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The economic dimensions of the sovereignty debate in Québec: debt, GDP and migration

by

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Introduction

The purpose of this paper is to present both the results from existing papers and of original research on three issues raised during the now fifty-five-year-old debate on sovereignty in Québec. This is of interest given the fact that there have been numerous contributions to this debate that are not all well known to the participants in the Scottish debate on independence yet may be of some use in contributing to a better understanding of these issues at least from a comparative perspective. The paper is divided in five sections. The first presents the context of the referendum debates of 1980 and 1995. The second third and fourth address the issue of the impact of both the independence debate and of the event itself on debt, GDP and migration. The fifth attempts to draw lessons of relevance to Scotland.

1. The debate on independence in Québec: the context

1.1 Historical background

The debate on independence takes place in the context of a shift in the behaviour of the francophone majority in Québec. This happens with the emergence of modernizing forces, after WWII and particularly over the 1960-1966 period onwards, called "la Révolution Tranquille." This "Quiet Revolution" was a period of rapid social and political change in the province of Québec (Durocher, 1996). Although significant industrialization, urbanization and rapid economic growth had taken place within the province throughout the first half of the twentieth century, the Union Nationale party that had governed Québec since 1944 advocated traditional, rural, Catholic values. Under the Liberal government of Jean Lesage elected in 1960, the goal became instead *le rattrapage* – catching up to the social, political and economic developments that had taken place elsewhere in North America (McRoberts, 1988).

One aspect was the correction of the under-representation of Francophones in the upper levels of the Québec economy (Vaillancourt, 1996). Another was the quest for more powers for the Québec government within the existing constitutional framework and thus less for the federal one. Finally concurrent with this was the quest for a revised constitution.

Two attempts were made to alter the formula for amending the Constitution in the period from 1960 (when *what does Québec want* came to the fore in Canadian politics) to 1976 (when the first separatist government was elected). The old amendment formula in place since 1867 required an act of the British parliament, enacted at the request of the federal government. The first attempt to alter this formula was the so-called Fulton-Favreau formula for constitutional amendment. This proposal was such that no changes could be made in the federal-provincial division of powers

without the consent of all the provinces. Initially, in 1964, all ten provincial premiers unanimously agreed to accept the Fulton-Favreau formula and promised to pass the enabling legislation. Subsequently, however, criticism in Québec became so strong that Premier Lesage was convinced by 1966 that Québec had to reject the formula (Russell, 1993). Later in 1966, a revamped Union Nationale party defeated the Liberals in the provincial election. The new Québec Premier, Daniel Johnson, who had called the Fulton-Favreau formula a straitjacket, demanded constitutional changes that would be explicitly based on a "deux nations" (two nations) concept of Canada.[1] Having been elected with the slogan "Égalité ou indépendance" (equality or independence), the Union Nationale argued that the only alternative to restructuring Canada (based on the somewhat vague concept of "associate states") was for Québec to separate. The second attempt to change amendment procedures was the Victoria Charter, based on an agreement in principle between the federal and provincial (again liberal in Québec) governments in 1971 (Meisel and Rocher, 1999). The Québec government soon rejected the Charter, however, on the grounds that it offered Québec insufficient autonomy in the implementation of social policy. The election of the sovereignty promoting Parti-Québécois (PQ) government in 1976 increased the sense of urgency about the need for major constitutional change. A provincial[2] referendum on "sovereignty-association" – the meaning of this term has never been entirely clear, in part by intent – was held in May 1980. René Lévesque, the PQ premier and leader of the Yes side, emphasized the immense costs to Québec of federalism and the feasibility of independence while the No side, led by Québec Liberal leader Claude Ryan and federal Prime Minister Pierre Trudeau, promised "renewed federalism" if Quebecers rejected the sovereignty option. On May 20, 1980, 60% of Quebecers voted against the proposal for sovereignty. One result of the failure of the PQ referendum was yet another attempt to repatriate the constitution.

Shortly after the referendum, a First Ministers' conference[3] – the mechanism used to consult the provinces in all attempts to repatriate the constitution – ended in failure in September 1980. Prime Minister Trudeau soon announced, however, that the federal government would nonetheless proceed unilaterally with repatriation, as well as with the introduction of a Charter of Rights and Freedoms and an amending formula. The amending formula would include the system of regional vetoes that had been proposed in the Victoria Charter (with vetoes for both Ontario

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[1] Like "distinct society" later, "deux nations" turned out to be one of those symbolic phrases that, so to speak, suffered a lot in translation, being generally understood in Québec to be a simple statement of the obvious reality of the francophone reality of Québec and in the Rest of Canada (ROC) to be a denial of Canadian nationhood.
[2] Provincial in that it was held only in Québec, administered by the Québec election commission and with funding rules and so on set provincially.
[3] These conferences have no constitutional or legal status but have emerged as an ad hoc mechanism for resolving (or at least discussing) federal-provincial issues. They have no set frequency and are convened by the federal Prime Minister. Provincial leaders meet in an annual premiers' conference. Since 2003,this has been convened by the Council of the Federation (http://www.councilofthefederation.ca/en/)

and Québec). In September 1981, the Supreme Court ruled that while the federal government's request to the British Parliament did not legally require provincial consent, unilateral action went against Canada's constitutional conventions. Ottawa, said the Court, should obtain a "substantial degree" of provincial consent. The federal government respected the Court's decision and returned to negotiations in November 1981. An agreement was reached with all provinces except Québec. Despite this lack of agreement, the federal government proceeded. On April 17, 1982, in a ceremony in Ottawa, Queen Elizabeth II officially proclaimed the 1982 Constitution Act. Canada's "new" constitution consisted of most of the original 1867 British North America Act as well as several important changes agreed to by the federal government and nine of the provinces. Québec had once again been isolated. Indeed, the province was now subject to a constitution to which it had not agreed. Moreover, the constitution led to challenges to Québec's language laws.

In 1984, the federal liberal party was defeated by the conservative party and constitutional discussions between First Ministers were renewed in 1985. After extensive discussion, in April 1987 the First Ministers drafted the so-called "Meech Lake Accord." In order to be adopted the Meech Lake Accord had to be ratified by Parliament and by the legislatures of all the provinces. Once the resolution was supported by one legislature, the other legislatures had three years to ratify it. Québec's National Assembly was the first to pass the resolution of approval on June 23, 1987. Ratification by the remaining nine provincial legislatures therefore had to occur before June 23, 1990. Despite considerable criticism of the Accord's "Distinct Society" clause outside Québec, by the fall of 1988 only two small provinces, New Brunswick and Manitoba, had not ratified the agreement. In April 1990, however, with the deadline less than three months away, the new Liberal government in Newfoundland rescinded its support for the Meech Lake Accord. Still more negotiations followed, leading eventually to New Brunswick ratifying the accord, but the two other provinces did not.

The failure of the Accord was interpreted by many Quebecers as an outright rejection of their aspirations and hopes by English Canada. The immediate result was a sharp rise in the polling support for sovereignty, reaching a high of 60% at one point. The political picture nationally was also altered by the rejection of Meech Lake. A number of federal MPs of the Conservative and Liberal parties joined together to create the Bloc Québécois – a federal party somewhat paradoxically committed to Québec independence. This party, supported by Québec nationalists, actually won enough seats in the 1993 federal election to form Canada's official opposition party in Parliament until the election of 1997.[4]

Prior to this, however, from the failure of Meech in June 1990 to the spring of 1992, yet another series of extensive public consultations as well as negotiations between First Ministers were held.

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[4] It did so in large part because of the virtual disappearance of the federal Conservative Party, which lost Québec on this issue and the rest of Canada on fiscal and trade issues.

The end product of this process was the Charlottetown Accord, which was much more complex than Meech Lake. In October 1992, for the first time in Canadian history, a national referendum was held to decide whether Canada's constitution should be renewed based upon the Charlottetown Accord.[5] The participation rate was 75%. The Charlottetown Accord was rejected by 54% of those who voted; the Accord received majorities in only four provinces (New Brunswick, Newfoundland, Prince Edward Island, and Ontario) and one territory (Northwest Territories). The defeat of the federal Conservative government in 1993 was soon followed by a victory by the Parti Québécois in the 1994 Québec provincial elections. The new provincial government soon held a second Québec referendum on "sovereignty-association" – still a term difficult to interpret -- in October 1995. As in 1980, the sovereignty option was again defeated. This time, however, it received 49.4% of the vote and a solid majority of the francophone vote. Canada was clearly still in question. This very close result motivated the premiers of the other provinces to return to the constitutional debate. Without the presence of the federal government, a meeting of provincial leaders was held in Calgary in 1997 to find a proposal that might bring Québec into the Constitution. In September 1997, despite Québec Premier Lucien Bouchard's refusal to attend the meetings, the other nine Premiers submitted the Calgary Declaration for the approval of the federal government and the provincial legislatures. In essence, this Declaration recognized Québec's unique character within the Canadian Confederation while restating the equality of all the provinces. All nine provinces quickly ratified it. Québec, however, rejected the proposal, criticizing it for its lack of concreteness with respect to provincial powers.

In response to a referred question by the federal government, in August 1998 the Supreme Court of Canada declared that Québec, under both constitutional and international law, does not have the right to unilaterally decide its independence. One result was that in June 2000 the federal parliament adopted the so-called Clarity Act, intended to remove any ambiguity from future referendums on sovereignty by insisting both that the question be clear[6] and that there be a clear majority before negotiations of any kind take place between the federal government and the province seeking sovereignty. The Act makes the House of Commons responsible for determining whether a referendum question is clear; that is, whether the question "would result in a clear expression of the will of the population of a province on whether the province should cease to be part of Canada and become an independent state." The Act also gives the House of Commons the right to decide what size of majority would constitute a clear will to secede. The government of Québec indicated it did not felt bound by this law and would organize a referendum as it saw fit. Since September 2012, the Parti Québécois is once more in power albeit

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[5] The referendum was organized by the Québec government in Québec and by the federal government outside Québec; it was neither required nor binding constitutionally.
[6] A common joke was that "sovereignty-association" meant an independent Québec within a strong and united Canada!

as a minority government. It is engaging in Sovereignist governance whatever that means but will not be able to hold a referendum as he national assembly would have to approve the question.

Having told an abbreviated version of the political history of Québec since 1960, we now examine the support for sovereignty using two indicators

Figure 1 shows that support for independence measured not by polls, but by actual voting. .We use the votes for the precursors of the PQ in 1966, and the PQ in 1970 and1973 since at that time the election of a PQ government would result in independence; this is not the case since1976 so we can only report the voting in the two referendums(1980 and 1995). Figure 2 shows support for sovereignty as indicated by poll results. In general, support for independence has been around 40% since 1980.

