteristics of the landscape, to be treated as given, but they are affected by the choices and

interactions of peoples and groups. When individuals can decide democratically whether to form a larger political country or secede from existing polities, voters with preferences that are remote from the central government bear higher heterogeneity costs. Thus, they may perceive that the heterogeneity cost are bigger than the economies of scale and thus make secession. This democratic outcome may lead to equilibrium with to many countries.

Chapter 3

Empirical evidence of economic factors influencing secession

The previous chapter presented the manner to model the economic of secession and formation of political jurisdictions. The purpose of the third chapter of this thesis is to introduce empirical studies presenting economic factors influencing secession. Buchanan and Faith (1987) highlight the fact that secession may be a “road not travelled”. This famous sentence means that breakups are relatively infrequent facts and each of them present specific characteristics. Indeed, secession arises given different circumstances like following a vote or after a civil war. However, strong demand for autonomy (even menace of secession) influences the government behaviour. Therefore, economists, political scientists have some trouble to analyse empirical evidence regarding secession. Moreover, they tend, sometimes, to focus on subnational jurisdictions. The aim of this third chapter is to test different economic factors having an impact on secession. Indeed, I will first deal with the basic trade-off between economies of scale and heterogeneity of preferences. Alesina, Baqir and Hoxby (2004) give attention to analysing the link between the number of jurisdictions (school districts in the US) and the heterogeneity of the jurisdiction (racial diversity), using the model of Alesina and Spolaore (1997) as a base. Then, I will show some empirical evidence regarding economic globalization and secession using the analysis of Sorens (2004). He deals with the evolution of secessionist parties in democratic states and economic globalization, controlling other economic determinants. Then, Daumal (2008) tries to assess the impact of fiscal federalism and separatist regions, on international trade. Finally, I will present the effect of decentralisation (including intergovernmental transfers) and federalism on secession. Bakke and Wibbels (2006) provide a compelling attempts to evaluate the relation between

decentralisation and ethnic conflict, taking into account the differences between federal states.

3.1 The basic trade-off between economies of scale and heterogeneity of preferences

Alesina, Baquir and Hoxby (2004) empirically test the basic trade-off between the benefit of large states (economies of scale) and the cost of heterogeneity of preferences using data at local level in the US. They argue that focusing on local jurisdictions is informative because they are more concerned about their own rights, there exists a greater number of local jurisdictions and they change very often, compared to greater jurisdictions. The authors focus on different kind of heterogeneity like race, ethnicity, religion, income and age. This section is organized as follows. I will first present the main variables and data. Then, I will present the empirical strategies and results, mainly a panel analysis on school districts.

3.1.1 Main variables and data

The theoretical model describes a simple model of jurisdictions (county) built on Alesina and Spolaore (1997). Indeed, they consider a county with a total population M . There are T types of peoples established at a distance h from each other, m represents the mass of people corresponding to each type, thus $M = mT$. Moreover, the authors add the notion of density $d = m/h$. One important aspect is the representation of their theoretical model in a single dimension. They argue that distance between people represents a general calculation of the difference between people (income, geographic, taste etc.). However, people are dissimilar on several dimensions. Their aim is to find the number of school districts into which the county is divided. In a similar way than Alesina and Spolaore (1997), the authors resolve a maximisation (sum of individual utilities) under constraint (school budget) and find that the school is located in the middle of each school district with N optimal number.

Up to this point, they consider all kind of heterogeneity into a single dimension. In order to deduce results with empirical significance, the authors have to relax this hypothesis. When they add the density in their theoretical model, they find that when density increases, heterogeneity of preferences decreases. However, nowadays, individuals, in cities, live very close to each other (high density) and individuals are very different in term of income, preferences or race. As a consequence, a single dimension model is not suitable and the authors will use a bi-dimensional model where the coincidence between preference heterogeneity and geographical distance is disconnected. Thus, they separate each county into J parts with a mass of population (m_j) and types of individual (T_j). The authors argue that it would be optimal to choose N equally sized school districts with different density. The solution is:

$$N = \frac{1}{2} \frac{\sqrt{gah}}{\bar{k}} (\sum_{j=1}^J T_j \sqrt{m_j}) \quad (3.1)$$

The authors deduce from the theory their empirical strategy in logs as:

$$\ln N = \frac{1}{2} \ln h + \frac{1}{2} \ln g + \frac{1}{2} \ln a - \frac{1}{2} \ln \bar{k} + \ln \sum_{j=1}^J T_j \sqrt{m_j} \quad (3.2)$$

where N denotes the number of school districts into which a county is divided, h represents the distance between the different types of individual, g and a are respectively parameters that capture the benefit of public good and the disutility of distance, \bar{k} corresponds to the fixed cost of school and thus captures the economies of scale and, finally, the sum expresses each fragment of the county (j) occupied by a mass of individual m_j and T_j types of individuals. In other words, it represents the total population in a fragmented way. Regarding the last term of equation (3.1), its purpose is to separate the coincidence between preference heterogeneity and geographical distance, in order to avoid the single dimension problem explained above.

The equation above means that the number of school districts should depend on (i) measures of heterogeneity of preference (which is the aim of their study), (ii) measures of benefit of the public good, (iii) measures of fix cost of school and (iv) measures of density and size of county. In other words, the number of School Districts is the dependent variable, and (i), (ii), (iii), (iv) are the independent variables.

Proxy variables like racial, ethnic or religious fragmentation indices and calculation of income inequality express the main variable of interest, the heterogeneity of preference.

The benefit of public good (g) or the degree to which individuals want the public good is represented by county's mean income, share of adults with a high school degree, college degree, share of individuals aged 65 or older, and, in some conditions, industry employment share.

A good proxy for the measure of fixed cost (recall \bar{k} detects the economies of scale) is, according to Hoxby (2000), quoted by Alesina, Baquir and Hoxby (2004), natural barriers like streams. Indeed, he demonstrates that domains with more streams will have more jurisdictions, *ceteris paribus*. In addition, state indicators are included.

The last term of the equation (3.2) necessitate a “measure of density and measure of total population in parts of the county with different population density” (Alesina, Baquir and Hoxby, 2004). Because of this, they use a multivariate taylor expansion. Thus, the authors propose a collection of population and density variables that determine the baseline for a new jurisdiction formation within the county. They suggest four classifications of density for each county, which are low, medium, high and very high density.

I will now present the different data that have a county-level dimension. They are partly originate from the US Censuses of Population and from 50 other sources³.

