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Inter-Jurisdictional Retirement in Canada

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Cette étude est la première qui porte sur la retraite interprovinciale au Canada, expression qui renvoie au fait de travailler dans un territoire de compétence donné, province ou territoire, et de s'installer à la retraite dans un autre territoire de compétence. En appliquant une méthode d'étude de l'évènement à des données administratives qui s'étendent de 1982 à 2018, je montre que la probabilité de déménager d'un territoire de compétence à un autre double à la retraite. Ce mouvement est probablement le fait de jeunes contribuables ayant un niveau de revenus supérieur, qui déménagent pendant leurs années d'activité professionnelle pour occuper des emplois à salaire élevé et ont le loisir, plus tard, de prendre une retraite précoce dans leur province ou territoire d'origine. Les provinces de l'Atlantique et la Colombie-Britannique sont des bénéficiaires nettes de retraites interprovinciales, alors que toutes les autres sont des contributrices nettes. Il existe par conséquent une asymétrie entre le lieu où les gens travaillent et paient leurs impôts, et le lieu de leur retraite.

Mots clés : retraite, revenu de pension, mobilité, étude d'évènement, Banque de données administratives longitudinales

I provide the first look at inter-jurisdictional retirement in Canada, which refers to working in one jurisdiction but moving to another at retirement. Using administrative data from 1982 to 2018, I find that the likelihood of moving jurisdictions doubles at retirement, using an event-study design. This effect is driven by younger and higher-income tax filers who likely moved during their working years for high-paying jobs and could afford to retire earlier and move home. The Atlantic provinces and British Columbia are net recipients of inter-jurisdictional retirees, whereas all others are net donors. Hence, there is asymmetry between where people work and pay taxes before retirement and where they live after retirement.

Keywords: retirement, pension income, mobility, event study, Longitudinal Administrative Databank

Introduction

Over the past few years, significant efforts have been made to better understand inter-jurisdictional employment in Canada (Laporte and Lu 2013; Bonikowska and Schellenberg 2014). Such employment may occur, for example, among rotational workers in the oil sector who work in Alberta but maintain primary residence in Atlantic Canada. The demand for information about the flow of employees and migrants across jurisdictions is great enough that Statistics Canada now produces official estimates of such behaviour.¹

A related issue that has received considerably less attention is the extent to which inter-jurisdictional retirement occurs—that is, holding a career in one jurisdiction but moving to another at retirement. For example, Canadians who move to large urban centres when they are young may decide to move back home in another province or territory to retire near family. Figure 1 shows that roughly 10 to 20 percent of all in-migrants in selected

provinces are around retirement age (aged 55–71 years), and this ratio has increased over time commensurate with population aging. This behaviour has implications for the optimal provision of provincially funded services, because regions with net out-migration of retirees collect tax revenues during their working years and also avoid the rising costs of providing health care to elderly individuals.

The goal of this study is to offer a first look at the extent to which such behaviour occurs in Canada. In contrast with inter-jurisdictional employment, there is no standard definition of inter-jurisdictional retirees; hence, this study is an exploratory analysis of whether retirement and mobility are interconnected and whether there are potential asymmetries in the flow of retirees across regions that warrant further consideration for policy.

The study is based on an analysis of Statistics Canada's Longitudinal Administrative Databank (LAD) from 1982 to 2018. The LAD is ideal because it consists of a 20 percent sample of T1 tax records and contains detailed information

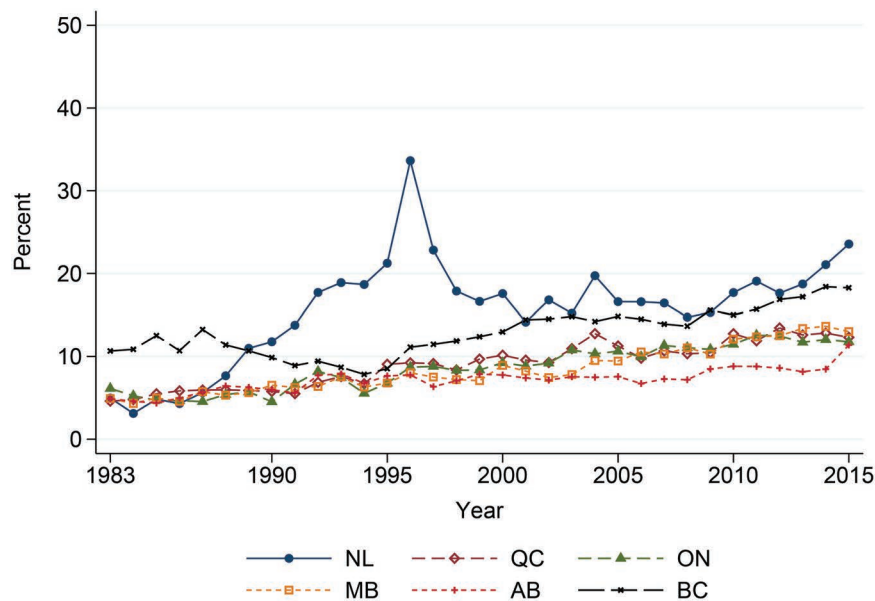


Figure 1: Percentage of Inter-Jurisdictional In-Migrants Aged 55–71 Years for Selected Provinces

Notes: This figure plots the percentage of in-migrants into selected provinces aged 55–71 years relative to the total number of in-migrants in the same province and year.

Source: Statistics Canada, Longitudinal Administrative Databank.

needed to track the location of residence of the individuals represented as well as their labour earnings and income from other sources—including pensions—for inferring retirement.

I estimate the effect of retiring on inter-jurisdictional mobility in an event-study design, which compares the probability of moving for a treatment group of retirees with that of a control group of tax filers of a similar age who either did not retire during the sample period or who retired at a later time. In this sense, my estimates are “quasi-causal” insofar as the effect of retiring on mobility can be reasonably well identified if the control group is selected properly to draw comparisons between the two groups. Retirement is an endogenous life event, so centering the analysis on retirement transitions is not truly causal, but this event-study approach nevertheless provides relevant information about how often and when inter-jurisdictional mobility occurs relative to the time of retirement.

The baseline results of this analysis indicate that retirement increases the likelihood of moving across jurisdictions by about 0.4 percentage points, which is small in absolute value but represents a doubling of migration over the base rate. This behaviour is driven primarily by tax filers who are younger and higher income. In contrast, age and marital status are not found to be significant determinants of inter-jurisdictional retirement.

Second, I explore the extent to which inter-jurisdictional retirement is affected by energy and petroleum price shocks. This is a natural question to explore because oil price shocks have been found to affect inter-jurisdictional

employment and mobility (Morissette and Chan 2016), given the large worker flows into oil-producing provinces that occur. Hence, it is possible that these shocks also affect the older workers’ decisions of when to retire and relocate. In contrast to the related literature, my exploratory analysis does not find evidence that price shocks for tax filers in oil-producing provinces affect such behaviour.

Last, further exploiting the dataset’s longitudinal design, I consider where inter-jurisdictional retirees lived before versus after retiring and their community attachment. I find that Atlantic Canada and British Columbia tend to be net recipients of retirees, whereas all other jurisdictions tend to be net donors. Although the flow of retirees across jurisdictions each year is small, this migration likely makes up a larger share of net migration, particularly for small jurisdictions such as those in Atlantic Canada. On average, about half of all inter-jurisdictional retirees lived in only one location during the ten years leading up to retirement, suggesting that there is an asymmetry between where individuals live and pay taxes during their working years and where they retire and rely on publicly funded services such as health care. These findings have implications for the evaluation of inter-jurisdictional transfers in a dynamic context, which I discuss in more detail in the final section of the article.

This paper proceeds as follows. In the next section, I describe the data, sample selection, and empirical methodology used. I then present the main results and robustness checks for the effect of retiring on mobility.

Next, I estimate the effect of energy and petroleum price shocks on inter-jurisdictional retirement and assess the location of residence of inter-jurisdictional retirees before versus after retirement and their community attachment. Last, I conclude with a summary of the findings and a brief discussion about the magnitude of the effects relative to total versus net in-migration.

Data and Methodology

In this section, I begin by describing the dataset and sample selection restrictions used in the analysis. Then, I discuss how retirement is identified in the data and my approach to estimating its effects on income and mobility.

Data and Sample Selection

This study is based on an analysis of Statistics Canada's LAD for the years 1982 to 2018. The LAD is a panel dataset of T1 tax records derived from the Canada Revenue Agency for a 20 percent sample of tax filers, augmented annually with new tax filers to maintain national representativeness over time. The LAD contains detailed information about the tax filers represented, including their demographics, labour earnings, income from all taxable sources, and tax liabilities and transfers.