Figure 1 – Proportion of Québec voters supporting independence (%)
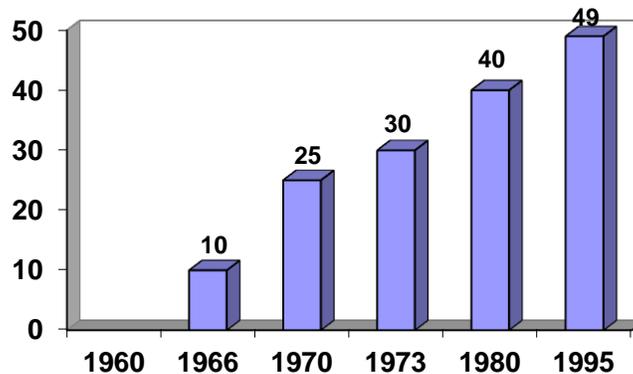
Sources :   1966: % voting for the Rassemblement pour l'indépendence nationale (RIN) and the Rassemblement national (RN).
1970 and 1973: % voting for PQ which stated that it would proclaim sovereignty upon forming the government.
1980 and 1995: % voting Yes in the referendum.

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Figure 2 - Evolution of the support for sovereignty based on poll results (in %), 1961-2010
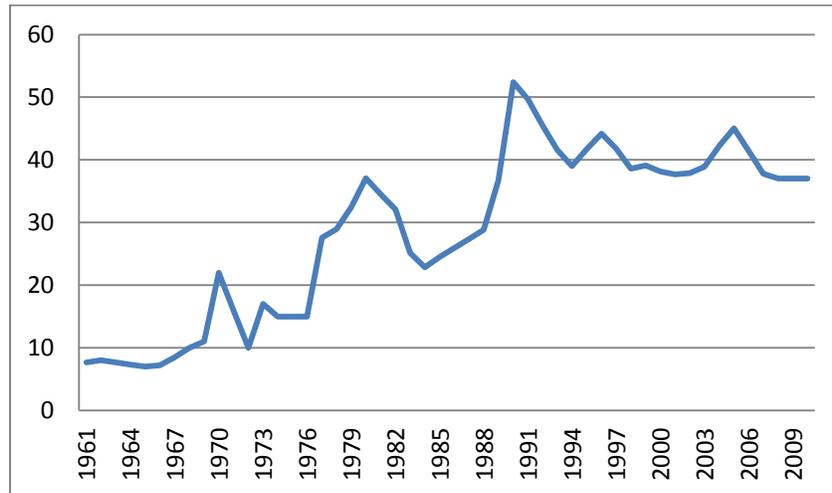
Source: Claire Durand, sociology department, Université de Montréal

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The strength of the support for sovereignty depends, in good part, on what the choices are. In both referendums, the other option was existing federal arrangements to be modified if the No side won. How can this support for sovereignty or at least a distinct/unique society be justified, especially given the degree of decentralization in Canada. This is the question we now try to answer, drawing on the following points:

-First, one should recall that Québec involuntarily joined British North America in 1760 following the conquest by British troops. The political (religion, language, etc.) rights of its French inhabitants then varied through time, increasing until 1840, decreasing with the Union Act of 1840 and then increasing anew in 1867. This historical background is still relevant in 1999, since the conquest led to a reduction in the value of the linguistic human capital of the original French inhabitants. Their language, which they could use for both intra-Québec and Québec-metropolis interactions, had therefore become useless for the latter type of interactions and had lost some of its importance for the first type;

-Second, the survival since 1760 of the Francophones of Québec as a distinct language group next to a large English-speaking population is the result of various factors. They are: the Conqueror's behaviour due to a combination of generosity, need (American Revolution) and incapacity to assimilate; the high birthrate of Francophones (1760-1950); the low assimilation rate of Québec Francophones into English, in part, as a result of self-binding legal constraints (Bill 101) that replaced the strictures ("qui perd sa langue perd sa foi") of the Catholic church. These

constraints reflect a collective desire to remain French and the will to use reasonable means to achieve this end;

-Third, Francophones have a high likelihood of remaining French-speaking only if they reside in Québec and adjacent parts of Eastern Ontario and New Brunswick (Madawaska and Acadia), since network externalities are what allow a language to thrive (Grin and Vaillancourt, 1997). Such externalities increase with the number of speakers in a given territory and with the range of functions that French can be used for. It is only in Québec that one can live exclusively in French while consuming a full array of services and thus make full use of this type of linguistic human capital;

-Fourth, Francophones are less mobile in North America than Anglophones. This lack of mobility stems from a preference for French and thus the desire to avoid an English language assimilationist environment. It also stems from a lack of knowledge of English, since from a labour market perspective, the Rest of Canada (ROC) is English-speaking. This lack of mobility reduces the standard of living of Francophones through a combination of lower labour force participation, higher unemployment and lower wages and salaries;

-Fifth, without specific policies that recognize both the need to protect French (language skills of immigrants, language of work and leisure, etc.) and the need to correct for reduced geographical mobility (industrial/occupational mobility, more general training) of Québec Francophones, the survival of French will be endangered. Such policies are required even with the recent (1960+) and rapid improvements in the socioeconomic status of Francophones (Vaillancourt, 1996a, b), since these improvements mask the long-term demographic threat of the low birthrate (1.6-1.7) of Francophones and of the natural attraction of immigrants, mainly Allophones, towards English. Demographic projections show that the share of Francophones in Québec's population should decline from 82.0% in 1991 to somewhere between 72% and 78% by 2041 (Termote, 1995).

Such a decline would probably not occur in a sovereign Québec since immigrants would be coming to a French-speaking country with a small English-speaking minority. But with Québec, an officially French-speaking province in an officially bilingual country, with a large English minority and with easy out-migration to ROC, one should not be surprised by the linguistic choices of allophones. One should also note that current Québec language policies still allow individuals to live in Montréal knowing only English, while having access to a full array of public and private goods and services and a limited but good selection of private employment opportunities;

-Sixth, Canada is increasingly an English-speaking country and one where the political weight of Québec is decreasing. Given that some English Canadians do not value highly the benefits they may derive from the existence of a French-speaking society in their midst, it is not surprising that Québec francophones prefer to give additional powers to the Québec government, which they control, than to the federal government.

To summarize, Québec Francophones are distinct because they are a French-speaking minority in North America who wish to remain French-speaking but are under a threat of long-term demographic decline. The issues then are: Should this be prevented? And, if so, at what costs and how?

**1.2 Québec's importance in Canada**

Québec is the second biggest Canadian provinces both in terms of economic and demographic importance. As shown by Figure 5, the Province of Québec roughly represents a fifth of the country's economic output and a quarter of its population. Interestingly, Québec's importance as represented by those two indicators has declined over the years. Figure 4 shows that Québec integration in the Canadian economy has also declined following the CUFTA and NAFTA agreements.

Figure 3 – Québec's GDP and population as a proportion of Canada's (%), 1966-2010
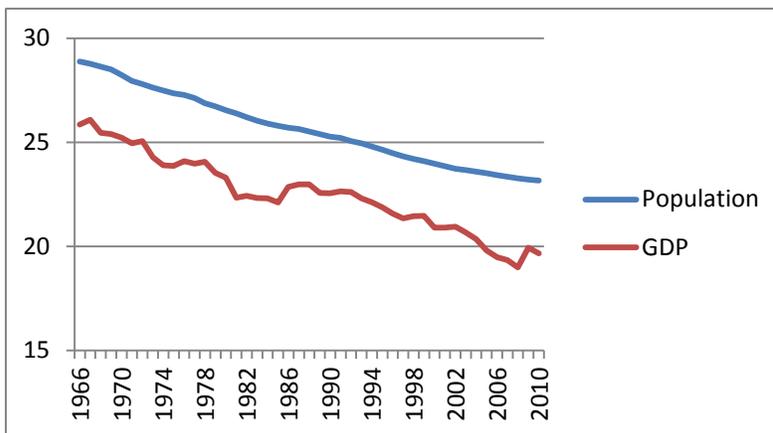
Sources: GDP: CANSIM 384-0035 (1966-1980), 384-0001 (1981-2010);
population: CANSIM 051-0026 (1966-1970), 051-0001(1971-2010)

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Figure 4 –Québec's interprovincial and international exports as a proportion of Canada's (%),
1992-2008
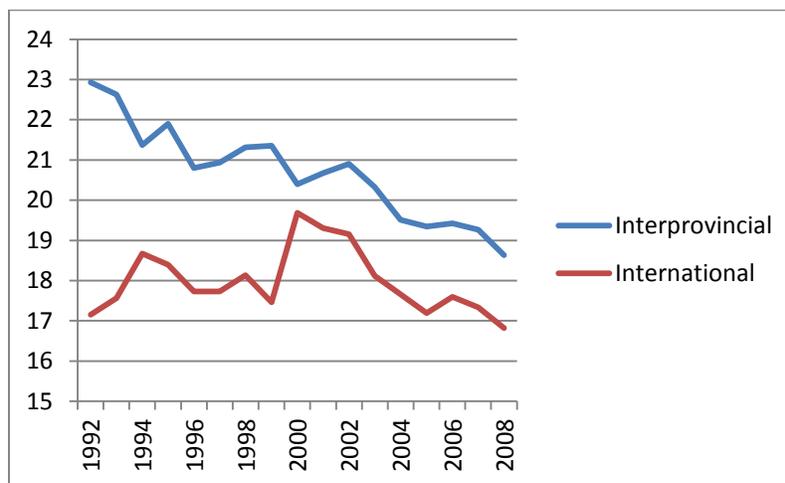
Sources: interprovincial exports: CANSIM 386-0001 (1992-1996), 386-0002
(1997-2004), international exports: CANSIM 226-0001

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2. The debt issues

There are two issues that fall under this heading. The first is the ongoing impact of the independence movement on the cost of borrowing of Québec's government or put differently is there a risk premium required by lenders? The second issue is the debate on the sharing of the debt should secession occur. We address each issue in turn. Before, however, note that the currency issue is not a major one in the sovereignty debate. Québec has never had its own currency and no one is advocating the creation of such a currency; the expectation of sovereingists is that Québec would use the Canadian $, with or without a jointly managed central bank. This is one aspect of the association dimension of sovereignty-association There has been no recent debate on this even if the Canadian $ in more of a resource currency now than in 1980 or1995. One option raised by a few analysts is the de facto use of the US$ with no policy input.

2.1 Is there a risk premium?

Investors require a risk premium to choose to purchase financial assets with a higher riskiness than that of a baseline risk free assets such as 90 days US government Treasury bill. This empirical fact that has theoretical foundations has led authors such as Grady (1991) and McCallum and Green (1991) to state that political uncertainty induced by the Sovereigntist movement's push for independence would foster the need for a higher risk premium to attract investment to Québec, be it real or financial and for the stock of Québec firms or Québec government bonds. Thus, the sovereignty debate in Québec would induce higher borrowing costs for the Québec government whatever its attitude towards sovereignty. This hypothesis is generally accepted and verified by most studies. However, some authors find no evidence of risk premiums in Québec (see Somers (2013) for a detailed review of data and methods).We now present ten studies on this topic grouped into two categories, either government bonds or corporate capital.

