Research Article

Financial Factors and Labour Market Transitions of Older Workers in Canada

Xuyang Chen, Maxime Fougère, and Bruno Rainville

Human Resources and Skills Development Canada, Gatineau, QC, Canada K1A 0J9

Correspondence should be addressed to Maxime Fougère, maxime.fougere@hrsdc-rhdcc.gc.ca

Received 3 November 2011; Revised 16 February 2012; Accepted 20 February 2012

Academic Editor: Alberto Davila

Copyright © 2012 Xuyang Chen et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

This paper looks at the influence of financial factors on the labour market transitions of Canadian older workers. Also, in contrast to previous studies, the analysis focuses on transitions between full-time work, part-time work, and retirement. Sequential annual observations of employment and retirement choices are examined for samples of full-time and part-time workers, drawn from the Survey of Labour and Income Dynamics (SLID), 2001–2006. Measures of potential pension wealth and one-year and peak pension accruals are imputed using data from the Survey of Consumer Finances, 1973–1997, and the SLID, 1997–2006. Regression results indicate that financial factors influence workers to move from full-time to part-time jobs and support the evidence found in previous studies that retirement is usually a process, not a single event. Also, an increase in pension accruals increases the probability of working full-time for lower-income earners only. Among nonfinancial factors, a negative health shock increases the probability of working part-time or retiring for full-time workers but has little effect on the labour market transitions of part-time workers. Finally, these results suggest that policies to encourage phased retirement are unlikely to have a significant labour market effect since bridge employment is already a common transition process among older workers.

1. Introduction

Factors explaining the labour market transition of older workers into and out of retirement are not fully understood and more complex in reality than standard life-cycle theory would predict. For many older workers, the retirement decision is not one single event but rather a process as they transit from career employment to bridge employment ([1] defines “bridge employment” as paid work received by an individual after receiving a pension) or part-time work before full retirement. There are also a significant proportion of people who return to work after supposedly having fully retired. There are several empirical papers that examined the labour force participation decisions of older workers (see, e.g., [2–7]), focussing on the impact of public and private pensions on retirement decisions but these studies ignored, for the most part, the transition dynamics into retirement. In addition, retirement wealth (pension and personal savings) is a key factor in the retirement decision but it is not available in Canadian longitudinal surveys, which makes empirical retirement models difficult to estimate.

This paper examines the relative importance of financial factors as determinants of older workers’ labour market transitions. Similar to Schirle [2], we build a general measure of potential wealth that Canadian workers may be entitled to at retirement and investigate its impact in a microeconometric model of labour force participation. Also, in contrast to previous studies, we focus on transitions between full-time work, part-time work, and retirement. Sequential annual observations of employment and retirement choices are examined for samples of full-time and part-time workers.

The remainder of this paper is divided as follows. Section 2 reviews some recent relevant literature and summarizes the structure of the retirement income system in Canada. Section 3 discusses the imputation of the pension wealth and accrual measures, which are included in the model of labour force participation. Section 4 provides an overview of the samples of full-time and part-time older workers used for the regression analysis, the reduced-form retirement model, and the estimation strategy. Section 5 presents descriptive statistics and the regression results for the different samples. Section 6 provides some concluding remarks.
2. Background

2.1. Recent Literature on Labour Force Participation of Older Workers. There is a vast Canadian and international literature on the factors involved in the retirement decision of older workers. Milligan and Schirle [8] provide a comprehensive overview of international evidence on the effect of public pensions on retirement decisions, while Coile and Gruber [9] and Diamond and Gruber [10] provide a thorough survey of the US literature on the impacts of the Social Security system on retirement. For Canada, Schirle [2], Baker et al. [4, 5], and Compton [7] examine the effect of Canada’s Income Security programs, while Chen et al. [11] compare the influence of the personal income tax structure and pensions on retirement decisions. Overall, the consensus from most studies is that public pensions have an impact on retirement incentives, and the Canadian public pension system generates fewer early retirement incentives than most OECD pension programs. Another interesting finding from Fougère et al. [3] is that Canadian defined-benefit private pension plans generate much larger early retirement incentives than the Canadian public pension system.

Several studies [12–15] also examined labour market transition patterns of older workers toward retirement. Overall, these studies support the view that retirement is not a one-time event but rather a gradual process. Similar findings were also found for the United States (e.g., [16]). Among these recent studies, an interesting finding from Hébert and Luong [12] using the Survey of Labour and Income Dynamics (SLID) is that, in Canada, the probability of entering bridge employment is consistently higher at each age between 55 and 66 than the probability of entering full retirement. Using the Longitudinal Administrative Database (LAD), Wannell [13] found that about half of recent cohorts of pensioners had at least some employment income the year after they began receiving a pension. Finally, Schellenberg [14] examined the phenomenon of postretirement employment in Canada using the 2002 General Social Survey and found that 45 percent of retirees returned to part-time paid employment. Among the reasons for returning to work, “financial considerations” is mentioned most often, although other nonfinancial factors, such as “did not like retirement,” are also important considerations.

2.2. Canadian Retirement Income System. When Canadians retire, they primarily draw income from three sources: (1) the public pension system, (2) employer and union provided Registered Pension Plans (RPPs), and (3) private savings, both registered (i.e., Registered Retirement Savings Plan (RRSPs) and Registered Retirement Income Funds (RRIFs)).

Canada’s public pension income security system has two components: Old Age Security Programs (i.e., Old Age Security (OAS), Guaranteed Income Supplement (GIS), and Spouse Allowance (SA)) and the Canada Pension Plan (CPP). (The province of Quebec administers its own plan, the Quebec Pension Plan (QPP). Both CPP and QPP have very similar structures.) The OAS program provides all individuals 65 years old and over who meet residency requirements with a maximum benefit of $540.12 per month as of January 2012. This benefit is clawed back at high income levels (over $69,562) and the average monthly payment is $508.35. The GIS is an additional income-tested benefit also available to low income individuals over the age of 65 that pays a maximum monthly amount of $732.36 for singles and roughly two-third of that amount of each member of a couple. The GIS is reduced by 50 cents for singles and 25 cents each for couples for every dollar of family income excepting OAS. The average monthly payments for singles are $491.40. The SA is designed to bridge certain individuals who are not yet eligible for OAS/GIS, and is paid to 60–64-year-old spouses of OAS recipients, widows, and widowers. The average value of SA payments is $416.89 per month. Less than 2% of OAS recipients have spouses who receive SA (Service Canada, Old Age Security benefit payment rates January–March 2012).

