The Determinants of Older Canadians' Labour Force Attachment

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Abstract

With a rapidly aging demographic, the labour force attachment of older Canadians has become a key area of policy research for mitigating ensuing economic issues. This paper examines the labour force attachment of older Canadians aged 50 years and older through the use of four labour force outcomes: labour force participation, employment status, full-time full-year status, and retirement status. Two sub-samples are created based on age to compare the impact and change in behaviour of individuals approaching the normal retirement age of 65 (i.e. 50-64) to those who have passed this age (i.e. 65+). Furthermore, genders are analyzed separately in order to assess the differences in behaviour between men and women. Determinants for the four outcomes are also assessed. These include, but are not limited to, age group, marital status, educational attainment, region of residence, and presence of children in the household. Of the analyzed determinants, the results suggest that age is the most impactful factor for men and women in both the 50-64 and 65+ sub-samples. Compared to the youngest age categories, older individuals are less likely to have strong labour force attachment. Marital status and educational attainment also demonstrate to be important determinants for the labour market outcomes of older workers. The results for marital status suggest differing experiences for men and women in the 50-64 and 65+ sub-samples and those for educational attainment generally show that higher educational attainment is associated with stronger labour force attachment.

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1. **Introduction**

Population aging has become a prevalent issue for the advanced economies of the world. As a result of low fertility rates, Canada is no exception and is facing a rapidly progressing demographic shift. This shift in the composition of the Canadian population will undoubtedly result in both fiscal and other economic pressures. Supporting an older demographic with a shrinking proportion of working-age individuals will be challenging, as an aging population is accompanied by an increase in demand for age-related services. Without strategic changes in policy, maintaining an appropriate level of economic well-being may prove to be difficult.

A frequently studied area of research that targets the mitigation of such issues is the labour force attachment of older Canadians. Particularly, in order to alleviate the pressure associated with the large retiring baby boom generation, increasing the normal retirement age and strengthening labour supply among older adults have been shown to have widely positive effects. In the mid-1990s Canada experienced a reversal in its declining trend of the labour force participation and employment rate of older workers, which may suggest that Canada may not be as greatly threatened by the issue of a shrinking workforce. Nevertheless, it is important to identify the determinants for this reversal in trend to determine whether it is a result of \preferences for longer careers rather than an issue of retirement affordability.

This paper employs the 2006 Canadian Census data to identify the determinants of labour force attachment among Canadians over the age of 50. Four dichotomous labour market outcomes are studied to assess the differences between the behaviour of older adults approaching the normal retirement age of 65 and individuals who have passed this age. These outcomes are labour force participation, employment status, full-time full-year status, and retirement status.

Furthermore, genders are assessed separately, as women and men typically demonstrate differing behaviour.

The paper is organized as follows. Section 2 provides a brief primer on the issue at hand, by reviewing the relevance of the matter in Canada. Following this review, section 3 presents an overview of older workers' historical labour market outcomes in Canada and begins an inventory of relevant factors that are later studied in the models of this paper. Section 4 continues this inventory by summarizing a few recent empirical studies in this area. Following the literature review, section 5 describes the data, samples and methodology for the analysis. Finally, section 6 presents the results of the analysis and is followed by the conclusion of this paper in section 7.

2. The Issue At Hand

Like many advanced economies of the world, Canada is facing an aging population. This phenomenon is typically a result of decreasing fertility and of increasing life expectancy. Due to the decline in fertility, Canada has been experiencing a gradually decreasing growth in population since its peak in the late 1950s baby boom of 2.8 percent per year to its current rate of 1 percent per year (Department of Finance Canada, 2012). This rate is expected to fall to 0.7 percent per year by 2050 (Department of Finance Canada, 2012). More importantly, this demographic shift is expected to progress rapidly as the large baby boom generation approaches retirement. In fact, the old age dependency ratio (the ratio of older adults (65+) to the working-age population (15-64)) is projected to approximately double from 21 percent in 2012 to 37 percent by 2030 (Department of Finance Canada, 2012).

Without offsetting changes in policy, an increasing dependency ratio poses many challenging fiscal and economic issues. Long-term fiscal sustainability will be threatened by a surge in demand for age-related services (such as public pensions and health care) that may not

be feasibly supported by a relatively smaller working-age population. With an increasing share of older individuals in the economy, the Canadian labour force is expected to shrink as older age groups typically demonstrate lower rates of labour force participation (Industry Canada, 2008). Consequently, maintaining appropriate levels of growth will require an increase in labour supply. To this end, improving the productivity of labour and/or bolstering labour force participation in Canada are methods of mitigating the effects of an aging workforce.

In addressing a shrinking and aging workforce, expansionary immigration policy may appear to be a simple fix. In fact, immigration has been and currently is an important source contributing to Canada's population growth and workforce growth. On average, between 1989 and 2007, annual net immigration was approximately 0.67% of the resident Canadian population (Banerjee & Robson, 2009). Immigration can serve as an important source of young and skilled entrants to the Canadian labour force, as immigrants are, on average, younger than Canadian residents (Banerjee & Robson, 2009). Hence, it may be expected that by increasing immigration to Canada, the old age dependency ratio and Canadian standard of living should improve. However, studies show that a very large and unlikely increase in immigration would be required to counterbalance the projected increase in dependency ratio. Banerjee and Robson (2009) evaluate the effect of several immigration policy options to assess their impact on the workforce growth rate, the dependency ratio, and the growth rate of output per capita in Canada for the years 1997 to 2057. Four different simulations are carried out to project Canada's population based on varying assumptions. The baseline scenario assumes that the fertility rate remains at its 2006 level (1.54 per woman) throughout the projection period. Life expectancy at birth by sex is assumed to gradually increase and a constant share of each age group and sex emigrates every year. The annual gross flow of immigrants is assumed to be 0.7 percent of the resident

population annually. The three other scenarios deviate from the baseline in that one assumes more immigration to Canada (1 percent of the resident population annually throughout the period), the second assumes a younger age profile of immigrants (favoring parents aged 20-29), and the third combines the two former scenarios.

The results of the study show that immigration policy alone is not a sufficient tool to offset the future projected challenges. For workforce growth, in spite of an increase of immigration to 1 percent of the resident population annually, significant decreases are projected by the 2020s. Moreover, coupling the increased flow of immigration with a younger age profile still shows that a very large flow of immigrants would be needed in order to maintain the dependency ratio at current levels. To put this in perspective, the 1989 to 2007 average net annual immigration rate of 0.67 percent of the resident population (mentioned earlier) would have to more than quadruple to 3 percent of the resident population annually. The authors calculate that this rate of 3 percent would have to persist for decades in order to come close to stabilizing the dependency ratio. Such drastic and large changes are both unlikely and infeasible. For example, to acquire the desired rate of immigrants, Canada would need to attract a large proportion of all immigrants that go to competing countries in the world.

An alternative policy, that is frequently studied and explored by governments of developed countries, is to increase the average effective or normal retirement age. Improving the labour market outcomes of older Canadians, minimizing possible disincentives to work at older ages, and implementing incentives to participate will enable older workers to remain in the workforce if they wish to do so. In fact, it is projected that postponing retirement may greatly benefit the fiscal and economic outlook of a population. Banerjee and Robson (2009) demonstrate that by gradually increasing the standard retirement age from 65 to 70, a boost in

workforce growth is projected. Also, a later normal age of retirement essentially delays and diminishes the ensuing increase in the old age dependency ratio.

Denton and Spencer (2009) also examine this issue by studying the effects that an increase in the labour force participation of older workers would have on the size and age composition of the labour force, on the productive capacity of the economy, and on the incomes of Canadians. Their standard scenario assumes that participation rates for both sexes aged 55 years and older remains at their 2008 level throughout the projection period. In a second scenario, they assume that labour force participation increases to higher rates and that female and male rates are similar when this peak is reached by year 2016. The assumed peak is set at a rate that has been observed in the last 30 years for men. Those assumptions are meant to assess the impact of the "largest possible increases" in the labour force participation rate of older workers. The results of that scenario show that by 2016 the older labour force will be approximately 30 percent larger and the overall labour force will increase by 6 percent, compared to the standard scenario. These differences are predicted to persist throughout the projection period. Without any changes in productivity, the productive capacity of the economy and the growth rate are also expected to increase as the size of the workforce increases.

However, Denton and Spencer (2009) also point out that increasing the labour force participation of older workers alone is not an all-encompassing solution for an aging population. Other combinations of policy options (e.g. improving productivity, boosting fertility, etc.) may collectively contribute in supporting an aging population. Nonetheless, there is strong motivation and empirical support to implement policies that encourage and facilitate longer work lives for older Canadians and to use other policy options as complimentary and supporting tools.

The context provided in this section highlights the importance of determining factors that

impact older adults' decisions in the labour force. With Canada's rapidly aging population, identifying determinants that influence older adults in decreasing their intensity of attachment to the labour force or leaving altogether can help form target areas for improvement. With this intention in mind, the following two sections of the paper will make an inventory of relevant characteristics that are later incorporated in the paper's models and analysis. This inventory is based on characteristics that are presented as being theoretically, historically, and/or empirically relevant.

3. Older Workers' Historical Labour Market Outcomes

In order to study the determinants of labour force participation among older individuals, it is important to understand the characteristics of older age groups and the types of decisions that they face. On an individual basis, there are certain factors that may play an important role in an older individual's retirement decision. For example, from a financial standpoint, older individuals must determine if they are able to comfortably retire with the retirement income that they expect to receive. The labour supply decision is based on various financial aspects including past private saving decisions, contributory pensions, public pensions, other investments, non-labour wealth, debt, and the individual's current labour market situation. Theoretically, the decision to retire is positively related to wealth, as through an income effect more wealth can afford an individual to retire (Benjamin et al., 2007). On the other hand, expected earnings involve both a substitution and income effect (Benjamin et al., 2007). If an individual expects an increase in earnings, the opportunity cost of retiring increases.