2.1.1 Government Bonds

In "The Economic Consequences of Quebec Sovereignty" (1991), Grady mentions risk and Québec's indebtedness as the two factors likely to justify the existence of risk premiums in the returns to Québec assets. Indeed, sovereignty would have important implications on the province's debt level as a sovereign Québec would be required to take on its share of the Canadian federal debt; at the same time, its revenues would suffer as it would also stop benefitting from equalization payments from the Government of Canada. This would make

Québec a "high public debt country," and would lead to investors demanding risk premiums on government-issued securities, as was shown to be the case in the '80s when support for sovereignty was high. Grady estimates Québec interest risk premium to be equivalent to a loss of 0.2% of the province's GDP in both the short and long terms.

In order to answer the risk-premium question econometrically, Johnson and McIlwraith (1998) rely on a measure of expected inflation and public opinion poll results to confirm the existence of a risk premium for Quebecers, but also for all Canadians. Johnson and McIlwraith's results are robust whether the proxy for political instability is the expected outcome of the referendum or unexpected 'news.' At its highest, the Québec over Ontario spread reaches approximately 50 basis points, but stays around 38 basis points for the whole pre-referendum period, August 28 to October 30, 1995. It is worth noting that this spread could in theory be attributed to differences in industrial structure, tax base or debt load between the provinces. However, data shows a substantial decrease in yields on Québec bonds as a result of a reduction in what authors call the "Sovereigntist threat." Indeed, immediately after the No victory, Québec bond yields fall by 40 basis points, while that of Canada and Ontario fall by 20 basis points. Nonetheless, Johnson and McIlwraith find that "the referendum did not resolve the uncertainty about the prospect of Québec sovereignty." An increase in the likelihood of sovereignty thus imposes higher borrowing costs on the Province of Québec as well as, at a smaller extent, on the Province of Ontario and the Government of Canada.

Burnie (1994) finds added investment costs of approximately 0.56% for Québec-based debt issuers, compared to Canadian-debt issuers, in the US market when activities related to Québec's separation make the news. Interestingly, the market yield is not affected by heightened media coverage of the Sovereigntist issue. In addition, Burnie notes that "self-selection is a possible problem" because of the perceived weakness of the Québec economy compared to other provinces.

Lemmen (1999) finds an increase of 3.7 basis points in borrowing costs when the share of the vote for the Bloc Québécois increases by 1%.

Booth *et al.* (2007) calculate that political uncertainty has had an impact on provincial spreads with an average increase in provincial spreads of 91 basis points. For Québec alone, political uncertainty would be responsible for an increase in yield spreads of 114 basis points. The authors summarize the issue at hand by concluding that "political events affect the attractiveness of holding provincial bonds and thus their spreads."

Even though Thibeault's and Wynant's (1979) study predates the first referendum on Québec's sovereignty, it still warrants attention as it offers an interesting insight on short-term and long-term impacts of the political uncertainty surrounding the Sovereigntist debate. Thibeault and Wynant

find that yield differentials on government-issued securities jump by about 60 basis points in Canadian market and 100 basis points in the US market following the 1976 PQ victory. However, "Québec's long-run borrowing image recovered" and risk premiums gradually decline in the two following years in both the Canadian and US markets, although at a slower pace in the latter. This goes to show that if the PQ is considered a short-term "threat" or if the prospect of sovereignty is considered "less unfavourable" than initially thought, investors should not require risk premiums.

Schuknecht, von Hagen and Wolswijk (2009) expand on Grady (1991) to find no Québec specific risk premium for the 1991-2005 period. Interestingly, they state that "provinces which are expected to receive transfers under fiscal equalization are not punished by financial markets for incurring larger deficits." In the authors' view, a risk premium would rather be exacted for the three largest provincial economies, i.e. Alberta, British Columbia and Ontario. This goes to say that equalization payments do not only reduce inequalities between provinces, but also "allow recipient states to borrow at more favourable terms than others."

2.1.2 Corporate Capital

Altug, Demers and Demers (2007) rely on simulations based on the firm's investment decision model to examine the reaction to political risk of the investment-capital stock ratio in machinery and equipment for major sectors of the economy, namely the manufacturing industries, business sector and total industries, in Québec and Ontario during the 1990s. Altug *et al.* include a risk premium variable in some of their simulations, and results prove to be consistent with the existing data. Authors hence admit the possibility of higher capital costs for firms in Québec. The authors find that "political risk affects the firm's investment decisions regardless of the party in power." In fact, as McCallum and Green (1991) and Grady (1991) hint at, expectations of higher interest rates or higher risk premia are "important channel[s] through which political risk must have made its effect [on Québec's economy]."

Beaulieu, Cosset and Essadam (2005) are amongst the few who invalidate the hypothesis of higher capital costs for the Québec government as a result of political instability. They start off by modelling political risk after Wells (1998) and Henisz (2002) which define political risk as "risks [to a firm's profitability] that are principally the results of external forces to the industry and which involve some sort of government action or, occasionally inaction." Authors come up with a list of 70 political news events having potentially had an impact on Québec-based firms' stock returns. Even though Beaulieu *et al.* admit the importance of the role of unfavorable political news regarding Québec's independence from Canada in the volatility of stock returns, their evidence does not support the need for a risk premium. Rather, it indicates that political risk is diversifiable.

Overall, it seems fair to conclude that there is a small risk premium associated with capital flows to Québec and that this premium varies with the immediacy and intensity of the perceived risk.

2.2 How should one share the debt post-independence?

The question of the separation of the debt is a difficult one because the stakes are just as high for both Québec and the rest of Canada (ROC). The now dissolved Economic Council of Canada compared the issue to a zero-sum game because both parties appear to have nothing to gain from the division of the debt except, some would argue, perceived stability in the eyes of the rest of the world. This stability could however be the key in reducing transition costs, especially to minimize negative impacts on changes and interest rates. So far, several approaches have been suggested, but four recurrently come up in the literature: the per capita, per GDP, Bélanger-Campeau and historical benefit methods. As put by Boothe and Harris (1991), "the choice of division formula should depend on the principles of transparency, equity, and hopefully minimization of negotiation costs." The option in which Québec refuses to pay its share seems irrelevant because the consequences would be too great for the newly formed country.

When discussing debt sharing, few modern examples,[7] such as that of the Austro-Hungarian Empire breakup, come to mind. In fact, secessions generally occurred in the context of decolonization, a context too different from Québec's to apply. Moreover, modern examples are too few for international norms to have been developed, as noted by Rowlands (1997). The Vienna Convention, which was not ratified by Canada and several other countries, suggests an "equitable" sharing of the general debt between successor states in cases similar to the Québec-Canada one. Corporate examples seem to offer a more sensible solution in which assets are divided before liabilities. With this in mind, Lamonde and Bolduc (1995) suggest a five-step method to allocate the federal debt between Québec and Canada:

> -"Inventorying and evaluating the Canadian government's assets;
>
> -Establishing the share of Canadian government assets to be transferred to the Government of Québec;
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> -Evaluating the share of Canadian government assets attributable to the Government of Québec;
>
> -Establishing the asset surplus or deficit and;
>
> -Establishing a sharing formula for the liabilities."

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[7] Armendariz de Aghion and Williamson (1993) offer a review of cases such as that of the Austro-Hungarian Empire and Central African Federation in their study on debt division negotiations following the dissolution of the Soviet Union.

On this last point, Lamonde and Bolduc note that the sharing formula for the Government of Canada liabilities need to be established so as Québec taxpayers pay their fair share of the debt, i.e. a share "neither smaller nor greater than they would have born had they stayed within Canada for the whole reimbursement period."

The Parti Québécois has alluded to the division of the debt in their 1980 and 1995 referendum programs but only to say that "it would enter in an agreement with the Government of Canada to facilitate […] the fair sharing of the assets and liabilities of the Government of Canada" (Assemblée nationale, 1995). In other words, the Government of Québec will be open to discussions on the issue of the division of the debt in the event of its declaration of independence, but has not put down any numbers so far. Rowlands (1997) notes that Jacques Parizeau, incumbent Prime Minister at the time of the second referendum, has advanced an approximation corresponding to 25% of the federal debt. The four methods noted above are explained in the following subsections.

2.2.1 Per capita

The per capita method is fairly self-explanatory: the federal debt is divided by the total population of Canada and each province gets its share. In other words, every Canadian gets an equal share of the debt notwithstanding his/her province of residence. Hence, the debt basis is the individual rather than the region. Under this method, Québec's share of the total federal debt is 25.4%in 1990 and 23.6 in 2011[8], as calculated by Boothe *et al.* (C.D. Howe Institute, 1991). The per capita formula has the merit of being simple and straightforward. However, large migration outflows preceding or following a referendum on sovereignty could alter the numbers. If this were to happen, Québec's share based on a per capita basis would be smaller/higher than it would otherwise be. Actually, such a formula also requires an agreement on a reference date, likely predating the referendum. Boothe and Harris (1991) suggest relying on the population figures from the last census before the referendum. But if say 5% of Québec's population (about 400 000 individuals or 1% of the Canadian total) leaves following the referendum, should they not carry their debt with them?

2.2.2 Relative GDP

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[8] 2011 census results in
http://en.wikipedia.org/wiki/List_of_Canadian_provinces_and_territories_by_population

The relative GDP method is equally straightforward: each province gets its share of the debt based on its relative GDP. This approach is based on the ability-to-pay principle for which "the past share of each province's gross provincial product in Canada's GDP is used as a proxy for the region's ability to pay the debt" (C.D. Howe Institute, 1991). Québec's share would amount to 23.2% (C.D. Howe Institute, 1991) in 1990 and 19.6% in 2011. Changes may occur from year to year since the industrial structure of the provinces differ; thus the small increase in the share of Québec observe din figure 4 is explained by the sharp drop in the automotive industry in Ontario at that time..

2.2.3 Bélanger-Campeau

The Bélanger-Campeau formula was first introduced, in 1991, in the wake of the Commission on the Political and Constitutional Future of Québec, commissioned by Liberal Premier Robert Bourassa. In this case, "the division of assets and liabilities is calculated simultaneously [because] the asset-division rules affect the debt division" (Rowlands, 1997). The Bélanger-Campeau secretariat proceeds in two steps. Firstly, Québec's share of the "accumulated deficit" is calculated, i.e. Québec's present value of future contributions to total federal revenues." This figure is then adjusted by subtracting the share of federal assets to be acquired by the Government of Québec as well as Québec's share of future pension (federal civil servants) and monetary liabilities. Assets are divided in the same way as liabilities. However, non-financial assets located in the Province of Québec are assigned to Québec. This approach attributes 16.6% of the Government of Canada debt to Québec (C.D. Howe Institute, 1991).