The CPP forms the largest component of Canada’s public retirement income system and is an earnings-based pension funded through payroll taxes paid by both employers and employees. The program is designed to replace approximately 25% of earnings up to a maximum acceptable earnings amount of $50,100 in 2012. Benefits are calculated based on individual’s earnings after the age of 18. Months in which a disability benefit was received, or spent caring for a child under age 7, as well as the lowest-earning 15% of months are dropped from the contributory period. The maximum benefit for new beneficiaries is currently $986.87 per month, and the average payment is $512.64. The normal retirement age for the CPP is 65. Individuals may apply for early benefits starting at age 60, currently subject to a permanent actuarial reduction of 0.52% for the number of months until the individual’s 65th birthday. Conversely, individuals who delay receiving CPP benefits until after the age of 65 are entitled to a 0.64% per month actuarial increase. Individuals must stop working before they can claim early CPP but may subsequently return to work and continue to receive their benefits.

RPPs are retirement income plans provided by private or public sector employers and unions. These plans are provided voluntarily and are either defined-benefit or defined-contribution. As of January 1st, 2009, 38% of paid workers participated in a RPP. Of these workers 75% were in a defined-benefit pension plan. The rate of participation in these plans has declined constantly over the last 10 years [17]. RRSPs are tax-sheltered retirement savings vehicles. Contributions made to an RRSP are not taxed until withdrawals. Limits on contributions ceilings are determined by the Canadian Revenue Agency (CRA). RRSPs have become an important source of retirement income for Canadians. In 2005, 6 in 10 families held RRSPs with a median value of $25,000 [18].

3. Imputation of Pension Wealth and Accruals

The retirement incentives from pensions take the form of wealth and accrual effects [8, 19]. Unfortunately, existing Canadian longitudinal surveys do not provide this information at the individual level. To circumvent this problem, using data from existing surveys and a methodology
proposed by Schirle [2], we calculate the expected wealth from public and private pensions and the accrual of wealth associated with pensions, at each potential retirement age. To do so, we first select a sample of full-time full-year older workers aged 50–68 years from the SLID in 2001–2006. We assume that workers may retire at age 51 to 69 and that they have a full-time full-year work history. Then, we use a five-step approach to impute measures of pension wealth and accruals for each worker. These steps are described below.

3.1. Construction of Earnings History. To compute the earnings history of workers, we use all cross-sectional years of the Survey of Consumer Finances (SCF, 1973–1997) and the SLID (1997–2006). For each year, earnings of full-time full-year workers (16 to 69 years old) are regressed on education, experience, province, gender, and marital status. We then use the yearly estimates to compute past earnings of each older worker in the sample based on their characteristics. Depending on their level of education, we go back as far as age 16. For example, we use years 1968 to 2000 to compute past earnings from age 22 to age 59 for an older worker with a university degree aged 55 years in 2001. When we need to compute earnings before 1973, we use 1973 estimates and adjust for inflation.

3.2. Imputation of Canada and Quebec Pension Plans (CPP/QPP). Computed earnings profiles are used to assign all 19 possible CPP/QPP amounts that each individual may be entitled to at different retirement ages between 51 and 69. At each potential retirement age, and based on gender-specific survival probabilities, we allow for the possibility that they live up to age 102. (We use gender-specific survival probabilities from the Statistics Canada life tables, 2000 to 2002.) Current and past benefit formula and Yearly Maximum Pensionable Earnings tables since 1966 are used for the calculation.

3.3. Imputation of Private Retirement Pensions. Private retirement pensions include employer-sponsored benefits, RRSP annuities, and RRIF withdrawals. We use a two-step Heckman selection model to estimate private retirement pensions for those who are only contributors. That is, we first estimate the probability of receiving private retirement pensions for all workers to take into account the fact that we do not observe private pension benefits for contributors. The estimated probability by gender is regressed on age, education, occupational groups, earnings, immigrant status, health, and dependent children. Second, we use these estimates to calculate predicted private pensions for contributors. We assign the reported values in the SLID for those who currently receive private retirement pensions.

3.4. Imputation of Old Age Security Program. The Old Age Security (OAS), the Guaranteed Income Supplement (GIS), and the Spouse’s Allowance (SA) are the major components of the Canadian Old Age Security Program. Based on combined expected CPP/QPP and private pension amounts, we calculate and assign 19 potential amounts that each individual may be entitled to at different retirement ages between 51 and 69. At each potential retirement age, we once again allow for the possibility that they live up to age 102. Overall, means and medians of imputed incomes compare rather well to the ones of actual incomes, as shown in Table 1. Imputed CPP/QPP overestimates actual CPP/QPP because of the assumption of full-time work history. Imputed OAS also overestimates actual OAS because we assume that earnings are null once older workers retire. Therefore, there are less clawbacks on OAS ($0.15 OAS reduction for each extra $1 over a specific threshold). Imputed GIS is lower than actual GIS because there are more clawbacks from higher imputed CPP/QPP ($0.50 GIS reduction for each extra $1 of CPP/QPP). At last, the mean and median of imputed private retirement pensions are very close to those of actual private pensions.