Furthermore, health status gains importance as an individual ages. This, coupled with the nature of the job (i.e. blue-collar vs. white-collar), may create difficulty in fulfilling occupational requirements (Benjamin et al., 2007). Family dynamics must also be considered, as the presence

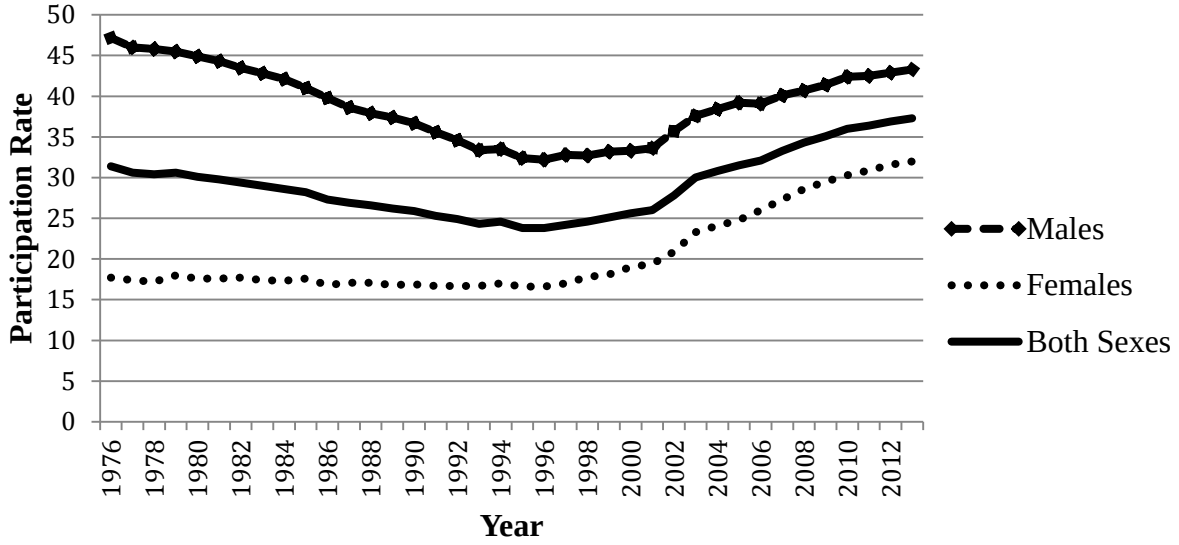
of an adult child within the household or a working spouse may lead an individual to postpone retirement (Benjamin et al., 2007). Moreover, labour market outcomes of older workers differ from their younger counterparts. For instance, the older unemployed are faced with particular challenges when trying to find employment. Although older workers have more experience than their younger counterparts, they generally have lower levels of education (Bernard, 2012). Also, older workers typically have skills that are specific to an industry, which creates problems when the demand for particular industries is declining (Bernard, 2012).

Such individualized factors, along with the prevalent economic climate and social transitions, are reflected in changing trends in the labour market attachment of older individuals through time. Figures 1 and 2 provide a historical picture of the labour market for older Canadians (aged 55 years or older) between years 1976 and 2013. The downward trends in the labour force participation rate and the employment rate up to the mid-90s were largely due to the growing labour supply at the time that motivated early retirement policies. The baby boom generation had become of working age and female participation in the labour force was on the rise (Hicks, 2012).

With recent trends of increasing labour force participation rates and employment rates, it appears that Canadians are moving towards postponing retirement. However, trends must be examined to determine whether they are due to changes in preferences or to changes in the nature of the Canadian labour market. That is, it is important to identify the extent to which this shift in behaviour is a result of involuntary and/or voluntary factors (Gomez & Gunderson, 2011). It may be that certain groups of older adults are postponing retirement due to financial pressures that are such that the normal retirement age is no longer feasible. Conversely, it is possible that older

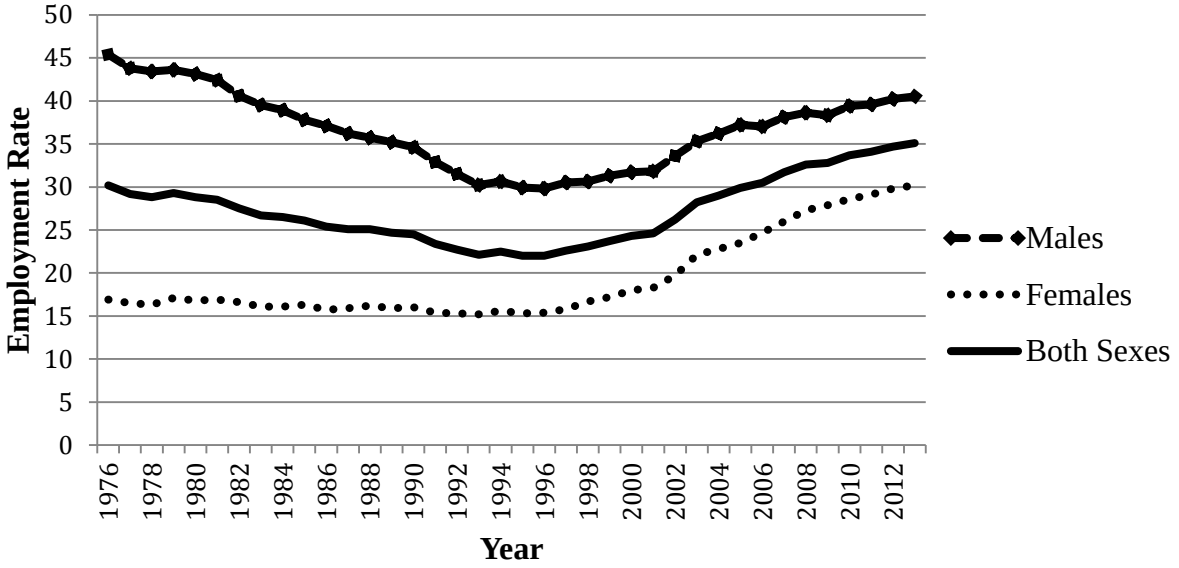
Canadians are generally valuing work more than leisure due to factors such as improved health, the shift towards less physically demanding occupations, and longer life expectancy.

Figure 1: Labour Force Participation Rate of Individuals Aged 55 Years and Older (1976-2013)



Source: Statistics Canada. Table 282-0002 - Labour force survey estimates (LFS), by sex and for 55 years and over age group, annual

Figure 2: Employment Rate for Individuals Aged 55 Years and Older (1976-2013)



Source: Statistics Canada. Table 282-0002 - Labour force survey estimates (LFS), by sex and for 55 years and over age group, annual

Through a survey of some empirical papers, the next section will shed light on several causes that may have led to the shift in behaviour and other factors that are generally relevant for the labour force outcomes of older adults.

4. Literature Review

This section surveys a few recent studies related to older Canadians. Specifically, the following review will focus on studies examining the determinants of retirement decisions and general labour market outcomes for older adults.

As previously mentioned, retirement is a relatively ambiguous concept. Post-retirement employment has become increasingly common and retirement has developed into a "transitional process" rather than a single defined life event (Hiscott, 2013). For this reason, many recent studies have focused on the determinants of employment after retirement. Hiscott (2013) employs the 2002 and 2007 cycles of the Canadian General Social Survey (GSS) to investigate how determinants related to post-retirement employment have changed over time. The study considers individual characteristics such as gender, age at retirement, education level, family status, and reasons for retirement identified by respondents. Specifically, the author looks at whether retirement is voluntary or not and at whether retirees enjoyed the work they did prior to retirement. Different elements related to financial status (e.g. debt repayment, private pension receipts, etc.) and health status (a self-measured category from poor to excellent) are also considered. Differences in objective and subjective definitions of retirement are emphasized. As an objective example, Hiscott identifies Statistic Canada's definition, where an individual is defined as retired if he/she is aged 55 years or more, is not in the labour force, and is receiving at least half of his/her total income from retirement sources. He employs a more subjective definition in order to retain a larger portion of GSS respondents who participate in post-

retirement employment. According to that definition, an individual is retired if he/she has reported retiring at least once at some point in his/her career. For his study, Hiscott extracts older workers by keeping individuals who are employed, yet retired by his definition.

The study employs a logistic regression with post-retirement employment as a dichotomous dependent variable for both surveys. Generally, the likelihood of post-retirement employment increases by 5 percentage points between the 2002 and 2007 surveys. Educational attainment and age at retirement are the two factors with the highest odds ratio. The study shows that individuals who retire before the age of 55 and individuals who hold a university degree are more than twice as likely to be participating in post-retirement employment as those who retire after the age of 55 and do not hold a university degree, respectively. Other factors that increase the likelihood include characteristics such as (actual responses italicized) being a *Male retiree,* being *Retired due to no longer enjoying work* they did prior to retirement, having a healthy financial status (i.e. having *RRSPs and/or other investments* and *Paid off debts before retirement),* being *Married or Common Law*, as well as *Voluntary retirement* for the 2007 survey. Factors that decrease this likelihood include *Retiring at age 60 or after*, having a *Spouse that retired in the last year*, and *Poor health status*. Having a *Single adult child at home* shows to be insignificant for both surveys. Overall, this study demonstrates that individuals with higher levels of educational attainment are more likely to return to paid work after retirement and that the timing of retirement is important. Individuals who retire earlier in their careers are most likely to be employed during retirement. Furthermore, it may be expected that individuals with a dire financial status are more likely to be employed throughout retirement out of necessity. Interestingly and contrary to these expectations, Hiscott shows that a more fortunate financial status is linked to higher odds of working. Also, all odd ratios related to better financial

situations increase between the two surveys. The author reasons that financially well-off individuals may be better equipped (in terms of skills, network connections, experience, etc.) in finding high-quality jobs and that this may increase their preferences for work in retirement.