Boothe, Jonhston and Powys-Libbe (C.D. Howe Institute,1991) offer a revised version of this formula mainly by removing gold holdings from the calculation and sharing financial assets and government enterprises differently. Rather, financial assets and government enterprises are split between provinces according to their historical tax contributions. Under the Bélanger-Campeau method, Québec keeps only the assets it is interested in controlling or participating in. Québec's share would be 19.3% (C.D. Howe Institute, 1991).

2.2.4 Historical Benefits

The historical benefits formula, attributed to Mansell and Schlenker, is the most controversial approach (Rowlands, 1997). According to this division rule, provinces should pay for the net benefits received in the past as members of the Canadian Confederation were they to secede. It relies on provincial fiscal balances including both attributable and non-attributable expenditures.

Boothe *et al.* (C.D. Howe Institute, 1991) estimate Québec's share of the federal debt to be 32% in that case. This is by far the largest figure.

Thus, Québec's share of the federal debt would range between 16.6% and 32%, depending on the method used. While no method is perfect, the relative population formula is often cited as the best option because of its apparent fairness and simplicity. In addition, it is fairly close to the approximation obtained with the modified Bélanger-Campeau formula or the average between all other three methods. The proportion to be repaid might not be set in stone according to Lamonde and Bolduc (1995). Adjustments might be necessary in the future to take "migration flows between Québec and the ROC during the reimbursement period of the debt" into account. This point is also stressed by Boothe *et al.*, "an approach that seems fair today may become unfair or even unmanageable in the future." Furthermore, the Economic Council of Canada suggests extending the transfer of the debt from the Canadian to the Québec government over a long period of time in order to avoid paying a premium on new security issues. Leaving the administration of the debt to the Government of Canada or a newly created body would also minimize transition costs.

3. Economic performance: GDP and Investment

Once more, one must distinguish between ongoing impacts and the shock resulting from independence. The possibility of independence can not only make purchasers of government bonds require a risk premium to purchase Québec bonds but it can also make private sector investors weary of carrying out real investment in Québec. Should independence occur, then the key determinant of the impact on Québec's economy would be the extent to which trade flows would be disturbed.

3.1 Does the economic performance of Québec suffer from the independence demands?

Most studies on the impact of the independence movement on Québec's economy were written in the 90s, when support for the Sovereigntist movement was at its highest in polls. Since the defeat of the "Yes" in the 1995 referendum, the question of Québec's independence has surfaced several times, but never to the point where it spurred debates as heated as before the second referendum. Existing studies express diverse opinions on the impacts of political instability caused by the eventuality of secession, but often rely on anecdotes rather than econometric analysis. This being said, two hypotheses prevail: political instability is harmful, especially

because of the loss of jobs due to major companies leaving the province, a high risk premium on government borrowing, a decrease in investments and a high debt level; or there is no clear relation between political instability and Québec's economic performance.

Supporting the first hypothesis, McCallum and Green (1991) paint a bleak picture of Québec's economy since the birth of the Parti Québécois. In *Parting as Friends: The Economic Consequences for Quebec*, the authors argue that the Sovereigntist movement is responsible for the migration from Montreal to Toronto of many corporations and head offices which caused an increase in the relative unemployment rate between the two cities. All in all, McCallum and Green conclude, "a failure to resolve Canada's constitutional crisis would be very bad for the Québec economy and for the economic well-being of many Québecers."

Invited to comment on McCallum's and Green's study, Vaillancourt (1991) finds the evidence evoked to demonstrate the PQ's negative influence on the province's economic indicators for the 1976-1985 period to be "weak." In fact, Vaillancourt notes that this period was marked by "a significant improvement in the socio-economic status of Francophones with respect to Anglophones."

Similarly to McCallum and Green, Grady (1991) argues that political uncertainty is responsible for a decrease in Québec's level of investment per capita compared to Ontario's. By seceding from Canada, Québec's net public debt would incur a substantial increase – in part because it would "receive" its share of the federal debt – which would make it a "high public debt country." This would have a deterrent effect on lenders and would prompt a higher interest premium.

Stewart (2012) offers a more nuanced analysis by looking back at the events that shaped Québec's economy before the PQ first came to power. According to him, several "adverse trends," such as the "historical shift from rail and sea transport toward trucking, and the general westward movement of Canadian industrial activity," were already affecting Québec's economic performance since the 1940s. Ryba (1974) also mentions the relative decline since 1950 of the financial sector in Quebec to the benefit of its growing counterpart in Toronto to explain the shift in business from Montreal to Toronto. Stewart notes that "investor nervousness" was triggered by the PQ's win in the 1994 election. All in all, political instability would be responsible for no more than a 5% decrease in total investment.

Kollenz (2000) attempts to establish "a correlation between political events, which could cause uncertainty, and socio-economic developments, which could stem from political instability," by relying on graphical evidence. In order to do so, Québec's economic indicators are compared to Ontario's and Canada's to identify trends and deviations from these trends. Kollenz uses four indicators, namely GDP, investment, consumption and employment, starting in 1961. Opinion polls commissioned by the Conseil du Patronat du Québec as well as newspapers articles

provide the data for Québecers' and outsiders' perception of the political climate in the province. No direct relation is found between the advent of the Sovereigntist movement and Québec's economic performance. Rather, the author asserts that migration and language policies were major determinants of the province's development. Kollenz's findings can be summarized as follow:

-The widening gap between Québec's and Ontario's GDP per capita comes from capital accumulation, not from slower growth rates in Québec.

-A causal relationship between lower level of investment in Québec after the 1995 referendum and political instability seems likely. However, the effects of political instability "are not strong enough to be provable."

-Québec's economic structure is more to blame than the PQ for higher unemployment rates.

Our analysis of the impact of political uncertainty on Québec's economic situation draws on the work of Lavoie, Perron and Vaillancourt (2000) which studies the impact of the Sovereigntist debate on Quebec's GDP, employment and investment levels for the 1961-1998 period. We use the same econometric models with similar data series but different proxies for political uncertainty. Firstly, we seek to establish through econometric analysis if there exists a clear link between political instability and GDP. Secondly, we seek to confirm (infirm) whether political uncertainty has depressed investment levels in Québec. For this first part of the analysis, equations are built in levels to control for the economic environment, i.e. Québec data is divided by Ontario data for all variables. In doing so, we measure the evolution of Québec's economic aggregates compared to Ontario's, which partly removes the fluctuations stemming from outside shocks, either from the Canadian or international economies. Variables are either expressed in percentages or per capita to remove the effect of the size of the population. The series come from Statistics Canada's CANSIM database and span 45 years, from 1966 to 2010. All series expressed in dollars are converted in real dollars of 1992 with the Canadian consumer price index (CPI).

Political instability is modelled with two distinct proxies. $Dummy\_PQ_t$ is a dichotomic variable equal to 1 for the years for which the Parti Québécois formed the government for more than six months and 0 otherwise. There are two periods for which $Dummy\_PQ_t$ equals 1, from 1977 to 1985 and 1995 to 2002. $Dummy\_PQ_t$ comprises the years preceding and following the two referendums (1980 and 1995), which possibly reflect the episodes of buildup and aftermath of both referendums. The second proxy, $Index\_PQ_t$, is an index reflecting Quebecers' support for sovereignty based on a list of survey results compiled by Claire Durand and the Quebec Inter-

University Centre for Social Statistics. The questions asked were not textually identical for all surveys but equally sought to measure the percentage of the population in favour of Quebec's secession from Canada. For the years for which more than one result is available, Index_PQ$_t$ is given by the average of those results. The index for the years with no data available is given by the average of the results for the preceding and following years. Since support for sovereignty was stagnant for the last years of the sample, Somers (2013) assumes that support for sovereignty in 2009 and 2010 was the same as in 2008. The evolution of the Parti Québécois sovereignty support index was presented in Figure 2.

3.1.1 GDP

If the Sovereigntist movement were to have a negative impact on investment and employment, as mentioned in the literature, Québec's GDP is also likely to react negatively. Since 1966, Québec's GDP per capita has followed an upward trend with some slumps in the early '80s and '90s (Figure 5). Ontario's GDP stands above Québec's for the whole period and seems to follow a similar trend. By looking at the evolution of the difference between the two provinces (Figure 6), it is not clear whether Ontario has systematically fared better than Québec, thus deepening the gap as suggested in the literature. In fact, the difference in GDP per capita between the provinces is about the same in 1966 and 2010. In addition, at 3,908$, the difference is at its lowest in 1980, a referendum year. Massive investments had taken place in Québec in the previous years, notably the James Bay Project and Montreal Olympics, which can partly explain the catching up by the Province of Québec. At its widest, the gap is almost twice that, at 6,922$, nine years later.

Figure 5 - Québec and Ontario GDP per capita (in real dollars of 1992), 1966-2010
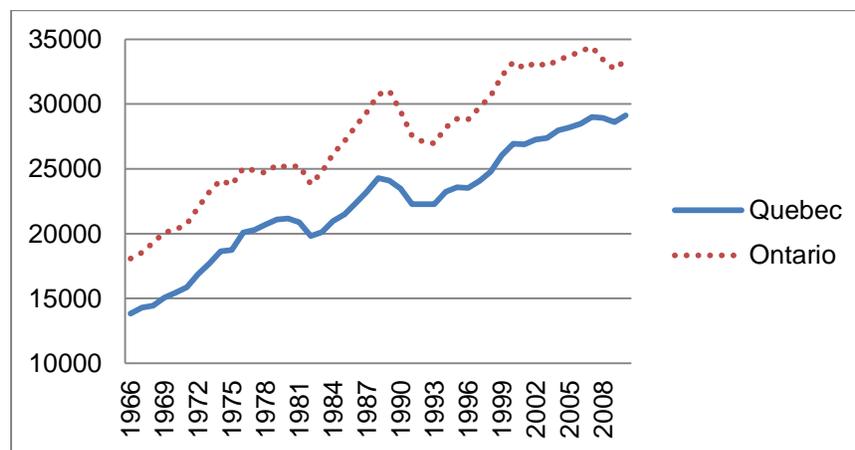
Sources: Somers (2013)