The LAD is an ideal dataset for this study for two reasons. First, it contains variables for province or territory of residence at the end of the calendar year and the amount of taxable labour earnings and pension income from public and private plans received during the year. This allows me to identify retirements as reflected by a change in composition of income over time, as well as to identify inter-jurisdictional mobility based on a change in province or territory of residence over time. Second, the wide time interval makes it possible to observe where inter-jurisdictional retirees worked and lived in the years leading up to retirement.

I restrict the analysis to individuals aged 55–71 years at the time of retirement. I chose this age range because individuals can typically begin to collect pension income from private plans when they turn 55, and individuals must begin drawing income from Registered Retirement Savings Plans by the end of the year in which they turn 71. As discussed later, the event-study analysis considers the evolution of income and mobility from five years before retirement to five years after retirement, for a total event-time of 11 years, including year zero (i.e., the year of retirement). Thus, in the event-study analysis, I restrict the sample to individuals aged 49–77 years so that they fall in the desired age range in the year they retired. In addition, I exclude individuals with zero or negative total after-tax income in the tax year because the focus of analysis is on retirements as evidenced by changes in the composition of income over time.

A limitation of the LAD is that it does not include province or territory of birth because the information derives

from T1 tax records, and this information is not collected. This would be an interesting variable to exploit to assess whether people who retire tend to move back to the region where they were born. Unfortunately, this is not possible here, but future work could exploit linkages between T1 tax records and Census data to explore this issue.

Table 1 reports descriptive statistics for the full and restricted samples. More precisely, the first two columns characterize all tax filers in the LAD, and the second two columns pertain to tax filers aged 55–71 years with strictly positive after-tax incomes. On average, in the full sample, tax filers are aged about 45 years, 52 percent are female, and 57 percent are married or in common-law relationships. The table also reports the distribution of tax filers across regions, as well as the probability of having income from various sources and the average amount of income conditional on receiving a positive amount from each source. For example, in the full sample, 70 percent of tax filers have labour earnings, and the average value of labour earnings is \$35,300. In the restricted sample, the distribution of tax filers across provinces remains mostly unchanged but, as a result of the age restriction being imposed, the average age is much greater. Tax filers in this sample are also more likely to be married and to receive pension income and less likely to have labour earnings than the full sample. Conditional on being employed, the average value of labour earnings is higher in the restricted sample because earnings typically increase with age. The average value of public pension income among recipients is the same across samples, although private pension income is higher in the restricted sample.

Identifying Retirement Transitions

In contrast with survey data, which contain subjective indicators of retirement status based on respondents' self-declarations, T1 personal income tax data do not provide a direct objective or subjective measure of retirement status.

In this study, I exploit the rich set of income variables and longitudinal design of the LAD to identify retirement based on a change in the composition of earnings over time. Specifically, I determine that a person has retired if one of two events (or both) occur. The first event is a sudden take-up of pension income from the Canada Pension Plan, Quebec Pension Plan, or a private plan when no income from these sources was received in any previous year. Old Age Security is not considered because this is a demogrant payment individuals start to collect when they turn age 65 and is not a strong predictor of labour market attachment. The second event is a drop in labour earnings of 50 percent or more followed by take-up of pensions in the following year.

This definition allows for the possibility that an individual may separate from their job and move jurisdictions but delay receiving pension benefits until the following year, after settling into their retirement situation and new home. This may commonly occur for workers who retire in

Table 1: Descriptive Statistics

Characteristic	Mean (SD)					
	Full Sample		Restricted Sample		Inter-Jurisdictional Retirees	
	(1)	(2)	(3)	(4)	(5)	(6)
Demographics						
Age, y	45.4	18.0	62.3	4.8	61.3	3.5
Female, %	51.5	50.0	49.5	50.0	46.6	49.9
Married or common-law, %	56.8	49.5	69.8	45.9	66.9	47.1
Region, %						
Atlantic Canada	7.7	26.6	7.8	26.9	18.0	38.4
Quebec	24.6	43.0	25.4	43.6	7.4	26.2
Ontario	37.7	48.5	37.6	48.4	19.8	39.9
Prairies	16.9	37.5	15.5	36.2	22.6	41.8
British Columbia	12.7	33.3	13.3	33.9	28.7	45.2
Territories	0.5	7.3	0.3	5.9	3.4	18.2
Sources of income, %						
Labour earnings	70.0	45.8	53.2	49.9	61.9	48.6
Public pension	19.3	39.5	50.2	50.0	59.3	49.1
Private pension	12.3	32.8	31.0	46.2	41.8	49.3
Conditional income, \$						
Labour earnings	35,300	76,500	40,700	116,600	38,700	124,100
Public pension	5,600	3,200	5,600	3,100	4,200	3,200
Private pension	15,400	20,900	17,400	19,500	16,600	21,000

Notes: Labour earnings includes the sum of employment and self-employment income. Conditional income refers to the average value of income (rounded to the nearest \$100) conditional on the amount being strictly positive. The estimates for inter-jurisdictional employees are based on data from Event-Times 0, 1, and 2. Atlantic Canada = Newfoundland and Labrador, Prince Edward Island, Nova Scotia, and New Brunswick; Prairies = Manitoba, Saskatchewan, and Alberta; Territories = Nunavut, Northwest Territories, and Yukon Territory.

Source: Statistics Canada, Longitudinal Administrative Databank.

the second half of a calendar year, especially because housing markets tend to clear gradually during the summer months. In the next section, I show how labour earnings and pension income evolve over time for retirees and find that this definition performs on average.

The last two columns of Table 1 summarize tax filers in this sample who are identified to be inter-jurisdictional retirees (which I define later in the article but consider briefly here for comparative purposes). These tax filers have similar demographic and conditional incomes as those reported for the restricted (i.e., retired) sample but are much more likely to reside in Atlantic Canada and British Columbia and to have higher labour market attachment. The strong labour market attachment is attributed to how retirement is identified in the tax data on the basis of a change in labour earnings, discussed later.

Empirical Model

The goal is to estimate the extent to which retiring is linked to the decision of tax filers to migrate across jurisdictions in Canada. To this end, denote by M_{it} as an indicator variable for whether individual i at time t lives in a different

jurisdiction than at $t - 1$ and continues to live in their new jurisdiction at $t + 1$. This three-period definition of migration is similar to the approach for identifying inter-jurisdictional employees.

Individuals who retire during the sample period comprise the treatment group. All others who satisfy the age and income restrictions to be included in the study but are never observed retiring comprise the control group. Let t_i^R denote the retirement year for individual i . If an individual appears to retire more than once, such as by re-entering and then exiting the workforce, then t_i^R is taken to be the first time retiring is observed. Then, $e_{it} = t - t_i^R$ is the event-time relative to the retirement year. The statistical model is as follows:

$$M_{it} = \mu_i + \rho_t + \sum_{\tau=\tau_1}^{\tau_2} \delta_k 1(e_{it} = \tau) + X'_{it} \theta + \varepsilon_{it}. \quad (1)$$

The term $1(\cdot)$ is an indicator function. Hence, estimation of the δ coefficients informs how the likelihood of migration evolves around the time of retiring. I focus the analysis on five years before and after retirement, that is, $\tau_1 = \tau_2 = 5$. The model accounts for individual and year fixed effects,

as reflected by the parameters μ_i and ρ_i , respectively, so that identification is based on within-person variation over time. I impose that $\delta_2 = 0$ so the treatment effects are expressed relative to a base likelihood at event-time -2 .

The variable X_{it} is a vector that controls for marital status and a cubic polynomial in after-tax income. Because the model is estimated with individual fixed effects, marital status is identified by changes that occur over time, capturing the effects of various life shocks, such as marriage dissolution or widowhood. Last, ε_{it} is the statistical residual. The model is estimated with clustered standard errors by jurisdiction and year because the variation of interest is mobility across provinces for different cohorts of retirees. The unit of analysis is the individual but clustering at this level produces smaller (less conservative) standard errors.

Although the focus of analysis is on migration decisions, Equation (1) can also estimate how labour earnings or pension income evolve around the time of retirement by replacing the dependent variable M_{it} with these other outcomes of interest.

Retiring and Mobility

In this section, I present the baseline estimates and robustness checks for the effects of retiring on inter-jurisdictional mobility. Before doing so, however, I consider the extent to which my approach to identifying retirement in the tax data is successful at generating trends in labour earnings and pension income that are consistent with a retirement transition.

