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An Analysis of the Ins and Outs of Migration within Canada

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Centre interuniversitaire de recherche en analyse des organisations

An Analysis of the Ins and Outs of Migration within Canada

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1 Introduction

Governments in Canada face a number of challenges. Among these is financing a variety of social programs, including health insurance, education and elder care. More specifically, the expenditures on many of these programs are funded either out of current revenue, or debt issuance. Since current tax revenues depend largely on income taxes, that tax base is particularly important. This study focuses on one aspect of the tax base: the relative wages of individuals moving across provincial boundaries, with particular emphasis on Québec.

Labor mobility is also important from the national perspective. It has long been recognized that migration is an important channel through which an individual finds the ‘right’ job: one that is suitable to the individual’s skills, abilities and aptitudes. Indeed, there is a large empirical literature showing that labor mobility is closely related to individual employment and earnings opportunities, at both the regional and national levels. A deeper understanding of who moves – and how their labor market experiences compare with the rest of the labor market – is essential to achieving a prime objective of labor market policy: ensuring that individuals match up with the right job.

There are two important dimensions to the economic contributions of migration. First, is a region a net attractor of migrants; and second, what is the quality of a regions migrants (both in and out). However, looking at net migration (inflows less outflows) misses the fact that there are sizable flows into and out of any given region; see section 3, as well as Osberg, Gordon, and Lin (1994), Bernard, Finnie, and St-Jean (2008), among others. Consequently, analyzing the gross flows gives a sharper picture of the determinants of the net flows. Furthermore, better public policy can be developed by keeping the gross flows of migrants in mind, tailoring some policies to retaining potential migrants, and other policies to attracting migrants. For example, Québec offers tax incentives to international migrants in certain professions, thereby making migration *to* Québec more attractive. Section 3 also documents that younger individuals are more likely to move than older ones, as are more educated people; these facts are well-established in the literature – see, for example, Bernard et al. (2008), Chen and Fougère (2009).

While there are a number of studies examining the size of labor flows across regions and the relationship of these flows to regional-level differences, there is little known about the *composition* of these labor flows, especially in the Canadian context. The bulk of the literature on Canadian inter-provincial migration asks: How do differences in wages affect the probability that an individual will move? See, for example, Osberg et al. (1994), Bernard et al. (2008), Chen and Fougère (2009). However, observable characteristics (age and education, for example) are probably only part of the story. Our logic is as follows. It is well known that in a typical wage regression, observable individual characteristics account for at most 30% of wage differences across individuals (see, for example, Heckman, Lochner, and Todd (2003)). Since the empirical work estimating the probability of moving is based on regressions similar to wage regressions, it stands to reason that there is likely considerable variation in the probability of moving that is not captured by differences in observable characteristics. Consequently, studies like those cited above likely miss a large portion of the differences between movers and stayers.

The main contribution of this study is to document the relative wages of Canadian inter-provincial migrants. There are several different ways to measure these wage gaps. Section 6 looks at the wages of migrants out of a province relative to those who stay in that province. As mentioned above, young and more educated people are more likely to move, suggesting that migrants are not a random selection from the population. Consequently, it is important to compare migrant wages relative to otherwise similar individuals who do not move. To this end, we use regression analysis in order to control for a variety of factors that are known to affect both wages as well as the likelihood of moving. For Québec, we find that recent migrants out of the province earned 16.6% more than otherwise similar workers who remained in Québec.¹ In other words, Québec loses relatively high wage workers to other provinces. However, as emphasized in the earlier discussion of gross and net migration, the wages of migrants out of Québec is only half of the story. Section 7 looks at wages of migrants into a province relative to otherwise similar workers already in that province. We find that the typical migrant to Québec earned 19.1% more than workers already in Québec. In other words, Québec manages to attract workers earning higher wages than it loses.

While this report emphasizes the relative wages of migrants into and out of Québec, looking at the experiences of other provinces helps put the Québec results in perspective. The only other provinces with statistically significant differences in wages between migrants and non-migrants are Nova Scotia and New Brunswick, both of which exhibit a similar ‘churning’ pattern (simultaneously attracting and losing above-average earners) as Québec. Arguably, the right comparison for Québec is not the Atlantic provinces, but rather its neighbor, Ontario: both are located in Central Canada; they are the two most populated provinces in Canada; and they have broadly similar resource endowments and industrial mixes. The difference in relative wages of in- and out-migrants is 2.5% (19.1% for in-migrants, 16.6% for out-migrants) for Québec; for Ontario, 8.2% (10.6% for those migrating to Ontario versus

¹As discussed in section 2, our data source is the Survey of Labour and Income Dynamics (SLID) which is an annual survey. Consequently, the relative wage of an immigrant out of Québec is measured in the year just prior to a move. Similarly, the relative wage of a migrant to Québec is measured in the year following a move.

2.4% for those migrating out).

Sections 6 and 7 measure the quality (relative wage) of migrants in and out of a given province. Section 8 provides two other measures of migrant quality. To avoid an overwhelming number of results, we focus on Ontario and Québec since these are the two most populous provinces in Canada, and Ontario is the most popular destination for Québec migrants. Focusing on Québec, we ask whether the province attracts workers who were above average wage earners in Ontario. We find that such migrants from Ontario were earning 9.3% more than similar workers who stayed in Ontario. Finally, we ask whether migrants from Québec end up earning more than similar workers already in Ontario. They do, by 9.5%. In other words, the finding that Québec simultaneously sees above average workers leaving the province and above average workers entering the province is robust to alternative ways of measuring quality or relative wages.

For those concerned about economic prosperity and Québec government finances, the overall picture is mildly positive: while migrants out of Québec earn considerably more than similar workers who remain in Québec, those migrating into Québec earn even more. That is to say, on net it appears that inter-provincial migration expands overall wage in Québec as well as the tax base. However, as discussed above, the difference in relative wages between in- and out-migrants is much larger for Ontario than for Québec, suggesting that Québec could be doing even better.

It is important to remember that one province's gains do not necessarily imply another province's losses. In a well-functioning labor market, over time workers will move from jobs for which they are poorly suited to ones they are better suited for. Some of this adjustment will, necessarily, involve inter-provincial movement of workers. In this context, all provinces can be winners. To be sure, changes in economic conditions may favor one region over another leading to one region 'winning' while another 'loses', but these losses cannot be attributed to migration.

2 Data

The Survey of Labour and Income Dynamics (SLID) is the source of data for this study. This survey was conducted annually from 1993 to 2011 at which time the survey was terminated. The SLID consists of seven panels; a new panel was introduced every three years. Each panel consists of roughly 15,000 households representing around 30,000 adults. Participants for the SLID were selected from the monthly Labour Force Survey (LFS) and so shares its sample design. Individuals in a panel were interviewed annually for six consecutive years. Consequently, apart from the first three years, the SLID is composed of two rotation groups at a time, maintaining an overlap between two rotation groups. Information collected by the SLID includes demographics, income, education level, labor market activities, financial situation, and province of residence.

Previous studies of migration flows within Canada have either used Canadian census data, or observations on an individual for a single year. The fact that the SLID surveys an individual for six consecutive years allows for a richer analysis of migrants. In particular, depending on when exactly an individual migrates between provinces, we have information on that individual for one or more years prior to a move, as well as one or more years after a move. In contrast, since the Canadian census occurs every five years, it is difficult to measure the labor market conditions in the source and destination provinces around the time of an inter-provincial move.