- Income heterogeneity is calculated with the Gini coefficient (similar results with Theil index, coefficient of variation and ratios of income deciles).
- Index of racial heterogeneity is the probability that two random people in a county are associated with different races (according to the Census of Population, race defines five categories: white non-Hispanic, black non-Hispanic, Asian and Pacific Islander, Native American, and Hispanic). Mathematically, this can be represented as “ $race = 1 - \sum_i (group_i)^2$ ” where group denotes the share of peoples associating to race i. According to the authors, their sample represents 98 per cent of whites in the counties. Therefore, if “heterogeneity” increases, the “number of whites” will decrease.
- Index of ethnic heterogeneity represents two different indexes: index of whites and Hispanics. They correspond to the probability that two random white (Hispanic) persons in a county are associated with different primary ancestry groups (with equal dissimilarity). For example, the Scottish are combined with the English, into the British.
- Religious heterogeneity is represented by data on attachment to 17 major Judeo-Christian groups.

In their analysis, the authors interpret the results in term of standard deviation because most of the variables do not have unities (for instance, the equation “race” presents no unity).

³ Regarding descriptive statistics for counties, see Table 1 in Alesina, Baquir and Hoxby (2004).

3.1.2 Empirical strategies and results

The authors first run a least-squares estimation of cross-sectional data (data collected at the same point of time). They use a specification log-log, therefore, the dependent/independent variables are in logarithm (in the equation), in order to interpret the coefficients as elasticity. They employ data from 1990 for the cross-sectional analysis, because it was the most complete year in terms of available data. However, the results will not make clear if there exists a causal link between the number of School Districts and the explanatory variables. The causal mechanism which the trade-off operates (Alesina, Baquir and Hoxby, 2004) is thus not yet defined.

In order to attempt to solve the problem of causal link or in other words whether the population heterogeneity have an effect on the number of jurisdictions or is it an other explanation, the authors run a regression with panel data. This method requires observations for more periods (panel of counties). In our case, the authors employ a panel of counties from 1960 to 1990. “By studying changes in the dependent variable over time, it is possible to eliminate the effect of omitted variables that differ across entities but are constant over time” (Stock and Watson, 2012). Indeed, the authors argue that with this method, many idiosyncratic characteristics of counties are not anymore considered as omitted variables. They use a specification log-log plot and, therefore, the dependent/independent variables are in logarithm (in the equation) in order to interpret the coefficients as elasticity.

First, they investigate if a change over time in heterogeneity leads to a change over time in number of jurisdictions. However, during this period, an augmentation of the number of jurisdictions were extremely infrequent. Thus, the authors assess if in more heterogeneous counties, consolidation was taking considerable time. Their main result is the following: counties that faced an augmentation in racial heterogeneity have a lower reduction in term of number of

jurisdictions. Nonetheless, this result is a necessary condition but not sufficient for a causal link.

Thus, the authors need changes in heterogeneity that are credibly exogenous in order to find the most robust evidence. Therefore, they employ shocks to heterogeneity during the World War I and World War II. Indeed, during this time, we observe a massive migration of Black individuals in the north (perturbing⁴ a small and discernible number of counties). Moreover, several counties (with industrial firms as well) were not perturbed because they did not produce any war goods. Their goal is to designate a number of counties perturbed by the black migration, and confront them to ex ante similar (in term of population, urbanization and initial share of black population) counties that were not perturbed.

Table 3.2 presents the panel analysis results. Column 1 presents the first regression, using exogenous shocks to heterogeneity during World War I, and column 2 shows the second regression using exogenous shocks to heterogeneity during World War II.

Table 3.2 – Effect of racial heterogeneity shocks generated by World War industry demand

	World War I "Experiment" (1910-1920)	World War II "Experiment" (1940-1950)
Change in racial heterogeneity	1,049 (0,42)	0,677 (0,317)
Change in white ethnic heterogeneity	-0,038 (0,107)	0,028 (0,099)
Change in hispanic ethnic heterogeneity	0,041 (0,185)	0,259 (0,186)
Change in religious heterogeneity	-0,868 (0,971)	-0,687 (0,810)
Observations	26	64

Source: Alesina, Baquir and Hoxby (2004)

⁴ An increase of at least two percentage point in the black share of the population.

The main significant result is the change in the racial index during World War I and II. Indeed, they obtained that an increase in the change in racial heterogeneity (in the counties affected by the massive migration) raised the number of school districts by 5 per cent, after World War I and by 4 per cent, after World War II.

In a nutshell, the authors find that racial heterogeneity had a positive impact on the number of school districts in the US and, thus, the basic trade-off is an important factor of size and number of local governments. In other words, individuals put more importance in the will of avoiding racial heterogeneity than benefit from economies of scales. Moreover, they discover less strong result regarding income heterogeneity. However, the trade-off between income heterogeneity and economies of scales is present. Finally, they obtain less evidence regarding the other proxy variables (ethnic and religious).

3.2 Empirical analysis regarding the link between economic globalization and secession

A state's market size corresponds with its domestic size only if the state's economy is perfectly integrated domestically but closed to the world. From the opposing point of view, in a total economically integrated world, market size of state is larger than its political size and represents the world. However, perfect economic integration among country is rarely seen in the real world. Some economists as Portes and Rey (2000) characterise the effects of borders in financial markets and consider the size of them to information costs. His argument is that economic costs of small states decline as economic integration augments. Thus international openness decreases the benefits of large political size. This may increase the demand for political autonomy.

Several economists and political scientists attempt to test the link between economic globalization and political autonomy. Indeed, I will first present the paper of Sorens (2004) that deals with the relation between the determination and evolution of secessionist parties in democratic countries, and economic

globalization controlling other determinants. Sorens (2004) associate secessionist parties with a wish to favour independence within a states or union as the Scottish National Party (in the European Union) or le Parti Québécois (in Canada).

Secondly, while Alesina et al. (2000), Graziosi (2006) analyse the repercussions of economic integration on political fragmentation, I will present the paper of Daumal (2008) where she attempts to empirically to analyse the opposite effect. Indeed, by running panel data estimation with a gravity model, she tries to test two hypotheses whether separatist regions (Quebec, Catalonia etc.) and political fragmentation in federalism system foster greater trade openness.

3.2.1 Secessionism and economic globalization

Sorens (2004) analyses the relation between secessionism and phenomenon that change over time (economic globalization), controlling other economic factors in democratic states. Indeed, this analysis does not consider cross-sectional factors of secessionism, but rather over-time factors of secessionism. The author considers three regressions (Tobit for all regions, least squares for 15 regions and ordered Probit for the autonomy) with fixed-effect specifications. This study takes into account data from 1980 to 2000.