Gomez and Gunderson (2011) also use the GSS to investigate changes in retirement decisions between 1994 and 2002. One particular goal of their study is to identify the determinants of retirement decisions in light of the ban on mandatory retirement in Canada. This significant change began in the early 1980s, with Quebec and Manitoba being the first provinces to adopt the ban. Currently, all provinces in Canada have essentially banned mandatory retirement. During this period, Gomez and Gunderson (2011) decompose the change in the probability of retiring due to mandatory retirement. Between the two surveys it is found that the probability to retire due to mandatory retirement declines by 1.3 percentage points. This overall shift is a result of both changes in the composition of the Canadian workforce (i.e. aging baby boomers) and changes in preferences (i.e. changes in the propensity to retire later). These components work in opposing directions, as the change in the composition of the workforce (i.e. changes in the independent variables) would lead to an increased probability to retire due to mandatory retirement, and the change in preferences (i.e. changes in the coefficient estimates) would decrease the probability of retiring due to mandatory retirement. Hence, the drop in the probability between the two surveys is mainly attributable to changes in preferences. This result emphasizes that the main driver for the trend of increasing labour force participation among older Canadians is not the change in the characteristics of the Canadian workforce, but rather the changes in preferences for a longer work life.

Additionally, Gomez and Gunderson (2011) study the expected age of retirement among those who have reported to have never retired. Between the two surveys the expected age at

retirement increases from 59.2 to 62.9 years. As an independent variable, the authors include a conditional life expectancy variable, which is based on the gender and age of respondents. The study demonstrates that a one year increase in life expectancy results in postponing retirement by 6 months in 1994 and 4 months in 2002. This decreased magnitude between the two surveys suggests that a larger proportion of increased life expectancy is dedicated to leisure time. Family dynamic variables also show to be significant determinants of expected retirement age, as married individuals generally plan to retire one year earlier than single/never married ones and respondents with two or more children living at home plan to retire approximately six months later than those with no children in the household. Furthermore, the study finds that individuals with high levels of family income and individuals who receive employer pensions can afford to retire at younger ages. Also, immigrants, individuals in good health, and self-employed workers planned to retire later compared to their opposing counterparts.

Chen, Fougère and Rainville (2012) examine the labour market transitions of older Canadian workers, with a focus on the importance of financial factors. They select two samples of individuals (aged 50-68 years) from the 2001-2006 Survey of Labour and Income Dynamics (SLID). For the 6-year period, the study sequentially examines the labour market decisions for both a part-time and a full-time sample of workers. That is, labour force participation decisions (working full-time full-year, part-time, or fully retiring) are examined for the following year (i.e. t+1) for each individual. The trichotomous dependent variable is regressed on a multitude of financial factors including current earnings, average historical earnings, pension accruals, present value of expected pension wealth, and investment income. These financial factors aim to account for both the income and substitution effects of retirement. The authors also consider non-financial factors such as health, the presence of a working spouse, immigrant status, the presence

of dependent child/children, educational attainment, and gender.

The study finds that the present value of wealth is significant for men only and that pension accruals are insignificant in explaining the probability of working full-time, part-time, and retiring. Although the present value of wealth is significant, it only decreases the probability of continuing to work full-time very slightly. Moreover, if an individual reports that his/her health has deteriorated between two consecutive years, the probability of continuing to work full-time decreases. Immigration status is significant for women between the ages of 50 and 59 in explaining the probability of working full-time, part-time, and retiring. An immigrant woman is 3.4 percentage points more likely to continue working full-time compared to a non-immigrant woman. In addition, the presence of a working spouse is not a significant factor for the labour force participation of women. In contrast, men aged 50-59 who have a working spouse have a higher probability (3.1 percentage points) of continuing to work full-time full-year than men without a working spouse. Lastly, the presence of a dependent child/children increases the probability of working full-time for men aged 50-59. However, for the age 60-69 group only women demonstrate an increased probability of continuing full-time employment.

Schirle (2008) carries out a study that focuses on the relationship between the labour force participation of older men and that of their spouses. Specifically, she aims to explain why labour force participation has increased among older men in the mid-90s and to what extent their participation decisions are related to those of their spouses. Using a decade's worth of data (1995-2005) from the Canadian Labour Force Survey, the study estimates a model based on the husband's educational attainment, age, number of children living in the household, and the wife's labour force participation status. She notes that age and educational attainment are used as proxies for the husband's earning potential.

There are two opposing effects that may explain the relationship between a husband and wife's retirement decisions. An income effect will decrease the husband's propensity to participate when his wife is participating in the labour market and earning income. On the other hand, there is another effect that the author calls a "shared leisure" effect, which makes independent retirement a less attractive option for a husband with a working wife. The results show that the labour force participation of men is positively influenced by the decision of their wives. Therefore the results suggest that the shared leisure effect outweighs the income effect. In fact, Canadian men who are married to working women are 23 percentage points more likely to participate in the labour force than those who do not have a wife in the labour force. Furthermore, educational attainment is another strong explanatory factor, as higher levels of educational attainment are associated with increased participation likelihood. A decomposition of the changes in labour force participation of Canadian men over time demonstrates that approximately one half of the observed changes can be explained by changes in their wives participation decisions and that another third can be attributed to changes in the educational attainment and age composition of older men.

To summarize, the studies presented above suggest that many variables play an important role in explaining the labour force outcomes of older Canadians. Demographic factors (e.g. gender, age, and immigrant status) and factors that largely influence preferences (e.g. family dynamics and educational attainment) are of particular interest. The affordability of retirement is another key element, as shown by various financial factors (e.g. family income and investment income). Also, the attachment of older Canadians to the workforce is shown to be a family decision, as many factors related to household characteristics (e.g. marital status and having dependent children) are shown to be influential.

Nonetheless, there is a gap in the literature regarding regional aspects that may explain disparities in labour force outcomes for older adults across Canada. For example, living in a metropolitan area may improve earning potential, which could in turn induce earlier retirement or certain provinces may generally be associated with higher employment rates for older workers. Moreover, some studies compare results of similar samples over time to explain changes in retirement decisions. Yet, few studies compare the outcomes/decisions of individuals approaching the "normal" or "traditional" retirement age to individuals who have passed this age. In Canada, the age of 65 is largely viewed as the normal retirement age, as it is the age of eligibility for some retirement benefits (like the Canada Pension Plan and Old Age Security). The normal retirement age may define a particular break in behaviour and preferences that is not thoroughly studied in the literature. The following sections of this paper will further explore these areas.

5. Data, Samples and Model Specification

For the purpose of this paper, data is obtained from the 2006 public use microdata file of the Canadian Census. The census in Canada is carried out every five years and provides data for a variety of demographic and economic characteristics including, but not limited to gender, immigrant status, educational attainment, province of residence, labour market activities, and household income.

Since this paper is related to older age groups, the sample includes individuals aged 50 years and older. I aim to identify the determinants of workforce attachment for older adults and to compare those who are younger than the normal retirement age of 65 to those who are older. Also, as outlined in the literature review, there are numerous gender-based factors that differentiate experiences. For these reasons, genders are analyzed separately and four sub-

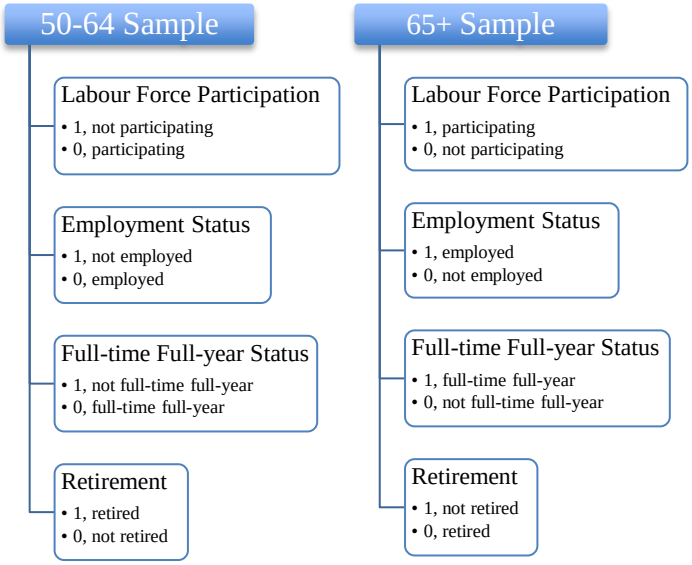
samples are created: females aged 50-64, males aged 50-64, females aged 65 and over, and males aged 65 and over. The sample of individuals aged 50-64 is comprised of 160,539 individuals, where 81,916 (51%) are female and 78,623 (49%) are male. The 65 and over sample (hereinafter called 65+) accounts for 109,354 individuals, where 60,761 (56%) are female and 48,593 (44%) are male. Essentially, the main goal of this study is to answer the following two questions: [1] What are the determinants for early retirement/decreased labour force attachment (for the 50-65 group)? [2] What are the determinants for postponing retirement/increased labour force attachment (for the 65+ group)? Note that early retirement is defined as retiring before the normal age of retirement and postponing retirement is defined as working past that age. The following two sections will outline the dependent and independent variables employed in the models of this paper. Each section will also be accompanied by some descriptive statistics.