3 A First Look at the Data

Figure 1 summarizes gross and net mobility by province for the entire SLID sample, 1993–2011. The *gross mobility rate* measures the average of the inflows and outflows of individuals for a province, expressed as a percentage of that province’s population; the *net mobility rate* is the flow into a province less that flow out, again divided by the province’s population.

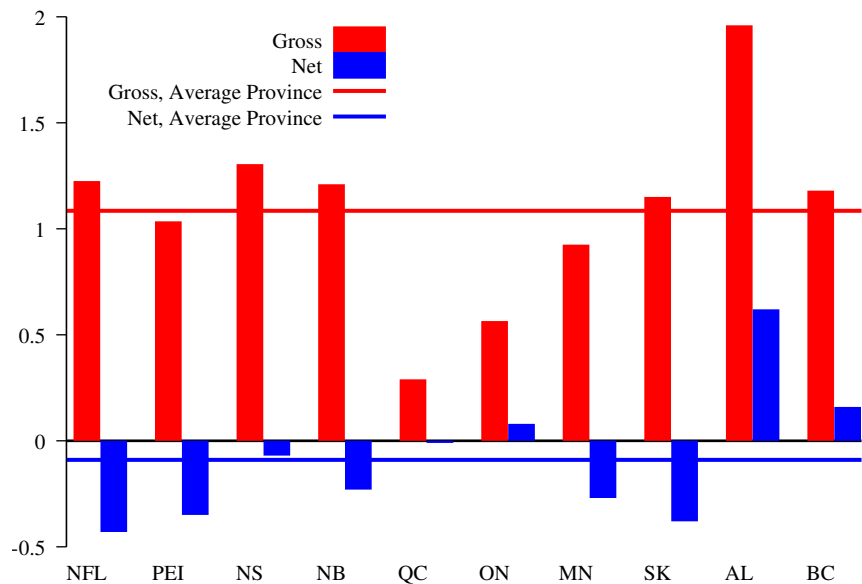


Figure 1: Gross and Net Mobility Across Provinces

Canada’s inter-provincial gross mobility is 1.1% per year. This number is smaller than inter-state mobility in the U.S., but much larger than labor mobility between EU countries (see, for example, [OECD, 2016](#)). The fact that Canada’s inter-provincial gross mobility rate is lower than inter-state mobility in the U.S. may be due to factors like the larger geographic size of Canadian provinces relative to U.S. states, as well as Canada’s lower population density.

More importantly, as seen in Figure 1, net mobility is much smaller than gross mobility. This pattern of Canada’s inter-provincial mobility is quite similar to that of the inter-state mobility in the U.S.. For example, [Lkhagvasuren \(2012\)](#) shows that in the U.S. most of the in- and outflows cancel out at the state level.

Within Canada, Québec has the *lowest* gross mobility rate: 0.3%. The province with the next lowest gross mobility rate is Ontario (0.6%) while Alberta has the highest gross mobility rate (2%). In terms of net mobility, the Atlantic provinces (Newfoundland and Labrador, Prince Edward Island, Nova Scotia, and New Brunswick), Manitoba and Saskatchewan have, on net, been losing workers while Alberta, British Columbia and Ontario have been gaining; Québec’s net migration rate is virtually zero (-0.01%).

It may be tempting to attribute Québec’s low gross mobility rate to its linguistic and

cultural differences relative to the rest of Canada. Indeed, [Bernard et al. \(2008\)](#) find that English speaking Quebecers are ten times more likely to move than other Canadians which suggests to them that Francophone Quebecers are not very mobile inter-provincially. While these considerations may be in play, a closer look at inter-provincial moves suggests a more nuanced reading of the data is needed. Each row in [Table 1](#) reports the fraction of the population in a particular province that moves to another province over a one year horizon. The *diagonal* entries give the probability of *staying* in a particular province. For example, the entry for Québec says that 99.79% of its residents stay in Québec. The remaining elements report the probability of moving out of province. For example, almost no residents of Québec move to either Newfoundland and Labrador or Prince Edward Island; 0.03% of Québec residents move to New Brunswick while 0.11% move to Ontario in any given year. While the probability that a resident of Québec stays in Québec is quite high (99.79%), the same can be said of residents of Ontario (99.63%). Does this high probability for Ontario reflect linguistic and cultural differences relative to the rest of Canada? Probably not.

Table 1: Probability Transition Matrix of Provincial Mobility

	NFL	PEI	NS	NB	QC	ON	MN	SK	AL	BC
NFL	98.91	0.04	0.13	0.04	0.05	0.25	0.04	0.04	0.40	0.11
PEI	0.12	99.05	0.34	0.21	0.00	0.03	0.00	0.00	0.12	0.12
NS	0.07	0.04	98.69	0.17	0.03	0.40	0.08	0.03	0.40	0.09
NB	0.01	0.10	0.16	99.02	0.16	0.17	0.01	0.11	0.21	0.04
QC	0.00	0.00	0.02	0.03	99.79	0.11	0.00	0.00	0.04	0.01
ON	0.03	0.00	0.06	0.03	0.05	99.63	0.03	0.01	0.11	0.06
MN	0.04	0.00	0.05	0.04	0.04	0.31	98.77	0.32	0.20	0.25
SK	0.00	0.01	0.00	0.02	0.01	0.16	0.16	98.79	0.73	0.11
AL	0.10	0.02	0.18	0.03	0.06	0.21	0.02	0.20	98.81	0.36
BC	0.02	0.01	0.01	0.00	0.04	0.19	0.07	0.09	0.25	99.32

Note: Authors' calculations from SLID, based on panel 5 (2003-2009) only. The diagonal elements give the probability that an individual will stay in the same province next year. Each row gives the probability that an individual from a given province is in some other province the following year.

There are several messages one can take from [Table 1](#). First, the two largest provinces

in terms of both geographic size as well as population, Ontario and Québec, have the lowest out-migration rates, 0.4% and 0.2%, respectively. Second, economic opportunity appears to play an important role in where migrants move. Alberta, which was experiencing an economic boom over the period 2003–2009, was the number one destination for six of the nine provinces, suggesting that migration out of the other provinces was at least partly directed toward job opportunities. Third, proximity is important: conditional on moving out of province, moves to a neighboring province are more likely. For instance, excluding Alberta, the most common destinations for migrants from Québec were its neighbors, Ontario and New Brunswick. While linguistic and cultural differences in Québec are clearly a factor, it is not clear they are the dominant factors.