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Figure 6 – Difference in GDP per capita between Ontario and Québec (in real dollars of 1992), 1966-2010
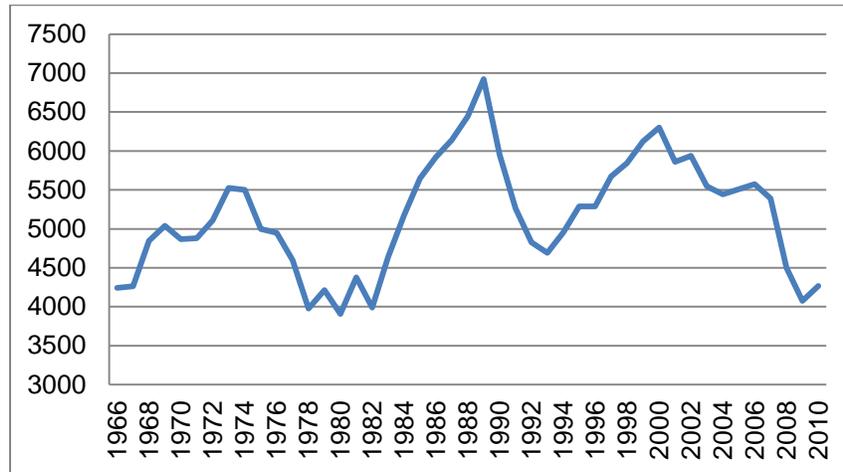
Sources: Somers (2013)

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To estimate the GDP equation, we use a classical production function in which output is explained by labour and capital inputs. We opt for a logarithmic form to be estimated by the method of Ordinary Least Squares (OLS). The following equation is estimated:

$\ln(GDPQC_t/GDPON_t) = a + b*\ln(EmploymentQC_t/EmploymentON_t) + c*\ln(CapitalQC_t/CapitalON_t) + d*PQ_t + e_t$

Where:

$GDPQC_t/GDPON_t$: Québec aggregated GDP per capita on Ontario aggregated GDP per capita;

$EmploymentQC_t/EmploymentON_t$: Québec employment rate on Ontario employment rate;

$CapitalQC_t/CapitalON_t$: Québec per capita capital stocks on Ontario per capita capital stocks;

PQ_t: either $Dummy\_PQ_t$ or $Index\_PQ_t$.

The employment rates ($EmploymentQC_t$ and $EmploymentON_t$) are calculated by dividing the number of employed workers by the population aged between 15 and 64. Other variables

(GDPQC$_t$, GDPON$_t$, CapitalQC$_t$ and CapitalON$_t$) are obtained directly from national account series in CANSIM.

Usual tests reveal the presence first-order autocorrelation and possible unit roots in all variables which warrant autocorrelation-robust estimators; we choose Prais-Winsten estimators.

Somers (2013) results show that equations estimated with OLS estimators and either political uncertainty proxy exhibit a better fit than the model relying on Prais-Winsten estimators, respective R^2 values are 0.73 and 0.72 compared to 0.24 and 0.25. With p-values above 16%, Dummy_PQ$_t$ and Index_PQ$_t$ are not found to be statistically significantly different from zero whether regressions are estimated with OLS or Prais-Winsten estimators. Therefore, we cannot conclude that political instability has an impact on Québec's GDP. All results are presented in Table 3 with a complete analysis in Appendix 1.

Table 3 - Explanatory factors for the Québec-Ontario GDP ratio, 1966-2010, different methodologies

Independent variable	Equation 1 (Robust OLS level)	Equation 2 (OLS level)	Equation 3 (PWE level)	Equation 4 (PWE level)
InEmployment$_t$	0.298* (0.005)	0.235* (0.009)	0.169 (0.301)	0.152 (0.321)
InCapital$_t$	0.395* (0.000)	0.451* (0.000)	0.492* (0.015)	0.462* (0.020)
Dummy_PQ$_t$	0.011 (0.191)		-0.004 (0.582)	
Index_PQ$_t$		-0.000 (0.920)		0.001 (0.163)
Dummybreak1$_t$				
R^2	0.73	0.72	0.24	0.25

Notes: * Significant coefficients at a 5% confidence level; P-values are in parenthesis below the estimated coefficients; Equations are specified as:

-Equation 1: Robust OLS in levels, PQ$_t$ = Dummy_PQ$_t$;
-Equation 2: OLS in levels, PQ$_t$ = Index_PQ$_t$;
-Equation 3: Robust PWE in levels, PQ$_t$ = Dummy_PQ$_t$;
-Equation 4: PWE in levels, PQ$_t$ = Index_PQ$_t$.
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3.1.2 Investment

The measure of investment used here only takes into account private non-residential investments and leaves out public and residential investments, which, respectively, depend on government agenda and demography more than anything else. Private non-residential investments are thought to be more mobile and give a better indication of investors' confidence. It is important to note that Crown (public) corporations' investments, such as those of Hydro-Québec's, are not considered public investments and are hence included in our data.

Figure 7 shows much more volatility than for previous economic indicators, with investment levels at times higher in Québec (in particular from 1975 to 1980), at times higher in Ontario (especially 1983-1993). Average private investment per capita levels are pretty close, with 911$ in Québec and 968$ in Ontario. As mentioned previously, Québec's investment peak occurs in 1975, the year following the launch of the James Bay Project. Contrarily to what is stated by McCallum and Green (1991) and Grady (1991), investment follows the same general trends in both provinces. There is no opposite movement in Québec's and Ontario's investment levels due to the departure of firms from Montreal to Toronto or to a loss of investors' confidence that could be imputed to political instability.

Figure 7 – Investment per capita in Québec and Ontario (in real dollars of 1992), 1966-2010
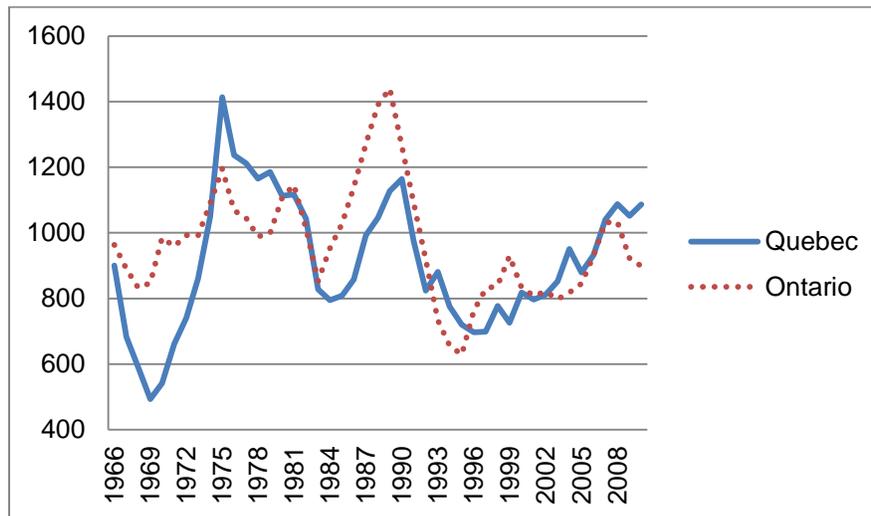
Sources: Somers (2013)

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The modelling of the investment is based on Cord (1962). The interest rate does not enter the equation as its coefficient is found to be not statistically significant when trying to explain empirically "highly" aggregated variables; furthermore the interest rate is set Canada wide in this case. Unlike Cord, the equation is estimated by relying on OLS rather than Two-Stage Least Squares. The following log-log regression is estimated:

$\ln(\text{InvestmentQC}_t/\text{InvestmentON}_t) = a + b*\ln(\text{BenefitsQC}_{t-1}/\text{BenefitsON}_{t-1}) + c*\ln(\text{GDPQC}_{t-1}/\text{GDPON}_{t-1}) + d*\text{PQ}_t + e_t$

Where:

$\text{InvestmentQC}_t/\text{InvestmentON}_t$: Québec private non-residential investment volume per capita on Ontario's;

$\text{BenefitsQC}_{t-1}/\text{BenefitsON}_{t-1}$: Québec corporations' net benefits per capita at the previous period on that of Ontario;

$\text{GDPQC}_t/\text{GDPON}_t$ and PQ_t: as defined previously.

Investment and GDP data are extracted directly from CANSIM. Net benefits (BenefitsQC_t and BenefitsON_t) are calculated by the author by subtracting direct corporate taxes from corporations' profits before taxes. The data for direct corporate taxes both in Québec and Ontario was not available for the last year of our sample. There are 44 observations for this series.

Similarly to what is observed when studying the impact of Québec's political uncertainty on GDP, the regressions relying on OLS estimation exhibit better fit than those relying on the Prais-Winsten method. R^2 values are respectively 0.49 and 0.25. It is worth noting that R^2 values are identical whether Dummy_PQ_t or Index_PQ_t accounts for political uncertainty. $\ln\text{GDP}_{t-1}$ is the only variable that is found to be significantly statistically different from 0, except in one case. Complete results are given in Table 4 and full analysis is in Appendix 2.

Even though investment was identified in the literature as the variable most likely to be affected by political instability, we cannot confirm this assertion based on Somers' (2013) results. In all the equations, Dummy_PQ_t and Index_PQ_t are both not statistically significant with p-values above 70%. As noted by Stewart (2012), major changes were already underway in Québec's economic fabric when the PQ first came to power and those transformations appear to have been supported successively by Federalist and Sovereignist governments.

Table 4 – Explanatory factors for the Québec-Ontario investment ratio, 1966-2010, different methodologies

Independent variable	Equation 1 (OLS level)	Equation 2 (Robust OLS level)	Equation 3 (PWE level)	Equation 4 (Robust PWE level)
$lnBenefits_{t-1}$	-0.031 (0.900)	-0.070 (0.732)	-0.314 (0.081)	-0.316* (0.043)
$lnGDP_{t-1}$	3.700* (0.000)	3.690* (0.000)	3.082* (0.004)	3.070* (0.006)
$Dummy\_PQ_t$	-0.019 (0.721)		-0.002 (0.971)	
$Index\_PQ_t$		-0.001 (0.805)		0.000 (0.960)
R^2	0.49	0.49	0.25	0.25

Notes: P-values are in parenthesis below the estimated coefficients;

*Significant coefficients at a 5% confidence level.

Equations are specified as:

-Equation 1: OLS in levels, $PQ_t = Dummy\_PQ_t$;

-Equation 2: Robust OLS in levels, $PQ_t = Index\_PQ_t$;

-Equation 3: PWE in levels, $PQ_t = Dummy\_PQ_t$;

-Equation 4: Robust PWE in levels, $PQ_t = Index\_PQ_t$.

3.1.3 Results

Somers' (2013) results are in line with Lavoie's *et al.* (2000) in that both studies cannot confirm the existence of a significant statistical relationship between the threat of sovereignty and the GDP or investment ratios between Québec and Ontario, as was suggested in the literature. Such arguments are thus supported by anecdotes rather than econometric evidence. Indeed, thorough econometric modelling of the province's main economic indicators has shown that estimated coefficients for the four political uncertainty proxies, namely two dummies for Parti Québécois governments, a referendum dummy and support for sovereignty index, are not significant either a 5% or 10% confidence level.