5.1 Dependent Variables

To examine older individuals' attachment to the labour force, four separate outcomes are used. These outcomes relate to labour force participation, employment status, full-time full-year status, and retirement. All four outcomes are implemented as binary dependent variables, meaning they take a value of 0 or 1. However, the dependent variables are implemented differently for the 50-64 sample and the 65+ sample. As previously explained, this study investigates the determinants of a decreased labour force attachment before the normal retirement age and those of an increased labour force attachment after the normal retirement age. Hence, as shown in Figure 3, the dependent variables for the 65+ sample take a value of 1 for participating, being employed, working full-time full-year, and not being retired. For the 50-64 sample, the dependent variables are the complements of the 65+ sample's dependent variables (i.e. a value of 1 is assigned for not participating, not being employed, not working full-time full-

year, and being retired). This method is employed for ease of interpretation of the results.

Figure 3: Dependent Variables by Sample and Outcome



To define the labour force participation and employment status outcomes, the labour force activity variable in the census is used. This variable provides labour market activity information for all individuals that are aged 15 years and older. The respondents are classified as "employed", "unemployed" or "not in the labour force", based on their activity in the week prior to May 16, 2006 (Census Day). Since the labour force is comprised of both employed and unemployed individuals, I group employed and unemployed classifications to define participation. If the individual was classified as "not in the labour force", then I define them as not participating. For the employment status outcome, respondents who were "unemployed" or "not in the labour force" are defined as not employed. It follows that the remaining respondents are defined as employed.

For the full-time full-year outcome, work activity in year 2005 is used to determine an individual's status. Individuals who worked 49-52 weeks in year 2005 are considered full-year and individuals who work 30 hours or more per week are considered full-time. An individual

with both of these traits is considered to be working full-time full-year. This outcome describes the level of attachment to the workforce.

The retirement outcome also indicates the degree of labour force attachment, yet it is defined differently. This outcome does not solely consider participation decisions, as it is defined based on income and its components. The census provides information regarding income received from retirement pensions that result from having been a member of a pension plan (such as the Registered Retirement Savings Plan (RRSP)). Also, the census provides the amounts received from the Old Age Security (OAS) pension and the Guaranteed Income Supplement (GIS). I define total retirement income as the sum of the OAS and GIS variable and the retirement pensions variable. If more than half of an individual's income comes from retirement income, then I consider the individual as being retired. As the denominator for this proportion, I use the total income variable available in the census. The total income variable provides an aggregate amount of income received from all sources.

This definition of retirement, which is similar to the one employed by Statistics Canada, allows a larger proportion of older adults to be retained for analysis. For example, an individual partaking in post-retirement employment, yet who was not participating in the week before census day, would not have been captured by the participation and employment outcomes. The rationale for this definition is that if less than half of an individual's income comes from retirement income, he/she still has a strong attachment to the labour market. This definition of retirement may also identify an individual who has never worked as being retired (as most of their income may come from OAS and GIS) and also a retired individual with high levels of investment income as someone who has not retired. Nonetheless, this definition allows for a broader definition of retirement, as an individual can continue participating in the labour market

(typically with decreased intensity) and still be considered retired. Despite some limitations, the retirement outcome serves as a secondary measure of the intensity of labour force attachment for older adults. Table 1 provides descriptive statistics for the four outcomes outlined above.

Table 1: Summary of Dependent Variables by Age and Sex

Outcome	49<Age<65			Age≥65			Age>49 (Whole Sample)		
	Fem.	Male	Both	Fem.	Male	Both	Fem.	Male	Both
Participating (%)	61.4	75.9	68.5	6.4	16.0	10.7	38.0	53.1	45.1
Employed (%)	58.5	72.0	65.1	6.1	15.3	10.2	36.2	50.3	42.8
Full-time full-year (%)	35.5	52.5	43.8	2.2	7.1	4.4	21.3	35.2	27.8
Not Retired (%)	91.8	90.6	91.2	28.4	35.5	31.5	64.8	69.5	67.0
Sample size	81,916	78,623	160,539	60,761	48,593	109,354	142,677	127,216	269,893
% of whole sample	30.4%	29.1%	59.5%	22.5%	18.0%	40.5%	52.9%	47.1%	100.0%

As expected, this table shows that labour force attachment of the 50-64 sample is stronger than that of the 65+ sample. Approximately 69% of the 50-64 sample participate and 65% of those individuals are employed. Only 11% of the 65+ sample participate and of those 10% are employed. In addition, a much larger proportion of the 50-64 sample works full-time full-year. Roughly 44% of the 50-64 sample works full-time full-year, whereas only a tenth of this proportion works full-time full-year in the 65+ sample. Furthermore, the summary of the not retired outcome demonstrates that a larger proportion of the 65+ sample is retained and defined as continuing their involvement in the labour force. In fact, approximately 32% of the 65+ sample is defined as not being retired.

The summary by gender shows that labour force attachment is generally stronger for males than females, as almost all percentages are higher for males. Interestingly, for the 50-64 sample, females have a slightly higher percentage of individuals who are not retired compared to males. This suggests that females in the younger sample are more likely than males to have non-retirement income as the principal component of their total income (i.e. more than 50%). This

observation does not hold in the 65+ sample, which suggests that women who pass the age of 65 are less likely than males to receive more than half of their income from non-retirement sources.

5.2 Independent Variables

This section outlines the independent variables used in the analysis. The four studied outcomes are a result of both labour supply and labour demand forces. Hence, variables affecting both are included in the models.

In the context of older adults, age plays an important role for both labour supply and labour demand. For example, at older ages health may deteriorate forcing an older worker to either work part-time or pull out of the labour force altogether. Although age is already used to define two different samples, age variables are also inputted in each model to capture the effect within a given sample. For the 50-64 sample two dummy variables are defined for the 55-59 and 60-64 age groups. Similarly, for the 65+ sample three dummy variables are defined for the 70-74, 75-79, and 80+ age groups. For all models pertaining to the 50-64 and 65+ sample, the 50-54 and 65-69 variables are retained as reference categories, respectively. It is expected that for older adults the age variables will decrease the propensity of maintaining a strong labour force attachment relative to the youngest reference categories and that the magnitude of this impact will increase for older ages.

As highlighted in the literature review, family dynamics can greatly impact the labour force decisions of older adults. For this reason, several variables relating to family status are incorporated in the models. The census provides marital status in five categories. I create three categorical variables and use married individuals as the reference category for all models. The three categories consist of [1] widowed individuals, [2] separated and divorced individuals, as well as [3] single individuals who have never legally married. Compared to married individuals,

being separated and divorced is expected to increase the likelihood of working, as these individuals must finance their retirement independently. Although widowed individuals also no longer have a spouse, they are likely to still receive some financial support from their deceased spouse (such as survivor benefits). As another family variable, I include a dummy variable for the presence of children within the household. The presence of children is expected increase the propensity of maintaining a strong labour force attachment, as older adults with child/children in the household may have a greater incentive to continue working to be able to financially support the child/children.

In addition, I create a variable called "other family income" that is meant to measure the census family income less the total earnings of the individuals themselves. The census provides ranged categories for census family income. With the exception of the first and last categories, I take the upper bound of each category's range as the family's total income. For the first category, which is census family income under $2,000, I define household income as $2,000. For the last category of census family income over $250,000, I approximate household income as $275,000. I then create a measure of each individual's total earnings by adding the total self-employment income and wages and salary income variables together. Other family income is defined by subtracting the individual's total earnings from their total household income. This difference is then divided by 10,000 to create a measure in ten thousands. The other family income variable directly reflects the income effect associated with the labour market decisions of older adults. It is expected to have a negative effect on working, as older adults with high levels of other family income have less of an incentive to continue working (and working at the same intensity) compared to those who do not.

Similarly, a variable called presence of investment income is incorporated in the models

to capture the effect of investment earnings on labour force decisions. This variable is implemented as a dummy variable to indicate that an individual is receiving positive income from interest paid on investments. Again, this variable affects labour supply, as the presence of additional sources of income may present an incentive for older adults to decrease their attachment to the labour force.

Immigrant status is included in the models as a variable that affects the labour demand of older adults. For example, immigrants may not have skills or experience that is completely transferable in Canada, which in turn may not qualify them for particular jobs. Moreover, immigrant status also relates to labour supply, as immigrants may not have the option of decreasing their labour force attachment at older ages due to an inability of financing retirement. This inability may arise due to a host of factors, one being residency requirements for public pensions such as the Old Age Security pension. For individuals who are non-permanent residents and immigrants, I define them as immigrants. I define Canadian citizens by birth as non-immigrants. Therefore, the immigrant status indicator variable takes a value of 1 for immigrants and 0 for non-immigrants.

Educational attainment is implemented in the models as a factor that largely impacts the labour demand of older adults. It can also be used as a proxy for earnings potential, as seen in the literature review. This factor may have a positive effect for labour force attachment, as individuals with higher levels of education typically work in occupations that are less physically strenuous and have better chances of finding high-quality employment. Conversely, the income effect associated with educational attainment may also afford an individual to decrease their attachment earlier in their career. The net effect of educational attainment will be left to be determined in the results section of this paper. To implement educational attainment I use the

highest certificate, diploma or degree variable available in the census. I create a set of categorical variables, using high school diploma as the reference category. I classify individuals into the following categorical variables: [1] no certificate, diploma or degree (i.e. less than high school), [2] trades, apprenticeship, college, and below bachelor level certificate or diploma (i.e. trades or college certificate), [3] bachelor's degree or certificate above bachelors level (i.e. bachelor's degree), and [4] master's degree, doctorate degree, and degree in medicine, dentistry, veterinary medicine or optometry (i.e. master's, doctorate or other professional degrees above the bachelor's level).