Income Trends

Figure 2 begins the analysis of income trends by plotting the probability of having any labour earnings in the year and the average value of labour earnings, in Panels (a) and (b), respectively. More precisely, these event-study plots derive from estimates of Equation (1) but use the labour market outcomes as the dependent variables. The dots in the figure are the δ coefficients, and the bars around the dots are the 95 percent confidence intervals.

Figure 2 shows that employment and earnings for the treatment group are relatively constant compared with those for the control group in the years leading up to retirement, with estimates of the δ coefficients that hover around zero (expressed relative to δ_2). However, in the post-treatment period, employment falls by nearly 30 percentage points, and average earnings falls by more than \$20,000 within the first two years. The gradual adjustment is expected, given that the tax data report earnings for the full year. For example, a tax filer who begins collecting pension income midway through the year will be identified as both employed and retired in that year.

Reported in brackets on the y-axis is the mean of the dependent variable at event-time -2 for the treated group. On average, 80.2 percent of the treated group were

employed and earning an annual salary of \$36,383 two years before retiring. This implies that approximately half of tax filers exited the labour market completely, and mean earnings fell by 55 percent within two years of retiring. Some continued labour market attachment after retiring is consistent with previous studies on post-retirement employment and partial retirement (Bonikowska and Schellenberg 2014; Messacar and Kocourek 2019; Schellenberg, Turcotte, and Ram 2005).

Similarly, Figure 3 plots event-study estimates of the effect of retiring on pension income and the pension income ratio in Panels (a) and (b), respectively. The pension income ratio is the fraction of total after-tax income deriving from pensions. For reasons described earlier, pension income from Old Age Security is excluded. These results show smooth and flat trends in the pre-treatment period but sharp increases in the first few years thereafter. Specifically, pension income rises to about \$12,000, and the pension income ratio approaches 50 percent, on average.

Taken together, although these results are largely driven mechanically by how I define retirement in the tax data, they show that employment and income behave predictably around the event time. Older tax filers who did not retire in the sample period or who retired at a later date are a reasonable control group for this analysis, as evidenced by the lack of pre-trends.

Inter-Jurisdictional Mobility

The main findings for how retirement leads to inter-jurisdictional mobility are presented in Figure 4. This corresponds to direct estimation of Equation (1) with the mobility indicator as the dependent variable and controlling for individual and year fixed effects. The analysis shows very smooth and flat pre-trends hovering at zero in the pre-treatment period, which further suggests that the treatment effect is well identified, and older tax filers who did not retire during the sample period are a reasonable control group. However, two years after retiring, the likelihood of migration is 0.4 percentage points higher for the treatment group relative to the control group (again expressed relative to δ_2). This effect quickly falls back to zero, indicating that tax filers who move after retiring do so within the first few years.

This finding clearly indicates that retirement and inter-jurisdictional mobility are interconnected. Whether this effect is economically relevant is a bit less clear. A point estimate that is less than half a percentage point seems small in absolute value but much larger when compared with the base migration rate. As shown on Figure 4's y-axis, the likelihood of moving is only 0.417 percent among the treatment group two years before retiring, which means that retirement leads to roughly a doubling of this base rate. This leads me to conclude that inter-jurisdictional retirees comprise an economically meaningful share of

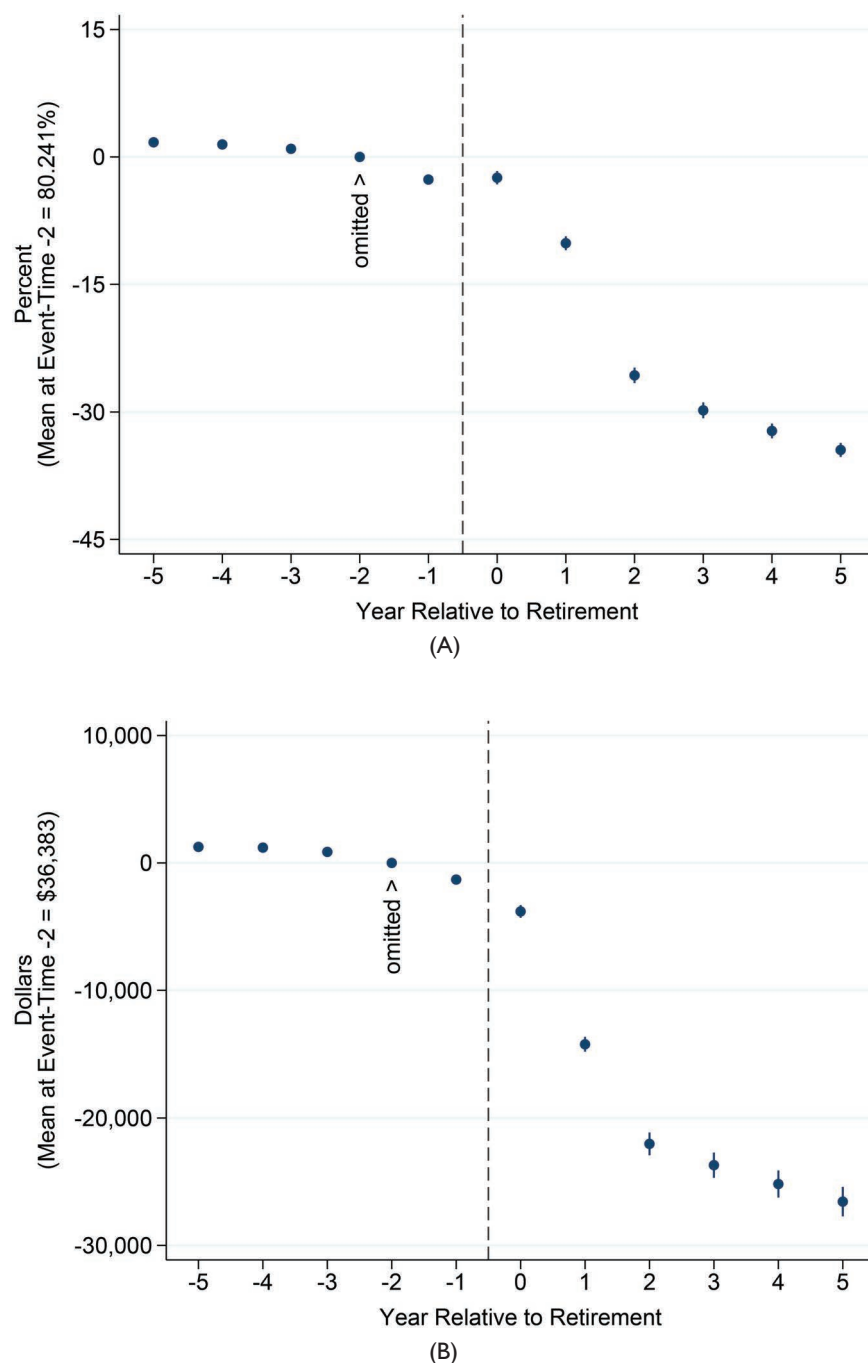


Figure 2: Event-Study of Retirement on Employment and Labour Earnings

Notes: This figure plots the γ_k coefficients from Equation (1) using an indicator for having any labour income in the year and the amount of labour earnings as the dependent variables in Panels (a) and (b), respectively. Labour earnings consists of wages and salaries, commissions, training allowances, tips and gratuities, and self-employment (net income from business, professional, farming, fishing, and commissions). The model specification includes individual, province, and year fixed effects, with controls. The bars around the dots represent the 95 percent confidence intervals, where standard errors are clustered by province and year. Event-time -2 is omitted to normalize the estimates relative to two years before the reform. Reported in brackets on the y-axis is the mean of the dependent variable at event-time -2 for the treated group.

Source: Statistics Canada, Longitudinal Administrative Databank.