Hypotheses

Hypothesis 1. Economic globalization increases secessionism.

The main idea is that minority or regions (with secessionist party) may prefer to breakup as international openness and economic integration increase. Moreover, there is a reinforced process between globalization and secession. Both strengthen each other.

Hypothesis 2. Higher ratio of Regions GDP per capita compared to countrywide GDP ratio per capita have a greater probability to favour secessionist parties.

The author presumes that high capacity regions will have to pay more in taxes compared to the government expenditure they can actually enjoy. Thus individuals favour secessionist party within high capacity regions.

Hypothesis 3. Political environment (more regional autonomy and existence of regional election) may have a positive or negative impact on secession.

The idea is that if the central government gives more power to a region, the majority of the inhabitants within it will not anymore vote for secessionist parties, because they feel satisfied of the agreement. Though, regions may be disappointed because they did not receive the promised autonomy and, in consequence, secession may benefit.

Methodology and variables

In order to evaluate the hypotheses mentioned above, the authors run three regressions. The first one takes into account all the regions⁵ with secessionist parties and without secessionist parties. Moreover, the regression considers a Tobit estimation because the explained variable cannot take a value under zero (the explained variable is censored).

The second regression takes into account 15 regions⁶ where secessionist parties exist (regions without secessionist parties are not considered). The regression consider a least square estimation.

For the first two regressions, the dependent variables are built from secessionist party vote share. The author argues that secessionist party vote share presents some benefit. Indeed, the variable offers important distinction among regions and over time, thus it can be interpreted and compared between subnational jurisdictions. Moreover, the variable is continuous and measurement error is below the normal level. For a well-established range of countries, voting for a

⁵ See Sorens (2004) pp.737-738 for the regions concerned.

⁶ See Sorens (2004) p. 734 for the regions concerned.

party advocating secession is a suitable method of asserting autonomy or secession. *LNVOTE* represents the dependent variable in the Tobit regression considering all the regions. It can be characterised as:

$$LNVOTE = \ln(3 + VOTE) \quad (3.3)$$

VOTE represents the dependent variable for the least square regression of the 15 regions. Finally, *DAUTO* represents the dependent variable for the ordered Probit regression with the increase in the regional autonomy as the dependent variable.

The author utilises fixed-effects specification that consider dummy variables. Their aim is to control the invariant factors that induce alteration in secessionist vote share across regions. In other words, fixed-effects control omitted time-invariant variables. It is important to capture significant factors that differ year to year, in order to forecast change in secessionist votes over the period.

Sorens (2004) characterises the main important economic explanatory variable (economic globalization) as the overall openness of the international system as world merchandise exports divided by world production. The author approximately simplifies the term of economic globalisation as the international trade between two countries. According to the Foreign Policy Globalization Index, it exists other interesting way to measure globalization as economic integration involving financial flows, political engagement or information technology. The expected sign of the economic globalization (*GLOB*) is positive.

Regarding the control variable, *GDPRATIO* is measured by regional per capita GDP, divided by nationwide per capita GDP. The expected sign is positive. The control variable called regional election (*PROVELEC*) is a dummy variable that can take the result of 0, if there are regional elections, or 1, if there are countrywide elections. The expected sign is positive. The control variable called regional autonomy (*DAUTO*) is represented by the change of *PROVAUTO* between two elections. The latter represents a compound variable that calculate

several aspects like elected executive, legislative power, administrative power and fiscal autonomy⁷. The expected sign is negative.

Results

Table 3.3 – Regression results

Variable / Spec.	All regions	15 Regions	Autonomy
Specification	F-E Tobit	F-E LS	ordered probit
Dependent variable	Invote	vote	dauto2
Provelec	0,3137 (0,06) ^b	2,4595 (1,24) ^a	
Year	0,0115 (0,01)	-0,365 (0,34)	
Dauto	0,0865 (0,05)	0,4712 (1,23)	
Glob	0,5991 (0,40)	27,846 (10,4) ^b	
Misind		-0,112 (0,23)	
Gdpratio		82,483 (19,7) ^b	
Unemdiff		0,7115 (0,46)	
Provauto			-2,13 (0,33) ^b
Lnvote			0,637 (0,21) ^b
_Cons	-22,7921	631,33	
R ²	75,57% (pseudo)	35,4% (within)	
Observations	2227	123	125

Source: Sorens (2004)

Note: Standard errors in parentheses

^a Statistically significant from zero at the 95% confidence level (two-tailed test)

^b Statistically significant from zero at the 99% confidence level (two-tailed test)

⁷ See Sorens (2004) for a complete description of the composite variable PROVAUTO.

The analysis of the persistence and evolution of secessionist vote share in democratic countries, during 1980 to 2000, provides the following results. The first column enumerates the results for the regression involving all the regions. The second column enumerates the results for the regression involving 15 regions with secessionist parties and, finally, the last column enumerates the results where the regression analyses whether central government gives more political autonomy to regions with secessionist parties, compared to regions without secessionist parties.

Hypothesis 1.

Concerning the regression involving all regions, we find no statistically significant result for the variable economic globalization. However, regarding the regression involving 15 regions with secessionist parties, we find statistically significant (from zero at 99 per cent confidence level) result and, thus, economic globalization is positively correlated with the evolution of secessionist vote. However, the author neglects the term of economic globalization. He does not consider the financial integration. Indeed, it is an important factor for making a country more efficient and competitive and, ultimately, for improving to sustainable economic growth. For example, the EU's financial integration has been an important process during the last decade. The Catalonia in Spain has to consider the financial markets, financial institutions (bank, central bank) in the context of secession. The monetary aspect is a key component. The evolution of the exchange rate (more precisely the new currency) after secession will depend on the EU's financial system and will imply some adaptation costs. Moreover, in the short term, absence of credibility of the new currency and a state of uncertainty regarding the economy may increase the interest rate and thus weaken the financial system.

Hypothesis 2.

Regarding the regression involving 15 regions with secessionist parties, we find strong evidence (statistically significant from zero at 99 per cent) that relative regional GDP is positively correlated with secessionist vote growth. The idea

behind this result is that high capacity regions may avoid to pay for low capacity regions. For example, Catalonia has a GDP per inhabitants higher than the mean in Europe.

Hypothesis 3.

Regarding both regressions (all regions and 15 regions), the result is statistically significant and, thus, existence of regional election increases secessionism. Regarding the ordered Probit regression involving regional autonomy as the dependent variable, we find strong evidence (statistically significant from zero at 99 per cent) that central governments give more autonomy to regions including greater secessionist vote share, from 1980 to 2000. The author asserts that nations with subnational jurisdictions involving secessionist parties are more likely to engage in favour of decentralisation.