As previously mentioned, this paper aims to also identify regional effects associated with older adults' labour market outcomes. For instance, it may be that labour-intensive industries (e.g. agriculture) are concentrated in particular regions of Canada and that the type of work is not feasible for older adults. All models in this paper incorporate variables to determine whether regional disparities exist in the experiences of older adults. Regional categorical variables are incorporated in the model by grouping provinces of Canada. I classify New Brunswick, Nova Scotia, Prince Edward Island, as well as Newfoundland and Labrador as the Atlantic Provinces. Similarly, I group Manitoba, Saskatchewan, and Alberta as the Prairies. Then each of Quebec and British Columbia are considered their own categories and Ontario is used as the reference category for all models. Individuals living in Northern Canada are not studied, as they represent a very small population in the chosen sample. Likewise, I include a large census metropolitan area (CMA) dummy variable to capture the effect of residing in such areas. This variable will reflect the effect that the nature of work and available opportunities in large urban labour markets may have on older adults' labour market outcomes, compared to that in the rural regions of Canada.

Table 2 provides a descriptive summary for a few selected independent variables mentioned above. This table demonstrates that the largest proportion of individuals over the age of 50 is married. Interestingly, the breakdown by gender indicates that men over the age of 50 are more likely to be married than women. This is possibly a result of women outliving their spouses due to lengthier life expectancies. The second largest category for the 50-64 sample is the separated and divorced category, with 19% of the sample falling under this category. As expected, the second largest category for the 65+ sample is the widowed category, representing 28% of the sample. Similarly, a larger percentage of the 50-64 sample is never married compared to the 65+ sample. Overall, the marital status breakdown for each sample is in line with expectations for the age group. Furthermore, approximately 41% of the 50-64 sample have children residing in their household, whereas this proportion is almost halved for the 65+ sample.

Table 2: Summary of Independent Variables by Age and Sex

Independent Variables	49<Age<65			Age≥65			Age>49 (Whole Sample)		
	Fem.	Male	Both	Fem.	Male	Both	Fem.	Male	Both
Marital Status									
Married	64.1	69.5	66.8	44.6	73.1	57.3	55.8	70.9	62.9
Widowed	6.4	1.8	4.1	40.7	11.8	27.9	21.0	5.6	13.8
Separated and divorced	20.4	17.4	18.9	9.3	9.5	9.4	15.7	14.4	15.1
Never married	9.2	11.3	10.2	5.3	5.6	5.4	7.5	9.1	8.3
Children in the household	38.7	43.6	41.1	19.4	17.7	18.6	30.5	33.7	32.0
Educational Attainment									
Less than high school	21.1	20.3	20.7	45.9	38.7	42.7	31.6	27.3	29.6
High school diploma	28.1	22.0	25.1	24.7	17.3	21.4	26.7	20.2	23.6
College or trades certificate	34.0	37.2	35.6	22.8	30.6	26.3	29.2	34.7	31.8
Bachelor's degree	12.6	13.7	13.2	5.0	8.3	6.5	9.4	11.6	10.4
Masters, Doctorate or other professional degrees above the bachelor level	4.2	6.9	5.5	1.7	5.1	3.2	3.1	6.2	4.6
Investment Income	41.2	39.7	40.5	56.9	55.0	56.1	47.9	45.6	46.8
Residing in a large CMA	64.7	63.3	64.0	64.4	61.5	63.1	64.6	62.6	63.6
Region									
Ontario	37.5	36.7	37.1	38.3	38.2	38.2	37.8	37.3	37.6
Atlantic Provinces	7.9	8.0	8.0	7.8	7.7	7.7	7.9	7.9	7.9
Quebec	25.6	25.7	25.6	25.1	23.9	24.6	25.4	25.0	25.2

Prairies	15.3	15.9	15.6	15.1	15.5	15.3	15.2	15.7	15.5
British Columbia	13.7	13.7	13.7	13.7	14.7	14.1	13.7	14.0	13.9
Sample size	81,916	78,623	160,539	60,761	48,593	109,354	142,677	127,216	269,893
% of whole sample	30.4%	29.1%	59.5%	22.5%	18.0%	40.5%	52.9%	47.1%	100.0%

The summary for highest level of educational attainment indicates that the 50-64 sample are generally better educated than the 65+ sample. In fact, 43% of the 65+ sample do not have any certificate, diploma or degree, where that category represents less than half of the 50-64 sample. At the other end of the spectrum, approximately 6% of the 50-64 sample and 3% of the 65+ have a degree above the bachelor's level. Furthermore, individuals holding a college or trades certificate represent the largest proportion of the whole sample (32%), with no certificate, diploma or degree coming in a close second (30%). Generally, women show to be less educated than men, as 58% of women and 48% of men aged 50 and over hold a high school diploma or less. This difference between genders is most pronounced for women in the 65+ sample, as approximately 71% of women (compared to 56% of men) hold a high school diploma or less. For 50-64 sample, this percentage is approximately 49% of women (compared to 42% of men). The reason for the gender-based differences between the two sub-samples is that women have been achieving higher levels of educational attainment over time. Hence, the younger 50-64 sample of women is more educated than the later generations of women in the 65+ sample.

The investment income indicator variable indicates that a larger proportion of 65+ individuals have investment income compared to the 50-64 sample. Within each sample, women and men fare roughly the same. For the residing in a large CMA indicator, all samples are roughly equivalent, with slightly more women living in CMAs than men. Similarly, provincial distribution is fairly equal for the 50-64 and 65+ samples. Ontario and the Atlantic provinces are the most and least populated regions, respectively.

5.3 Model Specification

In the present section, variables reviewed in the last two sections will be used to specify the models for the analysis. I employ four models that are applied to four sub-samples. These models regress the labour force participation, employment status, full-time full-year status, and retirement outcomes on the relevant independent variables. A linear probability model is used for all models of the analysis, as all dependent variables are dichotomous. The estimated coefficients for this method are interpreted as the effects on the probability that the binary dependent variable equals 1, given a unit change in an independent or explanatory variable. Therefore, the estimated coefficients are intuitively interpreted as marginal effects of each of the independent variables. One limitation of this model is that the estimated coefficients may indicate a probability that is either greater than 1 or negative. Use of the logistic model or probit model will bypass this issue. Nonetheless, I also carried out the analysis with the logistic model and results are very similar. Hence, this paper will present the results of the linear probability model using the ordinary least squares method.

As previously explained, the dependent variables are specified differently for the 50-64 and 65+ samples. The models for both the female and male sub-samples of the 50-64 sample are specified as follows:

$$Y = \beta_0 + \sum_{i=1}^{2} \beta_i AGE_i + \sum_{i=3}^{5} \beta_i MARITAL_i + \beta_6 CHILD + \beta_7 FAMINC + \beta_8 INVEST + \beta_9 IMMIG + \sum_{i=10}^{13} \beta_i EDUC_i + \sum_{i=14}^{17} \beta_i PROVINCE_i + \beta_{18} CMA + \varepsilon \qquad [1]$$

where $\hat{Y} = P(Y = 1|X = x)$ and $Y = 1$ is defined for the dependent variables of the 50-64 sample as seen in Figure 3 (i.e. not participating, not employed, not full-time full-year and

retired).

Similarly for both the female and male sub-samples of the 65+ sample the models are specified as follows:

$$Y = \beta_0 + \sum_{i=1}^{3} \beta_i AGE_i + \sum_{i=4}^{6} \beta_i MARITAL_i + \beta_7 CHILD + \beta_8 FAMINC + \beta_9 INVEST + \beta_{10} IMMIG + \sum_{i=11}^{14} \beta_i EDUC_i + \sum_{i=15}^{18} \beta_i PROVINCE_i + \beta_{19} CMA + \varepsilon \qquad [2]$$

Note that the difference in specification for [2] is that there are three categorical age variables and that $Y = 1$ is defined as the complement of that of the 50-64 sample (i.e. participating, employed, full-time full-year and not retired).

6. Results

This section presents the regression results for each sub-sample. Coefficient estimates using models [1] and [2] are presented, with robust standard errors in the parentheses.

6.1 Outcomes for the Pre-normal Retirement Age Individuals

Tables 3 and 4 present the results for the female and male sub-samples of the 50-64 sample, respectively. As previously mentioned, for the 50-64 sample the dependent variables take a value of 1 for not participating, not being employed, not working full-time full-year and being retired. Hence, positive coefficients demonstrate an increased probability for lower labour force attachment.

Table 3: Linear probability model results, women aged 50-64

Females (49 < Age < 65)	**Not Participating**	**Not Employed**	**Not Full-time Full-year**	**Retired**
Age *(Reference: Age 50-54)*				
Age 55-59	0.1380* (0.0037)	0.1329* 90.0038)	0.1118* (0.0040)	0.0647* (0.0017)
Age 60-64	0.3543* (0.0042)	0.3389* (0.0043)	0.2594* (0.0040)	0.1823* (0.0028)
Marital Status (*Reference: Married)*				
Separated or divorced	-0.0447* (0.0043)	-0.0358* (0.0044)	-0.0397* (0.0045)	-0.0023 (0.0023)
Widowed	0.0470* (0.0069)	0.0527* (0.0069)	0.0401* (0.0063)	0.0776* (0.0051)
Single and never legally married	0.0072 (0.0058)	0.0149** (0.0059)	-0.0155** (0.0061)	0.0334* (0.0035)
Presence of children	-0.0514* (0.0035)	-0.0504* (0.0036)	-0.0456* (0.0037)	-0.0283* (0.0019)
Other family income	0.0079* (0.0004)	0.0074* (0.0004)	0.0083* (0.0004)	0.0050* (0.0002)
Immigrant	0.0249* (0.0040)	0.0358* (0.0041)	0.0430* (0.0041)	-0.0229* 0.0022
Presence of investment income	-0.0095* (0.0033)	-0.0209* (0.0033)	-0.0083** (0.0034)	0.0018 (0.0020)
Highest level of education *(Reference: High school diploma)*				
Less than high school	0.1487* (0.0048)	0.1520* (0.0048)	0.1161* (0.0044)	-0.0106 (0.0025)
College or trades certificate	-0.0650* (0.0040)	-0.0646* (0.0041)	-0.0274* (0.0042)	0.0060* (0.0022)
Bachelor's degree	-0.0841* (0.0052)	-0.0887* (0.0053)	-0.0633* (0.0056)	0.0635* (0.0035)
Master's, Doctorate or other professional degrees above the bachelor level	-0.1678* (0.0073)	-0.1713* (0.0076)	-0.1197* (0.0088)	0.0281* (0.0050)
Residing in a CMA	-0.0276* (0.0036)	-0.0318* (0.0037)	-0.0511* (0.0036)	-0.0109* (0.0022)
Region *(Reference: Ontario)*				
Atlantic provinces	0.0676* (0.0065)	0.0909* (0.0066)	0.0667* (0.0063)	0.0172* (0.0041)
Quebec	0.0617* (0.0042)	0.0651* (0.0042)	0.0645* (0.0042)	0.0153* (0.0025)
Prairies	-0.0625* (0.0047)	-0.0675* (0.0048)	-0.0294* (0.0051)	-0.0331* (0.0025)

