Explaining Canada's Regional Migration Patterns

David Amirault, Daniel de Munnik and Sarah Miller, Canadian Economic Analysis

- Understanding the factors that determine the migration of labour between regions is crucial for assessing the response of the economy to macroeconomic shocks and identifying policies that will encourage an efficient reallocation of labour.
- Using a gravity model and census data for sub-provincial economic regions, this article examines the determinants of migration within Canada from 1991 to 2006 (the latest available census data). The inclusion of intraprovincial data provides a clearer perspective on the migration choices of Canadians than found in previous studies done at the provincial level.
- This research provides evidence that labour migration tends to increase with regional differences in employment rates and household incomes, and that provincial borders and language differences are barriers to migration.

In Canada, as in other small, open, commodity-producing economies with a flexible exchange rate, shocks to the terms of trade (the ratio of export prices to import prices) can cause significant regional variations in output and labour market conditions, because resource-based and manufacturing activities are unevenly distributed across the country (Lefebvre and Poloz 1996). The movement of labour from regions with excess supply to regions with excess demand in response to these and other shocks is an important macroeconomic adjustment mechanism. If this movement is efficient and unencumbered, monetary policy-makers do not need to respond as aggressively to shocks to stabilize prices and the economy. Furthermore, improvements in the efficiency of this adjustment mechanism could help to counteract future expected weak trend growth in labour supply (which is a function of the aging of the population)[1] and weak trend growth in productivity,[2] and therefore support Canada's potential output growth.

1 Macklem (2012) suggests that efforts to reduce barriers to interprovincial migration are important elements in a broad strategy to deal with limited growth in the supply of labour in coming years. Examples of current initiatives include the New West Partnership Trade Agreement and the Agreement on Internal Trade.

2 Leung and Cao (2009) report that the higher rates of reallocation within sectors are associated with stronger productivity growth (consistent with models of creative destruction). It therefore follows that the barriers to regional migration may impair sectoral mobility and can result in weaker productivity growth.

This article highlights the patterns of gross aggregate migration across economic regions of Canada and provides evidence of the factors that drive them. It begins with a discussion of insights obtained from previous research and the recent trends reflected in the data. It then describes a basic gravity model of migration (**Box 1**), and its three core explanatory variables: the respective populations of the two regions sharing the migrants in question plus the distance between the two regions. We extend this framework to include a rich set of additional explanatory variables related to economic, cultural and geographic factors (such as whether regions have a similar language profile, and whether they are adjacent to each other), as well as a variable to measure the effect of the provincial border. While our model remains a work in progress, we present findings on the extent to which labour markets, a provincial border and language differences influence migration.

In contrast to previous work that has focused on aggregate migration between provinces in Canada, this study uses data from economic regions within provinces

In contrast to previous work that has focused on aggregate migration between provinces in Canada, this study uses data from economic regions within provinces.[3] These regional data, taken from Statistics Canada's 1991, 1996, 2001 and 2006 censuses, allow us to improve on previous analyses. First, the regions are small enough to capture how intraprovincial migration flows (including rural-to-urban flows) are affected by economic factors. This is important because, as suggested by Coulombe (2006), differences in productivity and unemployment may have a greater impact on intraprovincial migration than on interprovincial migration, owing to institutional differences across provinces. Economic regions are also large enough that problems associated with too fine a level of geographic disaggregation can be avoided. For example, as Flowerdew and Amrhein (1989) note, data at the census subdivision level (totalling 260 areas) can be influenced by the inclusion of short-distance movers, whose migration decisions are based on different factors (such as housing choice, for example) than those of long-distance movers. Sub-provincial data also allow us to estimate the impact of provincial borders on migration, a factor that has not been estimated in previous studies. Finally, this is the first study to use migration data from the 2006 Census—a time when strong commodity prices contributed to sharp differences in economic conditions among Canadian regions.

In addition to providing insights on the appropriate size of geographic region to analyze, previous research on aggregate migration in Canada has directed our research in two other important ways.[4] First, the gravity model (**Box 1**) provides a solid framework for understanding aggregate migration; both Helliwell (1997) and Flowerdew and Amrhein (1989) find that the main variables of the gravity model (population size and distance) are the most important determinants of migration. Second, Helliwell's (1997) finding that the national border between Canada and the United States reduces migration motivates us to examine the role of provincial borders.[5]

3 Each economic region is a grouping of census subdivisions. Within the 10 provinces, there are 73 economic regions.

4 The growing body of research investigating the determinants of migration has given rise to two strands of literature: the first uses microdata to examine the factors that influence *individuals* to migrate (Finnie 2004; Audas and McDonald 2003; Osberg, Gordon and Lin 1994); and the second, the area of this study, analyzes *aggregate* migration flows, often using a gravity model (Stillwell 2005; Zimmermann and Bauer 2002; Greenwood 1997).