3.5. Imputation of Wealth, Peak Accrual, and One-Year Accrual. When each component of private and public pension has been imputed, we calculate the yearly amount of pension an individual may receive if he/she retires immediately. It is assumed that a retiree takes up his private and public pension benefits immediately when eligible. (For instance, a person who retires at age 59 does not receive his CPP/QPP benefits immediately but he will start receiving it at age 60 when he becomes eligible to early CPP/QPP benefits.) Then, we calculate the total wealth each individual may accumulate up to age 102 with a discount rate of 3 percent and gender-specific survival probabilities. We redo the exercise for each potential retirement age between 51 and 69. Finally, we calculate the difference between the present value (PV) of current wealth and wealth if a person retires one year later (one-year accrual) or between the PV of current wealth and the maximum expected wealth an individual would receive by delaying retirement (peak accrual). Table 2 reports mean wealth and accrual measures by age group for 2006 (latest year in the sample). (Results for other years have similar patterns and are available upon request.) At the mean level, older workers’ peak and one-year accruals from public pension turn negative around age 63 and remain negative afterwards. This result occurs because, after this age, actuarial penalties for early CPP/QPP are small and older workers become eligible for OAS at 65. When private pension benefits are taken into account, peak and one-year accruals become negative sooner, around age 57 to 60. This supports the view that private pension benefits provide incentives for early retirement. However, the extent to which changes in pension accruals affect older workers’ retirement decisions needs to be examined through regression analysis.

4. Samples, Labour Market Transition Models, and Estimation Strategy

4.1. Samples of Full-Time and Part-Time Older Workers. The two samples used for the regression analysis are drawn from the SLID 2001–2006. The full-time full-year sample of older workers is composed of about 12,000 workers (unweighted)
Table 1: Distribution of imputed and actual earnings and pension incomes, 2006.

|                        | Mean  | Median |
|------------------------|-------|--------|
| Actual earnings, age 50–68 | 36850 | 24716  |
| Imputed earnings, age 50–68 | 36734 | 33805  |
| Actual C/QPP, age 50–68  | 5513  | 5621   |
| Imputed C/QPP, age 50–68 | 6766  | 6825   |
| Actual OAS, age ≥65     | 4417  | 5846   |
| Imputed OAS, age ≥65    | 5963  | 6202   |
| Actual GIS, age ≥65     | 549   | 0      |
| Imputed GIS, age ≥65    | 175   | 0      |
| Actual private pension, age ≥50 | 21798 | 18265  |
| Imputed private pension, age ≥50 | 21225 | 19902  |
| Actual private pension, age ≥60 | 20233 | 15934  |
| Imputed private pension, age ≥60 | 18181 | 16385  |

Table 2: Mean of wealth and accrual measures, by age, 2006.

| Age     | Total | Public only | Total | Public only | One-year accruals Total | Public only |
|---------|-------|-------------|-------|-------------|-------------------------|-------------|
| 51      | 302511| 139945      | 45232 | 35194       | 5789                    | 1614        |
| 52      | 329815| 145933      | 40656 | 33018       | 6133                    | 1392        |
| 53      | 336128| 149998      | 33679 | 30517       | 6335                    | 1438        |
| 54      | 317582| 156205      | 25786 | 26956       | 6053                    | 1667        |
| 55      | 353533| 160264      | 21485 | 25298       | 7671                    | 2378        |
| 56      | 351529| 161474      | 14089 | 23577       | 7688                    | 2328        |
| 57      | 343363| 169615      | 3423  | 21375       | 2018                    | 2752        |
| 58      | 355575| 173087      | 827   | 17796       | 2546                    | 2808        |
| 59      | 330773| 182133      | 390   | 12611       | 894                     | 5589        |
| 60      | 337351| 186597      | 2846  | 4141        | 3520                    | 1432        |
| 61      | 321097| 188320      | 3087  | 2427        | 3622                    | 872         |
| 62      | 313711| 188474      | 3729  | 1134        | 4014                    | 313         |
| 63      | 305111| 195083      | 3681  | 332         | 3989                    | 24          |
| 64      | 316313| 193584      | 5165  | 554         | 5165                    | 554         |
| 65      | 286411| 197819      | 8853  | 5425        | 8853                    | 5425        |
| 66      | 289212| 195713      | 9732  | 6053        | 9732                    | 6053        |
| 67      | 297309| 191841      | 10989 | 6588        | 10989                   | 6588        |
| 68      | 285597| 189030      | 11388 | 7211        | 11388                   | 7211        |

Aged 50–68 years in any given year from 2001 to 2005. Each year, an older worker is considered full-time full-year if total hours of work are greater or equal to 1,560 (e.g., 30 hrs/week * 52 weeks). The sample of part-time workers is about 3,900 workers (unweighted) also aged 50–68 in any given year from 2001 to 2005. Each year, an older worker is considered part-time if total hours of work are less than 1,560 (but > 0). Approximately 71% of part-time workers are part-time full-year while the others may have worked or been out of the labour force some time during the year. Since we examine older workers’ labour force participation the following year (t + 1), an older worker has to be in the survey for at least two consecutive years with valid data to be included in the samples. An older worker may be in the sample for more than one sequential two-year period. For example, we may analyze labour market transitions up to five times for one older worker (2001-2002, 2002-2003, 2003-2004, 2004-2005, and 2005-2006).

4.2. Labour Market Transition Models. The theoretical framework is based on the option value of continued work, a retirement decision model developed by Stock and Wise [19]. This model is based on the assumption that an individual compares the expected present value of retiring immediately to the expected present value of continuing to work, thus evaluating the best option of expected immediate retirement. The choice between work and retirement is function of their expected wealth (wealth and accrual effects), earnings, and other factors known to influence retirement (age, health, spouse’s labour force participation, dependent children, and other demographic variables). Since retirement is not necessarily a one-time event and that transiting into bridge employment, is often a path towards full retirement, we examine the year-over-year labour force participation choices between full-time full-year work, part-time employment and full retirement. These choices are based on yearly total hours of work. The nature of the dependent variable is ordinal and hence the reduced-form models are estimated using ordered probit regressions. Although we may have multiple two-consecutive valid years for many older workers, we generally examine the impact of the variables at baseline (in the first year) on the labour force participation the second year. Note that there is no recognized method in the literature to obtain fixed- or random-effect ordered probit estimators in a panel data framework to control for unobserved heterogeneity.