British Columbia	0.0177* (0.0050)	0.0227* (0.0051)	0.0575* (0.0051)	-0.0086* (0.0028)
Constant	0.2378* (0.0057)	0.2741* (0.0058)	0.5163* (0.0059)	-0.0076** (0.0030)
R-squared	0.1550	0.1471	0.0956	0.0987
F statistic	974.93	934.16	582.65	359.55
Number of observations	81,916			

Source: 2006 Census public use microdata file. Robust standard errors in parentheses.
* p-value < 0.01 (significant at the 1% significance level)
** p-value < 0.05 (significant at the 5% significance level)

Starting with the first category of variables for women in the 50-64 sample, age is significant at the 1% significance level for all outcomes and both age categories of women. The age coefficients are positive, as expected, meaning that compared to the 50-54 age group women aged 55-64 years are more likely to be not participating, to be not employed, to be not working full-time full-year and to be retired. For example, a woman who is 60-64 years old is 18.2 percentage points more likely to be retired compared to a woman aged 50-54. Also, the magnitude of the age effect increases for the older category (age 60-64). These results are consistent with expectations, as labour supply typically decreases for older individuals. Furthermore, age appears to be one of the most significant determinants for the labour market outcomes of women aged 50-64, as the magnitude of the coefficients are largest for this category of variables.

Next to be reviewed are the family status variables, which also impact labour supply. The marital status category of variables shows varying effects. As expected, separated or divorced women have negative coefficients for each outcome. In fact compared to married women, separated or divorced women are 4.5 percentage points less likely to be not participating, 3.6 percentage points less likely to be not employed and 4 percentage points less likely to be not working full-time full-year. Hence, they demonstrate a stronger labour force attachment than married women. For the retirement outcome, the separated category also has a negative sign, yet

it is not statistically significant. These results are in line with expectations, as women who are separated and divorced do not typically financially benefit from their past spouse. Hence, they are faced with a negative income effect that requires them to finance retirement independently, which results in an increased propensity to maintain a strong labour force attachment before the normal retirement age. Conversely, women who are widowed demonstrate the opposite of separated or divorced women. A widowed woman aged 50-64 is 7.8 percentage points more likely to be retired before the normal retirement age compared to a married woman. Single and never married women have positive coefficients as well; however, the effects (although mostly significant at the 5% significance level) are rather small. It is expected that single women would behave similarly to separated women, however they have a slightly increased probability for decreasing their attachment to the labour force compared to married women. On the other hand, single and never married women who are working are more likely to be working full-time full-year compared to married women, as the coefficient for this outcome is negative. This slight difference between married and single women may be explained by the coordinated nature of making labour force decisions for married couples (as demonstrated in the literature review). That is, perhaps by not being married and not being subject to this coordinated effect, single women have less of an incentive to maintain a strong labour force attachment compared to married women who would most likely have working husbands in this age group.

Furthermore, for women aged 50-64 the presence of children within the household decreases the probability of lower labour force attachment. A woman living in a household with children is 5.1 percentage points less likely to not be participating, 5 percentage points less likely to be not employed, 4.6 percentage points less likely to not be working full-time full-year and 2.8 percentage points less likely to be retired, compared to women aged 50-64 without children in

their household. This result coincides with expectations for older age groups, as children of mothers who are over the age of 50 are typically older and do not require their mother's constant care. However, their presence in the mother's household incurs a cost, which increases the woman's incentive to retain her level of labour supply to support the child/children financially. Moreover, other family income affects labour supply for women in this age group, yet the impact of the variable is not very large. For example, an increase of other family income by $10,000 increases the probability of not participating by approximately 0.8 percentage points. Nevertheless, the sign of the coefficients for all outcomes are in line with the fact that other family income acts as a positive income effect, affording women to decrease their labour supply with increased other family income.

As explained previously, immigrant status can affect both labour supply and labour demand in opposing ways. Immigrant women aged 50-64 are more likely to be not participating, to be not employed and to not be working full-time full-year compared to their non-immigrant counterparts. This result demonstrates that the effect on labour demand is offsetting labour supply forces. Immigrant women in this age group may have greater difficulty assimilating in the Canadian labour market and therefore do not have the same opportunity for employment or full-time full-year work like non-immigrant women. The result for the full-time full-year outcome opposes that of Chen et al. (2012), as their model showed immigrant women to be more likely to be working full-time full-year compared to non-immigrant women. On other hand the coefficient for the retirement outcome is consistent with Gomez and Gunderson (2011)'s result of immigrant women retiring later in life compared to non-immigrant women, as immigrant women are 5.2 percentage points less likely to be retired compared to non-immigrant women in the 50-64 age group.

The presence of investment income has a negative coefficient for all outcomes, except for the retired outcome. However, the coefficient for the presence of investment variable for the retired outcome is not statistically significant. Contrary to expectations, having a source of investment income decreases the probability of lower labour force attachment for women in the 50-64 age group. It may be that women with an additional source of income through investment have the liberty of finding high quality occupations and therefore have an increased probability for participating, being employed, and working full-time full-year compared to those who do not have investment income.

The next category of variables in Table 3 pertains to educational attainment, which demonstrates that for women in the 50-64 sample higher educational attainment is associated with an increasing probability for strong labour force attachment. The magnitude of the coefficients also results in educational attainment being the second most important determinant for the labour market outcomes of women aged 50-64. Across all variables, signs of the coefficients are the same, but reversed for the retired outcome. For educational attainment below the reference category of a high school diploma, women are more likely to be not participating, not employed and not working full-time full-year. On the other hand, for categories of educational attainment above the high school level an increasingly negative effect is observed. For instance, women who have a Bachelor's degree are 8.9 percentage points less likely to be not employed. The opposite sign for the retired outcome may reflect something to do with the relationship between educational attainment and the components of income for women. It may be that better educated women who receive retirement benefits before the normal retirement age are more likely to have an employer that offers better retirement benefits (covering a larger proportion of their total income) compared to those who are less educated.

Finally, the regional categorical variables demonstrate that living in a CMA does in fact improve the labour market outcomes of women aged 50-64, as all coefficients are negative and significant. Also, compared to women residing in Ontario, women residing in the Atlantic provinces, Quebec or British Columbia are generally more likely to have lower labour force attachment prior to the normal retirement age. Conversely, women living in the Prairies are more likely to have increased labour force attachment compared to women living in Ontario. These results demonstrate that there are regional differences that impact the labour market outcomes of older Canadian women.

Table 4 presents the results for the male sub-sample of the 50-64 sample, which will help in determining the gender effects associated with the labour market decisions of older adults in this age group. Since many of the results demonstrate similar patterns to the results observed in Table 3 (which were extensively explained), only key differences will be discussed.

Table 4: Linear probability model results, men aged 50-64

Males (49 < Age < 65)	**Not Participating**	**Not Employed**	**Not Full-time Full-year**	**Retired**
Age *(Reference: Age 50-54)*				
Age 55-59	0.1015* (0.0031)	0.0985* (0.0034)	0.0970* (0.0041)	0.0679* (0.0018)
Age 60-64	0.2909* (0.0040)	0.2812* (0.0042)	0.2669* (0.0045)	0.1814* (0.0029)
Marital Status (*Reference: Married)*				
Separated or divorced	0.0501* (0.0042)	0.0643* (0.0044)	0.0731* (0.0048)	-0.0024 (0.0029)
Widowed	0.1136* (0.0124)	0.1226* (0.0128)	0.1351* (0.0128)	0.0567* (0.0097)
Single and never legally married	0.1225* (0.0053)	0.1455* (0.0055)	0.1614* (0.0058)	-0.0123* (0.0031)
Presence of children	-0.0661* (0.0032)	-0.0631* (0.0034)	-0.0698* (0.0039)	-0.0654* (0.0023)
Other family income	0.0087* (0.0004)	0.0081* (0.0004)	0.0080* (0.0004)	0.0138* (0.0005)
Immigrant	-0.0059 (0.0036)	0.0068 (0.0038)	0.0491* (0.0044)	-0.0516* (0.0023)