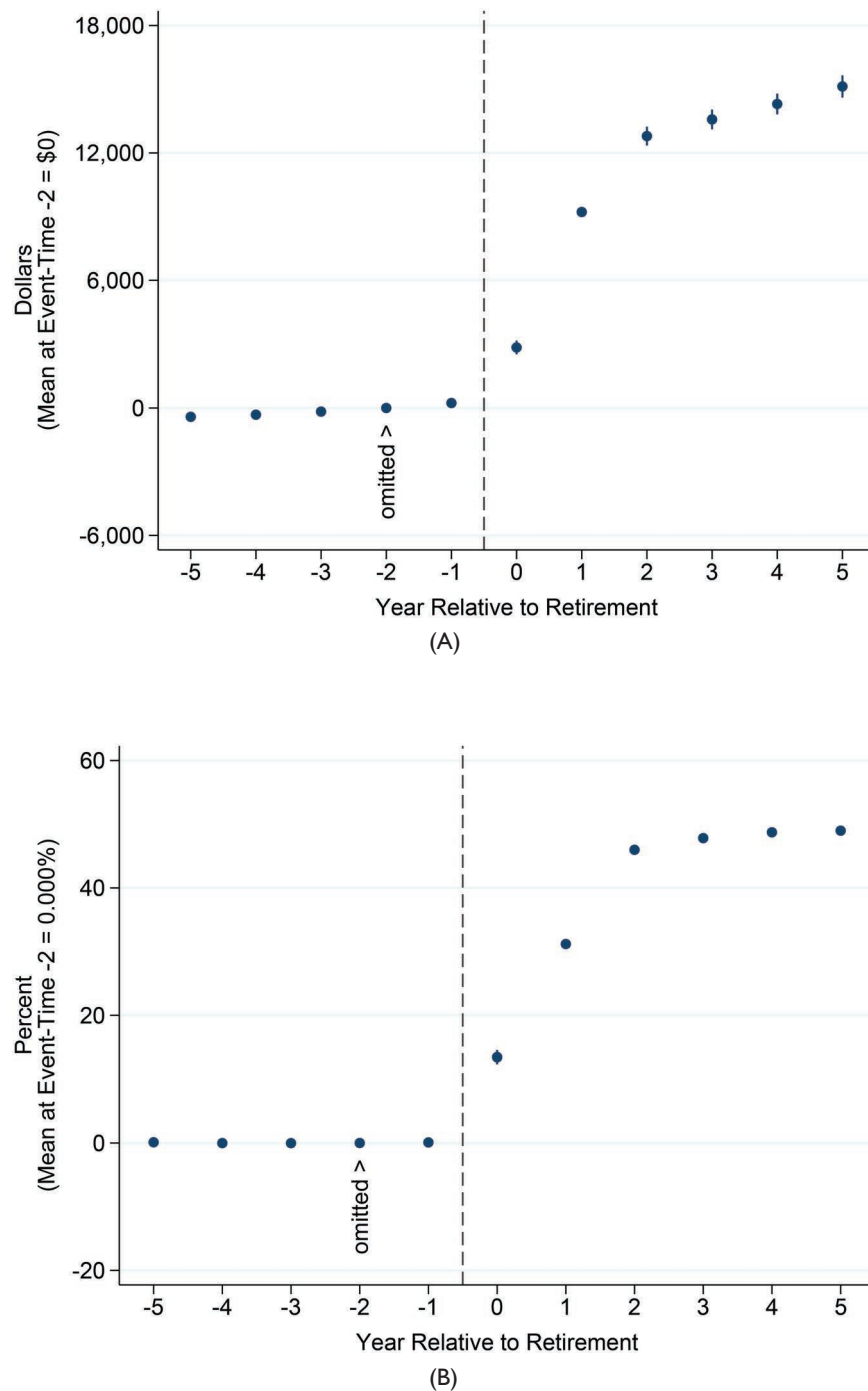


Figure 3: Event-Study of Retirement on Pension Income and the Pension Income Ratio

Notes: This figure plots the γ_k coefficients from Equation (1) using the amount of pension income and the pension income ratio as the dependent variables in Panels (a) and (b), respectively. Pension income consists of income from the Canada Pension Plan and the Quebec Pension Plan as well as private pensions. Old Age Security is excluded because this is a demogrant payment based on age and not a strong predictor of labour market attachment. The pension income ratio is the fraction of total after-tax income deriving from pensions. The model specification includes individual, province, and year fixed effects, with controls. The bars around the dots represent the 95 percent confidence intervals, where standard errors are clustered by province and year. Event-time -2 is omitted to normalize the estimates relative to two years before the reform. Reported in brackets on the y-axis is the mean of the dependent variable at event-time -2 for the treated group.

Source: Statistics Canada, Longitudinal Administrative Databank.

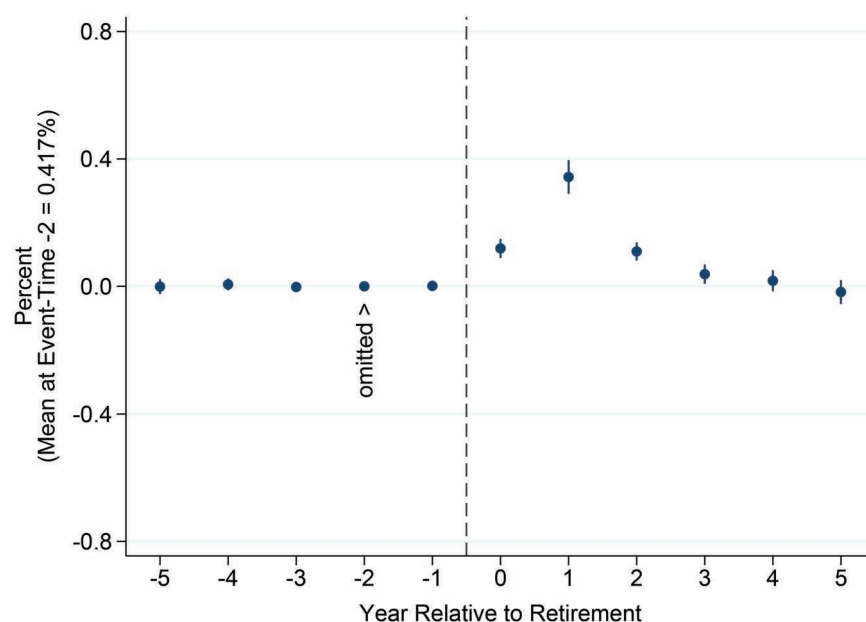


Figure 4: Event-Study of Retirement on Inter-Jurisdictional Retirement

Notes: This figure plots the γ_k coefficients from Equation (1) using an indicator for being an inter-jurisdictional retiree as the dependent variable. The bars around the dots represent the 95 percent confidence intervals, where standard errors are clustered by province and year. Event-time -2 is omitted to normalize the estimates relative to two years before the reform. Reported in brackets on the y-axis is the mean of the dependent variable at event-time -2 for the treated group.

Source: Statistics Canada, Longitudinal Administrative Databank.

older migrants. Further discussion about magnitude is provided later in the article.

To explore the robustness of this finding, I present results using different sets of controls in Table 2. More precisely, in Column (1), I begin by plotting the unconditional probabilities of migration per year relative to retirement among the treatment group. These estimates derive from a regression of M_{it} on the set of event-time dummies but dropping the control group from the sample, not normalizing the estimates, and omitting fixed effects and additional controls, as well as omitting the model's constant. The purpose of reporting these unconditional probabilities is to assess whether the pattern observed in Figure 4 is driven by a change in behaviour among the treatment group or arises from some change in behaviour of the control group. As shown, the unconditional probability of migration for the treatment group is roughly 0.4 percent in the years leading up to retirement and increases above 0.7 percent within two years of retiring, indicating that the baseline results are driven by migration among the treatment group.

Columns (2)–(4) report event-study estimates of the δ coefficients with the iterative addition of control variables for jurisdiction of residence, marital status, and a cubic polynomial in after-tax income. The main estimates are not affected by the addition of controls.

I now turn to characterizing inter-jurisdictional retirees on the basis of characteristics observed in the tax data. Figure 5 carries out the event-study analysis separately for tax filers by age (< 65 vs. ³ 65), gender (male vs. female), marital status (married or common-law vs. single, separated, or divorced), and level of income (lower vs. higher) in Panels (a), (b), (c), and (d), respectively. Lower income and higher income refer to income relative to the median. Because these characteristics—notably age and income—may be endogenous with treatment, I assign tax filers into groups on the basis of their characteristics at event-time -2. It is not possible to assign an event-time to the control group who never retired during the sample period, so I hold the control group constant in all regressions and only allow the treatment group to vary, which allows for direct comparisons across groups.