An additional information is that the R-squared for the 15 regions is 35,4 per cent. It means that approximately 36 per cent of the variance in secessionist vote share is explicated by the independent variables. This result holds attention in the sense that party strategy, popularity of current parties, coalition, media and other non-measured determinants are not taken into account.

To sum up, we discover evidence that secessionism augments with the growth of globalization only in regions that already have secessionist parties. However, the definition of the term economic globalisation has to be taken with a pinch of salt. The authors find strong support that relative regional economic growth increases secessionism. Finally, secessionist regions have a greater probability to get autonomy than non-secessionist regions. This means that central government believe that autonomy may reduce the effect of electoral secessionism.

3.2.2 Separatist regions promote trade openness

Alesina et al. (2000) argue that economic integration brings about political disintegration, due to a decrease in the economic costs of smallness and secession.

Moreover, Casella and Feinstein (2002) point out that the implementation of a nation into worldwide markets could lead to political disintegration. Although several economists attempt to assess the effect of international openness on secession or political fragmentation, Daumal (2008) deals with the opposite link. Therefore, she empirically tests with the help of a gravity model (i) the impact of political fragmentation (namely federalism) on trade openness and whether (ii) separatist regions of federal countries encourage international trade.

Hypotheses

Hypothesis 1. Political fragmentation leads to market fragmentation and thus to greater trade openness.

The idea of this hypothesis can be described as follows. One important principle of federalism is that there is no subordinate link between the central government and subnational jurisdictions, there is a share of the competence rule by a federal constitution. Moreover, in federations, subnational jurisdictions have a certain degree of power regarding taxes or regulations and can implement inter-regional trade barriers (norms, taxes, quantitative restrictions). Thus, national market fragmentation results from inter-regional barriers. Hence, Daumal (2008) asserts that unitary countries are more integrated within the country than federal countries. Therefore, federal countries, at a higher level, integrated in the worldwide economy. In other words, the international trade costs are smaller, compared to inter-regional trade costs, due to inter-regional barriers. For instance, in Canada, we observe several inter-provincial trade barriers leading to a fragmented market. Indeed, provincial governments implement some inter-provincial barriers so that their local economy is preserved from the state competition. Moreover, according to Zadorozhniy (2002) quoted by Daumal (2008), inter-regional barriers mainly in agricultural trade are more and more important in the Russian Federation.

Hypothesis 2. Separatist regions of federal states promote international trade.

This hypothesis is built on results derived by Alesina et al. (2000) and express that minority regions have an advantage by creating new small jurisdictions under free

trade. Since trade openness decreases the cost of secession and of being a small state, secessionist regions have an advantage to be in favour of low trade barriers. The author argues that secessionist regions in most federal countries (Canada, Austria, Ethiopia etc.) are entitled either to secede or to have more autonomy peacefully. These regions lead a secessionist strategy with the aim of reducing the economic cost of secession. Thus, more integration with international trade (that diminishes the dependence to national economy and the cost of secession) seems to be an important aspect for secessionist groups. In addition, subnational jurisdictions enjoy a degree of autonomy regarding implementing laws or taxation. Thus, according to Daumal (2008), separatist regions have the possibility to strengthen the trade globalisation system⁸. For instance, in Quebec, some parties attempts to implement a free trade agreement between the US and Quebec (this agreement was refused by the US), in order to increase their autonomy from the Canadian market. According to Paquin (2004) quoted by Daumel (2008), yesteryear, Flemish parties in Belgium highly bear trade liberalization and the European common market, in order to promote independence.

Methodology and variables

The author analyses a panel data of 148 states, from 1980 to 2002, based on a gravity model coming from Anderson and van Wincoop (2003) theory. These authors argue that the conventional gravity equation is not correctly specified, as it does not consider multilateral trade-resistance. The idea is that two states, surrounded by other big trading economies, will trade less between themselves than if they were encircled by oceans or deserts. The gravity equation is the following:

$$\ln X_{ijt} = \beta_0 + \beta_1 \ln(GDP_{it}) + \beta_2(GDP_{jt}) + \beta_3(Exchangerate_{ijt}) + \beta_4 (\ln Distance_{ij}) + \beta_5 (Language_{ij}) + \beta_6 (CommonBorder_{ij}) + \beta_7 (Federalism_i) + \beta_8 (Federalism_j) + \lambda_t + FE_{ij} + u_{ijt} \quad (3.4)$$

⁸ See Hillman (2005) for an opposite hypothesis concerning the relation between separatism and international trade.

where the dependent variable represents the exports from state i to j for year t (US dollars). Notice that i represents the exporting state, while j the importing state. Then, the explanatory variables are represented by (i) gross national product of country i for year t , (ii) gross national product of country j for year t , (iii) the bilateral exchange rate between state i and j for year t , (iv) the bilateral distance between the two main considerable cities of the states, (v) a dummy variable taking the value 1, if states i and j share a common border, otherwise 0, (vi) a dummy variable taking the value 1, if states i and j share a common language, otherwise 0, (vii) a dummy variable taking the value 1, if state i is a federal state, otherwise 0, and finally, (viii) a dummy variable that take the value 1, if state j is a federal state, otherwise 0. The last two terms of the equation represent respectively, time dummies (control all events limited to year t and widespread to all states), and random bilateral effect.

Two remarks have to be notified. Firstly the author uses random effect instead of fixed effect, because it considers the fact that error terms are not correlated with independent variables. Thus, it is possible to use time-invariant variables as explanatory variables. However, it can result from the random effect some bias (correlation between independent variables and bilateral effect). Daumal (2008) argues that federalism and separatist variables have a small probability to be correlated with bilateral effects. Therefore, they coefficient can be interpreted.

Secondly, a great number of bilateral trade flows are equivalent to zero. However, these zeros may include important information. In consequence, in order to perform the gravity equation (3.3), the author employs the poisson maximum likelihood estimator. "This method is a good alternative to include the zero values of the dependent variable since it consists of estimating the bilateral trade X_{ij} in levels" (Daumal, 2008). Indeed, this method is applicable to the level of trade and, therefore, estimating directly the non-linear form of the gravity model, and avert a value of zero, concerning trade flows.

Results

The author encounters some trouble to test empirically hypothesis 1 because of a lack of data on market fragmentation. Nonetheless, the hypothesis 2 can be tested successfully, so the results of federalism and separatism on international trade, are estimated. Table 3.4 presents the panel data estimation that captures the impact of federalism and separatism on foreign trade.