5 McCallum (1995) was the first to document the importance of the national border for international trade.

Patterns of Migration: What Recent Data Show

While there was considerable adjustment and a similar level of total migration in all three intercensal periods, for illustrative purposes we focus on the most recent period to highlight the importance of economic signals. Between May 2001 and May 2006, the Canadian dollar appreciated by almost 40 per cent, and the Bank of Canada commodity price index (BCPI) increased by 63 per cent—two indicators that characterize the significant change in the economic environment. **Chart 1** shows trends in Canadian regional migration during this period of structural adjustment. For each of the 73 economic regions, the shares of population in 2006 comprising recent migrants are shown according to their source (either intraprovincial, interprovincial or external).[6] As expected, regions that directly benefit from higher commodity prices (i.e., those with a relatively large endowment of commodities) experienced a large amount of in-migration between the 2001 and 2006 censuses. For example, recent migrants accounted for nearly one-third of the population of Wood Buffalo-Cold Lake, the economic region in Alberta at the epicentre of the Canadian oil-sands mining sector.[7] All eight economic regions in Alberta show similarly high inflows and are among the top 25 regions in terms of recent in-migration as a share of total population. The migrants to these regions came from all 65 economic regions in the remaining nine provinces, from other regions within the province and from outside Canada.

While aggregate migration within Canada is remarkably stable, migration flows between regions can shift dramatically, as relative opportunity changes in response to shocks

Chart 1 also provides evidence of the importance of intraprovincial migration compared with interprovincial migration. In 2006, population flows within provinces outpaced flows between provinces in 68 of the 73 economic regions. The relative importance of intraprovincial migration is further confirmed, in aggregate, in **Table 1**. In all three intercensal periods, intraprovincial migration accounts for approximately two-thirds of the total migration between economic regions in Canada. The data in **Table 1** also show that roughly 8.5 per cent of the population, approximately 2.5 million Canadians, moved between regions (either intraprovincial or interprovincial movements) in each of the past three intercensal periods, illustrating that aggregate migration within Canada has been remarkably stable over this period. When disaggregated to the economic region level, however, migration flows and directions can shift dramatically from one census to the next, as the relative economic opportunity between regions changes.[8]

There are several potential reasons why intraprovincial migration may exceed interprovincial migration. Distances within provinces are, on average, significantly shorter than distances between provinces, and distance is considered to be one of the main barriers to migration.[9] Language differences may also play a role. For example, **Chart 1** shows that, compared with all other provinces, intraprovincial migration is a much larger source of migrant flows for economic regions in Quebec, which is primarily a

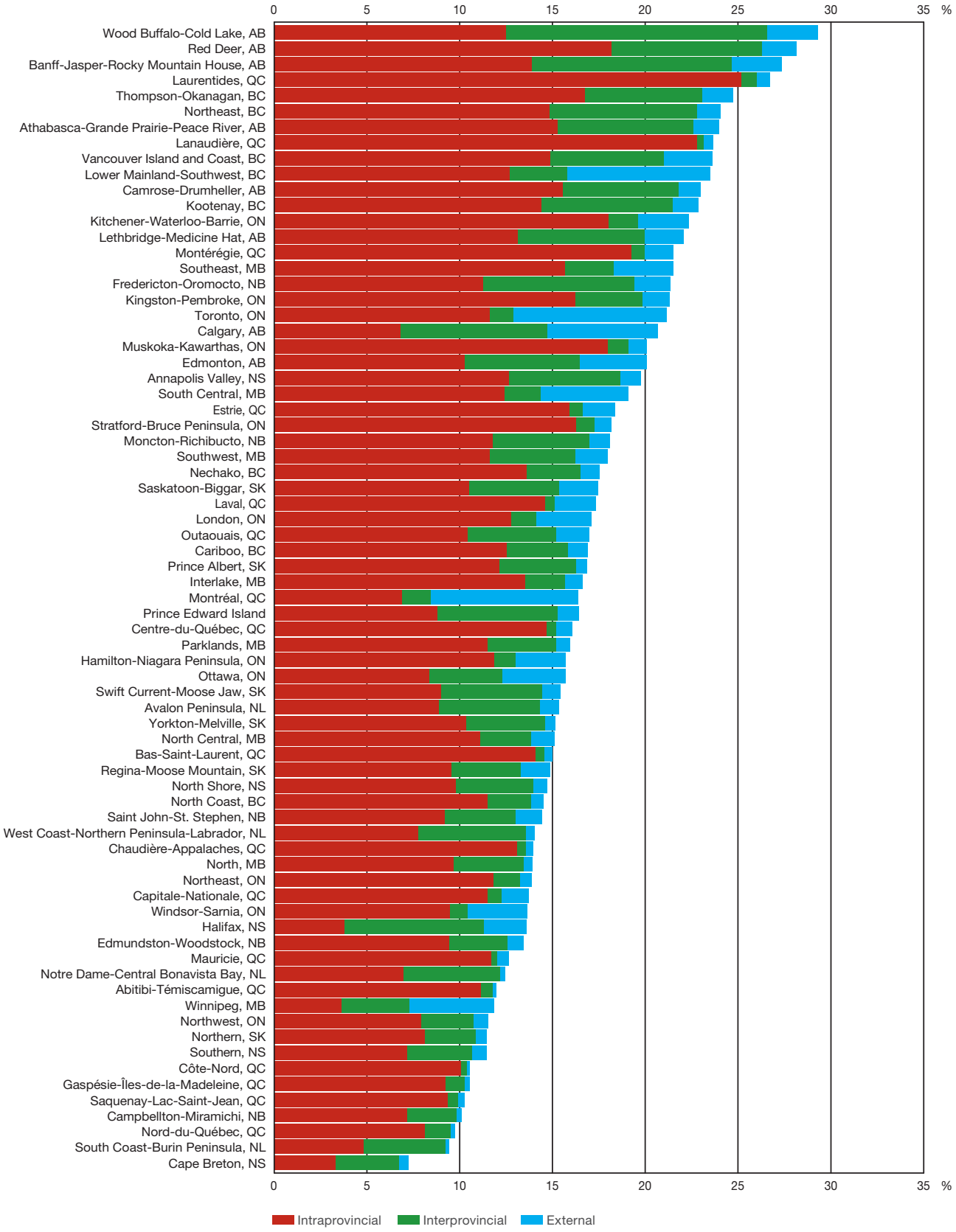
6 Recent migrants are defined as individuals who migrated in the five years since the previous census.