The reduced-form model for the sample of full-time full-year (for the remainder of the paper, the expression full-time older workers will refer to full-time full-year work) older workers takes the following form:

\[
LFP_{it+1} = \beta_{0i} + \beta_{1i} \text{Earn}_{it} + \beta_{2i} \text{Life Earn}_{it} + \beta_{3i} \text{Acc}_{it} + \beta_{4i} \text{W}W_{it}^{+} + \beta_{5i} \text{Inv}_{it}^{+} + \beta_{6i} (H_{it+1} - H_{it}) + \beta_{7i} \text{Imm}_{it}^{+} + \beta_{8i} \text{Spouse}_{it+1} + \beta_{9i} \text{Age}_{it} + \beta_{10i} \text{Male}_{it} + \beta_{11i} \text{DepCh}_{it} + \beta_{12i} \text{Educ}_{it} + \beta_{13i} \text{Year}_{it}.
\]

Dependent Variable

\[
\text{LFP}_{it+1} = 2 \text{ if individual } (i) \text{ decides to work full-time full-year in } t + 1 \text{ (yearly total hours of work } \geq 1,560); = 1 \text{ if } i \text{ works part-time in } t + 1 \text{ (1,560 > yearly total hours of work > 0)}; = 0 \text{ if } i \text{ fully retires from the labour force (defined by 0 yearly total hours of work).}
\]

Explanatory Variables

\[
\text{Earn}_{it}: \text{ current earnings} = \text{ wages, salaries, and compensation.}
\]
Life Earn\textsubscript{it}: lifetime earnings = average earnings during work history.
Acc\textsubscript{it}: either one-year or peak accrual.
W\textsubscript{it}: the present-value of expected public and private pension wealth.
Inv\textsubscript{it}: investment income.
H\textsubscript{it+1}−H\textsubscript{it}: 1 if deterioration of health status between t and t + 1 (from excellent, very good or good, to fair or poor), else 0;
Imm\textsubscript{it}: 1 if immigrant, else 0.
Spouse\textsubscript{it+1}: 1 if individual has a working spouse in t + 1, else 0;
Age\textsubscript{it}: set of dummy variables for age (50–54, 55–59, 60–64, and 65+);
Male\textsubscript{it}: 1 if male, 0 else.
DepCh\textsubscript{it}: 1 if having at least one dependent child at home, else 0;
Educ\textsubscript{it}: set of dummy variables for education level (postsecondary, high-school, less than high-school).
Year\textsubscript{it}: set of dummy variables for current year (2001–2005).

The model captures both wealth/income and substitution effects. If we assume that leisure is a normal good, increased pension wealth and investment income should lead to more consumption, including leisure, thus raising incentives to retire. (Our wealth measure does not account for financial assets associated with investment income. Given the high volatility of investment income, it was practically impossible to estimate a wealth component associated with it. Hence, investment income is included as a separate explanatory variable.) The model also captures a substitution effect through accruals associated with pensions and earnings. If working more raises future retirement wealth, the individual has an incentive to continue to work. We use two alternative measures of pension accruals, the one-year and peak accrual. However, only the results using one-year pension accruals are presented in the tables. The reason is that the peak accrual effect is always not statistically significant and the signs of the coefficients are sometimes counterintuitive. The model also includes earnings as an explanatory variable. An increase in earnings is expected to raise incentives to continue to work. As in Schirle [2] and Baker et al. [4], a measure of lifetime earnings (i.e., average earnings during work history) is included to control for individual heterogeneity in preferences for leisure and work. Moreover, we control for variables known to be associated with older workers’ labour force participation (health, having a working spouse, immigrant status, having dependent children, education level, and gender) (We ran specifications without education dummies and it did not change much the coefficients of other variables although it might be correlated with earnings. We also ran specifications with self-reported health status dummies (excellent health being the reference) and as for education it did not change much the coefficients of other variables.) and a labour market variable (year dummies).

The reduced-form model for the sample of part-time workers is different from (1) and takes the following form:

\[
\text{LFP}_{it+1} = \beta_0 + \beta_1 \text{H}_wage_{it} + \beta_2 \text{CPP}_{it} + \beta_3 \text{OAS}_{it} + \beta_4 \text{PRP}_{it} + \beta_5 \text{Inv}_{it} + \beta_6 (H_{it+1} - H_{it}) + \beta_7 \text{Imm}_{it} + \beta_8 \text{Spouse}_{it+1} + \beta_9 \text{Male}_{it} + \beta_{10} \text{DepCh}_{it} + \beta_{11} \text{Educ}_{it} + \beta_{12} \text{Year}_{it}.
\]

The reduced-form model for the sample of part-time workers is different from (1) and takes the following form:

\[
\text{Dependent Variable}
\]

\[
\text{LFP}_{it+1}: 2 \text{ if individual (i) decides to work full-time full-year in } t + 1 \text{ (yearly total hours of work } \geq 1,560) = 1 \text{ if } i \text{ works part-time in } t + 1 (1,560 > \text{ yearly total hours of work } > 0) = 0 \text{ if } i \text{ fully retires from the labour force (defined by 0 yearly total hours of work).}
\]

\[
\text{Explanatory Variables}
\]

\[
\text{H}_wage_{it}: \text{ hourly wage}.
\text{CPP}_{it}: \text{ benefits from the Canadian or Quebec Pension Plan.}
\text{OAS}_{it}: \text{ total benefits from Old Age Security/Guaranteed Income Supplement/Spouse’s Allowance.}
\text{PRP}_{it}: \text{ employer-sponsored benefits, RRSP annuities and RRIF withdrawals.}
\text{Inv}_{it}: \text{ investment income.}
\text{H}_{it+1}−H_{it}: 1 \text{ if deterioration of health status between } t \text{ and } t + 1 \text{ (from excellent, very good, or good to fair or poor), else 0}.
\text{Imm}_{it}: 1 \text{ if immigrant, else 0}.
\text{Spouse}_{it+1}: 1 \text{ if individual has a working spouse in } t + 1, \text{ else 0}.
\text{Male}_{it}: 1 \text{ if male, 0 else}.
\text{DepCh}_{it}: 1 \text{ if having at least one dependent child at home, else 0}.
\text{Educ}_{it}: \text{ set of dummy variables for education level (postsecondary, high-school, less than high-school).}
\text{Year}_{it}: \text{ set of dummy variables for current year (2001–2005).}
\]

Expected discounted wealth and accruals are not included in (2) because they are derived from a history of full-time employment. For part-time older workers, the income effect from pensions is captured through public pension (CPP/QPP, OAS/GIS/SPA) and private pension (PRP) income, which include employer-sponsored benefits, RRSP annuities, and RRIF withdrawals. We use hourly wage instead of earnings since hours of work are highly variable among part-time workers.