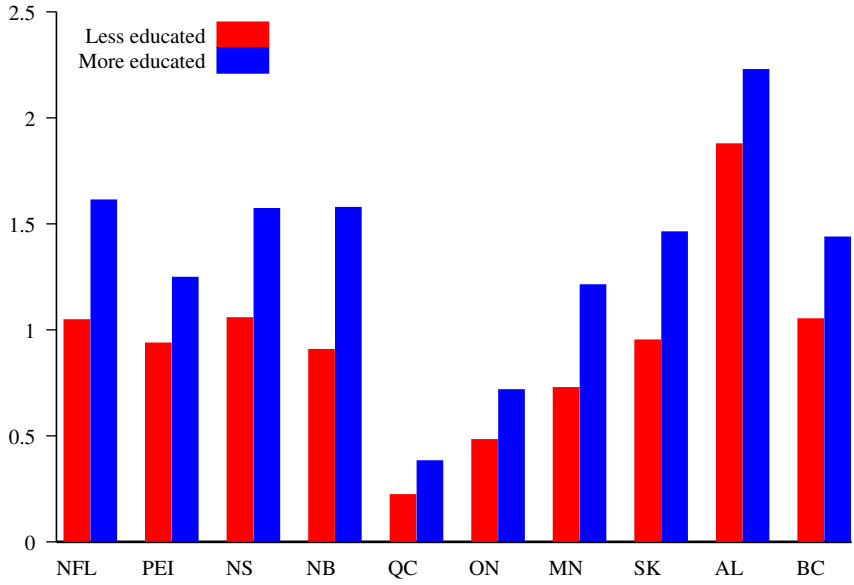


Figure 2: Gross Mobility by Education Across Provinces

Figures 2 and 3 break the mobility data down by education.² *Less educated* refers to individuals who have, at most, completed high school; *more education* corresponds to those with college and university degrees. The general pattern of gross mobility across provinces reported in Figure 1 continues to hold across education groups: Alberta has the highest gross

²Greenwood (1997) surveys earlier studies on mobility by demographic characteristics such as education and age.

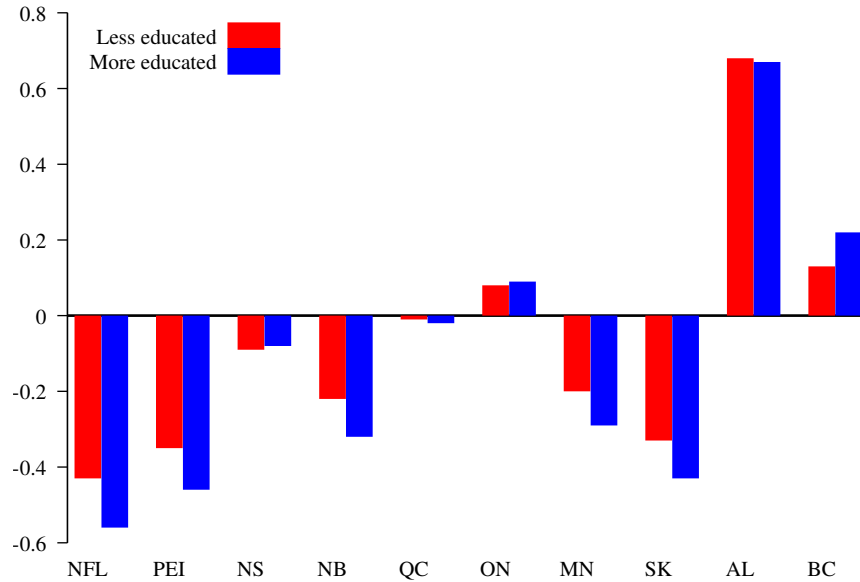


Figure 3: Net Mobility by Education Across Provinces

mobility rate while Québec has the lowest. Figure 2 also reveals a new regularity: Individuals with higher education exhibit more mobility than those with lower levels of education. For example, for Québec, the gross mobility rate for more educated workers is over 70% higher than for the less educated (0.39% compared to 0.23%).

Net mobility rates by education, reported in Figure 3, conforms with the findings in Figure 1: Alberta, British Columbia and Ontario are net recipients of migrants, drawing from the remaining seven provinces. While the net migration rates of more and less educated workers is negative for Québec, the figures are quite close to zero (-0.02 for the more educated, -0.01 for the less educated).

Figure 4 breaks the gross mobility rate by age. *Younger* refers to those individuals aged 16 to 30 while *older* includes those aged 31 to 55.³ This figure shows that younger individuals are far more likely to move across provincial boundaries than older people. Indeed, the gross mobility rate for the young is more than twice that of older individuals. Across provinces, the gross mobility rates broken up by age share the same qualitative pattern as

³We exclude workers over the age of 55 because their migration decisions are driven by factors other than employment opportunities; see Lkhagvasuren (2012).

the undifferentiated rates reported in Figure 1 with Alberta once more having the highest gross mobility rate while Québec has the lowest. In fact, for Québec, the gross mobility rate for younger individuals is lower than for older individuals in the rest of Canada with the exceptions of Ontario and Québec.

Just as gross mobility rates across provinces are higher for the younger age group, so are the net mobility rates, reported in Figure 5. This figure reinforces the message on overall net mobility: Alberta, British Columbia and Ontario are, on net, attracting workers from the other seven provinces. Once again, though, Québec’s net migration rates are almost indistinguishable from zero (-0.01% for both younger and older individuals).

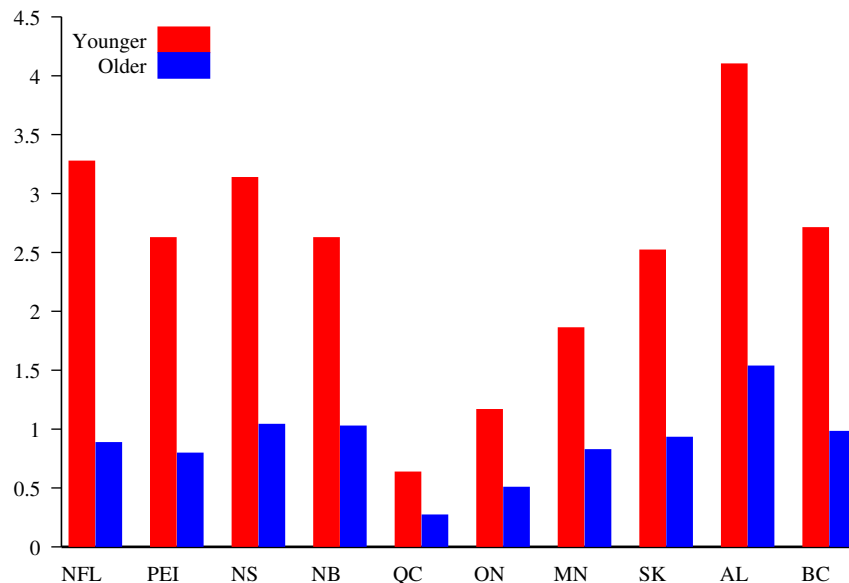


Figure 4: Gross Mobility by Age Across Provinces

4 A Gravity Model

The discussion of Table 1 suggested that the flows of migrants between any two provinces was positively affected by the sizes of the two provinces as well their physical proximity. The gravity model of migration provides a more formal framework to account for these stylized facts. Consistent with Coen-Pirani (2010) and Sander (2014) who apply the gravity model