7 Fort McMurray is the economic centre (the largest town or city in the economic region) of the Wood Buffalo-Cold Lake region.

8 For example, the Vancouver Island and Coast region of British Columbia attracted 45,500 net migrants from all other economic regions of Canada's provinces from 1991 to 1996–a period of strong consumer-led growth in that province. However, from 1996 to 2001, a period in British Columbia dominated by the negative effects of the Asian Crisis, this region received only 2,200 net migrants. Benefiting from the strength of U.S. demand for its exports in the late 1990s, Windsor-Sarnia, Ontario, attracted 2,800 net migrants from 1996 to 2001. In contrast, from 2001 to 2006, this region lost 4,200 net migrants to other economic regions.

9 Indeed, the average distance between two economic regions within the same province is 526 kilometres, whereas the average distance between two regions in different provinces is 2,977 kilometres.

Chart 1: Share of recent migrants in population, by source, in 2006



Note: Recent migrants are defined as individuals who migrated in the five years since the previous census.

Source: Statistics Canada 2006 Census

Table 1: Intra- and interprovincial migration flows in each intercensal period

	1991–96		1996–2001		2001–06	
	Number of individuals	Share of total population	Number of individuals	Share of total population	Number of individuals	Share of total population
Population	28,353,196		29,470,770		31,061,360	
Intraprovincial (movement within province to a different economic region)	1,627,498	5.7%	1,672,290	5.7%	1,634,430	5.3%
Interprovincial (movement to a different province)	860,315	3.0%	873,715	3.0%	825,575	2.7%

French-speaking province, suggesting that language differences act as a barrier to interprovincial migration. Beyond distance and language, a host of implicit and explicit barriers—differences in provincial occupational licensing requirements,[10] other legislative differences, costs associated with moving to a new province (e.g., changing a driver's licence and government-provided programs or subsidies), and other institutional and non-economic barriers (such as cultural differences and preferences)—are avoided by migrating within a province.

Finally, another possible reason for these large intraprovincial migration flows is that labour market conditions in different regions of a province can vary widely; therefore, any additional benefit from undertaking out-of-province migration may be small relative to the additional costs associated with relocation noted above. **Chart 2** highlights this fact by showing the average unemployment rates, as well as the highest and lowest regional unemployment rates, in each province at the time of the 2006 Census. Individuals migrating from the rural, high-unemployment economic regions of provinces in Eastern and Central Canada, for example, can improve their labour market potential by migrating to urban, low-unemployment regions in the same province without incurring the distance-related costs associated with migration to low-unemployment economic regions in Western Canada. If these intraprovincial options are not taken into account, as is the case in studies using provincial-level data, the results may understate the response of migration to economic signals.