The labour force participation of older workers is also likely to be very sensitive to the age at which individuals
become eligible for a public pension (or private pension) and the income level. Labour market behaviours may also differ between older men and women. Accordingly, we run separate regressions by age group (50–59 and 60–69) and gender for both samples and by income quartile for the sample of full-time workers only.

5. Results

5.1. Descriptive Analysis. Figures 1 and 2 illustrate the patterns by age of the dependent variables, the labour market transitions of full-time workers and part-time workers over one year, respectively. In Figure 1, the proportion of older workers remaining full-time during the next year decreases with age as workers transit into part-time work or retirement. There are two significant drops, at age 60 and 65, corresponding to ages at which older workers become eligible to early Canada and Quebec Pension Plan benefits at age 60 and to Old Age Security benefits at age 65. The proportion of full-time workers transiting into part-time employment (part-time work or retirement part of the year) increases significantly with age from 10.4% at age 55 to 30% at age 65. Finally, the proportion of full-time workers entering full retirement increases with age but is very low, from less than 5.0% at age 55 to near 8% at age 65 and after. This suggests that most full-time older workers transit to part-time employment before full retirement.

In Figure 2, the proportion of older workers in part-time employment remains fairly stable up to age 65 (between 55% and 61%) and decline slightly afterwards. The proportion of workers in part-time employment entering full retirement increases with age, reaching a peak at age 65 when they become eligible for OAS. The proportion of workers in part-time employment who move to full-time full-year work decreases marginally with age until 65 but increases afterwards.

Table 3 presents summary statistics of the explanatory variables for 2006 as well as the distribution of workers by occupation with mean and median values for the financial variables. As of 2006, the sample contains 5,886 full-time older workers and 1,132 part-time workers. The actual values for private and public pension variables are reported for the sample of part-time workers because these values are used in the regression analysis for part-time workers. Among the statistics, the mean wealth is $343,054 for full-time workers and $352,785 for part-time workers. About 59% of full-time workers are males compared to 57% for part-time workers. The average age is 57 years. The proportion of workers by age does not change much between full-time and part-time workers. About 19% of both full-time and part-time workers have excellent health, compared to 38.6% and 37.1%, respectively with very good health. About 32% and 33% have good health. Finally, the proportion of workers in fair and poor health is much smaller.

5.2. Regression Results. The results (i.e., marginal effects) from ordered probit regressions for the sample of full-time workers are presented in Tables 4 and 5. The marginal effects are computed at the mean values for all explanatory variables. In both tables, when a variable is found to increase (decrease) the probability of continuing to work full-time, it decreases (increases) the probability of working part-time and fully retiring. The computed marginal effects on the probability of fully retiring are small in most cases, which can be explained by the small proportion of workers who fully retire the following year.

Table 4 shows the regression results by age group (50–59 and 60–69) and gender. In these specifications, the present value (PV) of wealth is statistically significant for men but not for women, while the one-year pension accrual is not statistically significant but has the expected sign. The PV of wealth also only has a very small impact on the labour market transitions of older workers. A $10,000 increase in the PV of wealth decreases the probability of continuing to work full-time by 0.05 percentage point (p.p.) for men aged 50–59 and by 0.22 p.p. for men aged 60–69. This leads to an increase in the probability of moving to part-time work for both age
Table 3: Summary statistics of explanatory and selected variables, 2006.

| Pension wealth and accrual variables ($) mean/median | Full-time workers (n = 5,886) | Part-time workers (n = 1,132) |
|-----------------------------------------------------|-------------------------------|-------------------------------|
| Wealth                                              | 343,054/330,351               | 352,785/340,210               |
| One-year accrual                                    | 1,999/2,504                   | 636/1,652                     |
| Peak accrual                                        | 20,509/25,500                 | 17,541/20,863                 |
| Income variables ($) mean/median                    |                               |                               |
| Wages and salaries                                  | 46,012/37,324                 | 15,816/9,510                  |
| Other employment income                             | 3,882/0                      | 1,466/0                       |
| Investment income                                   | 2,500/0                      | 1,726/0                       |
| CPP income                                          | —                             | 2,700/0                       |
| Private pension income                              | —                             | 12,471/2,342                  |
| OAS/GIS/SPA                                        | —                             | 1,142/0                       |
| Job variables                                       |                               |                               |
| Usual hours of work per year, mean/median           | 2,405/2,086                   | 1,240/890                     |
| Occupational groups, %                              |                               |                               |
| Management                                          | 13.2%                         | 3.5%                          |
| Business, finance, and administration               | 18.7%                         | 18.3%                         |
| Nature and applied science                          | 4.8%                          | 3.8%                          |
| Health                                              | 6.4%                          | 9.7%                          |
| Social science education, government                | 9.4%                          | 15.3%                         |
| Art, culture, recreation, and sport                 | 2.0%                          | 2.7%                          |
| Sales and service                                   | 16.7%                         | 27.5%                         |
| Trade, transportation, and equipment                | 17.0%                         | 13.5%                         |
| Primary industry                                    | 5.8%                          | 3.9%                          |
| Processing, manufacturing, and utilities            | 6.0%                          | 1.6%                          |
| Demographic variables                               |                               |                               |
| Age, mean/median                                    | 57/56.7                       | 57/57.4                       |
| Male, %                                             | 58.7%                         | 57.9%                         |
| Health shock (deterioration of health status), %    | 3.3%                          | 5.9%                          |
| Health status, %                                    |                               |                               |
| Excellent                                           | 19.4%                         | 19.1%                         |
| Very good                                           | 38.6%                         | 37.1%                         |
| Good                                                | 31.9%                         | 33.2%                         |
| Fair                                                | 8.3%                          | 8.8%                          |
| Bad                                                 | 1.8%                          | 1.8%                          |
| Working spouse, %                                    | 53.3%                         | 47.2%                         |
| Dependent children at home, %                       | 25.3%                         | 23.6%                         |
| Immigrant, %                                        | 15.5%                         | 15.1%                         |
| Province, %                                         |                               |                               |
| Atlantic provinces                                  | 19.4%                         | 16.8%                         |
| Quebec                                              | 16.5%                         | 15.3%                         |
| Ontario                                             | 27.8%                         | 28.2%                         |
| Manitoba + Saskatchewan                             | 15.7%                         | 16.2%                         |
| Alberta                                             | 10.4%                         | 11.7%                         |
| British Columbia                                    | 10.2%                         | 11.9%                         |

groups, while the probability of shifting to full retirement is very small.