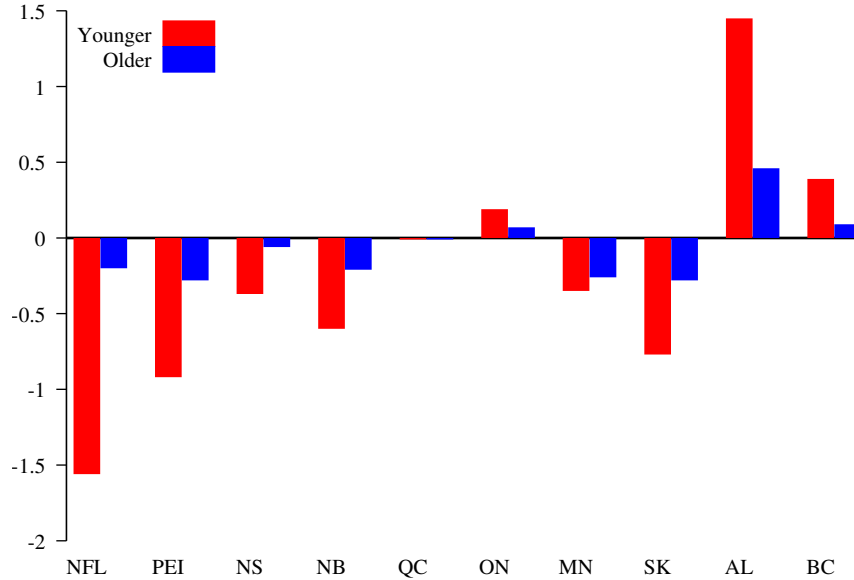


Figure 5: Net Mobility by Age Across Provinces

to U.S. and German internal migration, we consider the following specification:

$$\begin{aligned} \log(\text{Gross Mobility}_{ij}) = & \alpha_0 + \alpha_1 \log(\text{Population}_i) + \alpha_2 \log(\text{Population}_j) \\ & + \alpha_3 \log(\text{Distance}_{ij}) + \alpha_4 \text{Border}_{ij} + e_{i,j}. \end{aligned} \quad (1)$$

In the above equation, $\text{Gross Mobility}_{ij}$ is the total number of migrants between the pair of provinces denoted i and j . For example, i might refer to Québec while j to Ontario. Population_i is the population in province i (Québec in this example) while Population_j is population in province j (for example, Ontario). Distance_{ij} is the distance between provinces, measured in kilometers between their respective capital cities. Border_{ij} is equal to 1 if provinces i and j share a border (as Québec and Ontario do), and 0 if they do not (for example, Québec and British Columbia). Finally, $e_{i,j}$ is the error term.

Coefficient estimates from the gravity model are summarized in Table 2. All of the coefficients are significant at conventional levels of significance, with the provincial populations being highly significant.

The advantage of expressing variables in logarithms in the gravity equation is that the

Table 2: Regression Results: Gravity Model

Dependent variable: log Gross mobility		
Variable	Coefficient	Standard Error
log Population of Origin	0.642***	0.152
log Population of Destination	0.689***	0.151
log Distance	-0.373**	0.184
Border	0.678*	0.363

Notes: The estimation is based on SLID 1993-2011. $R^2 = 0.39$. Standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

coefficient estimates are *elasticities*. For example, the coefficient estimate of 0.6642 on population of the origin province gives the percentage increase in gross flows between a pair of provinces resulting from a one percentage point increase in the origin province's population. To make these numbers more concrete, the gross flow between Québec and Ontario is 9020 persons.⁴ Québec's population is 8.2 million while Ontario's is 13.6. Suppose that Québec's population was the same as Ontario's – how much would the gross flow increase between these two provinces, holding all else fixed? Increasing Québec's population from 8.2 to 13.6 represents a 66% increase. Multiplying this 66% by the coefficient estimate, 0.642, gives a predicted increase in the gross flow of 42.3%, or 3815 persons.

Similarly, the coefficient estimate for Population of Destination, 0.689, gives the percentage increase in the gross flow owing to a one percent increase in the destination province's population. Continuing the example from above, now suppose that Ontario's population fell to that of Québec. The population figures above imply a 40% fall in Ontario's population; multiplying by the coefficient estimate of 0.689 gives a predicted decrease in the gross flow of 27.4%, or 2471 persons.

Next, consider the coefficient on the Distance variable. Recalling that distance is measured between provincial capitals, the distance between Québec and Ontario is 726 km.

⁴From table 1, the probability that a resident of Québec moves to Ontario is 0.11%. Multiplying by Québec's population (8.2 million) gives 9020.

Suppose that Ontario was, instead, as far away as Manitoba – 1941 km. This change corresponds to a 167% increase in the distance between Québec and Ontario. Multiplying by the coefficient estimate, -0.373 , gives a predicted reduction in the gross flow of 62.4%, or 5628 persons.

Finally, the border variable gives the importance of two provinces actually sharing a border. In this case, the coefficient estimate, 0.678 , gives the predicted increase in the logarithm of the gross flows associated with sharing a border. To get a feel for this parameter estimate, think about what it says about gross flows if Québec and Ontario did *not* share a border. The calculations are somewhat more involved in this case, but answer is that the gross flow between Québec and Ontario would fall from 15,820 persons to 8031.

In summary, there is considerable inter-provincial mobility within Canada. The results for the gravity model indicate that Québec’s lower gross mobility rate can be attributed, in part, to its size: its population, 8.2 million as of 2016, makes it the second largest province after Ontario (14.2 million).

5 Net Mobility and the Average Wage across Provinces

Based on economic factors, we expect that migration should tend to be directed to provinces with better labor market opportunities. Here, we focus on one measure of opportunity, average wages. In order to focus on differences in average wages across provinces, we express these differences as the percentage difference relative to the province with the lowest average wage, namely Newfoundland and Labrador.⁵ Since we are comparing average wages across provinces, the appropriate measure of mobility is net as in Figure 1.⁶

Figure 6 shows that there is a positive relationship between average provincial wages and net mobility: Provinces with higher average wages, like Alberta, experience a net inflow of workers. By the same token, those with below average wages – most of the Atlantic

⁵Technically, we compute differences in logarithms which is approximately the percentage difference.

⁶Gross mobility is determined by differences in *individual* wages. Since a province’s average wage is an average across individuals, we need to average across gross mobility, leaving net mobility.

provinces – see a net outflow of workers.⁷ In other words, there is a positive relationship between average wages and net mobility: The correlation is 75.5%, significant at the 5% level. To guide the eye, Figure 6 also includes the least squares best fit line. The regression coefficients, included in the figure, indicate that variation in average wages account for 57% of the differences in net mobility. The slope coefficient says that a 10% increase in the average wage (roughly the difference between Québec and Ontario) is associated with a 0.265 percentage point increase in its net mobility. Given the range of net mobility rates for Canadian provinces (they range from roughly -0.4% and $+0.6\%$), this is a large effect.