Consistent with Helliwell (1997) and Flowerdew and Amrhein (1989), population size and distance seem to be important to migration patterns in our data, which lends support to a gravity-model approach. More specifically, we note three trends:

(i) **Large population centres exchange large flows.** All else being equal, large population centres attract and exchange migrants for several reasons, including thicker labour markets (Brown and Scott 2012) and network effects.[11] **Chart 3** shows some of the key migration flows between four of Canada's largest population centres—Toronto, Vancouver, Montréal and Calgary. The flows between each of these centres are much larger than the average gross flows among all regions in Canada.[12]

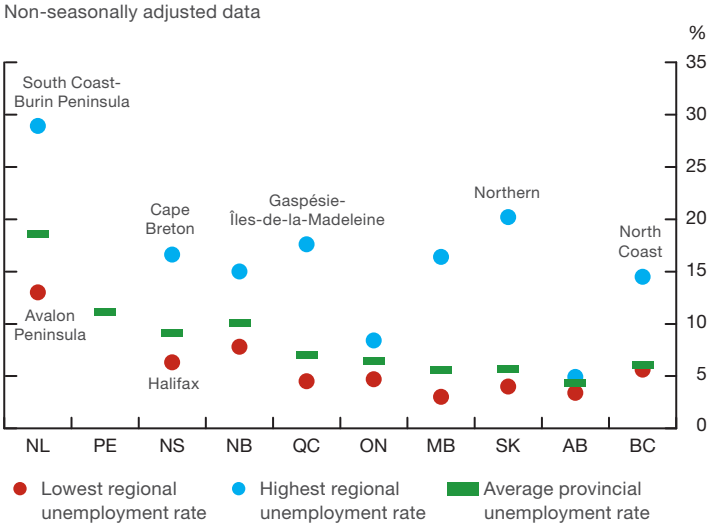
10 For evidence of differences in occupational standards across provinces, see the survey results from the Forum of Labour Market Ministers (2005).

11 Labour markets are considered "thick" if there are many opportunities for inter-firm mobility, even in specialized fields. Network effects arise from having more firms, more opportunities for economic interaction and more amenities in an area.

12 The smallest gross flow between these regions is 7,675 migrants from Vancouver to Calgary between 1991 and 1996, which is 16 times the average number of migrants between all regions and in all time periods (477).