Table 3.4 – Impact of federalism and separatism on international trade

Dependent variable: X_{ij} exports from i to j					
	1	2	3	4	5
$\ln(\text{GDP}_i)$	1,09 (0,001)***	1,11 (0,001)***	1,28 (0,001)***	1,28 (0,001)***	1,28 (0,001)***
$\ln(\text{GDP}_j)$	0,75 (0,001)***	0,78 (0,001)***	0,98 (0,001)***	0,98 (0,001)***	0,99 (0,001)***
$\ln(\text{Exchangerate}_{it})$	-0,004 (0,0001)***	-0,004 (0,0001)***	-0,0003 (0,0001)**	-0,0002 (0,0001)	-0,0002 (0,0001)
$\ln\text{distance}_{ij}$	-1,12 (0,018)***	-1,15 (0,018)***	-0,68 (0,025)***	-0,95 (0,022)***	-0,90 (0,022)***
$\text{commonLanguage}_{ij}$	0,91 (0,047)***	0,91 (0,047)***	0,14 (0,063)**	0,17 (0,059)***	0,13 (0,059)**
commonBorder_{ij}	0,82 (0,092)***	0,84 (0,092)***	2,12 (0,122)***	1,96 (0,114)***	1,97 (0,113)***
federalism_i	-0,67 (0,039)***	-0,74 (0,039)***	0,90 (0,053)***	1,01 (0,049)***	0,95 (0,05)***
federalism_j	0,22 (0,039)***	0,11 (0,039)***	0,85 (0,053)***	0,79 (0,049)***	0,75 (0,049)***
$\ln(\text{democracy})_i$		0,05 (0,0007)***	0,01 (0,0007)***	0,01 (0,0007)***	0,01 (0,0007)***
$\ln(\text{democracy})_j$		0,07 (0,0007)***	0,06 (0,0007)***	0,06 (0,0007)***	0,06 (0,0007)***
$\ln(\text{population})_i$			-1,12 (0,003)***	-1,14 (0,003)***	-1,13 (0,003)***
$\ln(\text{population})_j$			-0,79 (0,003)***	-0,79 (0,003)***	-0,79 (0,003)***
separatism_i				1,77 (0,04)***	1,73 (0,04)***
separatism_j				1,29 (0,039)***	1,24 (0,04)***
$\ln\text{Linguistic Diversity}_i$					0,13 (0,014)***
$\ln\text{Linguistic Diversity}_j$					0,06 (0,13)***
Observations	321628	321628	321628	321628	320086

Source: Dsumal (2008)

Note: Standard errors in parentheses

*** represents statistical significance at the 1% level

** represents statistical significance at the 5% level

All values in Column 1 correspond to what the existing literature have already found about this topic. Indeed, gross national product of the both states are roughly one, a decrease in bilateral distance between two states increases the exports from i to j , common border and common language have a positive impact on bilateral trade, and a slight appreciation of the exchange rate (coefficient of -0,004) increases bilateral trade. Regarding the principal variable, federalism, the author finds a surprising result (the expected sign of federalism is positive). Indeed, the coefficient (-0,67) is negative and significant at 1 per cent and signifies that federalism in state i has a negative impact on international trade. Federalism in state j has a positive impact on their importations. Neglected variables explaining foreign trade and correlated with federalism, is an explanation of the negative sign of federalism and, thus, can insert some bias in the coefficients of federalism.

Consequently, the author wants to control the factors of trade that may be correlated with federalism in order to find a correct coefficient of federalism. The author adds, respectively, in column 2 and 3, the variables democracy and population, because they have an impact on international trade. In consequence, the coefficients are different. Indeed, $Federalism_i$ is now positive and equivalent to 0,90 and $Federalism_j$ is positive and greater than before. Recall that $Federalism_i$ before controlling democracy and population had a negative sign. A first result can now be obtained. A federal system has a positive effect on international trade.

In order to find more robust evidence, the author includes another factor correlated with federalism. Thereby, in order to test the second hypothesis, she adds a variable concerning separatism. By using, for the data, a university project that controls “the status of politically-active minority groups” in all states (MAR project), thus establishing a list of separatist movements. The dummy variable $Separatism_i$ takes the value 1, if we find at least one active separatist region (it means coded at level three in the MAR data set) in state i in 1980, otherwise 0. This variable is built from 1980 only, so as to control the endogeneity problem.

In consequence, the author adds the dummy variable explained before in column 4. The coefficient associated with $\text{Separatism}_{i,j}$ take a positive value (1,77 and 1,29). This leads to the second result, active separatist regions impact international trade, whatever be the political system. Moreover, in other robustness checks, Daumal (2008) decomposes the separatism variable into four interactions, in order to test if separatist regions in federal states or unitary states have an effect on international trade. The four interactions terms are presented as follows. “ $\text{Federalism}_i \times \text{Separatism}_i$ ” and “ $\text{Federalism}_j \times \text{Separatism}_j$ ” describe the effect of separatist regions in federal country on international trade. “ $\text{Unitary}_i \times \text{Separatism}_i$ ” and “ $\text{Unitary}_j \times \text{Separatism}_j$ ” describe the effect of separatist regions in unitary country on international trade. This leads to the third result, all the coefficients of the four interactions are positive and significantly different from zero. Furthermore, separatism in unitary states has a bigger effect on international trade than separatism in federal states (coefficient linked to federalism represent 0,43 and 0,81 and are lower than coefficient linked to unitary state which are 1,95 and 1,29).

In a nutshell, several economists argue that economic integration may involve political disintegration. Daumal (2008) finds, empirically, that federalism enhance international trade. In consequence, these two forces (federalism and economic globalization) reinforce each other and, thus, should influence the world in the time to come. Moreover, the author tests, empirically, the effect of separatist regions on international trade, and suggests that whatever the system (federalism, unitary), separatism has a positive impact on international trade.

3.3 The impact of decentralisation and federalism on borders stability

The question whether central government can keep subnational jurisdictions together, using decentralization or sharing power (with the regions) is important. There are a few arguments in support or against the stabilizing capacity of federalism and decentralization. In this last section, I will deal with an empirical

analysis related with the link between decentralisation, federalism and borders stability. Indeed, this section proposes an analysis of Bakke and Wibbels (2006) where they assess the relation between decentralization and three different levels of ethnic conflict (leading to secession).