It can be argued that Ontario's economic indicators are also possibly negatively affected by the political instability caused by the Parti Québécois. In this sense, Ontario would not be an accurate comparison point. However, based on the literature cited above, Ontario would benefit from Quebec's misfortunes as firms, jobs and workers would move from the latter to the former.

Consequently, the effect on Ontario's economy would be positive rather than negative, as is thought to be the case with Quebec, and the gap between the two provinces would widen even further.

In addition, graphic analysis does not indicate that Ontario's economy systematically fares better than Québec's. If this might be the case in terms of GDP per capita, Québec's employment figures have caught up with Ontario's and no clear picture can be taken for investment per capita levels. In this sense, Québec's economic performance was not as bad as many authors have painted it to be.

3.2 Post independence, how big a shock

The extent of the post-independence shock will greatly depend on the conditions the Government of Canada and the Government of Québec agree upon following a Yes victory. Impacts are likely to be felt in two major areas, namely the demography and economy. In this sense, Vaillancourt (2008) presents seven possible constitutional options and their aftermaths, with the uniform treatment of provinces in Canada and sovereignty at opposite ends of the spectrum. In this paper, we focus on the economic impacts of the sovereignty option[9].

3.2.1 Economic

The choice of currency, sharing of the debt and accession to international treaties are three economic issues that will need to be negotiated post-independence. In its programme for the 1995 referendum (Assemblée nationale, 1995), the Parti Québécois has announced its intention of keeping the Canadian dollar as the currency having legal tender in an independent Québec. Nevertheless, it is not so obvious that Québec and Canada would form an economic monetary union *de facto*. The latter might be tempted to set an example for other provinces by imposing, or at least threatening to impose, restrictive conditions on the former (C.D. Howe Institute, 1991). Grady (1991), notes "in the past, monetary unions without political unions have always eventually collapsed (Howitt, 1991)."

The PQ also states that "Québec assumes the obligation and has the rights conferred in treaties, conventions and relevant international agreements to which Canada or Quebec is part of the date of accession to sovereignty, notably those of NAFTA." Once again, *de facto* accession to

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[9] Demographic impacts are discussed in the next part of the paper

international treaties is not a given. In addition, provincial governments have not been under the same scrutiny as the Canadian federal government and, in this sense, were not bound by the same set of rules (Grady, 1991). Grady further claims, "Quebecers must know that they would not hold all the trump cards in negotiations with Canada if bargaining were to get really tough."

As mentioned previously, the PQ has recognized that it would assume its fair share of the federal debt. However, it has not alluded to its preferred division method. Québec's share is likely to stand around 22%-23%, a very close approximated to what is obtained with the per capita method. Grady (1991) estimates Québec's net public debt to stand at 95% of GDP, a 60% increase from its 1989 level, if the federal debt were assigned based on relative population. This is lower in 2013 as the federal debt has dropped since the 1995 referendum .Thus *the bonds that bind, an* expression used then have been loosened

Moreover, in the event of a Yes victory in a referendum, it is reasonable to expect higher borrowing costs for the Québec government at least in the short run, i.e. during the three to five years following the separation. According to the Economic Council of Canada (1991), financial markets would react to "any real or apparent increase in uncertainty" by exhibiting higher risk premiums on both government-issued and corporate-issued bonds. However, the ECC admits that this type of risk premium tends to be temporary. In fact, anticipations play a key role in determining risk premiums. It is very hard to predict the magnitude of the risk premiums arising from Québec's secession, if there are any, but it is most likely to be felt in foreign exchange markets because of their increased sensitivity to volatility (ECC, 1991).

Lastly, in the event of sovereignty, GDP is expected to decrease as a result of multiple factors including, but not limited to, job losses, perturbed trade relations and a perception of increased riskiness in regards with investment. Dungan and Vaillancourt (1991) modelled the impacts of an increase in international borrowing costs; a drop in international direct investments; a population outflow from Québec; an increase in trade barriers reflected in decreased total factor productivity. They show:

-that both Québec and Canada as a whole are affected negatively by investor uncertainty in particular when it manifests itself by reduced foreign direct investment;

-that an outflow of Anglophones from Québec has an important impact on total, but not on per capita GDP in Québec;

-that reduced productivity through reduced trade is the most devastating possible impact of sovereignty for both Québec and Canada.

Dungan and Vaillancourt (1991) estimate the overall impact of sovereignty on GDP to be around 1.5% to 3.5%, results consistent with those of the Economic Council of Canada. Grady's (1991) estimates are more alarmists with "real output in Québec [that] could easily be depressed in the short run by as much as 10% and in the long run by 5%."

4. Human Capital and Migration

Since 1961, Québec has been a net loser in terms of internal migration within Canada with outflows larger than inflows. In this case, it is a set on nationalist policies that may impact on these flows, not just the possibility of independence. Again, we address both ongoing flows and the shock of independence.

4.1 Language policies and independence as determinants of migration flows

In parallel with the exodus of corporate head offices from Montreal to Toronto, political instability is also thought to be responsible for the out-migration of a great number of Quebecers, especially towards Ontario. Vachon and Vaillancourt (1998) find that interprovincial migration has decreased by one third in Canada over the 1971-1996 period. However, the national trend appears to have been masked by strong provincial trends such as the important out-migration from Québec following the election of the PQ in 1976. Québec lost approximately 8% of its population, compared to a basis scenario in which interprovincial flows are null and nothing else changes, between 1961 and 1996, and is found to be one of the main losers of interprovincial migration flows in absolute terms in Canada. Ontario is a net gainer with its in-migration peaking in the years 1969 to 1971, largely because of Québec's out-migration. The authors note that Ontario is the most popular destination for Québec out-migrants. Age and education come out as the factors most likely to prompt Canadians to move from one province to another. Québec's Anglophones are also found to form the most mobile group out of that province.

As indicated in Vachon and Vaillancourt (1998), graphical evidence shows that Québec has been a net loser in terms of interprovincial migration flows since 1963. The most important out-migration episodes occurred in 1970 and between the years 1976 and 1983. Interestingly, these years marked turning points for the Sovereigntist movement with the October Crisis, in 1970, and the adoption of nationalist policies such as Bill 101, in 1977, by a Parti Québécois government. Figure 8 present the annual interprovincial migration balance (inflows-outflows) for the 1961-2010 period for Québec.

Figure 8 – Net interprovincial migration flows in Québec, 1961-2010
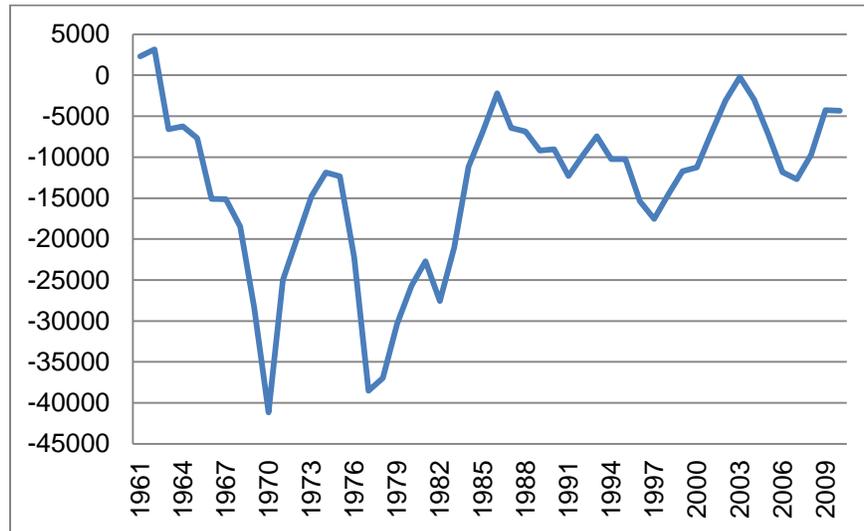
Sources: Somers (2013)

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Net Interprovincial migration flows are modelled as a linear function with Québec's employment rate relative to Ontario's, Québec's weekly average income relative to Ontario's and demographic characteristics of the Québec population (mother tongue and knowledge of official languages) as independent variables. The estimated equation is:

$Migration_t = a + b*(EmploymentQC_t/EmploymentON_t) + c*(EarningsQC_t/EarningsON_t) + d*Anglo_t + e*Allo_t + g*Official\_languages_t + h*PQ_t + i_t$

Where:

$Migration_t$: Net migration flows to Québec;

$EarningsQC_t/EarningsON_t$: ratio of Québec average weekly household income on that of Ontario;

$Anglo_t$: Percentage of Québec's population having English as a mother tongue;

$Allo_t$: Percentage of Québec's population having neither French nor English as a mother tongue;

$Official\_languages_t$: Percentage of Québec's population speaking both official languages;

$EmploymentQC_t/EmploymentON_t$ and PQ_t: as defined previously.

This series contains 50 observations with the data spanning 1961 to 2010.

The measure of political uncertainty is statistically significant at a 5% level in all regressions except for one in which it is significant at a 10% confidence level. OLS estimators reveal that a Parti Québécois government is related to a decrease in net interprovincial migration flows by 8,471 people per year of that a 1% increase in the support for sovereignty is responsible for the departure of 342 Quebecers per year. When relying on Prais-Winsten estimators, we find that a PQ government is responsible for the yearly departure of 6,895 Quebecers and a 1% increase in the support for sovereignty induces annual outflows of 453 people. Thereby, econometric modelling of the factors influencing net interprovincial migration flows reveals that political instability has had an impact on Québec's population in the past 50 years. Full results are given in Table 5 while we present the evolution of the importance of the three mother tongue groups in Figure 9.

Table 5 – Explanatory factors for net migration flows in the Province of Quebec, 1961-2010, Francophones as the reference group, different methodologies

| Independent variable	Equation 1 (Robust OLS level)	Equation 2 (Robust OLS level)	Equation 5 (Robust PWE level)	Equation 6 (Robust PWE level)
$Employment_t$	204,699* (0.001)	265,164* (0.000)	291,606* (0.002)	220,970* (0.001)
$Earnings_t$	-19,547 (0.564)	-32,839 (0.322)	-10,585 (0.832)	-9.561 (0.849)
$Anglo_t$	-416,794* (0.035)	-848,106* (0.000)	-476,376 (0.072)	-812,673* (0.004)
$Allo_t$	-796,637* (0.000)	-661,822* (0.000)	-734,734* 0.001)	-512,364* (0.011)
$Official\_languages_t$	212,203 (0.060)	-28,489 (0.758)	152,200 (0.406)	-23,000 (0.889)
$Dummy\_PQ_t$	-8,471* (0.000)		-6,895* (0.024)	
$Index\_PQ_t$		-342* (0.023)		-453 (0.092)
R^2	0.78	0.74	0.56	0.50

Notes: P-values are in parenthesis below the estimated coefficients;

*Significant coefficients at a 5% confidence level.