Although the accrual effect is not statistically significant, the results suggest that a $10,000 increase in one-year pension accrual would increase the probability of continuing to work full-time by 0.26 p.p. for women, mainly at the expense of a reduction in the probability of moving to a part-time job. A $10,000 rise in current earnings increases the probability of continuing to work full-time by 1.8 p.p. for men and 4.6 p.p. for women aged 50–59. This substitution effect associated with earnings is likely an indication that older workers with better labour market outcomes are more attached to the
For the older age group, the marginal effect is much greater, 2.6 p.p. for men and 8.5 p.p. for women. These findings suggest that wages do matter, especially for individuals with stronger labour force attachment.

Moving to the control variables, a deterioration of self-reported health decreases the probability of continuing to work full-time for men and women aged 50–59, but the impact is statistically significant only for women. At age 60–69, the impact is statistically significant and large for both men and women. For the 50–59 age group, immigrant women are 3.4 p.p. more likely to continue working full-time compared to non-immigrants. The impact for men is also positive but not statistically significant. However, at older ages, the probability of continuing to work is about the same for immigrant men and women, 4.1 p.p. and 3.9 p.p., respectively.

For the 50–59 age group, men with a working spouse have a 3.1 p.p. greater probability of continuing to work full-time. Finally, having dependant children increases the probability of men aged 50–59 working full-time by 1.3 p.p., while for the older age group, only women are more likely to continue working full-time (a 13.1 p.p. increase).

Although, the imputed measures of pension wealth and accruals appear to have little impact on the labour market transition of older workers by age, they may have a larger impact by income level. Equation (1) was estimated by gender and income quartile, and Table 5 reports the computed marginal effects of the ordered probit regression results. The first quartile (the lowest) of the earnings distribution represents the low earners, the second and the third quartiles are combined to form the middle earners, and the highest quartile corresponds to the high earners.

In all earnings levels, an increase in the PV of pension wealth decreases the probability of continuing to work full-time. Finally, having dependant children increases the probability of men aged 50–59 working full-time by 1.3 p.p., while for the older age group, only women are more likely to continue working full-time (a 13.1 p.p. increase).

Table 4: Marginal effects on the probability of working full-time, part-time and choosing to retire, sample of full-time workers 2001–2005, by age and gender (Percentage points difference in estimated probability).

|                             | Age 50–59 | Age 60–69 |
|-----------------------------|-----------|-----------|
|                             | Male      | Female    | Male      | Female    |
| Earnings ($10,000 increase) |           |           |           |           |
| Full-time                   | 1.79***   | 4.55***   | 2.58***   | 8.52***   |
| Part-time                   | −1.61***  | −4.32***  | −2.01***  | −7.79***  |
| Retirement                  | −0.18***  | −0.23***  | −0.57***  | −0.73***  |
| Lifetime earnings ($10,000 increase) |         |           |           |           |
| Full-time                   | 0.01      | 0.07      | −0.16     | −0.38     |
| Part-time                   | −0.01     | −0.06     | 0.13      | 0.35      |
| Retirement                  | 0         | −0.01     | 0.03      | 0.03      |
| Wealth ($10,000 increase)   |           |           |           |           |
| Full-time                   | −0.05***  | 0.01      | −0.22***  | −0.08     |
| Part-time                   | 0.04***   | −0.01     | 0.17***   | 0.07      |
| Retirement                  | 0.01***   | −0.00     | 0.05***   | 0.01      |
| One-year accrual ($10,000 increase) |         |           |           |           |
| Full-time                   | 0.04      | −0.17     | −0.09     | 0.26      |
| Part-time                   | −0.03     | 0.16      | 0.07      | −0.23     |
| Retirement                  | −0.01     | 0.01      | 0.02      | −0.03     |
| Health shock                |           |           |           |           |
| Full-time                   | −1.73     | −10.27**  | −10.54*** | −13.68*** |
| Part-time                   | 1.64      | 9.51**    | 7.74***   | 12.86***  |
| Retirement                  | 0.19      | 0.75**    | 2.80***   | 0.82***   |
| Immigrant                   |           |           |           |           |
| Full-time                   | 0.89      | 3.38***   | 4.05*     | 3.86      |
| Part-time                   | −0.80     | −3.22***  | −3.19*    | −3.55     |
| Retirement                  | −0.09     | −0.16***  | −0.86*    | −0.31     |
| Working spouse              |           |           |           |           |
| Full-time                   | 3.08***   | 0.05      | 6.53***   | 3.66      |
| Part-time                   | −2.76***  | −0.05     | −5.06***  | −3.35     |
| Retirement                  | −0.32***  | 0.00      | −1.49***  | −0.31     |
| Dependent children          |           |           |           |           |
| Full-time                   | 1.33***   | 0.59      | −1.08     | 13.06*    |
| Part-time                   | −1.12***  | −0.56     | 0.83      | −12.27*   |
| Retirement                  | −0.21***  | −0.03     | 0.25      | −0.79*    |

Other control variables (education level and year dummies) are included in ordered probit regressions. Marginal effects are significant at 99% (**), 95% (**), and 90% (*), not significant otherwise.
other interesting finding is that changes in pension accruals appear to have a larger influence on lower income people. This is not surprising since a $10,000 increase in future pension wealth if an individual works one more year has a much greater importance for a lower income individual than for a richer individual.

Probability values on changes in earnings are also much greater than probability values on wealth variables, which is also not surprising. A $10,000 change in the present value of wealth has a much smaller annual income effect than a $10,000 annual change in earnings.