3.3.1 The relation between decentralization and ethnic conflict

Bakke and Wibbels (2006) try to evaluate, in an interesting manner, the relationship between decentralization and ethnic conflict, by concentrating on differences across federal nations. They run a regression with three different levels of ethnic conflict (from violent to non-violent) with interactive explanatory variables and control (non-federal) variables. Moreover, they use graphics (due to some problem of interpretation) to show how the interactive variables have an effect on ethnic conflict.

Hypotheses

Hypothesis 1. The interaction between regionally concentrated ethnic groups and high interregional income inequality leads to conflict.

A wide body of literature exists which argues that ethnicity leads to conflict due to emotions like hatred or resentment over differences from others. On the other hand, arguments say that difference in resources or wealth may lead to disagreement. Indeed, richer regions may have to transfer their wealth to the rest of the country and, thus, hope of enhancing its conditions by escaping via secession. Poorer regions may want to secede in order to find better conditions regarding redistribution policy. The authors argue that both mechanisms often intersect.

Hypothesis 2. The interaction between fiscal decentralization and interregional inequality leads to conflict.

The authors argue that fiscal decentralisation may intensify interregional inequalities. Firstly, the central government has less capacity to engage in a redistributive policy from richer regions to poorer ones, because the sub-national

jurisdictions use a greater share of the public budget. Therefore, central government disposes less fiscal tools. Secondly, the authors assert that fiscal decentralisation is combined with a competition between regions regarding capital and that under some conditions can increase inequalities. Indeed, poorer regions may have some low potential to engage in capital bargaining against richer regions. As a consequence, with high interregional inequality, fiscal decentralisation will increase inequality and, thus, lead to conflict.

Hypothesis 3. The interaction of large federal fiscal transfers and regionally concentrated ethnic groups diminishes conflict.

Fiscal federalism and conflict literature highlight the presence of fiscal transfers for moderating interregional conflict. The authors expect that fiscal transfers, conditioned by the ethnic composition of the population, promote peace.

Hypothesis 4. The interaction of national parties and the incorporation of ethnic minorities within those parties diminishes conflict.

The authors argue that inclusive national party systems supports federation from fragmenting into conflicting regions. On the other hand, Brancati (2006) proposes that regional parties exacerbate conflict by making stronger the separatist identities and, thus, mobilizing groups to attempt a secession process. Legislation regarding main characteristics of decentralized governance often fail to consider the minorities. In contrast, when ethnic minorities are taken into account in national governing coalitions, this detracts conflict.

Methodology and variables

In order to test the hypotheses above, the authors carry out a time-series, cross-sectional analysis of conflict in 22 federal nations⁹ (or semi-federal) from 1978 to 2000. Their goal is not to describe the difference between a federal system and a unitary system, but to know how federal nations have an effect on the probability

⁹ Countries concerned are Argentina, Australia, Austria, Belgium, Brazil, Canada, Czechoslovakia, Ethiopia, Germany, India, Malaysia, Mexico, Nigeria, Pakistan, Russia, the Soviet Union, South Africa, Spain, Switzerland, the US, Venezuela and Yugoslavia.

of separatist conflict. Moreover, they add several federal variables (ethnic regional concentration, interregional inequality, fiscal decentralisation, and central governments grants, etc.) and multiplicative terms, in order to catch the conditional relationships in the hypotheses.

Regarding the first hypothesis, the authors use the share of a state's population living in ethnic regions (determined by race, language and religions) for regionally concentrated ethnic groups. Moreover, they distinguish ethnic majority (the half of the residents at least belong to the ethnic groups) and minority regions. The interregional income inequality is represented by per capita regional GDP. For a country-year, the authors compute the income of the first 10 richest percentile divided by the income of the last 10 poorest percentile. Regarding the second hypothesis, the authors calculate the fiscal decentralization as the share of entire public sector spending at the local level, and count on IMF's Government Finance Statistics. Furthermore, the measure of interregional inequality is the same as the first hypothesis described above. Then, regarding the third hypothesis, the authors calculate fiscal transfers as the share of entire public sector that is concerned by federal grants or shared revenues. Finally, for the last hypothesis, the authors regroup regional and national data election results, in order to create a variable that "measures the share of regional governments controlled by the nationally governing party of coalition" (Bakke and Wibbels, 2006). In addition, the authors lag the calculation of both fiscal decentralization and fiscal transfers coming from the central government, because they do not anticipate that institutions have an impact on conflict.

Furthermore, they add other variables affecting conflicts in federal nations (control variables or non-federal variables). Indeed, first, a variable of per capita income representing the economic strength of the nation is added in the regression, because nations that are economically advanced (thus have strong capacities regarding financial, police, administrative or military) can reduce conflict. Second, in a similar way, they add a variable denoting the size of the nation's population. Third, they add a dummy variable representing oil exporters.

It can be linked to conflict if the oil resources, in federal nations, is mainly clustered in one or two regions and central government wants to use the revenues generated in order to redistribute it within the nation. Fourth, they add a variable of democracies. It faces less conflict compared to authoritarian nations. Finally, they add a lagged dependent variable in order to control what happened the year before (more precisely, they want to take into account anterior conflict).

Moreover, in order to solve the problem of causality, they do not add all of the variables that are times significant (political instability, non-contiguous territory etc.)

Concerning the dependent variable, they use three calculations that measure different levels of separatism conflict. Indeed, the first one represents armed conflict as violent encounter. The second one represents ethnic rebellion as political banditry to extended civil war. Finally, the last dependent variable is ethnic protest as groups showing non-violent protest action (verbal opposition or manifestation). In order to find the impact of the independent variables on the three dependent variables, the authors run Logit regression.

A technical point is that the interaction between two variables can be expressed as the effect of one independent variable, depending on the level of the other independent variable. The relationship between the two independent variables and how they simultaneously influence the dependent variable, is not additive and, thus, poses some problems in interpretation. As a consequence, the authors employ graphs to show the effect of the conditional hypotheses on conflict.

Results

Table 3.5 presents the results of the three regressions with the three different dependent variables (armed conflict, ethnic rebellion, and ethnic protest). Regarding the control variables (or non-federal variables), as expected, GDP per capita tends to decrease the probability of ethnic rebellion and ethnic protest. States with large population appear to increase the probability of conflict. The result for

democracy has no significant results and, thus, no effect on conflict. Country exporting oil seems to reduce the probability of ethnic rebellions compared to country without such resources.