Presence of investment income	-0.0193* (0.0030)	-0.0307* (0.0031)	-0.0378* (0.0036)	-0.0023 (0.0021)
Highest level of education *(Reference: High school diploma)*				
Less than high school	0.0763* (0.0048)	0.0884* (0.0050)	0.0934* (0.0053)	-0.0322* (0.0029)
College or trades certificate	-0.0292* (0.0038)	-0.0253* (0.0040)	-0.0189* (0.0046)	-0.0111* (0.0026)
Bachelor's degree	-0.0372* (0.0048)	-0.0421* (0.0051)	-0.0325* (0.0059)	0.0218* (0.0036)
Master's, Doctorate or other professional degrees above the bachelor level	-0.0813* (0.0058)	-0.0891* (0.0061)	-0.0630* (0.0075)	-0.0076 (0.0044)
Residing in a CMA	-0.0130* (0.0033)	-0.0261* (0.0034)	-0.0490* (0.0038)	-0.0118* (0.0024)
Region *(Reference: Ontario)*				
Atlantic provinces	0.0473* (0.0061)	0.0909* (0.0065)	0.1208* (0.0068)	0.0094** (0.0044)
Quebec	0.0222* (0.0039)	0.0350* (0.0041)	0.0681* (0.0045)	0.0103* (0.0027)
Prairies	-0.0716* (0.0041)	-0.0753* (0.0043)	-0.0499* (0.0051)	-0.0334* (0.0028)
British Columbia	0.0052 (0.0046)	0.0105** (0.0048)	0.0614* (0.0055)	-0.0197* (0.0029)
Constant	0.1184* (0.0052)	0.1578* (0.0055)	0.3347* (0.0064)	0.0246* (0.0038)
R-squared	0.1241	0.1190	0.0988	0.1344
F statistic	603.54	608.84	551.49	414.15
Number of observations	78,623			

Source: 2006 Census public use microdata file. Robust standard errors in parentheses.
* p-value < 0.01 (significant at the 1% significance level)
** p-value < 0.05 (significant at the 5% significance level)

First, the labour market outcomes for men aged 50-64 are not as sensitive to age as those of their female counterparts. The magnitude of the categorical age variables are generally smaller compared to women, yet age still plays a leading role as a determinant. Furthermore, the age effects for men in this age group are similar to that found in women, as men who are a part of the older age categories are more likely to be not participating, not employed, not full-time full-year and retired compared to men aged 50-54.

Another key difference between men and women in the 50-64 sample is the result for the marital status variables. Separated or divorced men behave oppositely to their female counterparts, as the coefficients for this variable are mostly positive. For example, a separated or divorced man is 6.4 percentage points more likely to be not employed compared to a married man. Referring back to Schirle (2008), it could be that this is a result of these men no longer having a working wife. That is, the "shared leisure" effect is no longer existent. In contrast, both widowed and single men behave similarly to their female counterparts, as coefficients are mostly positive for these categories. Overall, the marital status coefficients are larger in magnitude compared to that found for women. In fact, marital status appears to be the second most important determinant for men aged 50-64.

In addition, although the educational attainment variables show similar patterns to those found for women, the retired outcomes coefficients do not change in sign as they did for women. The negative or positive sign is maintained for all outcomes of each category of educational attainment above a high school diploma.

6.2 Outcomes for the Post-normal Retirement Age Individuals

Now we turn to tables 5 and 6, which present the results for the female and male sub-samples of the 65+ sample, respectively. For these results, the dependent variables take a value of 1 for participating, being employed, working full-time full-year and not being retired. Therefore, positive coefficients demonstrate an increased probability for greater labour force attachment. These tables will help determine whether there is a shift in behaviour for women and men after they pass the normal retirement age. Also, the results will shed light on the key determinants for increased labour force attachment for older adults aged 65 and over. The

summary of results for the next two tables, compare the 50-64 and 65+ sub-samples for the same genders.

Table 5: Linear probability model results, women aged 65+

Females (Age 65+)	**Participating**	**Employed**	**Full-time Full-year**	**Not Retired**
Age *(Reference: Age 65-69)*				
Age 70-74	-0.0780* (0.0033)	-0.0746* (0.0032)	-0.0316* (0.0020)	-0.1631* (0.0049)
Age 75-79	-0.1002* (0.0031)	-0.0958* (0.0030)	-0.0375* (0.0019)	-0.1493* (0.0052)
Age 80+	-0.1112* (0.0030)	-0.1065* (0.0029)	-0.0404* (0.0018)	-0.0994* (0.0054)
Marital Status (*Reference: Married)*				
Separated or divorced	0.0249* (0.0044)	0.0208* (0.0043)	0.0058** (0.0027)	0.0406* (0.0066)
Widowed	-0.0085* (0.0022)	-0.0087* (0.0022)	-0.0073* (0.0013)	0.0427* (0.0043)
Single and never married	0.0202* (0.0052)	0.0180* (0.0051)	0.0092* (0.0033)	-0.0133 (0.0080)
Presence of children	0.0100* (0.0027)	0.0089* (0.0026)	0.0106* (0.0017)	-0.0245* (0.0047)
Other family income	0.0007 (0.0004)	0.0009** (0.0004)	-0.0007* (0.0002)	0.0106* (0.0006)
Immigrant	-0.0091* (0.0024)	-0.0099* (0.0023)	-0.0052* (0.0014)	0.0349* (0.0044)
Presence of investment income	0.0008 (0.0021)	0.0014 (0.0021)	-0.0007 (0.0013)	0.1117* (0.0037)
Highest level of education *(Reference: High school diploma)*				
Less than high school	-0.0197* (0.0023)	-0.0190* (0.0022)	-0.0093* (0.0014)	-0.0201* (0.0045)
College or trades certificate	0.0256* (0.0031)	0.0257* (0.0031)	0.0066* (0.0019)	0.0076 (0.0053)
Bachelor's degree	0.0482* (0.0064)	0.0477* (0.0063)	0.0070 (0.0036)	-0.0024 (0.0093)
Master's, Doctorate or other professional degrees above the bachelor level	0.0930* (0.0118)	0.0935* (0.0117)	0.0278* (0.0072)	-0.0013 (0.0152)
Residing in a CMA	-0.0074* (0.0022)	-0.0074* (0.0022)	-0.0027** (0.0013)	0.0238* (0.0040)
Region *(Reference: Ontario)*				
Atlantic provinces	-0.0315* (0.0035)	-0.0325* (0.0034)	-0.0141* (0.0020)	-0.1057* (0.0065)

Quebec	-0.0215* (0.0024)	-0.0224* (0.0024)	-0.0080* (0.0015)	-0.0728 (0.0047)
Prairies	0.0333* (0.0034)	0.0337* (0.0034)	0.0155* (0.0022)	0.0144** (0.0057)
British Columbia	0.0019 (0.0032)	0.0008 (0.0031)	-0.0021 (0.0018)	0.006 (0.0059)
Constant	0.1376* (0.0045)	0.1315* (0.0044)	0.0579* (0.0029)	0.2617* (0.0073)
R-squared	0.0614	0.0609	0.0238	0.0667
F statistic	140.83	138.20	45.69	254.17
Number of observations	60,761			

Source: 2006 Census public use microdata file. Robust standard errors in parentheses.
* p-value < 0.01 (significant at the 1% significance level)
** p-value < 0.05 (significant at the 5% significance level)

Beginning with women aged 65+ the results show to be relatively consistent, yet magnitudes of the coefficients are generally smaller compared to that of the 50-64 sample of women. That is, the behaviour of women who have passed the normal retirement age is less sensitive to the analyzed factors, compared to their younger counterparts.

The categorical age variables show the same pattern as seen for the 50-64 sub-sample, as all coefficients are positive and imply that compared to the youngest age category (65-69) older women are less likely to be participating, to be employed, to be working full-time full-year, and to be not retired (i.e. more likely to be retired). Collectively, the age variables again have the greatest impact for the labour market outcomes of women aged 65+. For the marital status categorical variables, all but the single and never married category present similar results to the 50-64 female sub-sample. In contrast with single and never married women in the 50-64 sub-sample, those in the 65+ are more likely to be participating and employed compared to married women. In addition, for the 65+ sample the widowed category's coefficients are rather small, suggesting that widowed women in this age group behave fairly similarly to married women. Furthermore, the other family income coefficients imply an opposite effect than that of the 50-64

sample for the participating, employed and not retired outcomes. A $10,000 increase in family income increases the probability of both participating and being employed by approximately 0.1 percentage points. Also, women of the 50-64 sample are more likely to be retired with increased other family income, whereas for the 65+ sample women are 1.1 percentage points more likely to be not retired for an increase in other family income of $10,000. Moreover, although other family income is significant for all four outcomes, the coefficients imply a much smaller marginal effect compared to that observed for 50-64 sub-sample.

In addition, the presence of investment income is mostly a significant variable for women aged 50-64, yet for the 65+ women it is only statistically significant for the not retired outcome. The sign of this coefficient implies the opposite effect and is much larger in magnitude than the insignificant one found for 50-64 female sub-sample. A woman aged 65+ who receives some sort of investment income is 11.2 percentage points more likely to be not retired compared to a woman who does not receive investment income.

The educational attainment variables display similar results to the 50-64 sample, as higher educational attainment is associated with increased labour force attachment. Of note, however, is the small magnitude of these coefficients compared to those of the 50-64 sample. For example, a woman with no certificate, degree, or diploma in the 50-64 sample is 14.9 percentage points more likely to be not participating compared to women holding a high school diploma. This figure for the 65+ sub-sample is only 2 percentage points. Nevertheless, educational attainment is still the second most impactful determinant for the labour market outcomes of women in this age group.

The regional variables also show two main differences compared to the 50-64 sample of women. First, the CMA variable implies a smaller and opposite effect, as women living in a

CMA are less likely to be participating, employed, and working full-time full-year. Also, women living in British Columbia are no different than women living in Ontario, as the coefficients for all outcomes are insignificant for women aged 65+ residing in British Columbia.

Turning to the male sub-sample of the 65+ sample, results in Table 6 are compared to the results for men in the 50-64 sample. The age categorical variables illustrate the age effect associated with each of the labour market outcomes, as older categories result in a generally decreasing probability for participating, being employed, working full-time full-year and being not retired, compared to the youngest category (65-69). Again, it also appears that age is the most impactful determinant for the labour market outcomes of men over the age of 65.