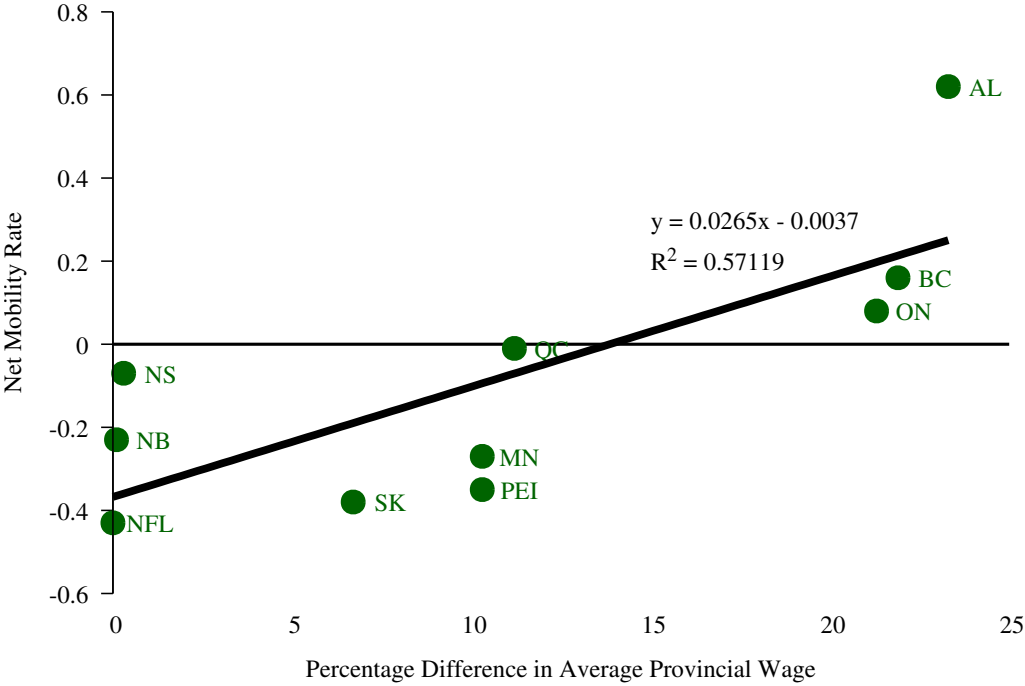


Figure 6: Net Mobility and Average Log Wage Across Provinces

⁷A similar analysis was conducted by Blanchard and Katz (1992) for interstate mobility in the U.S.

6 Wages of Future Out-Migrants

The question addressed in this section is: How do the wages of migrants into and out of Québec compare to those who remain in Québec? The analysis above shows that more highly educated individuals as well as younger individuals are more likely to move across provincial boundaries. These observations suggest the importance of comparing the wages of migrants to otherwise similar individuals rather than simply computing the raw differences in wages. In other words, the relevant question is: How much did a migrant out of Québec earn relative to otherwise similar peers who stayed in Québec?⁸

To answer this question, we adopt the following regression from [Borjas, Bronars, and Trejo \(1992\)](#) and [McLaughlin and Bills \(2001\)](#):

$$\log(\text{wage}_{itp}) = \beta X_i + \gamma^{\text{out}} \text{future-mover}_{itp} + \delta_p + \delta_t + \epsilon_{itp}. \quad (2)$$

In this equation, i indexes individuals within the sample, t denotes the year, and p indicates the province. X_i is a set of controls such as age, education, sex, marital status, living with children, Canadian-born, and immigration status. The term δ_p captures province-specific effects while δ_t is a year effect (capturing, for example, whether the Canadian economy is experiencing an expansion or a recession). The dummy variable `future-mover` is equal to 1 if individual i will move out of province p between year t and $t + 1$, and zero otherwise. Finally, ϵ_{itp} is a classical error term capturing variations in wage rates not accounted for by the explanatory variables.

The coefficient of interest is γ^{out} which measures how much higher (lower if negative) a migrant's wage is relative to otherwise identical individuals who remained in a particular province. [Table 3](#) summarizes the estimates of the parameter γ^{out} ; the remaining parameter estimates are suppressed in order to focus on the wage differential of inter-provincial movers.⁹

⁸[Borjas \(1987\)](#) is among the first to examine the selection of movers by wage, in the context of international migration. [Greenwood \(1997\)](#) contains the literature on self-selection and internal migration.

⁹Coefficient estimates and standard errors for all regressors can be found in a supplementary appendix.

Table 3: Pre-Move Wage Difference between Movers and Stayers Across Provinces

Province	All	Less Educated	More Educated	Young	Old
NFL	-0.015 (0.114)	0.532*** (0.096)	-0.067 (0.154)	0.275** (0.143)	-0.545*** (0.187)
PEI	0.042 (0.087)	0.310*** (0.096)	0.046 (0.102)	0.102 (0.104)	0.259** (0.118)
NS	0.187*** (0.056)	0.403*** (0.091)	0.127** (0.067)	0.213*** (0.062)	0.356*** (0.096)
NB	0.168*** (0.051)	0.286*** (0.078)	0.137** (0.071)	0.183*** (0.052)	0.249 (0.163)
QC	0.166*** (0.055)	0.368*** (0.098)	0.159** (0.07)	0.303*** (0.056)	0.149 (0.136)
ON	0.024 (0.046)	0.174** (0.079)	0.013 (0.06)	0.088* (0.053)	0.088 (0.103)
MN	0.066 (0.054)	-0.026 (0.083)	0.159** (0.067)	0.119* (0.063)	0.206* (0.114)
SK	0.072 (0.051)	0.070 (0.083)	0.077 (0.065)	0.166*** (0.053)	-0.027 (0.117)
AL	-0.024** (0.011)	-0.091*** (0.026)	0.061 (0.06)	-0.018 (0.057)	0.168 (0.121)
BC	-0.002 (0.06)	-0.026 (0.088)	0.045 (0.083)	0.075 (0.074)	-0.036 (0.114)

Notes: This table represents the pre-move wage difference between provincial movers and non-movers of the province from where out-migrants are moving out. The wages are those at the origin. For example, column 1 shows that on average, those who are going to leave Québec in the next year make 16 percent more than those who are going to stay in the province. The positive and significant coefficients indicate that the provinces are losing above average workers. Standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

6.1 All Workers

Looking across all workers, a typical migrant out of Québec earned 16.6% more than otherwise similar individuals who chose to remain in Québec. This effect is statistically significant at the 1% level, and economically large. Québec is not unusual in losing higher-than-average wage workers: 7 out of 10 provinces, including Québec, exhibit a similar pattern. The wage differential of Québec migrants is exceeded only by Nova Scotia (18.7%) and New Brunswick (16.8%), both of which have populations of less than a million.

As discussed earlier, the appropriate comparison is not between Québec and its smaller neighbors, but rather with its larger neighbor Ontario: both are located in central Canada (Nova Scotia and New Brunswick are in Atlantic Canada along with Prince Edward Island, and Newfoundland and Labrador); Ontario and Québec have the largest populations within Canada (13.6 million for Ontario, 8.2 million for Québec); and these two provinces have roughly similar industry mixes. While it is true that migrants out of Ontario earned 2.4% more than those who remained, this difference is much smaller than Québec’s 16.6% figure, and is statistically insignificant (meaning that at conventional levels of significance, there is no difference between the reported 2.4% and 0.0%).

6.2 Looking Across Education

Here, we dig deeper into the results, dividing the sample by educational attainment: “less educated” corresponding to workers with no more than a high school education, “more educated” to more than high school. By selecting samples that differ by education, we allow the differential in wages of migrants to differ across the two education groups.

The main reason for dividing the main sample by education is as follows. Earlier work by [Borjas et al. \(1992\)](#) and [McLaughlin and Bills \(2001\)](#) measured the wage gap between movers and stayers by considering Eq. (2) using the pooled sample (that is, not differentiating by either age or education). However, [Lkhagvasuren \(2014\)](#) showed that such pooling can conceal massive differences in the wage-mobility relationship between educational groups.

Lkhagvasuren also showed that estimating Eq. (2) separately for each educational group is important for quantifying the wage gap between movers and stayers.

Restricting the sample to less educated workers, the picture for most provinces, including Québec, is even worse. Less educated migrants from Québec earned 36.8% more than the peers they left behind, compared to 16.6% for the “all workers” sample; both coefficient estimates are highly statistically significant. It can be little comfort that migrants out of Newfoundland and Labrador (53.2%) and Nova Scotia (40.3) earned even more than similar non-migrants for those provinces. Nor can it be comforting that less educated migrants from Ontario earned 17.4% more than their peers who remained in Ontario.