Table 3.5 – Peace preservation in federal states

	Armed Conflict	Ethnic Rebellion	Ethnic Protest
Per Capita Income (lag)	-0,211 (0,214)	-0,461 (0,141)***	-0,217 (0,099)***
Oil	-0,921 (0,9)	-4,705 (2,044)**	0,219 (0,456)
Population (log)	2,840 (0,599)***	2,024 (0,501)***	0,954 (0,227)***
Democracy (lag)	0,092 (0,081)	-0,059 (0,05)	-0,079 (0,063)
Ethnic Regional Concentration	2,430 (12,095)	-36,431 (11,002)***	-6,995 (7,322)
Interregional Inequality	-2,309 (1,801)	-2,423 (0,919)***	-2,693 (1,117)**
Fiscal Decentralization (lag)	-9,043 (5,017)*	6,304 (4,288)	-2,138 (4,902)
Central Governments Grants (lag)	4,853 (8,063)	-8,718 (9,613)	-2,601 (2,108)
Federal / Provincial Copartisanship	3,898 (2,196)*	3,940 (2,127)*	3,203 (2,081)
Ethnic Federal / Provincial Copartisanship	-7,103 (2,678)***	-8,429 (1,939)***	2,056 (1,715)
Fiscal Decentralization * Interregional Inequality	5,062 (3,554)	3,680 (1,746)**	2,767 (1,978)
Ethnic Regional Concentration * Interregional Inequality	-0,010 (3,346)	7,906 (2,026)***	3,583 (2,069)*
Ethnic Regional Concentration * Central Governments Grants	-46,360 (16,037)***	35,533 (21,666)*	-10,597 (8,383)
Copartisanship * Ethnic Copartisanship	2,473 (2,345)	1,141 (2,101)	-5,333 (2,733)**
Lagged dependent variable	1,174 (0,465)**	2,787 (0,670)***	2,231 (0,319)***
Constant	-28,956 (6,887)***	-14,015 (6,226)**	-5,875 (3,862)
Observations	356	354	354
Pseudo R ²	73,55%	66,64%	54,03%

Source: Bakke and Wibbels (2006)

Note: Standard errors in parentheses

*** represents statistical significance at the 1% level

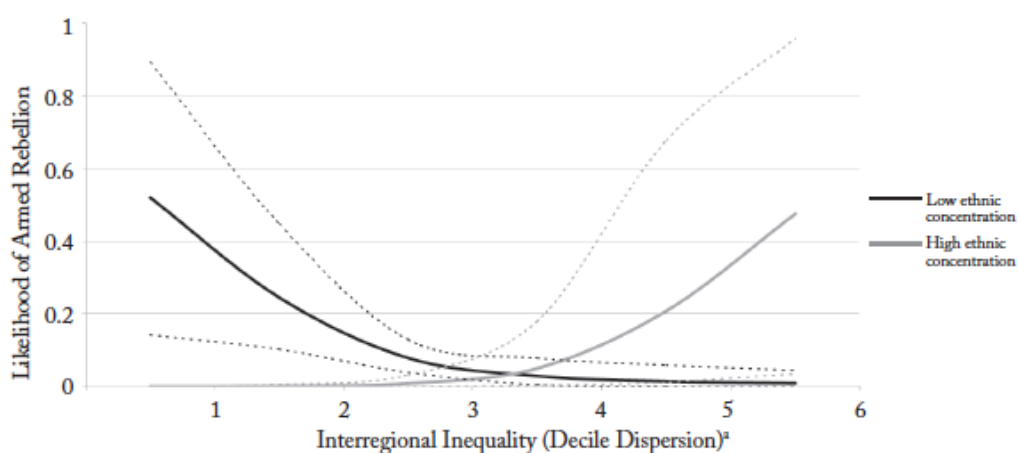
** represents statistical significance at the 5% level

* represents statistical significance at the 10% level

Concerning the federal variables, the authors find preliminary evidence on each of the hypotheses. However, interpreting the coefficient of variables with conditional relationships may pose some problem.

Furthermore, the authors argue that a multicollinearity problem may arise. Therefore, they show the effect of the four interactive hypotheses by graphs. They establish one constitutive variable constant at two extreme values, as low and high (one standard deviation below or above the sample mean). It interacts on the level of the other constitutive variable. This leads to create predicted values based on results of Table 3.5. Moreover, the dashed line represents the confidence interval at 90 per cent. In a more intuitive manner, the graphs present how the interaction of the variables have an effect on conflict.

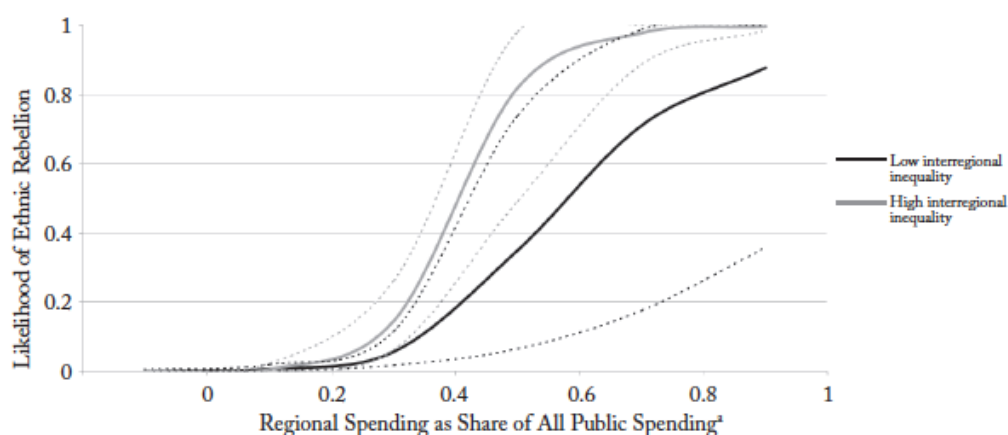
- The authors find evidence regarding hypothesis 1. Indeed, Graph 3.1 shows that with high regional ethnic concentration, the probability of ethnic rebellion increases as interregional inequality rises. Rich majority or minority want to avoid a redistributive policy, or poor majority or minority “may feel a strong sense of grievance” (Bakke and Wibbels, 2006). However, with low regional ethnic concentration, the probability of conflict is near zero, when interregional inequality is high.