Equations are specified as:

-Equation 1: Robust OLS in levels, $PQ_t = Dummy\_PQ_t$;

-Equation 2: Robust OLS in levels, $PQ_t = Index\_PQ_t$;

-Equation 3: Robust PWE in levels, $PQ_t = Dummy\_PQ_t$;

-Equation 4: Robust PWE in levels, $PQ_t = Index\_PQ_t$.

Figure 9 – Breakdown of Quebec's population by mother tongue (%), 1961-2010
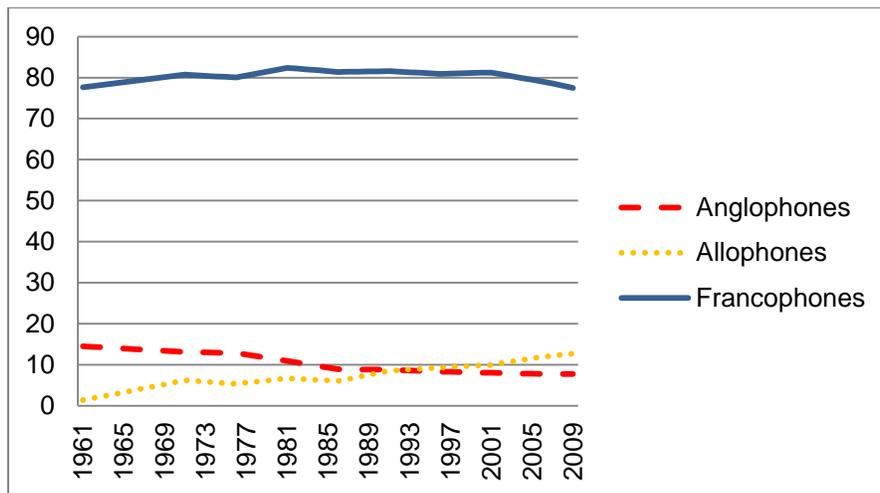
Sources: Somers 2013

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Another way to examine this issue is to use the results of Charest (2008).He calculates the loss of Québec in human capital for three periods : 1976-1981 ;1986-1991; and 1996-2001.The human capital is valued using discounted earnings all in 2007 $. He finds the following results for a total of 59 billions.

	Total loss $ billions	% anglophones in migrants	% CH loss in CH capital stock
1976-1981	32	64	3,8
1986-1991	8	47	0,7
1996-2001	19	43	1,6

Source Tables 8 and 9 Charest,2008

4.2 Will there be a post-independence exodus?

In terms of demography, the most noticeable impact of Québec's sovereignty would be on the proportion of Francophones residing in Québec as a result of the departure of Anglophones and Allophones. Vaillancourt (2008) advances a reasonable lower-bound estimate of 10%, or 125,000, non-Francophones that would leave the Province of Québec were it to secede from Canada. This assumption is based on past out-migrations from Québec in politically uncertain times (1970, 1977) and survey evidence. Côté (1995), rather, claims that one in two Anglophones, or 250,000 individuals, would leave within the five years following sovereignty, which seems like a reasonable upper-bound estimate given the absorption capacity of the ROC. Let's not forget that Francophones might also be tempted to leave. A proportion of 1%, or approximately 55,000, says they may emigrate. This yields a total out-migration flow of about 300,000, the figure used by Dungan and Vaillancourt (1991).

5. Relevance for Scotland

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APPENDIX 1

GDP - Analysis and Results

Most Advanced Dickey-Fuller stationarity (ADF) tests conducted on our different variables for both the GDP and investment regressions indicate the presence of unit roots. However, these results need to be put into perspective as stationary processes and unit roots are thought to be very hard to distinguish in finite samples, especially in small samples like ours (Cochrane, 1991). Moreover, using ratios, like we do for the GDP and investment regressions, should remove non-stationarity, if there is any, from these variables. Nevertheless, we also estimate the regressions in first differences to compare with results obtained when no corrections are made. Thereby, we estimate the two main regressions introduced in the previous section with variables expressed either in levels or in first differences, and using either one of our two proxies for political instability.

Usual tests reveal the presence of first-order autocorrelation according to the Scwharz's Bayesian information criterion (SBIC) as well as heteroskedasticity in equation 1. We also test for cointegration following the Engle-Granger two-step method which requires running additional ADF tests on equations' 1 and 2 residuals. Because non-stationarity is detected in all independent variables and residuals are also found to be non-stationary, we conclude to the absence of cointegration. We do not rely on a Johansen test because our sample is too small to return reliable results.

In addition, graphic analysis of the dependent variable shows a linear upward trend with a possible break for the years 1974 to 1984. A Chow test confirms a break in the trend for those years. We generate a dummy variable equal to 1 for the years between 1974 and 1984 and 0 for the rest to account for this break. $Dummybreak1_t$ is included as a regressor in equations 3 and 4, for which variables are in levels and PQ_t is given by $Dummy\_PQ_t$ or $Index\_PQ_t$. The equations are estimated using robust standard errors because of heteroskedasticity.

The two main equations are estimated twice: once using robust OLS estimators to correct for heteroskedasticity, when necessary, and once using Prais-Winsten estimators to eliminate autocorrelation. Results are found in Table A1. Estimated equations are as follow:

-Equation 1: Robust OLS in levels, $PQ_t = Dummy\_PQ_t$;

-Equation 2: OLS in levels, $PQ_t = Index\_PQ_t$;

-Equation 3: Robust OLS in levels, $PQ_t = Dummy\_PQ_t$, with $Dummybreak1_t$;

-Equation 4: Robust OLS in levels, $PQ_t = Index\_PQ_t$, with $Dummybreak1_t$;

-Equation 5: Robust Prais-Winsten estimators (PWE) in levels, $PQ_t = Dummy\_PQ_t$;

-Equation 6: PWE in levels, $PQ_t = Index\_PQ_t$.

As discussed previously, tests to detect unit roots may not be reliable because of the size of the sample. In this sense, equations in first differences are not the preferred options (results available in appendix Table A1). In both cases, all variables are found to be not statistically significantly different from 0 at a confidence level of 5%. R^2 values are low, at 0.08 and 0.12, and denote a poor fit of the regressions.

Equations 3 and 4 include a dummy variable to account for an apparent break in $lnGDP_t$ for the years 1974 to 1984. It should be noted that these years correspond to the first election of a Parti Québécois government, in 1976, and the first referendum, in 1980. Moreover, the 1974-1984 period sees the ratio of employment between Québec and Ontario fall and reach its lowest level for the whole sample at 84%, in 1982. Meanwhile, support for sovereignty steadily increases up to the 1980 referendum and falls thereafter. Including $Dummybreak1_t$ as a regressor removes ten observations out of the 45 observation sample. Because it takes away what can be considered as crucial years for the independence movement, $Dummybreak1_t$ could be responsible for diverting some of the PQ variables impact. Out of the six equations, equations 3 and 4 return the best fit with R^2 values of 0.86 and 0.87. All coefficients are found to be statistically significant except for $Dummy\_PQ_t$, in equation 3. $lnEmployment_t$ and $lnCapital_t$ have expected positive signs. Interestingly, equation 4 is the only instance for which a political instability proxy, $Index\_PQ_t$, is statistically significant at a 5% level. However, it does not have the expected sign.

Equations 1 and 2 estimated with OLS estimators exhibit a good fit for our model with R^2 values of 0.73 and 0.72. In both cases, $lnEmployment_t$ and $lnCapital_t$ coefficients are statistically significant and take expected positive signs. In equation 1, a 1% increase in the employment ratio, i.e. an improvement in the Québec-to-Ontario figures, would lead to a 0.30% increase in the GDP ratio. Similarly, a 1% increase in the capital ratio would lead to a 0.40% increase in the GDP ratio. In equation 2, figures are similar with an elasticity of 0.24% for the employment ratio and 0.45% for the capital ratio. With p-values above 19%, $Dummy\_PQ_t$ and $Index\_PQ_t$ are not found to be statistically significantly different from zero. Results are similar when using Prais-Winsten estimators to correct for first-order autocorrelation, except for $lnEmployment_t$ which is found to be not significant in both equations 5 and 6. Therefore, we cannot conclude that political instability has an impact on Québec's GDP.

Table A1 - Explanatory factors for the Québec-Ontario GDP ratio, 1966-2010, different methodologies

Independent variable	Equation 1 (Robust OLS level)	Equation 2 (OLS level)	Equation 3 (OLS level)	Equation 4 (OLS level)	Equation 5 (PWE level)	Equation 6 (PWE level)	Equation 7 (OLS 1st diff)	Equation 8 (OLS 1st diff)
$lnEmployment_t$	0.298*	0.235*	0.494*	0.498*	0.169	0.152	0.089	0.087
	(0.005)	(0.009)	(0.000)	(0.000)	(0.301)	(0.321)	(0.619)	(0.620)
$lnCapital_t$	0.395*	0.451*	0.378*	0.262*	0.492*	0.462*	0.391	0.378
	(0.000)	(0.000)	(0.000)	(0.000)	(0.015)	(0.020)	(0.090)	(0.086)
$Dummy\_PQ_t$	0.011		-0.001		-0.004		-0.003	
	(0.191)		(0.802)		(0.582)		(0.606)	
$Index\_PQ_t$		-0.000		0.001*		0.001		0.001
		(0.920)		(0.028)		(0.163)		(0.164)
$Dummybreak1_t$			0.040*	0.044*				
			(0.000)	(0.000)				
R^2	0.73	0.72	0.86	0.87	0.24	0.25	0.08	0.12

Notes: * Significant coefficients at a 5% confidence level;

P-values are in parenthesis below the estimated coefficients;

Equations are specified as:

-Equation 1: Robust OLS in levels, $PQ_t = Dummy\_PQ_t$;

-Equation 2: OLS in levels, $PQ_t = Index\_PQ_t$;

-Equation 3: OLS in levels, $PQ_t = Dummy\_PQ_t$, with $Dummybreak1_t$;

-Equation 4: OLS in levels, $PQ_t = Index\_PQ_t$, with $Dummybreak1_t$;

-Equation 5: Robust PWE in levels, $PQ_t = Dummy\_PQ_t$;

-Equation 6: PWE in levels, $PQ_t = Index\_PQ_t$;

-Equation 7: OLS in first differences, $PQ_t = Dummy\_PQ_t$;

-Equation 8: OLS in first differences, $PQ_t = Index\_PQ_t$.