Computed marginal effects from ordered probit regressions for the sample of part-time workers by age group (50–59, 60–69) and gender are presented in Table 6. As expected, receiving public and private pension benefits while working part-time increases the probability of fully retiring (an income effect). CPP/QPP income received before age 60 corresponds to disability benefits. For age group 50–59, receiving CPP/QPP disability benefits significantly raises the probability of moving to full retirement. More specifically, a $1000 increase in CPP/QPP benefits raises the probability of retiring by about 1 p.p., on average for males and females. For the 60–69 age group, a $1000 increase in CPP/QPP retirement benefits raises the probability of retiring by 1.8 and 1.6 p.p. for males and females, respectively.

### Table 5: Marginal effects on the probability of working full-time part-time and choosing to retire, sample of full-time workers 2001 and 2005, by earnings and gender (percentage points difference in estimated probability).

|                  | Low earners |          | Middle earners |          | High earners |          |
|------------------|-------------|----------|----------------|----------|-------------|----------|
|                  | Male        | Female   | Male           | Female   | Male        | Female   |
| **Earnings ($10,000 increase)** |             |          |                |          |             |          |
| Full-time        | 3.31***     | 7.43***  | 5.34***        | 6.86***  | 1.02***     | 2.93***  |
| Part-time        | −2.62***    | −6.46*** | −4.91***       | −6.64*** | −0.92***    | −2.93*** |
| Retirement       | −0.69***    | −0.97*** | −0.43***       | −0.22*** | −0.10***    |          |
| **Lifetime earnings ($10,000 increase)** |             |          |                |          |             |          |
| Full-time        | 1.24        | 0.78     | −0.48          | 0.52     | 0.03        | −0.83    |
| Part-time        | −0.98       | −0.68    | 0.44           | −0.50    | 0.03        | 0.83     |
| Retirement       | −0.26       | −0.10    | 0.04           | −0.02    | 0           |          |
| **Wealth ($10,000 increase)** |             |          |                |          |             |          |
| Full-time        | −0.15***    | −0.05    | −0.03          | 0.03     | −0.10***    | −0.02    |
| Part-time        | 0.12***     | 0.05     | 0.03           | −0.03    | 0.09***     | 0.02     |
| Retirement       | 0.03***     | 0        | 0.00           | 0.00     | 0.01***     | 0        |
| **One-year accrual ($10,000 increase)** |             |          |                |          |             |          |
| Full-time        | 0.72*       | 0.50     | 0.05           | −0.03    | −0.04       | −0.02    |
| Part-time        | −0.57*      | −0.43    | −0.05          | 0.03     | 0.03        | 0.02     |
| Retirement       | −0.15*      | −0.07    | 0              | 0        | 0.01        | 0.00     |
| **Health shock** |             |          |                |          |             |          |
| Full-time        | −1.82       | −2.74    | −5.27**        | −9.98**  | −1.60       | −9.53    |
| Part-time        | 1.43        | 2.36     | 4.75**         | 9.50**   | 1.45        | 9.47     |
| Retirement       | 0.39        | 0.38     | 0.52**         | 0.48**   | 0.15        | 0.06     |
| **Immigrant**    |             |          |                |          |             |          |
| Full-time        | 6.59*       | 8.69***  | 1.16           | 1.87     | −0.71       | 2.23     |
| Part-time        | −5.33*      | −7.69**  | −1.07          | −1.81    | 0.65        | −2.22    |
| Retirement       | −1.26*      | −0.99**  | −0.09          | −0.07    | 0.06        | 0.01     |
| **Working spouse** |             |          |                |          |             |          |
| Full-time        | 9.32***     | −1.92    | 3.45***        | 0.27     | 2.56***     | 0.00     |
| Part-time        | −7.31***    | −1.67    | −3.16**        | −0.26    | −2.30***    | 0.00     |
| Retirement       | −2.01***    | −0.25    | −0.29**        | −0.01    | −0.26***    | 0.00     |
| **Dependent children** |             |          |                |          |             |          |
| Full-time        | 2.85        | −0.31    | 2.68*          | 0.12*    | 1.01***     | 2.31***  |
| Part-time        | −2.27       | 0.27     | −2.47*         | −0.11*   | −0.91***    | −2.30*** |
| Retirement       | −0.58       | 0.04     | −0.21*         | −0.01*   | −0.10***    | −0.01*** |

Other control variables (education level and year dummies) are included in ordered probit regressions. Marginal effects are significant at 99% (***), 95% (**), and 90% (*), not significant otherwise.
In comparison, a $1000 increase in private pension income has a smaller impact on the probability of retiring. It raises the probability of part-time workers aged 55–59 to move to full-time work by about 0.4 p.p. for both males and females. For workers aged 60–69, the marginal effect is also statistically significant, but half the size of the effect on younger part-time workers. This suggests that private pension plans have a greater influence on retirement decisions for younger seniors who work part-time. At age 60 and over, public pension plans are the main determining factor. A $1000 increase in OAS/GIS payments raises the probability of full retirement for men and women by about 1 and 1.4 p.p., respectively, for men and women aged 60–69.

For males in part-time work, having a working spouse raises the probability of moving to a full-time job sharply by 11.7 p.p., for age group 50–59 and 6.9 p.p. for the older group. For women, having a working spouse does not have a significant effect on their retirement decision. Finally, all other variables have expected signs but are not statistically significant. One interesting exception is wages, measured as hourly wage, which has virtually no impact on retirement decisions for part-time workers.

### 6. Conclusion

This paper estimates a microeconometric model of labour market transitions for older workers to examine the relative importance of financial and nonfinancial factors on the probability of moving from full-time to part-time work as well as moving to full retirement. Sequential annual observations of employment and retirement choices are examined for samples of full-time workers and part-time workers, drawn from the Survey of Labour and Income Dynamics (SLID), 2001–2006. Also, since longitudinal data on pension wealth and accruals are not available, we applied the method from Schirle [2] to construct a measure of potential wealth that Canadian workers may be entitled to at retirement.

Overall, the analysis suggests that higher pension wealth influences older workers to move from full-time to part-time jobs, thus supporting the evidence found in previous studies that retirement is usually a process, not a single event. Moreover, the influence of non-financial factors, such as a negative health shock, is also more likely to lead individuals to move from full-time to part-time work rather than to move to full retirement. These findings suggest that although policies to encourage phased retirement can help to give more flexibility, they are unlikely to have a significant labour market effect since bridge employment is already a common transition practice among older workers.