Chart 2: Regional unemployment rates, 2006 Census

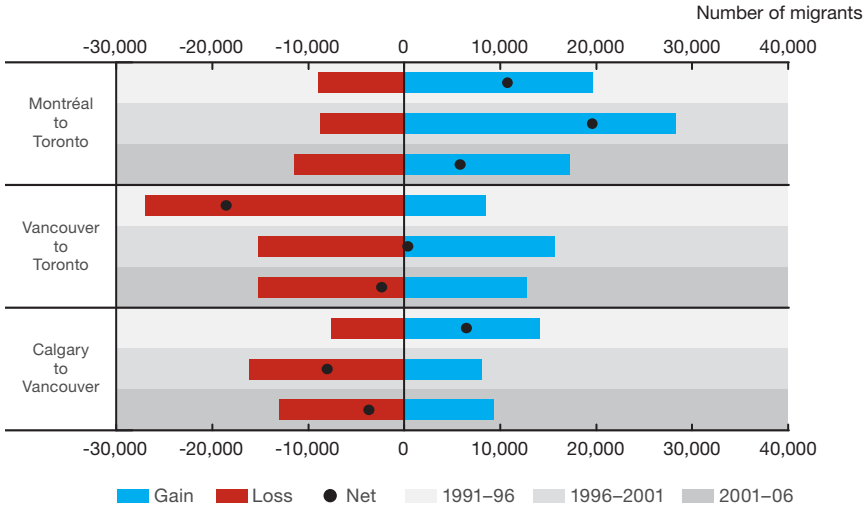
Non-seasonally adjusted data



Source: Statistics Canada 2006 Census

Last observation: 2006

Chart 3: Migration flows between large population centres



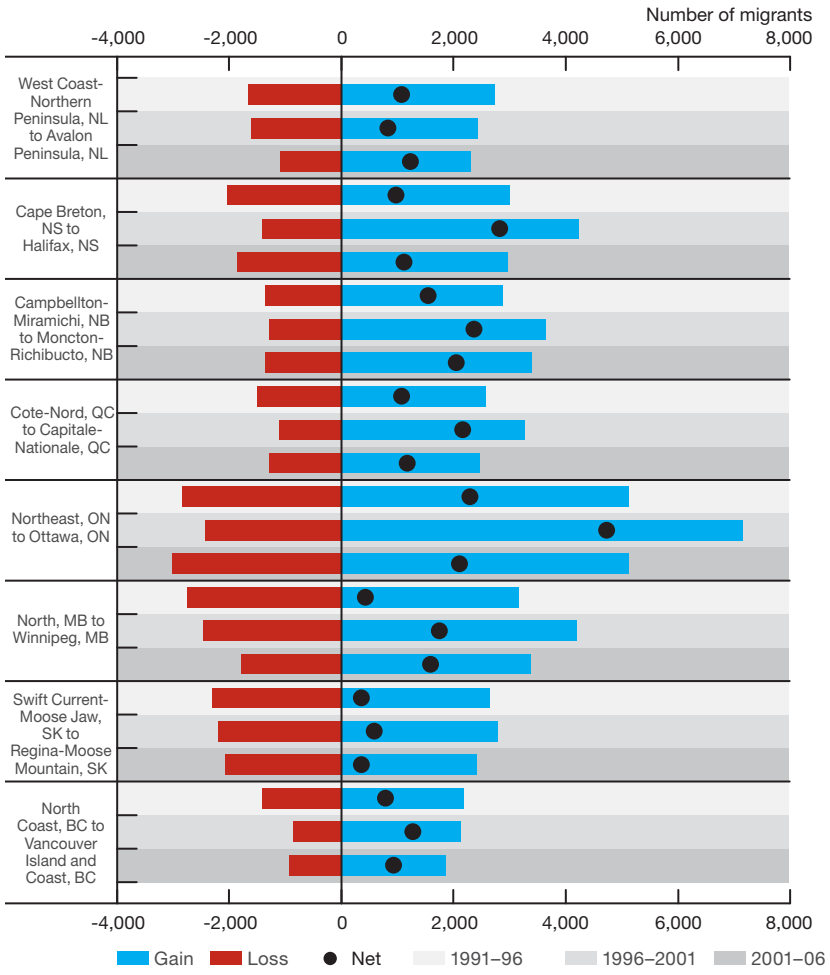
Source: Statistics Canada Census, 1991–2006

Last observation: 2006

(ii) **Even medium-sized population centres will attract migrants from smaller regions nearby.** The gravity-model framework suggests that the attractiveness of medium-sized regions to nearby migrants in small and rural economic regions is fairly compelling. These medium-sized centres offer thicker labour markets and the benefits of network effects, but at a fraction of the distance (cost) of migration to large urban centres. **Chart 4** shows the flows to medium-sized Canadian cities (such as Halifax, Québec and Winnipeg) from smaller, rural areas nearby. These flows persistently outweigh flows in the other direction.

(iii) **Small regions exchange few flows.** Many less-populated economic regions share few, if any, migrants with other similarly small regions. Of the total flows between pairs of economic regions over the 15-year period, roughly 23 per cent were equal to zero, and over 80 per cent of these were between regions with fewer than 300,000 people.

Chart 4: Migration flows to medium-sized population centres from small populations nearby



Source: Statistics Canada Census, 1991–2006 Last observation: 2006

Box 1

Gravity Model

The roots of the gravity model in economics lie in geography and trade literature.[1] The basic gravity model, when adapted to studies of migration, suggests that gross migration is positively related to the size of the populations in the origin and destination, and inversely related to the distance between them. The gravity model can be expressed as:

$$M_{ij} = F(Pop_i, Pop_j, Dist_{ij}), \quad (1)$$

where F represents the distribution function (discussed briefly below), and M_{ij} equals the total number of Canadians who moved from economic region *i* to economic region *j* in the years between two censuses.[2] Population size in the origin, Pop_i, is a proxy for the pool of potential movers.

(continued...)

1 Under the gravity model in trade literature, the volume of trade is positively associated with the economic size of trading partners (often measured by national incomes) but is inversely related to the distance between them. The origins of the gravity model in geography literature date back to Zipf (1946).

2 For the gravity-model estimation, the five economic regions in and around Montréal were combined into one region, since, in our opinion, they represent a single labour market because of their heavy flows of labour market commuting (the other four regions, in addition to Montréal, are Lanaudière, Laurentides, Laval and Montérégie). With these changes, our sample is reduced to 69 economic regions. In our analysis, migrants can flow from each of the 69 regions to any of the other 68 regions. Each observation represents a pair of economic regions, giving 4,692 (69 X 68) pairs of flows in each intercensal period. With three intercensal periods per pair, there are 14,076 total observations.