The results of this heterogeneity analysis are threefold. First, gender and marital status are not relevant determinants of inter-jurisdictional retirement. Second, migration is driven by retirees aged younger than 65 years. In contrast, tax filers who retire after turning 65 are slightly less likely to migrate relative to the control group. Third, the behaviour is driven by tax filers with higher incomes, whereas the likelihood of migrating does not change after retirement for those with lower income. Taken together, a possible explanation is that tax filers move during working

Table 2: Event-Study of Retirement on Inter-Jurisdictional Retirement

Event Time	Baseline Trend of Treated Group (1)	Event-Study Estimates		
		Individual and Year Fixed Effects (2)	Individual, Province, and Year Fixed Effects (3)	Individual, Province, and Year Fixed Effects, with Controls (5)
-5	0.415*** (0.026)	-0.001 (0.012)	-0.001 (0.012)	-0.003 (0.012)
-4	0.417*** (0.024)	0.006 (0.009)	0.006 (0.009)	0.004 (0.009)
-3	0.410*** (0.024)	-0.002 (0.008)	-0.002 (0.008)	-0.004 (0.008)
-2	0.415*** (0.024)			
-1	0.429*** (0.025)	0.001 (0.008)	0.002 (0.008)	0.003 (0.009)
0	0.515*** (0.042)	0.119*** (0.015)	0.113*** (0.014)	0.115*** (0.014)
1	0.743*** (0.048)	0.343*** (0.027)	0.321*** (0.024)	0.324*** (0.024)
2	0.520*** (0.032)	0.109*** (0.014)	0.082*** (0.014)	0.084*** (0.014)
3	0.458*** (0.030)	0.038** (0.015)	0.006 (0.016)	0.008 (0.016)
4	0.444*** (0.029)	0.017 (0.017)	-0.017 (0.019)	-0.015 (0.019)
5	0.413*** (0.030)	-0.018 (0.019)	-0.055** (0.023)	-0.051** (0.023)
No. of observations	30,764,044	30,546,076	30,546,075	30,316,687
R ²	0.004	0.149	0.156	0.157

Notes: Column (1) reports the unconditional probability of being an inter-jurisdictional retiree expressed relative to the retirement year, for the treatment group. Columns (2)–(4) report the γ_i coefficients from Equation (1) using an indicator for being an inter-jurisdictional retiree as the dependent variable. The dependent variable is an indicator on a scale ranging from 0 to 100. The additional controls include marital status and a cubic polynomial in after-tax income. Standard errors are clustered by province and year. Event-time -2 is omitted to normalize the estimates relative to two years before the reform.

Source: Statistics Canada, Longitudinal Administrative Databank.

years in search of higher-paying jobs and then move back to their province of birth at retirement, where earning a higher income during the working years makes retiring earlier affordable. Exploring the relationship between inter-jurisdictional retirement and earlier moves during the working years to test this conjecture is an interesting avenue for future research. The homogeneity by gender and marital status likely arises from the fact that the majority of the sample is married or in a common-law relationship (Table 1), and retirement decisions of individuals and their spouses tend to be co-determined.

The heterogeneity by age is striking and raises the question of whether restrictions for pension benefit eligibility affect this behaviour in some way. To explore this issue, I condition the sample on inter-jurisdictional retirees and

plot their age distribution in Figure 6. This analysis is delineated by gender and marital status in Panels (a) and (b), respectively. The results show that inter-jurisdictional retirement occurs most prevalently among tax filers aged 60–65 years, consistent with the fact that receipt of the Canada Pension Plan and Quebec Pension Plan can begin at age 60 and the age for full benefit receipt is 65. However, a large share of inter-jurisdictional retirees still fall outside this age range, and the distributions do not vary widely by gender or marital status, suggesting that the main effect of the age restriction is on benefit receipt.

Energy and Petroleum Price Shocks

Previous studies cited in the introduction point to a strong correlation between oil price shocks and

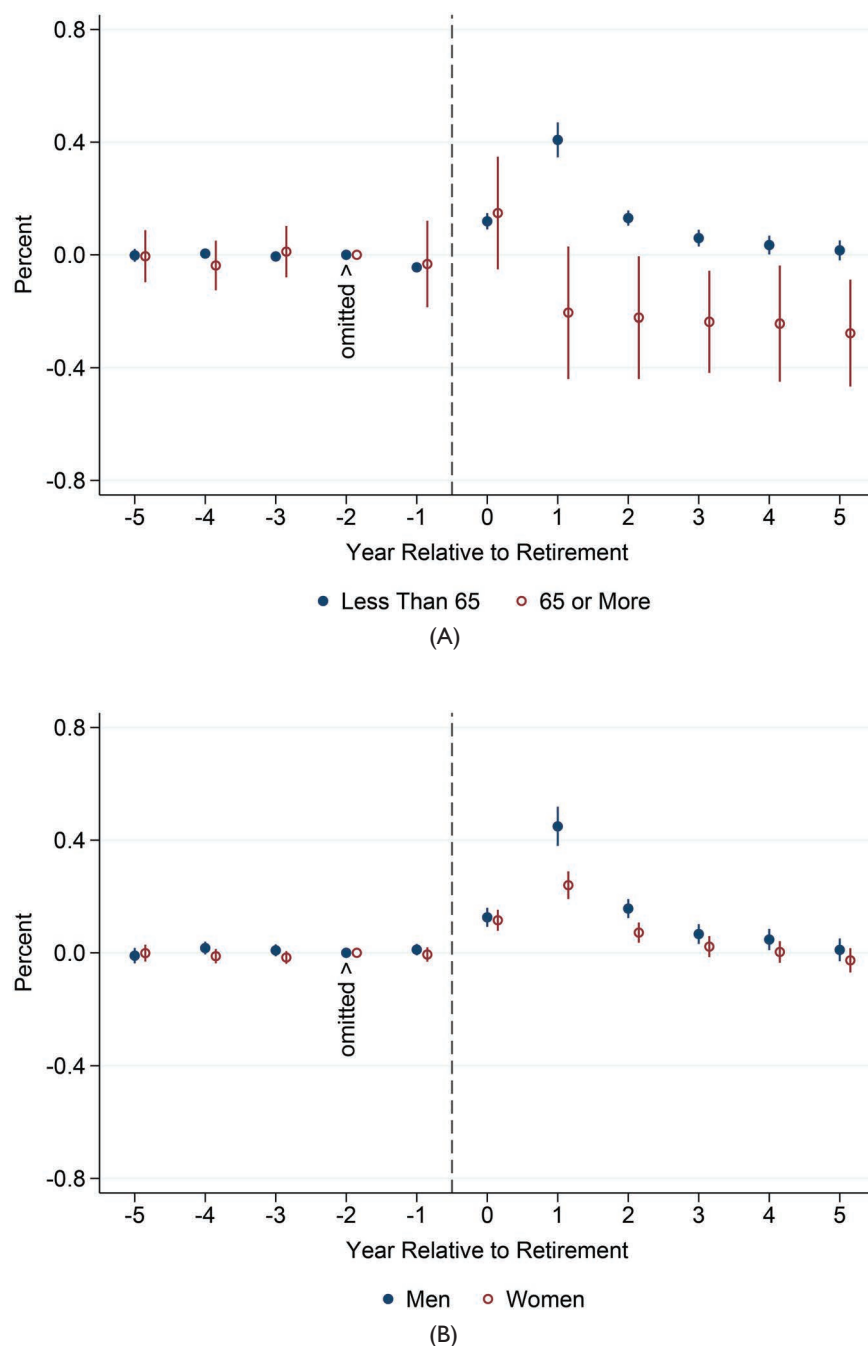
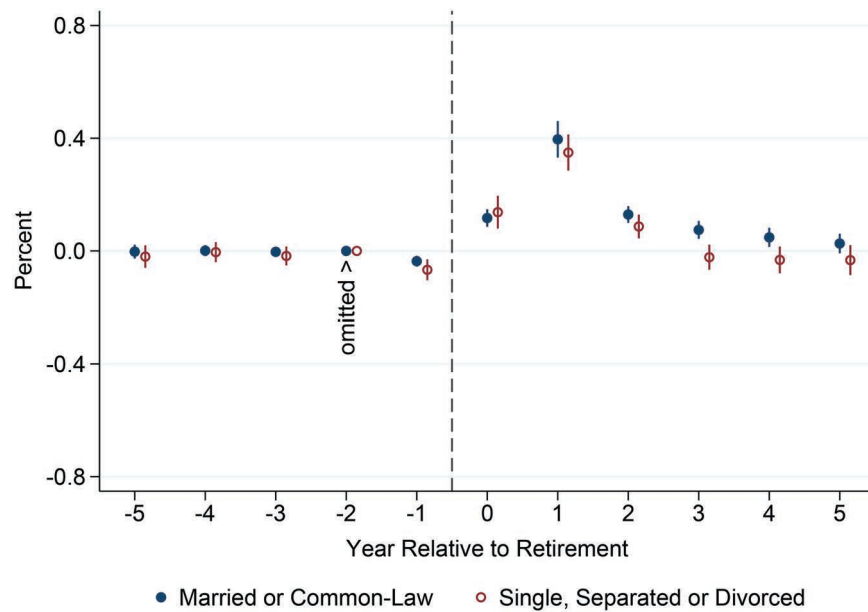