Another interesting finding from the results is that the substitution effect associated with pension plans (i.e., pension accruals) tends to mainly influence lower income individuals. This would imply that reducing or eliminating early retirement incentives in pension programs is likely to
encourage older workers of lower income groups to work longer and have a much smaller impact on higher income individuals. For part-time older workers, the analysis shows that an increase in their public pension income reduces the probability of moving to full-time work, to some extent, suggesting that a negative wealth shock might increase the labour supply of older workers. Finally, results indicate that older workers with higher family income, through higher earnings or living with a working spouse, are more likely to work full-time. This is a display of their stronger labour market attachment and the fact that the retirement is often a joint decision.

Finally, given the limitations of the study, here are a few caveats. First, since there is no information available in Canada on pension wealth at the individual level, we apply the imputation method proposed by Schirle [2]. This is a first limitation as imputed data cannot be as accurate as real wealth information, if it existed. It is thus likely to attenuate the estimates. However, our findings are in line with other international studies (e.g., [20]). Second, we use a single definition of the dependant variable. The definition of retirement that we use may be restrictive (i.e., 0 hours of work in one year), resulting in a small proportion of full-time workers who retire the following year. Third, we do not control directly for unobserved heterogeneity in preferences for leisure and work because there is no recognized method to address this issue using ordered probit regressions. However, we include lifetime earnings in the regression analysis, which capture to some extent the upward bias on wealth effects associated with the fact that people with stronger labour force attachment tend to have higher pension wealth.

Acknowledgements

The authors wish to thank Gilles Bérubé, Jeff Carr, Ross Finnie, Tammy Schirle, and two anonymous referees for useful comments. All remaining errors are those of the authors. The views expressed in this paper are solely those of the authors and do not necessarily reflect the views of HRSDC nor those of the Government of Canada.

References

[1] C. J. Ruhm, “Bridge jobs and partial retirement,” *Journal of Labor Economics*, vol. 8, no. 4, pp. 482–501, 1990.
[2] T. Schirle, “Health, pensions, and the retirement decision: evidence from Canada,” *Canadian Journal of Aging*, vol. 29, no. 4, pp. 519–527, 2010.
[3] M. Fougère, S. Harvey, Y. Lan, A. Léonard, and B. Rainville, “Incentives for Early Retirement in Canada: An Analysis with a Dynamic Life-Cycle CGE Model,” in *Retirement Policy Issues in Canada*, John Deutsch Institute for the Study of Economic Policy Conference Book, M. G. Abbott, C. M. Beach, R. W. Badoway, and J. G. MacKinnon, Eds., McGill-Queen’s University Press, 2009.
[4] M. Baker, J. Gruber, and K. Milligan, “The retirement incentive effects of Canada’s Income Security programs,” *Canadian Journal of Economics*, vol. 36, no. 2, pp. 261–290, 2003.
[5] M. Baker, J. Gruber, and K. Milligan, “Income security programs and retirement in Canada,” in *Social Security Programs and Retirement Around the World: Micro-Estimation*, pp. 99–152, University of Chicago Press, Chicago, Ill, USA, 2004.
[6] C. Pescarus and M. Rivard, “Régimes de retraite d’employeur et incitations à la retraite anticipée au Canada,” Department of Finance Working Paper 2005-02, 2005.
[7] J. Compton, “Determinants of Retirement—Does Money Really Matter?” Department of Finance, Canada, Working Paper #2001-02, 2002, http://www.fin.gc.ca/wp/2001-02-eng.asp.
[8] K. Milligan and T. Schirle, “Public Pensions and Retirement: International Evidence in the Canadian Context,” Skills Research Initiative Working Paper 2006 A-13, 2006, http://strategis.ic.gc.ca/epic/site/eas-aes.nsf/en/ra02019e.html.
[9] C. Coile and J. Gruber, “Future social security entitlements and the retirement decision,” *Review of Economics and Statistics*, vol. 89, no. 2, pp. 234–246, 2007.
[10] P. Diamond and G. Jonathan, “Social Security and Retirement in the US,” in *Social Security and Retirement Around the World*, J. Gruber and D. Wise, Eds., University of Chicago Press, Chicago, Ill, USA, 1999.
[11] X. Chen, M. Fougère, and B. Rainville, “Taxes, Pension and the Retirement Decision of Older Canadians,” in *Canadian Economic Association Meetings*, Ottawa, Canada, 2011.
[12] B.-F. Hébert and M. Luong, “Bridge Employment,” *Perspectives on Labour and Income*, November, Statistics Canada, Catalogue no. 75-001, 2008.
[13] T. Wannell, “Young Pensioners,” Perspectives on Labour and Income, October, Statistics Canada, Catalogue no. 75-001, 2007.
[14] G. Schellenberg, M. Turcotte, and B. Ram, “Post-retirement Employment,” Perspectives on Labour and Income, September, Statistics Canada, Catalogue no. 75-001, 2005.
[15] W. Pyper and P. Giles, “Approaching Retirement,” Perspectives on Labour and Income, September, Statistics Canada, Catalogue no. 75-001, 2002.
[16] K. E. Cahill, M. D. Giandrea, and J. F. Quinn, “Are Traditional Retirements a Thing of the Past? New Evidence on Retirement Patterns and bridge Jobs,” BLS Working paper no. 384, September 2005.
[17] Statistics Canada, “Pension Plans in Canada,” Catalogue no. 74C0002, 2009.
[18] W. Pyper, “RRSP investments,” Perspectives on Labour and Income, February, Statistics Canada, Catalogue no. 75-001, 2008.
[19] J. Stock and D. Wise, “Pensions, the option value of work and retirement,” *Econometrica*, vol. 58, no. 5, pp. 1151–1180, 1990.
[20] C. Coile and J. Gruber, *Social Security Programs and Retirement Around the World: Micro-Estimation*, J. Gruber and D. Wise, Eds., NBER Book Series—International Social Security, University of Chicago Press, 2004.
Submit your manuscripts at
http://www.hindawi.com