Among more educated workers, Québec migrants earned a statistically significant 15.9% more than their peers – placing Québec in a tie with Manitoba for the largest effect. In contrast, migrants out of Ontario earned a scant 1.3% more than their non-migrating peer group – an effect that is statistically indistinguishable from zero.

6.3 Looking Across Age

Next, we look at migrant wage differential across age groups. As before, “younger” refers to individual aged 16 to 30 while “older” includes those aged 31 to 55. In this paper, we focus on employment-related moves. According to Ihrkel (2014), employment-related reasons are more frequent among long distance moves such as those considered in our analysis. Moreover, Lkhagvasuren (2012) finds that employment-related reasons sharply drop between 55 and 60 years of age. Therefore, to reduce the impact of mobility related to health and family related reasons among older workers we exclude workers above 55 years of age.

The typical young migrant from Québec earned 30.3% more than those who remained in Québec; see the second last column in Table 3. Within Canada, the next largest effect was recorded by Newfoundland and Labrador at 27.5%. The migrant wage differential for Ontario, 8.8%, is less than a third of that for Québec.

Among older workers, migrants from Québec earned 14.9% more than non-migrants,

although this effect is statistically not different from zero (see the last column of Table 3). Much larger and statistically significant effects are recorded for Nova Scotia (35.6%) and Prince Edward Island (25.9%), both with much smaller populations than Québec. Older migrants from Ontario earned 8.8% more than their peers, although again this effect is statistically insignificant. Newfoundland and Labrador is unusual in that its older migrants earned 54.5% *less* than those who stayed behind. While there is considerable uncertainty over this point estimate, the effect is nonetheless statistically highly significant.

7 Wages of Recent In-Migrants

Here, we measure the wages of migrants into a province relative to: (a) the wages of those in the destination province, and (b) the wages of the source province. We are able to say: (a) whether individuals moving into Québec (for example) earn more *in Québec* than those who are already in Québec; and (b) where in the distribution of wages in *other* provinces does Québec draw migrants from the rest of Canada.

To answer the first question, we run the following regression:¹⁰

$$\log(\text{wage}_{itp}) = \beta X_i + \gamma^{\text{in}} \text{in-migrant}_{itp} + \delta_p + \delta_t + \epsilon_{itp}. \quad (3)$$

As before, i indexes individuals within the sample, t denotes the year, and p indicates the province. X_i is again a set of controls including education, sex, marital status, living with children, Canadian-born, immigration status and a quartic polynomial of age of person i . The term δ_p captures province-specific effects while δ_t is again a year effect (capturing the state of the business cycle within Canada as a whole). The variable in-migrant_{itp} is a dummy variable equal to 1 if individual i recently moved into province p in between years $t - 1$ and t or zero otherwise. Once more, ϵ_{itp} is a classical error term capturing variations in wage rates not accounted for by the explanatory variables.

¹⁰A similar regression is considered by [Borjas et al. \(1992\)](#) for regional mobility in the National Longitudinal Survey of Youth (NLSY) and by [McLaughlin and Bils \(2001\)](#) for sectoral mobility in the Panel Study of Income Dynamics (PSID).

The coefficient of interest is γ^{in} which measures how much higher (lower if negative) a recent in-migrant’s wage is relative to otherwise identical incumbent workers of a particular province. Table 4 summarizes the estimates of the parameter γ^{in} ; the remaining parameter estimates are suppressed in order to focus on the wage differential of inter-provincial movers.¹¹

7.1 Main results

In somewhat plainer language, Table 4 compares the post-move wages of recent migrants to, say, Québec to the wages of those already in Québec, controlling for observable characteristics that affect individual mobility (age, sex, and so on). Here, focus on the column labeled “All”. Table 4 reveals that recent migrants to Nova Scotia, New Brunswick, Québec and Ontario earn at least 10% more than workers already in those provinces, and that these differences are statistically highly significant. The negative coefficient for B.C. indicates that recent migrants to B.C. from other Canadian provinces earn slightly less than otherwise similar workers in that province, although this effect is statistically insignificant.

Whereas Table 3 painted a rather bleak picture in which Québec loses high quality (i.e., high wage) workers, that in Table 4 is decidedly brighter. Overall, migrants out of Québec earned 16.6% more than their peers; in-migrants earn 19.1% more than otherwise similar workers already in Québec. While the point estimates suggest a small gain in worker quality, the difference is statistically insignificant.

The experiences of Nova Scotia and New Brunswick mirror that of Québec: All three provinces lose high quality workers to other provinces while simultaneously attracting high quality workers from other provinces. Alberta, on the other hand, loses below-average workers while gaining above-average ones. Observations like these point to the importance of studying the determinants of gross mobility rather than net.

How does Québec’s experience compare to Ontario, its neighbor and most similar of other provinces? From Table 3, Ontario loses somewhat above-average workers to other provinces

¹¹Coefficient estimates and standard errors for all regressors can be found in a supplementary appendix.

(a wage differential of 2.4%, although statistically insignificant), while it attracts workers of decidedly higher quality (a statistically significant 10.6%). In brief, inter-provincial migration leads to higher worker quality in Ontario, but not much change for Québec.

Table 4: Post-Move Wage Difference Between Movers and Stayers Across Provinces

Province	All	Less Educated	More Educated	Young	Old
NFL	0.134 (0.101)	0.696*** (0.103)	-0.023 (0.125)	0.198* (0.124)	0.201 (0.133)
PEI	0.066 (0.148)	0.210** (0.075)	0.097 (0.149)	0.201 (0.166)	0.290 (0.195)
NS	0.177*** (0.048)	0.365*** (0.083)	0.200*** (0.063)	0.283*** (0.054)	0.205** (0.111)
NB	0.194*** (0.065)	0.357*** (0.100)	0.207*** (0.081)	0.270*** (0.064)	0.361** (0.175)
QC	0.191*** (0.032)	0.352*** (0.058)	0.203*** (0.051)	0.321*** (0.044)	0.236*** (0.084)
ON	0.106*** (0.034)	0.114* (0.062)	0.183*** (0.042)	0.110*** (0.037)	0.350*** (0.086)
MN	0.044 (0.061)	0.088 (0.094)	0.116 (0.076)	0.164*** (0.062)	0.041 (0.159)
SK	0.064 (0.071)	-0.103 (0.108)	0.206*** (0.082)	0.097 (0.084)	0.075 (0.178)
AL	0.050* (0.031)	0.171*** (0.050)	0.018 (0.042)	0.105*** (0.036)	-0.027 (0.071)
BC	-0.011 (0.061)	0.099 (0.094)	-0.029 (0.079)	0.019 (0.070)	0.035 (0.117)

Notes: This table represents the post-move wage difference between in-migrants and incumbent non-movers of the province where the in-migrants are moving in. The wages are those at the destination. The positive and significant coefficients indicate that the provinces are losing above average workers. Standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

7.2 Educational composition

Earlier, we found that among less educated workers (those with at most a high school education), migrants out of Québec earned 36.8% more than those who remained in Québec.

Table 4 shows that Québec simultaneously attracts low education workers who, after moving to Québec, earn 35.2% more than similar workers in Québec. Among higher educated workers, Québec attracts workers who end up earning 20.3% more than similar workers in Québec; at the same time, it loses workers who earned 15.9% more than their peers – a slight and statistically insignificant gain.