Box 1 (*continued*)

Table 1-A: Poisson pseudo-maximum likelihood estimates with origin and destination province fixed effects

	Coefficient estimates		Coefficient estimates
Log population DB†	0.832[a] (0.0484)	Difference between economic regions in employment-rate gap over intercensal period (D-O)†	0.0245[a] (0.00587)
Log population OB†	0.699[a] (0.0528)	Difference between economic regions in log median household income (DB-OB)	0.645[b] (0.275)
Log distance (kilometres)	-0.427[a] (0.123)	Absolute difference in percentage of French-speaking population (DB-OB)	-0.0152[a] (0.00127)
2001 log distance (kilometres)	0.0264 (0.0190)	Dummy variable for 1996–2001 period	-0.198 (0.144)
2006 log distance (kilometres)	0.0125 (0.0197)	Dummy variable for 2001–06 period	-0.138 (0.151)
Home province	0.977[a] (0.0814)	Number of observations	14,076

a. $p < 0.01$ b. $p < 0.05$

Standard errors are in parentheses.

† D and O denote that the values used are for the destination and origin, respectively. B denotes that the values are from the beginning year of the intercensal period.

Note: Results also include controls for multilateral resistance, adjacent regions, home-ownership rate in the origin (B), average value of dwelling in the destination (B), difference in tax rates (low, medium, high), percentage aged 15 to 29 in the origin (B), percentage difference in non-labour income (B), percentage difference in Aboriginal population (B), difference in January temperatures, difference in rain days. Multilateral resistance captures the idea that migration depends not only on the distances between two regions, but also on the distances from these regions to all other regions.

Source: Statistics Canada Census, 1991–2006

On average, there will be more migrants from larger origin populations than smaller origin populations, since the pool of potential migrants is larger. The population in the destination, Pop_j, acts as a proxy for the "pull" of the destination region. $Dist_{ij}$ is the distance by road, measured in kilometres, between the economic centres of regions *i* and *j*, and acts as a proxy for the costs associated with migration (explicit costs for transportation, psychological costs that arise from being separated from family and friends, and the costs to gather information about an unfamiliar location).

We build on this basic gravity model in two important ways. First, we add an extensive set of economic, geographic and cultural variables for the origin and destination regions.[3, 4] These additional variables were selected based on economic theory, trends in our data and stylized facts on migration, as well as anecdotal information. Second, we use a model specification that handles widely dispersed count data[5] and controls for unobserved differences across provinces that might be confounding the key relationships of interest, two issues that could lead to biased results and that previous research has not adequately addressed. We use a Poisson pseudo-maximum likelihood model (PPML), a commonly used specification to estimate relationships using count data (Santos Silva and Tenreyro 2006), to model the distribution of the migration data. Unlike popular alternatives,[6] the key benefit of PPML models is that they can handle data sets with many zero observations and are robust to the misspecification of the distribution. We also use fixed effects separately for origin and destination provinces to control for factors (either observed or unobserved) that are common among economic regions of the same province over the three periods. These fixed effects help to reduce bias in our results.[7] For more details on the selection of explanatory variables and the model specification, see our working paper (Amirault, de Munnik and Miller 2012). **Table 1-A** presents the estimated coefficients for the key variables.

3 For further information on these variables, including their definition, hypothesized relationship with migration, mean and expected sign, see Amirault, de Munnik and Miller (2012). Since this model remains a work in progress, we consider the examples drawn from the model estimates to be illustrative.

4 The main source for this analysis is census data from 1991–2006, which are used to create the dependent variable (gross migration), as well as the explanatory variables related to demographic, economic and cultural factors such as population sizes, the employment rate and the size of the French-speaking population. Other sources were used to create variables related to distance (Google Maps), marginal tax rates (available on the Canada Revenue Agency website, http://www.cra-arc.gc.ca/tx/ndvdls/fq/txrts-py-eng.html) and weather ("Canadian Climate Normals or Averages 1971–2000," National Climate Data and Information Archive, Environment Canada, available at http://climate.weatheroffice.gc.ca/climate_normals/index_e.html). To create the distance and weather variables, we identify an "economic centre," which is typically the largest city or town, for each economic region, for example, St. John's for the Avalon Peninsula, Newfoundland and Labrador.

5 The data for our dependent variable, gross migration, include a large number of zeros combined with many small values and the presence of very large values, which is typical of count data.

6 Log-linear models are not considered appropriate, since our data include a large number of zeros, which are undefined when logged. Negative binomial models with fixed effects are unbiased only if the distribution assumed in the model is correct; therefore, these results are not presented here.

7 For example, the provincial fixed effects will reduce the risk of bias in estimating the impact of language differences.

Influences on Regional Migration

Using parameter estimates from **Box 1**, we present findings for population size and distance that provide support for the use of a gravity-model framework for understanding migration patterns. Furthermore, we discuss the role of labour market variables and barriers to migration (namely, the home-province and language variables) in explaining migration trends over three census periods.