APPENDIX 2

Investment – Method, Analysis and Results

Investment data also exhibits first-order autocorrelation as suggested by the SBIC. Heteroskedasticity is found in equation 2, which makes it the only regression to be estimated with robust standard errors. ADF tests reveal the presence of unit roots in residuals for equations 1 and 2, which means that there is no cointegration, notwithstanding whether there truly is non-stationarity in $\ln Investment_t$ and $\ln GDP_{t-1}$. In equations 3 and 4, Prais-Winsten estimators are used to eliminate autocorrelation. Equations with variables in first differences are also estimated (results in Table A2). It is worth mentioning that, in this case, $\ln Benefits_{t-1}$ is not in first differences because it is stationary. Estimated regressions are found in Table A2. Equations are as follow:

-Equation 1: OLS in levels, $PQ_t = Dummy\_PQ_t$;

-Equation 2: Robust OLS in levels, $PQ_t = Index\_PQ_t$;

-Equation 3: PWE in levels, $PQ_t = Dummy\_PQ_t$;

-Equation 4: Robust PWE in levels, $PQ_t = Index\_PQ_t$.

In both equations 1 and 2, $\ln GDP_{t-1}$ is the only variable that is found to be significantly statistically different from 0. The GDP ratio elasticity is 3.7%, should $Dummy\_PQ_t$ or $Index\_PQ_t$ be used as the political instability indicator. A Ramsey RESET test shows these equations to be properly specified. Equations exhibit a good fit with R^2 values of 0.49. Equations using Prais-Winsten estimators have lower R^2 values, at 0.25. Results are similar except for $\ln Benefits_{t-1}$ which is found to be significant in equation 4. However, it does not have the expected positive sign. As for previous indicators, we do not rely on equations in first differences to draw conclusions.

Table A2 – Explanatory factors for the Quebec-Ontario investment ratio, 1966-2010, different methodologies

Independent variable	Equation 1 (OLS level)	Equation 2 (Robust OLS level)	Equation 3 (PWE level)	Equation 4 (Robust PWE level)	Equation 5 (OLS 1st diff)	Equation 6 (OLS 1st diff)
lnBenefits$_{t-1}$	-0.031 (0.900)	-0.070 (0.732)	-0.314 (0.081)	-0.316* (0.043)	-0.116 (0.483)	-0.133 (0.431)
lnGDP$_{t-1}$	3.700* (0.000)	3.690* (0.000)	3.082* (0.004)	3.070* (0.006)	2.975* (0.031)	2.901* (0.036)
Dummy_PQ$_t$	-0.019 (0.721)		-0.002 (0.971)		-0.028 (0.628)	
Index_PQ$_t$		-0.001 (0.805)		0.000 *0.960)		0.000 (0.951)
R^2	0.49	0.49	0.25	0.25	0.12	0.11

Notes: *Significant coefficients at a 5% confidence level;

P-values are in parenthesis below the estimated coefficients;

Equations are specified as:

-Equation 1: OLS in levels, PQ$_t$ = Dummy_PQ$_t$;

-Equation 2: Robust OLS in levels, PQ$_t$ = Index_PQ$_t$;

-Equation 3: Prais-Winsten estimators (PWE) in levels, PQ$_t$ = Dummy_PQ$_t$;

-Equation 4: Robust PWE in levels, PQ$_t$ = Index_PQ$_t$;

-Equation 5: OLS in first differences, PQ$_t$ = Dummy_PQ$_t$;

-Equation 6: OLS in first differences, PQ$_t$ = Index_PQ$_t$.

APPENDIX 3

Migration – Method, Analysis and Results

Many manipulations are required to build the database for assessing the impact of the PQ on interprovincial migration. This series contains 50 observations with the data spanning 1961 to 2010. Net migration figures are obtained by subtracting the number of out-migrants from the number of in-migrants. This data is not available for the two first quarters of 1961. In supposing that migration figures are the same for the first and the second semester, we obtain a yearly figure by deducting the outflows from the inflows for the last two quarters and doubling that number. Employment data for 1961 to 1965 is found in the Labour Force Survey published yearly by Statistics Canada. We use figures for the month of July each year. Employment figures for 1966 to 2010 and average weekly household incomes for the whole sample come from CANSIM. The proportions of Anglophones and Allophones are available in Statistics Canada censuses every five years starting in 1971 and ending in 2006. Mother tongue figures are not available for 1961, but knowledge of official language is. Consequently, mother tongue figures are obtained by calculating the proportion of Quebecers speaking French only, English only and neither French nor English, and, for each linguistic group, multiplying the number of Quebecers speaking both official languages by the corresponding proportion and, respectively, adding it to the number of unilingual Francophones, unilingual Anglophones and Allophones speaking neither French nor English. For the years in between censuses, data is smoothed. Extrapolations complete the last four years of the sample. Official languages figures are smoothed following the same method. The series for average weekly earnings including overtime, all categories of employment combined, is built using three CANSIM series. Data is available for the years 1991-2010, 1983-2000 and 1961-1985. We construct a conversion factor by taking the ratio of the most recent data on the least recent for the years overlapping two series. Data series are actualised by multiplying least recent figures by this conversion factor.

Our study of interprovincial migration relies on a linear model estimated with employment and income variables expressed in levels and demographic variables, namely $Franco_t$, $Anglo_t$, $Allo_t$ and $Official\_languages_t$, expressed in percentages. We take the proportion of native French speakers as our reference point in order to avoid multicolinearity with $Anglo_t$ and $Allo_t$. A Ramsey RESET test confirms the proper specification of the model when estimated with OLS at a 5% confidence level when $Dummy\_PQ_t$ is included, but not when $Index\_PQ_t$ is. We also estimate regressions omitting $Official\_languages_t$ as one of the demographic characteristic independent variables. The same set of equations is estimated with Anglophones as the reference group to see if results are consistent (estimated regressions in appendix Table A3). ADF tests reveal the

presence of unit roots in all series. We choose not to estimate regressions in first differences because the interpretation would not be relevant. Following the two-step Engle-Granger method, we find cointegration in equations 1 and 2, i.e. it is not clear whether the independent variable causes the dependent variable or vice versa. Because non-stationarity seems plausible in variables such as $Anglo_t$, $Allo_t$ and $Official\_languages_t$, we accept the possibility of cointegration. Moreover, we denote first-order autocorrelation in $Migration_t$. In this light, we estimate our equations both with robust-OLS estimators and autocorrelation-robust Prais-Winsten estimators. The following regressions are estimated with either French or English as the basis for mother tongue:

-Equation 1: Robust OLS in levels, $PQ_t = Dummy\_PQ_t$;

-Equation 2: Robust OLS in levels, $PQ_t = Index\_PQ_t$;

-Equation 3: Robust OLS in levels, $PQ_t = Dummy\_PQ_t$, without $Official\_languages_t$;

-Equation 4: Robust OLS in levels, $PQ_t = Index\_PQ_t$, without $Official\_languages_t$;

-Equation 5: Robust PWE in levels, $PQ_t = Dummy\_PQ_t$;

-Equation 6: Robust PWE in levels, $PQ_t = Index\_PQ_t$.

Interestingly, relative average weekly income, $Earnings_t$, is not statistically significant in all of the regressions. We expected the prospect of higher revenues to have an attractive effect, but it does not appear to be the case. $Employment_t$ is significant in all four equations and takes the expected positive sign. As noted by Cousineau and Vaillancourt (2001), "workers move from the low-wage and low-employment region to the high-wage and high-employment region." Consequently, it is reasonable to believe that Quebecers move westward seeking job opportunities.

When looking at the demographic characteristics of the Quebec population, we notice that $Anglo_t$ and $Allo_t$ coefficients are significant at a 5% confidence level in all the equations except for equation 5 where $Anglo_t$ is significant at 10%. As expected they have a negative sign, meaning that a higher percentage of native English speakers or Allophones within Quebec's population increases migration outflows. $Official\_languages_t$ is not significant in any case.

Moving on to the measure of the impact of political instability, we find $Dummy\_PQ_t$ and $Index\_PQ_t$ to be statistically significant at a 5% level in all regressions except for equation 6 where $Index\_PQ_t$ is significant at a 10% confidence level. In equation 1, the presence of a Parti Québécois government in power means a decrease in net interprovincial migration flows by 8,471 people per year. In equation 3, a PQ government is responsible for an annual outflow of 5,778

migrants. When measuring political instability with the support for sovereignty index, we note that a 1% increase in the support for sovereignty is responsible for the departure of 342 Quebecers per year, in equation 2. If Official_languages$_t$ is not one of the explicative variables, equation 4, this number goes up to 346 out-migrants per year. We find similar figures when using Prais-Winsten estimators. In equation 5, a PQ government is responsible for the yearly departure of 6,895 Quebecers and, in equation 6, a 1% increase in the support for sovereignty induces annual outflows of 453 people.

Table A3 – Explanatory factors for net migration flows in the Province of Quebec, 1961-2010, Francophones as the reference group, different methodologies

Independent variable	Equation 1 (Robust OLS level)	Equation 2 (Robust OLS level)	Equation 3 (Robust OLS level)	Equation 4 (Robust OLS level)	Equation 5 (Robust PWE level)	Equation 6 (Robust PWE level)
Employment$_t$	204,699* (0.001)	265,164* (0.000)	246,813* (0.000)	261,557* (0.000)	291,606* (0.002)	220,970* (0.001)
Earnings$_t$	-19,547 (0.564)	-32,839 (0.322)	-30,360 (0.337)	-31,940 (0.307)	-10,585 (0.832)	-9.561 (0.849)
Anglo$_t$	-416,794* (0.035)	-848,106* (0.000)	-718,123* (0.000)	-806,889* (0.000)	-476,376 (0.072)	-812,673* (0.004)
Allo$_t$	-796,637* (0.000)	-661,822* (0.000)	-712,781* (0.000)	-674,177* (0.000)	-734,734* 0.001)	-512,364* (0.011)
Official_languages$_t$	212,203 (0.060)	-28,489 (0.758)			152,200 (0.406)	-23,000 (0.889)
Dummy_PQ$_t$	-8,471* (0.000)		-5,778* (0.001)		-6,895* (0.024)	
Index_PQ$_t$		-342* (0.023)		-346* (0.021)		-453 (0.092)
R^2	0.78	0.74	0.76	0.74	0.56	0.50

Notes: P-values are in parenthesis below the estimated coefficients;

    *Significant coefficients at a 5% confidence level.

Equations are specified as:

    -Equation 1: Robust OLS in levels, PQ$_t$ = Dummy_PQ$_t$;

    -Equation 2: Robust OLS in levels, PQ$_t$ = Index_PQ$_t$;

    -Equation 3: Robust OLS in levels, PQ$_t$ = Dummy_PQ$_t$, without Official_languages$_t$;

    -Equation 4: Robust OLS in levels, PQ$_t$ = Index_PQ$_t$, without Official_languages$_t$;

    -Equation 5: Robust PWE in levels, PQ$_t$ = Dummy_PQ$_t$;

-Equation 6: Robust PWE in levels, $PQ_t = Index\_PQ_t$.