Again, it is instructive to contrast the experience of Québec with that of Ontario. Among less educated workers, Ontario loses on net: out-migrants earned 17.4% more than their peers while in-migrants will earn 11.4% more – a difference of 6 percentage points. However, looking at more educated workers, Ontario decidedly gains: in-migrants end up earning a statistically significant 18.3% more than similar peers while out-migrants earned a statistically insignificant 1.3% more. From these observations, one can conclude that while both Ontario and Québec attract high wage, educated workers, Ontario is more successful than Québec in keeping such workers. Keeping in mind the higher migration rates for more educated workers reported in Figure 2, and the fact that more educated workers earn, on average, more, these differential experiences of Québec and Ontario among more educated workers have greater economic consequences which favor Ontario rather than Québec.

In many ways, Québec’s migration patterns by education mirror those of the Atlantic provinces. All simultaneously lose and attract high quality, less educated workers. Among such workers, Newfoundland and Labrador, Prince Edward Island and Nova Scotia attract higher quality workers than they lose; the opposite is true of New Brunswick and Québec. Looking at more educated workers, all but Newfoundland and Labrador attract higher quality workers than they lose. It can be of cold comfort that the quality of workers attracted to Newfoundland and Labrador are “less bad” than the workers who leave (in-migrants earn, on average, 2.3% less than incumbents while out-migrants earned 6.7% less).

Another interesting case is Alberta: Among less educated workers, it attracts higher quality workers (wages 17.1% higher) while losing lower quality workers (earned 9.1% less). Among more educated workers, the quality of those leaving Alberta is higher than those

leaving (6.1% compared to 1.8%), although these estimates are statistically insignificant.

7.3 Age Decomposition

The last two columns of Table 4 uses the same age grouping as before. For both younger and older workers, Québec attracts workers who end up in the top half of the wage distribution: The typical young in-migrant ends up earning 32.1% more than similar workers already in Québec; for older workers, 23.6% more. In both cases, the differences in wages is highly statistically significant. Once again, the facts reported in Table 4 more than offset the facts, reported in Table 3, that Québec loses high quality young and old workers.

Both Ontario and Québec attract migrants who earn more than existing workers. However, among young migrants, Québec does much better than Ontario: 32.1% higher wages versus 11.0% for Ontario. On the other hand, older migrants to Ontario earn 35.0% more than similar workers, compared to 23.6% for Québec. To the extent that older workers tend to earn more than younger ones, Ontario's performance with respect to older workers tends to brighten its financial situation; Québec's superior experience with younger workers, not so much.

Among the remaining provinces, Québec in-migrants' subsequent relative wages most resembles those of the Atlantic provinces. All of these provinces attract workers – young and old – who go on to earn substantially more than otherwise similar workers in those provinces. In all cases, this ability to attract relatively high quality workers largely offsets their losses of relatively high quality workers reported in Table 3

8 Who is moving between Ontario and Québec?

This section introduces two more wage-based measures of migrant quality. To understand these additional measures, first think about migrants from Québec. As already discussed, such migrants typically come from the upper half of Québec's wage distribution (on average,

they earned more than similar peers in Québec). Here, we ask: Where in the wage distribution do migrants from Québec end up in the province that they migrate to? To sharpen the focus of this analysis, we concentrate on migrants between Ontario and Québec, again motivated by their similarity in size and overall economic conditions, and by the fact that Ontario is a popular destination for migrants out of Québec; see Table 1.

The first line in Table 5 measures the typical wage of a migrant from Québec relative to similar workers in Québec; this line is comparable to the results previously reported in Table 3 except that, here, we focus only on migrants between Ontario and Québec. Such migrants from Québec earned 22.4% more than similar peers in Québec. The second line in Table 5 gives the new result. It shows that the typical migrant from Québec to Ontario earns, in Ontario, 9.5% more than similar workers in Ontario. This confirms our earlier finding that migrants from Québec are, on average, high quality.

Next, our earlier results showed that migrants into Québec tend to earn more than similar workers in Québec. The second new measure of migrant relative wages asks: Did the typical migrant from Ontario to Québec earn an above-average wage in Ontario? As shown on the third line of Table 5, such migrants earned 9.3% more than their peers in Ontario. Line four shows that such individuals earn 23.2% more in Québec than similar workers in Québec; this is the counterpart to the results presented for migrants into Québec from all provinces, reported in Table 4.

How do we reconcile the fact that the typical migrant from Québec to Ontario earned 22.4% more than the average in Québec, but ‘only’ 9.5% more, on average, in Ontario? After all, we are looking at exactly the same migrants. The answer lies in the average wages in the two provinces: The average wage in Ontario is 9.1% higher than in Québec; see Figure 6.¹²

These differences in pre- and post-move wages yield interesting insights. To put some numbers on these calculations, suppose that a ‘typical’ worker in Québec earns \$50,000.

¹²On average, workers in Ontario earn 21.3% more than the Canadian average while those in Québec earn 11.2% more. From these figures, one finds that average income in Ontario is $1.214 \div 1.112 = 1.091$ or 9.1% higher than in Québec.

Table 5: Mover-Stayer Wage Gap for Labour Flows Between ON and QC

	all	less educated	more educated
<i>Movers from Québec to Ontario</i>			
Pre Move Wage Difference	0.224*** (0.070)	0.391*** (0.128)	0.225*** (0.081)
Post Move Wage Difference	0.095 (0.068)	0.211* (0.118)	0.096 (0.085)
<i>Movers from Ontario to Québec</i>			
Pre Move Wage Difference	0.093 (0.065)	0.058 (0.045)	0.162 (0.111)
Post Move Wage Difference	0.232*** (0.064)	0.338*** (0.145)	0.258*** (0.094)

Notes: This table represents the post-move wage difference between in-migrants and incumbent non-movers of the province where the in-migrants are moving in. The wages are those at the destination. The positive and significant coefficients indicate that the provinces are losing above average workers. Standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

Keep in mind that all of the results presented in Table 5 account for observable differences in workers, and so this hypothetical annual income of \$50,000 also controls for these differences. Since incomes in Ontario are 9.1%, we assume that a ‘typical’ worker in Ontario earns \$54,541 (= \$50,000 plus 9.1%). From the top half of Table 5, we find that the typical migrant from Ontario to Quebec was earning \$61,200 in Québec (that is, 22.4% more than otherwise similar workers in Québec who, recall, earned \$50,000), and \$59,723 in Ontario (9.5% more than otherwise similar workers in Ontario who earn \$54,541). Put together, it seems that such a migrant takes a 2.4% wage *cut*.

We can use the results in the bottom half of Table 5 to run our example for migrants from Ontario to Québec. Using the same ‘typical’ provincial incomes as above, the migrant from Ontario to Québec earned \$59,614 in Ontario (9.3% more than the \$54,541 earned by similar workers in Ontario), and \$61,600 in Québec (that is, a premium of 23.2% over similar Québec workers). This translates into a 3.3% wage gain.

That the typical Ontario to Québec migrant enjoys a 3% wage hike is easy to understand: Moving involves not only monetary costs, but a variety of non-monetary costs (developing a new network of friends, buying and selling a house, settling children into new schools, and so on). Migrants need to be compensated for these costs, and higher wages is the chief means of doing so. As well, migrants may self-select into jobs for which they are a better match, and so earn higher wages. The wage cut taken by the average migrant from Québec to Ontario is more difficult to understand. To be sure, it is difficult to reject the notion that migrants simply like the province that they move to. However, while such a consideration can explain why the average Québec migrant to Ontario accepts lower wage, it does not explain the wage increase for the average migrant from Ontario to Québec.