Source: Bakke and Wibbels (2006)

Graph 3.6 – The impact of interregional inequality on ethnic rebellion, conditional on ethnic concentration

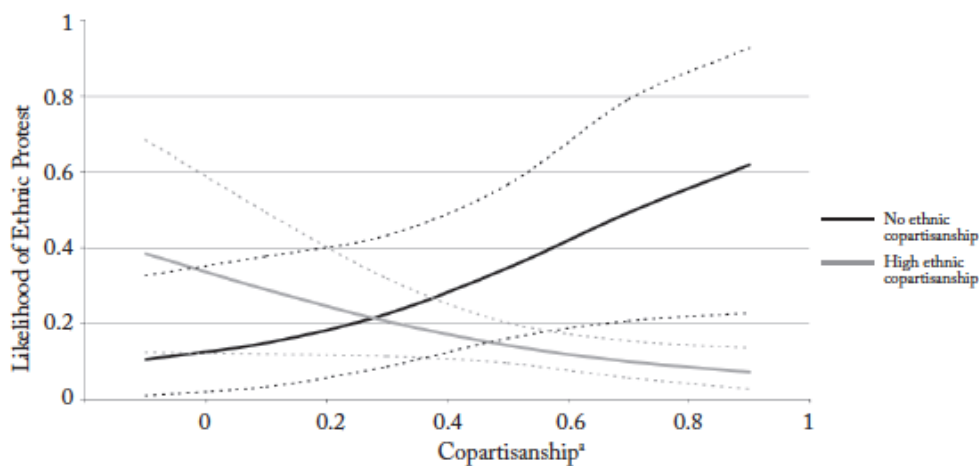
- The authors find evidence regarding hypothesis 2. Indeed, Graph 3.2 shows that with high or low interregional inequality, the probability of ethnic rebellion increases drastically as fiscal decentralization rises. Surprisingly, fiscal decentralisation seems to have no clear moderate impact in states with low interregional inequality.



Source: Bakke and Wibbels (2006)

Graph 3.7 – The impact of fiscal decentralisation on ethnic rebellion, conditional on interregional inequality

- The authors find no clear evidence for hypothesis 3. Indeed, there is no support for a diminution of armed conflict and ethnic rebellion with the interaction of fiscal transfers and central government grants
- Finally, the authors find strong evidence for hypothesis 4. Indeed, Graph 3.3 shows that with ethnic regions that are not copartisans of the centre, the probability of ethnic protest increases as general copartisanship rises. In other words, the probability of ethnic protest increases when ethnic groups are not taken into account in the national parties, or ethnic groups are present in an opposition party. Moreover, if ethnic regions are considered in the nationally governing party, the probability of ethnic conflict decreases as copartisanship increases.



Source: Bakke and Wibbels (2006)

Graph 3.8 – The impact of copartisanship on ethnic protest, conditional on ethnic copartisanship

To sum up, Bakker and Wibbels (2006) proposes an interesting way to evaluate the relation between decentralization and ethnic conflict, leading to separatism. One of their results shows that fiscal decentralisation increase ethnic conflict when there are inequalities between regions. This coincides with the fact that heterogeneity of preference and difference in income may lead to borders instability and may counterbalance the positive effect of decentralization. Nevertheless, this does not suggest that government has to give up decentralization, but rather put more emphasize on the need of more decentralization.

Chapter 4

Conclusion

The purpose of this thesis was to highlight, from a theoretical and an empirical point of view, the economic factors affecting the probability of secession at national or sub-national level.

From a theoretical point of view, I used the model of Alesina and Spolaore as a benchmark case. The authors investigated how the advantages and costs from size and heterogeneity have an effect on the formation and breaking up of countries. They considered several economic perspectives on endogenous borders.

In the first phase, they defined the arrangement of boundaries in an ideal world where the number and size of states result from a maximization of the difference between the total benefits and total costs. This led to the optimal number of states where borders are efficient. This efficiency analysis of boundaries was an indispensable step to evaluate how far from that optimal benchmark actual political borders may be arranged. Indeed, actual boundaries are established through imperfect mechanisms and, therefore, may lead to inefficiencies.

In the second phase, they analysed the arrangement of boundaries when individuals have the possibility to choose democratically whether to be part of a greater political union or to secede from an existing states. They found that voters far away from the government endure more heterogeneity costs from living in a large state and, thus, have a preference to create smaller and more homogenous states. Nevertheless, secession led to inefficiencies because the sum of the individuals' utilities is lower. This necessitates mentioning aspect. The presence of compensations scheme may change voters' behaviour and have an effect on the stability of boundaries. Though, the authors argued that these transfers might be difficult to implement. In addition, they analysed the impact of economic

integration on the equilibrium number of states and found that greater economic integration imply smaller states, and smaller states will require more economic integration.

In the third phase, they defined a configuration of boundaries when Leviathans rule the world. Leviathan can be seen as monarchs, dictators or colonial powers where their aim is to maximize the size of the government. These rulers, less concerned with the utilities of the individuals, may follow expansionary policies leading to the creation of inefficiently large states or empires. Furthermore, these processes imply, in many cases, the use of violence or conflict.

At the end of the theoretical chapter, we relaxed several assumptions and presented some extensions of the seminal model. The model of Bolton and Roland (1997) was characterised by exogenous borders, in order to avoid a purely symmetric world representation and matching more the reality. Moreover, they considered the heterogeneity, in terms of difference in income, and, thus, preferences over policies might lead to secession. They found that redistribution regarding the income had three distinct effects on the desire to make secession: a political effect, an efficiency effect, and a tax-base effect. Moreover, when the authors considered perfect factor mobility, the tax rate was the same and the union held (always preferred than secession).

From an empirical point of view, I exposed several empirical analyses of economic determinants affecting the probability of secession. First, Alesina, Baquir and Hoxby (2004) tested the basic trade-off between heterogeneity and economies of scales using counties data in the US. They found that counties, affected by the black migration, had more School Districts after World Wars I and II. In other words, their most important finding was that racial heterogeneity increases the number of School Districts. Second, regarding the link between economic globalization and secessions, the results were mixed. Indeed, Sorens (2004) found relevant support that secessionist growth is fuelled by globalization, but only in regions that already possess secessionist parties. However, the author

limited the term of economic globalisation. He did not consider the financial integration in his analysis but simplified the term of economic globalisation as the international trade between two countries. In addition, he demonstrated that secessionist regions have a greater likelihood to receive more autonomy than non secessionist-regions. Then, Daumal (2008) found interesting results where secessionist regions in federal states foster international trade and, therefore, decrease the reliance to trade within the national economy. Finally, Bakke and Wibbels (2006) tried to show a relation between decentralisation and federalism, and ethnic conflict. They found that fiscal decentralization within federal states is combined with more ethnic conflict when there is high inequality between regions.

According to the fact and studies described in this thesis, economic determinants are important in secession process. The literature regarding the size of nations has already considered several economic variables affecting countries borders. Nevertheless, important dimensions, such as technological progress, the decrease in communication and transport costs or the size of firms can be integrated in order to have a full understanding of the economic factors of the size of countries.

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