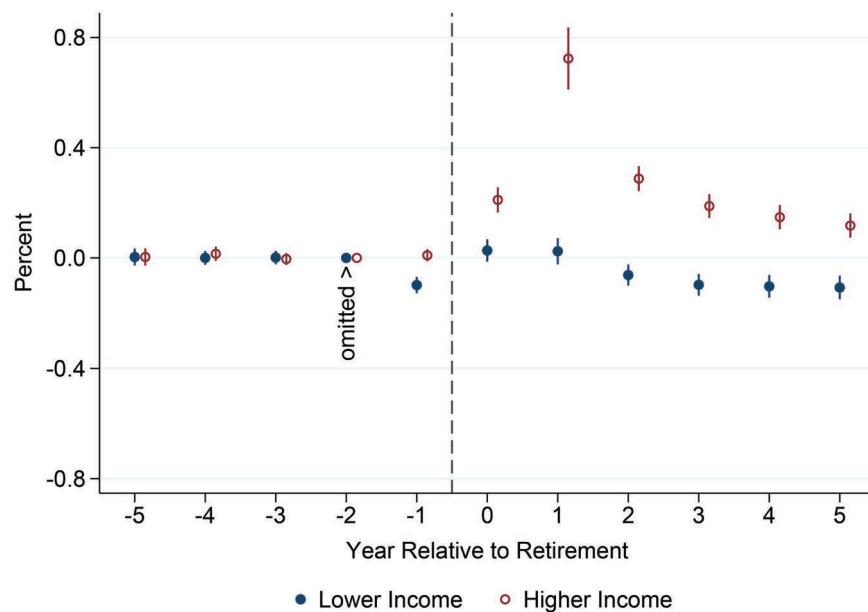
Figure 5: Event-Study of Retirement on Inter-Jurisdictional Retirement by Observed Characteristics

Notes: This figure plots the γ_k coefficients from Equation (1) using an indicator for being an inter-jurisdictional retiree as the dependent variable. The analysis is carried out separately on the basis of age, gender, marital status, and level of income in Panels (a), (b), (c), and (d), respectively. Lower and higher income categories are based on the level of after-tax income relative to the median. Individuals are assigned into groups on the basis of their observed characteristics two years before retirement. The control group is not delineated by age group, because individuals who are not observed retiring do not have an event-time that can be used to assign them into groups. Hence, the control group is the same for all treatment groups, which facilitates direct comparisons of the results across treatment groups. The bars around the dots represent the 95 percent confidence intervals, where standard errors are clustered by province and year. Event-time -2 is omitted to normalize the estimates relative to two years before the reform.

Source: Statistics Canada, Longitudinal Administrative Databank.



(C)



(D)

Figure 5: (Continued)

inter-jurisdictional mobility and employment resulting from the migration of workers into oil-producing provinces during periods of high labour demand and production. A natural question to ask is whether oil price shocks are also correlated with inter-jurisdictional retirement. For example, older workers who moved across jurisdictions to work in the oil industry at some point in their careers may choose to retire and move back home after a drop in prices and labour demand rather than face the risk of layoff.

In this section, I consider the relationship between energy and petroleum prices as a proxy for labour demand and inter-jurisdictional retirement. Specifically, I estimate the effect of the percentage change in prices on the probability of inter-jurisdictional retirement for individuals living in the oil-producing provinces of Newfoundland and Labrador, Saskatchewan, and Alberta relative to their counterparts in all other jurisdictions. I restrict this analysis to the treatment group (i.e., tax filers who retired in the sample period) and to Event-Times 0, 1, or 2

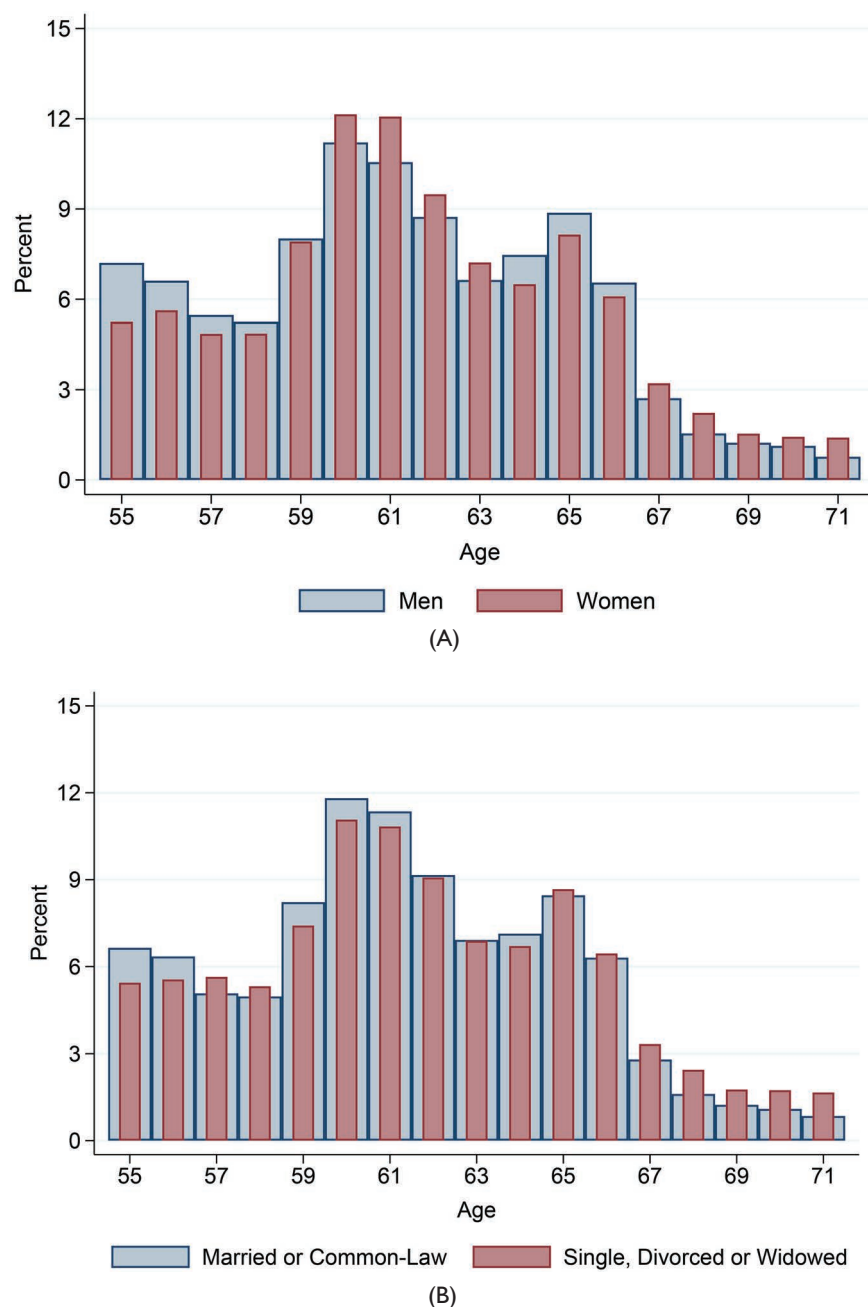


Figure 6: Distribution of Inter-Jurisdictional Retirees by Gender and Marital Status

Notes: This figure restricts the sample to inter-jurisdictional retirees at the time of their move and then plots their age distribution by gender and marital status.

Source: Statistics Canada, Longitudinal Administrative Databank.

because migration typically occurs in the first three years of retirement.

Denote by J_{it} an indicator variable for whether individual i was an inter-jurisdictional retiree in year t . Moreover, denote by P_{it}^{OIL} an indicator for whether individual i resides in an oil-producing province at time t and π_t as the percentage change in the price of energy and petroleum from year $t - 1$ to year t . The statistical model is as follows:

$$J_{i,t+1} = \mu_i + \rho_t + \beta(P_{it}^{OIL} \times \pi_t) + X_{it}'\phi + v_{it}. \quad (2)$$

As before, μ_i and ρ_t are individual and year fixed effects, respectively; X_{it} is a vector of control variables; and v_{it} is the residual. Because location of residence in the tax data is based on address at the end of the calendar year, I use a one-period leading variable $J_{i,t+1}$ as the dependent variable so that the price–location interaction is based on location

of residence before moving. Hence, β captures the effect of the price shock in year t on the probability of retiring and moving jurisdictions between years t and $t + 1$ benchmarked against tax filers who also retired during the same three-year window but did not move jurisdictions. This specification is consistent with [Morissette and Chan \(2016\)](#), who allow for a one-period delay because the effects of oil shocks on labour demand are gradual, and workers require time to adjust. [Figure 7](#) plots the evolution of prices and percentage change in prices over time since 1982. There is indeed significant variation to exploit empirically in this analysis.