There is a simpler explanation that starts with the observation that the data reports pre-tax wages. It is well known that Québec’s tax burden is higher than that of Ontario. Four online income tax calculators were used to compute after-tax income for the hypothetical migrants discussed above. As reported in table 6, the estimates for the pre-move after-tax

income of a migrant from Québec to Ontario ranges from \$43,446 (SimpleTax) to \$46,888 (H&R Block). Perhaps more important are the pre- versus post-move after tax incomes. Before accounting for taxes, a migrant from Québec to Ontario experiences a 2.4% fall in income; on an after-tax basis, such an individual sees higher income (ranging from 3.2% to 4.7%).

Table 6: After-tax Incomes

	Québec	Ontario
Pre-move, pre-tax	61200	59614
SimpleTax	43446	45401
EY	46671	48703
H&R Block	46887.52	48290.79
TurboTax	43824	45377
Post-move, pre-tax	59723	61600
SimpleTax	45477	43698
EY	48780	46923
H&R Block	48367.47	47139.05
TurboTax	45454	44076
Percentage difference, pre-tax	-2.41	3.33
SimpleTax	4.65	-3.75
EY	4.52	-3.65
H&R Block	3.16	-2.39
TurboTax	3.72	-2.87

Notes: After-tax incomes were computed using income tax calculators for several on-line tax preparation services. The only entries used were “Province of residence” and “Employment income”.

While these tax considerations can make sense of the decision to move from Québec to Ontario, it presents problems for the reverse pattern. In particular, the migrant who saw a 3.3% pre-tax income gain suffers a fall in after-tax income ranging from 2.4% to 3.8%.

9 Contributions to the Mobility Literature

Relative to Canada, there is a much larger literature looking at U.S. inter-state migration and mobility. [Borjas et al. \(1992\)](#) was among the first to analyze the mover-stayer wage

gap using panel data for the U.S. They found that, on average, wages of movers fall below the average of incumbent workers in their destination. Specifically, they found that after controlling for observable characteristics, newcomers' wages are, on average, 3–10% below those of observationally identical local workers. These findings support the notion that human capital is location specific, meaning that local workers have more location-specific skills than new in-migrants.

More recently, [Lkhagvasuren \(2014\)](#) re-examined the earlier findings of [Borjas et al. \(1992\)](#). [Lkhagvasuren](#) pointed out that the earlier work maintained a strong assumption of common age-earning profiles across educational groups. He estimated the wage gap between movers and stayers in the same way as [Borjas et al.](#), but separated the sample into different education groups. [Lkhagvasuren](#) found a negative mover-stayer wage gap only among lower educated workers. For better educated workers, the mover-stayer wage gap is positive. This new finding led him to consider a multi-region model in which mobility is influenced by both a wage shock as well as a shock to the cost of moving. [Lkhagvasuren](#) showed that the magnitude of the moving cost relative to location-specific wage variation is key to understanding the wage gap between movers and stayers. This finding is consistent with an earlier conjecture of [Heckman, Layne-Farrar, and Todd \(1996\)](#) that high skilled labor trades in a national market while there are relatively few differences in regional labor markets for less skilled workers.

This report presents new evidence on wage gaps of movers and stayers for Canada. Interestingly, the wage gap is positive for workers with either high or low educational attainment. Indeed, the wage gap for less educated workers often exceeds that of those with higher levels of education. For Québec, Nova Scotia and New Brunswick, the wage gaps for less educated workers exceeds 35%; for Newfoundland and Labrador, the figure is nearly 70% (these wage gaps are all highly statistically significant).

Think through these results using the framework developed in [Lkhagvasuren](#): individuals move across regions when the difference in their lifetime income from moving exceeds the cost of moving. Consequently, the large, positive wage gaps between movers and stayers

in Canada suggest that inter-provincial movers incur high moving costs. This conclusion is consistent with the observation that Canadian labor mobility is lower than that of the U.S. Put differently, understanding differences in mobility in Canada versus the U.S. will likely entail accounting for differences in moving costs across the two countries. Since high moving costs inhibit moving, governments in Canada may wish to do more to subsidize moving within Canada in order to promote a better match between worker skills and job requirements.

A further contribution of our paper is to measure wage differences of movers relative to not only similar workers in their destination (as in [Borjas et al. \(1992\)](#)) but also relative to their province of origin. We are able to measure wage differences of movers relative to their place of origin because we are using a high frequency data set (SLID) whereas exiting work has mainly used cross-sectional data which only allows these earlier works to look at post-move relative wages. From the Québec perspective, the pre-move wage is of interest since it tells us the characteristics of the workers Québec loses. Of course, we also measure the relative wages of the workers that Québec gains.

10 Summary

This report documented a number of facts concerning Canadian inter-provincial migration. First, in any given year, there are considerable flows of workers in and out of any given province. Gross mobility – the average of the in- and outflows – averages 1.1% for Canada as a whole. Among Canadian provinces, Québec has the lowest gross flow at 0.3% per year. Net mobility – inflows less outflows – is much lower, but obscures the fact that workers are simultaneously moving into and out of the same province. Younger workers were found to be more mobile than older workers, and more educated workers more mobile than the less educated.

Second, we document new facts concerning the ‘quality’ (average wage) of inter-provincial

migrants. In any given year, almost all provinces simultaneously lose and attract workers who are above-average. For example, relative to otherwise similar workers in Québec, migrants out of Québec earned 16.6% more than those who stayed; migrants into Québec, 19.1% more than similar workers in Québec. While the specific numbers differ, these facts are robust to splitting the population by either age or education.

Third, we measured relative wages of migrants between Ontario and Québec. The focus on these two provinces is motivated by their geographic proximity, reasonably similar population and geographic sizes (the remaining provinces are considerably smaller), and the fact that much of the migration in and out of Québec is with Ontario. Relative to similar workers in Québec, migrants to Ontario earned 22.4% more; migrants from Ontario, 23.2% more. The new information from this analysis is that Québec draws from Ontario workers who earned 9.3% more than similar workers in Ontario, while migrants from Québec to Ontario earn 9.5% more than similar workers in Ontario. By any of these metrics, migrants between Québec and Ontario are above-average income earners. Some back-of-the-envelope calculations suggest that migrants from Québec to Ontario experience an average 2.4% fall in income; migrants in the other direction earn, on average, 3.3% more. We investigated whether these differences in average wages is due to differences in the relative tax burdens in the two provinces. Accounting for taxes, migrants from Québec to Ontario receive 3.2 to 4.7% more after moving while those moving from Ontario to Québec earn 2.4 to 3.8% less. That migrants from Ontario to Québec earn less, after tax, than they would have staying in Ontario suggests that there are factors other than simple monetary ones that influence inter-provincial migration.

One reading of our results is that, overall, Québec gains from inter-provincial migration: the typical out-migrant earned 16.6% more than similar workers in Québec while the typical in-migrant earns 19.1% more – a gain of 2.5%. Given the challenges in funding important social programs like health and elder care as well as financing education, it would be better to

ask: Could Québec be doing better? In other words, could Québec keep more of the above-average workers who move out of the province, and attract more above-average workers from other provinces? The comparison with Ontario suggests that it is, in principle, possible: Migrants out of Ontario earn 2.4% more than otherwise similar workers while migrants in earn 10.6% more.

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