Population sizes in both the origin and the destination have a positive effect on the number of migrants

Population sizes in both the origin and the destination have a statistically significant positive effect on the number of migrants that move from one economic region to another. The results from our model suggest that a 10 per cent increase in the destination's population (approximately 200,000 people) will increase the predicted migration to that region by about 8 per cent for a representative pair of regions over a 5-year period. If we take a given region, for example, Halifax, which had a population of about 356,000 in 2001, a 10 per cent rise in population would increase total predicted migration by about 4,900 people overall (that is, between Halifax and all other 68 economic regions) over a 5-year period.

The distance between economic centres has a negative influence on migration

The distance between economic centres has a negative influence on migration and this effect is statistically significant. For a representative pair of regions, a 10 per cent decrease in the number of kilometres between them would increase the predicted migration by roughly 4 per cent over a 5-year period. From a simulation exercise, our results suggest that if the distances between all regions were halved, the average predicted gross migration would grow by 164, to a total of 641 migrants. To test whether the effect of distance changed over our sample period, we include additional indicator variables for 2001 and 2006 that interact with distance. The positive coefficient estimates for these variables suggest that distance is becoming less restrictive on migration over time; however, the impact on the estimated number of migrants is small and neither variable is statistically significant.[13] Note also that the coefficient estimates for the two time indicator variables, 2001 and 2006 (1991–96 is the base), in **Table 1**-A in **Box 1**, are also statistically insignificant, which implies that average gross migration was not significantly different over time.

Differences in employment rates and in median household incomes have positive effects on migration

Differences in employment rates and in median household incomes have positive and statistically significant effects on migration. In general, this result is consistent with the previous literature that finds that migration is positively related to the unemployment rate in the origin (Finnie (2004), who investigates individual migration decisions) or the difference in rates between the two regions (Coulombe (2006) and Flowerdew and Amrhein (1989) in aggregate migration studies).[14, 15] When considering individual migration decisions (Osberg, Gordon and Lin 1994) or aggregate migration flows (Helliwell 1997; Flowerdew and Amrhein 1989), migration

13 Our working paper (Amirault, de Munnik and Miller 2012) presents an alternative specification that shows statistically significant coefficient estimates for these two interaction variables. While those results provide some evidence that barriers to migration associated with distance have decreased over time, they are not emphasized, since the estimates from that specification are unbiased only if the distribution assumed by the model is correct.

14 Note that this study uses employment rates (the employment to population rate) to measure labour market conditions, while several other studies have used unemployment rates (Coulombe 2006; Finnie 2004; Flowerdew and Amrhein 1989). While both provide information on labour market conditions, weak economic conditions would also lead to lower labour force participation, which the employment rate captures better than the unemployment rate.

15 Some of these studies are not directly comparable with ours, since they examine individual, rather than aggregate, migration (Finnie 2004; Osberg, Gordon and Lin 1994), or focus on net migration (Coulombe 2006).

studies also find that higher measures of income in the origin are negatively related to migration. The exception is Finnie (2004), who finds that out-migration is slightly positively related to an individual's income level for men aged 35–54.

Our results suggest that a 5-percentage-point increase in the gap in employment rates between regions will increase in-migration to the region with the higher employment rate by 12 per cent for a representative pair of regions.[16] When compared with the estimated impact of distance, this effect is equivalent to a 553-kilometre (or a 29 per cent) decrease in distance between two regions. If we impose a 5-percentage-point increase in the difference in the employment-rate gap in a specific region, for example, Winnipeg, relative to all other regions, total predicted migration (the sum of inflows and outflows) in 2006 actually falls by almost 1,050. The reason for this is that a relatively better labour market in Winnipeg attracts more migrants but also holds people in that region. Whether the total predicted migration increases or decreases will depend on the economic region under consideration.

Our model's estimates for median income suggest that a 10 per cent increase in the difference in median household income between two typical regions would motivate roughly 6 per cent additional migrants to relocate to the region with the higher income. Relative to the effect of distance, this would have the same impact as a 292-kilometre (or a 15 per cent) decrease in the distance between two regions. Similar to the difference in the employment-rate gap, if we apply a 10 per cent increase to the difference in median income in a specific region, for example, Montréal, the total predicted migration (inflows plus outflows) increases by 1,200 migrants, relative to all other regions. A 3.8 per cent increase in the difference in median incomes between two regions would have the same impact as a 1-percentage-point increase in the employment-rate gap, indicating the relative strength of the two labour market variables. This finding supports the notion that a significant wage premium is required to attract migrants to low-employment-rate regions.