For the 65+ sub-sample of men, marital status is no longer a leading determinant for the outcomes, as it was for men aged 50-64. The separated variable is insignificant for all outcomes, meaning that men who are separated or divorced do not behave differently than men who are married in the 65+ age group. Also, the single variable is mostly insignificant and the coefficients have opposite signs to that of the 50-64 sub-sample. A single man over the age of 65 is 1.8 percentage points more likely to be working full-time full-year, whereas the same coefficient for the 50-64 sample implies that men are 1.6 percentage points more likely to be not working full-time full-year.

Furthermore, residing in a CMA has opposite effects for men over the age of 65 to that found for the 50-64 sub-sample. All coefficients for this indicator variable are significant and negative, implying a decreased probability for strong labour force attachment. Though, the provincial variables act similarly to the 50-64 sub-sample.

Table 6: Linear probability model results, men aged 65+

Males (Age 65+)	**Participating**	**Employed**	**Full-time Full-year**	**Not Retired**
Age *(Reference: Age 65-69)*				
Age 70-74	-0.1325* (0.0047)	-0.1247* (0.0046)	-0.0773* (0.0034)	-0.1694* (0.0056)
Age 75-79	-0.1821* (0.0046)	-0.1721* (0.0045)	-0.0982* (0.0033)	-0.1788* (0.0060)
Age 80+	-0.2129* (0.0044)	-0.2029* (0.0043)	-0.1065* (0.0033)	-0.1232* (0.0064)
Marital Status (*Reference: Married)*				
Separated	0.0044 (0.0060)	-0.0013 (0.0058)	0.0011 (0.0043)	-0.0054 (0.0075)
Widowed	-0.0376* (0.0041)	-0.0376* (0.0040)	-0.0198* (0.0028)	-0.0207* (0.0069)
Single	0.0137 (0.0077)	0.0080 (0.0075)	0.0184* (0.0058)	0.0057 (0.0095)
Presence of children	0.0360* (0.0046)	0.0334* (0.0045)	0.0319* (0.0035)	0.0376* (0.0060)
Other family income	0.0001 (0.0005)	0.0002 (0.0005)	-0.0016* (0.0003)	-0.0009 (0.0007)
Immigrant	-0.0256* (0.0038)	-0.0261* (0.0038)	-0.0121* (0.0028)	0.0557* (0.0052)
Presence of investment income	0.0195* (0.0034)	0.0226* (0.0033)	0.0126* (0.0024)	0.0917* (0.0045)
Highest level of education *(Reference: High school diploma)*				
Less than high school	-0.0315* (0.0045)	-0.0303* (0.0044)	-0.0161* (0.0033)	0.0248* (0.0062)
College or trades certificate	0.0057 (0.0049)	0.0044 (0.0048)	0.0006 (0.0035)	-0.0033 (0.0064)
Bachelor's degree	0.0613* (0.0076)	0.0582* (0.0075)	0.0202* (0.0055)	-0.0253* (0.0090)
Master's, Doctorate or other professional degrees above the bachelor level	0.1074* (0.0096)	0.1051* (0.0095)	0.0303* (0.0068)	-0.0209 (0.0109)
Residing in a CMA	-0.0221* (0.0036)	-0.0197* 0.0036	-0.0056** (0.0025)	-0.0034 (0.0048)
Region *(Reference: Ontario)*				
Atlantic provinces	-0.0591* (0.0061)	-0.0641* (0.0059)	-0.0377* (0.0041)	-0.0846* (0.0083)
Quebec	-0.0431* (0.0042)	-0.0435* (0.0041)	-0.0235* (0.0030)	-0.0846* (0.0083)
Prairies	0.0841*	0.0834*	0.0395*	0.0659*

	(0.0055)	(0.0054)	(0.0041)	(0.0067)
British Columbia	-0.0111** (0.0049)	-0.0108** (0.0048)	-0.0163* (0.0033)	-0.0131** (0.0066)
Constant	0.2867 (0.0068)	0.2719* (0.0067)	0.1453* (0.0050	0.3952* 0.0087)
R-squared	0.0873	0.0840	0.0459	0.0434
F statistic	227.5	217.23	95.18	120.91
Number of observations	48,593			

Source: 2006 Census public use microdata file. Robust standard errors in parentheses.
* p-value < 0.01 (significant at the 1% significance level)
** p-value < 0.05 (significant at the 5% significance level)

Also, the results for the female and male sub-samples of the 65+ sample are rather similar in terms of sign and significance. However, age is a much more important explanatory factor for men than it is for women over 65, as the magnitude of the coefficients are much larger. Also, the separated and divorced as well as single variables are only significant for women over 65. Surprisingly, the presence of children in the household has a larger effect on men over 65 than on women. For example, men with children in the household are 3.3 percentage points more likely to be employed compared to men without children, whereas this value for women over 65 is only 0.9 percentage points. The same is true for the presence of investment income variable and the highest level of education variables. Men's results are consistent in terms of sign and significance, yet they are more sensitive to these variables compared to women. Finally, the British Columbia regional variable for men over 65 is significant at the 5% significance level for all outcomes and men residing there are less likely to have strong labour force attachment compared to men in Ontario.

7. Conclusion

This paper employs the 2006 Canadian Census in order to study the labour market outcomes of older Canadians over the age of 50. The main goals of the study are to determine the central factors contributing to the labour force attachment of older workers before and after the normal retirement age of 65. The study uses four labour market outcomes to compare and evaluate the results and differences between the 50-64 and 65+ samples. These outcomes consist of labour force participation, employment status, full-time full-year work status, and retirement status, which are employed as dichotomous independent variables. Also, genders are analyzed separately in order to identify gender-specific behaviour. The key results of the analysis are summarized in the following.

Generally speaking, among the analyzed factors, age is the most impactful and implies a consistent result for all four sub-samples of the analysis. All coefficients are significant and imply a decreased labour force attachment for workers in older age categories compared to the youngest reference categories. In addition, the effect is increasing as the coefficients for the oldest categories present the largest magnitudes.

Marital status for women in the 50-64 sample illustrates differing results. Separated and divorced women are more likely to have a strong labour force attachment compared to married women. On the other hand, compared to married women, women aged 50-64 who are single/never married and widowed are more likely to have a weaker attachment to the labour force. For men in the 50-64 sub-sample, similar results are observed. However, men who are separated and divorced behave oppositely to their female counterparts, as they are less likely to participate compared to married men. Nevertheless, marital status is the second most important determinant for men aged 50-64. Furthermore, the effect of marital status for women aged 65+

differs from that of the 50-64 sample of women, as single women are more likely to be participating compared to married women. Finally, marital status is no longer the second most important factor for men in the 65+ sub-sample, as both the separated and single coefficients are largely insignificant. The presence of children has a similar effect for all four sub-samples, as it increases the probability for strong labour force attachment. For men over the age of 65 the presence of children has a stronger impact on labour market outcomes, compared to their female counterparts. In addition, other family income has a rather small effect for most outcomes and sub-samples. For all sub-samples, with the exception of women over the age of 65, other family income is associated with decreased labour force attachment. For women over the age of 65, other family income has an opposite effect, as it increases the probability of participating, being employed, and being not retired.

The results for immigrant status are similar for all four sub-samples and show that immigrant men and women are more likely to have a strong attachment to the labour force compared to non-immigrant men and women. Similarly, the presence of investment income generally increases labour force attachment compared to men and women without any investment income. For women over the age of 65, however, the presence of investment income is only significant for the not retired outcome.

As for educational attainment, results are consistent for all sub-samples. Men and women with levels of education higher than the reference category of a high school diploma are more likely to be strongly attached to the labour market. On the other hand, those who do not hold a degree, certificate or diploma are more likely to be not participating, not employed, not full-time full-year, and retired. It is also important to note that educational attainment was the second most important determinant for the labour market outcomes of women over the age of 65.

Lastly, regional variables demonstrate that living in a large CMA improves the labour market outcomes of older adults aged 50-64. Conversely, men and women in the 65+ sample living is a CMA were less likely to have a strong attachment to the labour market. Also, compared to individuals living in Ontario, individuals residing in Atlantic Provinces, Quebec, and British Columbia were more likely to have low labour force attachment, whereas those in the Prairies were more likely to have a strong labour force attachment. The 65+ sub-sample of women shows no difference between Ontario and British Columbia, as the coefficient for British Columbia is statistically insignificant. Overall, results for the regional variables are not consistent with expectations relating to regional variation in labour markets and its association with older individuals' labour market outcomes.

As with every empirical study, limitations within the paper present opportunities for consideration in future studies. For example, the use of census data does not allow the analysis of changes in the labour market outcomes of older adults over time. A similar study can be carried out using longitudinal data to observe the change in behaviours of older adults approaching the normal retirement age and those who have surpassed this age. Furthermore, additional factors (not studied in this paper) that have shown in other studies to be significant in determining the labour market outcomes of older adults can be incorporated in the models with data sources that provide these types of information. For example, health status is an important factor that affects many facets of an older adult's labour market outcomes and decisions.

Nevertheless, these results outline several important determinants for the labour force attachment of older Canadians. Although some are more important than others, this study highlights a few key factors that may inform target areas for policy action in support of Canada's aging population. For instance, the results suggest that age is a principal determining factor for

the labour force attachment of older Canadians. This strong impact may be a result of ageism in the workforce or the lack of appropriate training suited to older individuals' learning styles. Future research of key determinants may potentially lead to diminishing disincentives for maintaining a strong attachment to the labour force, creating incentives, and eventually, strengthening the labour supply of older Canadians.

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