The results from Equation (2) are presented in [Table 3](#). As before, each column controls for a different set of fixed effects and covariates as listed in the column headings. In contrast to the related literature on inter-jurisdictional employment, I do not find evidence that oil price shocks among the treatment group affect migration. The estimates for β are all nearly zero and statistically insignificant regardless of the control variables used. This suggests that either workers outside the oil industry are the most likely to move at retirement or that labour demand shocks among retirees from the oil industry are not as relevant a determinant of migration as other factors, such as age and income. Although these findings are largely exploratory and leave room for further research, the next section will shed more light on why oil price shocks may not be expected to affect mobility at retirement compared with during the working years.

Locations of Residence

Although new retirees are much more likely than other tax filers of similar ages to migrate across jurisdictions, the implications for tax and transfer policy are potentially very different depending on tax filers' attachment to their locations of residence before retiring. If a person moves for only a couple of years to a jurisdiction in search of high pay but spends most of their career working in the same jurisdiction as the one to which they return to retire, then tax implications are negligible because this person paid into the same system that they rely on in retirement. In contrast, if most inter-jurisdictional retirees pay into a system for most of their careers that differs from the one they rely on in retirement, then asymmetry exists.

To inform this issue, in [Figure 8](#), I plot the distribution of inter-jurisdictional retirees across provinces and territories in the year before retiring versus the retirement year (after the move). The sample for this analysis is restricted to a balanced sample of inter-jurisdictional employees in these two event-times. Interestingly, the results show that the Atlantic provinces and British Columbia are the only net recipients of inter-jurisdictional retirees. In contrast, Quebec, Ontario, Manitoba, Saskatchewan, and Alberta, as well as the Territories, are all net donors of inter-jurisdictional retirees.

These results are generally consistent with the variation in sense of belonging across jurisdictions. For example, according to [Statistics Canada \(2019\)](#), in 2019, the Atlantic provinces and British Columbia had among the highest

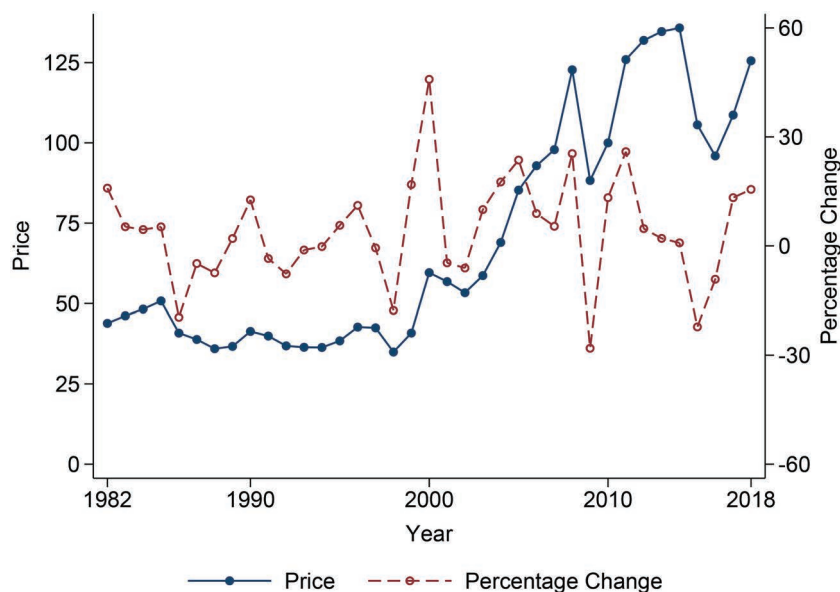


Figure 7: Energy and Petroleum Prices, by Year

Notes: Energy and petroleum prices are reported in monthly values in the raw data and converted to annual values by taking the 12-month averages. The percentage change is computed as the change in price in year t from $t - 1$ expressed as a percent relative to year $t - 1$.

Source: Statistics Canada Table 18-10-0029-01 (formerly CANSIM 329-0074).

Table 3: Effect of Energy and Petroleum Prices on Inter-Jurisdictional Retirement

Statistic	Province and Year Fixed Effects (1)	Province and Year Fixed Effects, with Demographic Controls (2)	Province and Year Fixed Effects, with Demographic and Income Controls (3)	Individual, Province and year Fixed Effects, with Demographic and Income Controls (4)
Price × province interaction	0.005 (0.004)	0.005 (0.004)	0.005 (0.004)	−0.002 (0.007)
No. of observations	4,056,465	4,054,932	4,054,932	4,054,932
R ²	0.006	0.006	0.006	0.560

Notes: This table estimates the effect of percentage changes in energy and petroleum prices on inter-jurisdictional retirement for individuals initially living in oil-producing provinces relative to non-oil-producing provinces. The dependent variable is an indicator on a scale ranging from 0 to 100. The sample is restricted to the treatment group five years before to five years after retirement. The oil-producing provinces are Newfoundland and Labrador, Saskatchewan, and Alberta. The demographic controls include age, gender, and marital status fixed effects (age and gender are omitted when individual fixed effects are included because of collinearity). The income control is a cubic polynomial in after-tax income. Standard errors are clustered by province and year.

Source: Statistics Canada, Longitudinal Administrative Databank and Table 18-10-0029-01 (formerly CANSIM 329-0074).

**Figure 8:** Provinces of Residence of Inter-Jurisdictional Retirees Before versus After Retiring

Notes: The figure restricts the sample to inter-jurisdictional retirees and then plots their distribution in their province of residence before versus after the move. The sample is balanced to individuals observed in these two event-times. TT = the territories (i.e., Nunavut, Northwest Territories, and Yukon Territory).

Source: Statistics Canada, Longitudinal Administrative Databank.

shares of the population aged 50–64 years who had a somewhat strong or very strong sense of belonging to their local community, whereas Ontario and Quebec scored the lowest (the only exception is Saskatchewan, which also scored high). In addition, the results suggest why energy and petroleum price shocks are not a strong determinant of migration, namely because net out-migration does not appear to be correlated with whether the jurisdiction is oil producing.

Although the preceding results show which jurisdictions are net donors versus recipients, they do not inform the issue of tax filers' attachment to their location of residence before retiring. To address this issue, I further exploit the longitudinal design and long time horizon of the LAD and restrict the sample to inter-jurisdictional employees who are observed for 10 or more years before they retire. Then, I compute the "mode jurisdiction" of each tax filer, that is, the jurisdiction in which the tax filer

lived the most number of years during the 10 years leading up to retirement. Last, I calculate the number of years that the tax filer lived in the mode jurisdiction: six years or less, seven years, eight years, nine years, or 10 years.

Grouping tax filers into a binned category for six years or less is desirable in cases in which a mode is not calculable. This occurs if there is more than one mode; in this case, the maximum length of time over the 10-year period that an individual could live in each mode jurisdiction is five years when there are two modes, and this length of time shortens as the number of modes increases so that it is always strictly less than six.

The distribution of tax filers by number of years living in their mode jurisdiction is reported in Table 4. Specifically, the unconditional distribution is reported in Column (1). These estimates are the same in both panels but are reported twice to facilitate comparisons with the remaining columns. In Columns (2)–(7), I report the distributions conditional on tax filers' region of residence in the year of retirement in the top panel or mode region in the bottom panel. For compactness, jurisdictions are grouped into Atlantic Canada, Quebec, Ontario, Prairies, British Columbia, and the Territories.

For example, as shown in the top estimate of the top panel, Column (2), 22.0 percent of inter-jurisdictional retirees who retired in Atlantic Canada lived for only six years or less in their mode jurisdiction during the 10 years leading up to retirement. This estimate does not inform where they resided before retirement except that it was some province (including another Atlantic province) other than the one in which they chose to retire. The top estimate in the bottom panel, Column (2) indicates that 23.0 percent of inter-jurisdictional retirees whose mode province during the 10 years leading up to retirement was Atlantic Canada lived in that province for only six years or less, although this does not inform where those tax filers eventually retired.