Provincial borders have a negative impact on migration

Provincial borders have a statistically significant negative impact on migration. Even after controlling for such variables as distance, language differences and provincial fixed effects, the impact of the home-province variable is positive and suggests that, for a representative pair of regions, total migration over a 5-year period will be higher by 104 individuals on average when there is no provincial border.[17] In addition to examining migration between two regions, we consider a scenario where there are no provincial borders between any regions, and find that the estimated average predicted gross migration would increase from 477 migrants to 777 migrants, or 63 per cent, implying that the gains from removing the border would be significant.

We also perform a simulation in which we remove the border between two specific regions (**Table 2**). The results show that migration flows between Prince Albert, Saskatchewan, and Camrose-Drumheller, Alberta, would be significantly higher without the presence of a provincial border. Notably, simulating removal of the border raises the predicted flows to levels that

16 We also estimate, in results not shown, the effect of the level of the gap in the employment rates between two regions in the beginning period (rather than the change in the gap), and the results are essentially the same. We present the estimates regarding the change in the gap, since that measure is more indicative of the new information that would affect migration decisions throughout the 5-year period.

17 Caution should be exercised when emphasizing the size of the border effect, since results from an alternative model in our working paper (Amirault, de Munnik and Miller 2012) are smaller (although still statistically significant). However, those findings are not emphasized, since the estimates from that specification are unbiased only if the distribution assumed in the model is correct.

Table 2: Simulations of migration flows with and without a provincial border

		Predicted gross migration	
Flow	Intercensal period	With border	Without border
Prince Albert, Saskatchewan, to Camrose-Drumheller, Alberta	1991–96	744	1,947
	1996–2001	889	2,361
	2001–06	687	1,825
Prince Albert to Saskatoon-Biggar, Saskatchewan	1991–96	-	3,398
	1996–2001	-	2,924
	2001–06	-	2,824

are much closer to those between Prince Albert and Saskatoon-Biggar, Saskatchewan—a destination similar to Camrose-Drumheller, Alberta, in terms of distance and labour market conditions, but within the same province.[18]

Language differences reduce migration between regions

Language differences reduce migration between regions. This result is consistent with findings in Helliwell (1997) and Flowerdew and Amrhein (1989). Helliwell (1997) uses an indicator variable for flows to and from Quebec as a control for language differences, which improves the overall fit of the model. Finnie (2004) also finds that language differences are important for individual migration decisions. In our estimation, which includes provincial fixed effects in the origin and destination, a 10-percentage-point difference between two regions' share of their populations that is French-speaking decreases the predicted number of migrants by 15 per cent. To put this into perspective, a 2.3 per cent increase in median income, or a 0.6-percentage-point increase in the employment-rate gap, is needed to offset the disincentive to migrate created by a 1-percentage-point increase in the difference in the share of the population that is French-speaking between two regions. Given that the average difference in the share of the population that is French-speaking between two economic regions is 30.8 percentage points, the total effect could be much greater in some regions.

Other variables of interest from an economic perspective are relative income tax rates and housing market variables. Our research finds that higher marginal tax rates at lower income levels increase migration inflows, while higher rates for the highest-income earners reduce them. We interpret this result to mean that higher tax rates for lower-income earners signal better services. For higher-income earners, higher taxes represent a greater relative burden. Home-ownership rates in the region of origin have a meaningful negative effect on migration, while housing prices in the destination have no significant effect. For more details on these and other results, see Amirault, de Munnik and Miller (2012).

Conclusion

Using data for sub-provincial economic regions (each representing a grouping of census subdivisions), we find that differences in both employment rates and household incomes are positively related to migration flows and help to explain Canadian migration patterns. Such results provide evidence that migrants respond to economic signals and that they are a key element in the stabilization process following economic shocks. Our estimates also suggest that, even after controlling for origin and destination provincial fixed effects, language differences restrict migration.

18 Note, however, that the actual flows of migrants from Prince Albert to Saskatoon-Biggar, Saskatchewan, in these three periods are much higher than the model predicts.

We also find that provincial borders are negatively related to migration flows. This implies that obstacles to interprovincial mobility remain. While the Agreement on Internal Trade came into effect in 1995 with the objective of removing barriers to mobility across provinces,[19] no empirical evidence has quantified the impact of this initiative. The situation requires an increase in awareness of these issues and a sustained effort at improvement (Gomez and Gunderson 2007; Grady and Macmillan 2007). It would be interesting to investigate whether the border effect reflects occupational licensing differences, the lower costs of remaining in the same province or simply preferences. If barriers created by provincial borders can be removed, easier labour mobility would ultimately facilitate macroeconomic adjustment and possibly result in stronger productivity growth (Leung and Cao 2009).

19 Specifically, these barriers were in the areas of (i) residency requirements; (ii) licensing, certification and registration of workers; and (iii) recognition of occupational qualifications (Gomez and Gunderson 2007; Grady and Macmillan 2007).

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