These two different approaches to reporting the distribution of mode province together paint a picture about community attachment of inter-jurisdictional retirees. Around 50 percent of retirees have very high attachment (all 10 years), and less than a quarter of retirees have low attachment (six years or less), which is a finding that holds irrespective of how the sample is restricted. Atlantic Canada and British Columbia tend to receive retirees who spent the most number of years working in their mode

Table 4: Attachment to Mode Jurisdiction during the 10 Years Before Retirement

No. of Years Before Retirement	By Region						
	Canada (1)	Atlantic Canada (2)	Quebec (3)	Ontario (4)	Prairies (5)	British Columbia (6)	Territories (7)
By Region at Retirement							
≤ 6	20.7	22.0	26.3	23.7	21.0	15.1	21.8
7	8.1	8.5	9.5	9.8	8.3	5.8	7.9
8	8.3	9.4	10.1	9.0	8.6	6.3	6.6
9	10.7	10.0	12.0	10.6	11.7	9.9	12.5
10	52.3	50.0	42.0	46.9	50.5	63.0	51.3
By Mode Region							
≤ 6	20.7	23.0	13.8	16.5	14.9	21.1	71.1
7	8.1	10.1	9.1	8.0	7.7	8.5	3.7
8	8.3	10.1	8.8	8.9	7.1	10.3	3.9
9	10.7	12.2	11.7	10.7	10.3	12.8	4.9
10	52.3	44.6	56.6	56.0	60.0	47.3	16.5

Notes: This table reports the distribution of inter-jurisdictional retirees based on the number of years they spent in their mode jurisdiction during the 10 years observed before retirement. The sample is restricted to inter-jurisdictional retirees who are observed at least 10 times before retirement. If the mode jurisdiction is not calculable, the number of years is set to be six or less. A mode is not calculable if there is more than one; in this case, the maximum length of time over the 10-year period that an individual could live in each mode jurisdiction is five years when there are two modes, and this length of time shortens as the number of modes increases. Column (1) reports the unconditional results. Columns (2)–(7) condition the analysis on the region. In the top panel, individuals are assigned into regions on the basis of the jurisdiction in which they lived after retiring. In the bottom panel, individuals are assigned into regions based on their mode jurisdiction during the 10 years before retiring, for those who had a calculable mode. Atlantic Canada = Newfoundland and Labrador, Prince Edward Island, Nova Scotia, and New Brunswick; Prairies = Manitoba, Saskatchewan, and Alberta; Territories = Nunavut, Northwest Territories, and Yukon Territory.

Source: Statistics Canada, Longitudinal Administrative Databank.

jurisdictions before retiring, whereas Ontario and Quebec tend to have the highest shares of retirees who worked in those provinces before leaving to retire elsewhere in the country. Hence, these results are generally consistent with the findings in Figure 8 that Ontario and Quebec are net donors. The main implication is that inter-jurisdictional retirees consist primarily of people who had strong attachment to their location of residence in the years leading up to retirement.

Discussion

This study provides an exploratory analysis of the extent to which inter-jurisdictional mobility occurs around the time of retirement among Canadian tax filers. The results indicate that the likelihood of migrating increases by roughly 0.4 percentage points within two years of retiring among tax filers aged 55–71 years, expressed relative to the likelihood of migrating for tax filers in the same age range but who do not retire. Although this estimate is small in absolute magnitude, it reflects a doubling of the base rate and is estimated with a high degree of statistical precision. Such behaviour is driven primarily by younger and higher-income tax filers who perhaps relocated during the working years in search of high-paying jobs and could then afford to retire and move back home earlier in life.

Inter-jurisdictional retirement has potential implications for tax and transfer systems, because the majority of retirees leaving their location of residence had strong attachment to that location in the years leading up to

retiring. On average, 50 percent of inter-jurisdictional retirees lived for 10 or more years in the same location before moving, implying an asymmetry between the jurisdiction that collects taxes during the working years and the jurisdiction incurring health care and other social costs of its retired residents.

Is this demographic phenomenon a cause for concern, or are the costs implied by this asymmetry simply too small? It is outside the scope of this exploratory analysis to answer this question definitively, but some insight can be gleaned from assessing the fraction of inter-jurisdictional retirees compared with net migration flows. As already shown in Figure 1, the ratio of in-migrants aged 55–71 years relative to all in-migrants varies across jurisdictions but does not typically exceed 20 percent in any case. In Figure 9, I replicate this analysis but express the ratio of inter-jurisdictional retirees relative to all in-migrants and find this never exceeds about 6 percent and is lower for most jurisdictions. This suggests that costs from the asymmetry are not likely very large on an annual basis.

However, as a simple example, in January 2022, the Government of Newfoundland and Labrador (2022) released a statement that the population increased by 695 persons (or 0.1%) from the previous quarter, reflecting the fourth straight quarter of growth according to Statistics Canada data. Because the Atlantic provinces tend to be net recipients of inter-jurisdictional retirees, coupled with the fact that their annual population growth is low, the extent to which this asymmetry has been compounding over

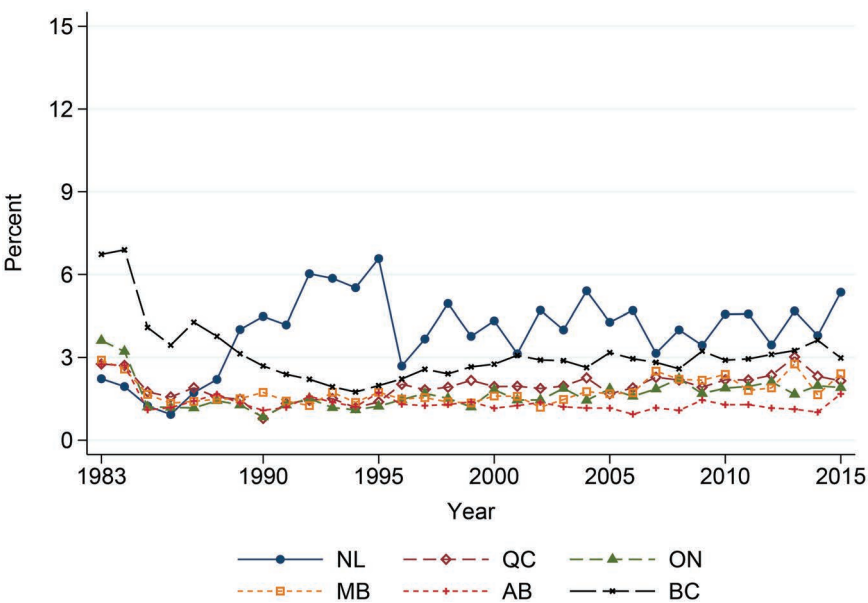


Figure 9: Ratio of Inter-Jurisdictional Retirees to Inter-Jurisdictional In-Migrants

Notes: This figure plots the number of inter-jurisdictional retirees into select provinces expressed relative to the total number of in-migrants in the same province and year.

Source: Statistics Canada, Longitudinal Administrative Databank.

time and contributes to regional differences in population aging is a different matter that warrants further investigation. This study has found that the Atlantic provinces and British Columbia are net recipients of inter-jurisdictional retirees and these are indeed the provinces whose populations are aging the most.

Moreover, inter-jurisdictional migration may be more prevalent among older Canadians who experience different shocks several years after retiring, such as adverse health shocks, divorce or widowhood, or changes in health conditions of elderly parents who require assistance. Because this study focuses exclusively on mobility within a few years of retirement, broader patterns of migration among older Canadians that have yet to be documented may contribute meaningfully to regional differences in population aging.

Note

- 1 Estimates of inter-jurisdictional employment are available upon request; for example, see Statistics Canada (2021). Estimates of inter-jurisdictional migrants are reported in Tables 17-10-0015-01 and 17-10-0022-01.

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GUEST EDITORS' INTRODUCTION

Pierre-Carl Michaud, Kevin Milligan, and Tammy Schirle
Pensions, Retirement, Longevity, and Long-term Care

ARTICLES

Derek Messacar
Inter-Jurisdictional Retirement in Canada

Nicholas-James Clavet, Mayssun El-Attar, and Raquel Fonseca
Replacement Rates of Public Pensions in Canada: Heterogeneity across Socio-Economic Status

Nicholas-James Clavet, Réjean Hébert, Pierre-Carl Michaud, and Julien Navaux
The Future of Long-term Care in Quebec: What Are the Cost Savings from a Realistic Shift toward More Home Care?

Blair Roblin, Raisa Deber, and Andrea Baumann
Addressing the Capital Requirement: Perspectives on the Need for More Long-term Care Beds in Ontario

Lisa Halpern, Susan D. Phillips, and Nathan J. Grasse
Non-Profit Long-term Care in Ontario: How Financially Robust Is the System?

Catherine Deri Armstrong and Rose Anne Devlin
Dying at Home: A Privilege for Those with Time and Money



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