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Public Pensions and Low Income Dynamics in Canada

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Abstract

This paper focuses on individuals over 50 and shows that considering persistence and low income dynamics is essential to understanding poverty. We use administrative data for Canada from the Longitudinal and International Study of Adults (LISA). The paper shows that poverty for seniors is highly persistent and strongly depends on lifetime earnings. We show that beginning to receive a public pension implies a higher probability of exit from poverty. Public pensions thereby help to explain the lower overall incidence of poverty among the elderly. These results are confirmed in a dynamic probit model, which allows to control for individuals' unobserved heterogeneity and state dependence. While public pensions do not eliminate poverty among older adults, they help to alleviate it by reducing persistence and increasing exit for those who are most at risk.

JEL Classification : H55, J26, I32

Keywords: low-income, elderly, poverty dynamics, Canadian public pensions

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1 Introduction

Public and occupational pension reforms have been on the Canadian policy agenda for decades. In recent years, this issue has become more and more pressing as the Canadian population is aging and the Baby Boomers have started to reach retirement age. One particular concern is the increase in the older adults' dependency ratio (the ratio of the number of people ages 65 and over who are not in the labor force to the total number of labor force participants) observed over the past decades: even if Canada's situation appears relatively good in comparison to other OECD economies, the rise is not negligible. From 14.0% in 1950, the ratio increased to 26.1% in 2015, with a projected value of 54.5% in 2075 (OECD, 2017). In response to such increases in their dependency ratios, most OECD countries have introduced changes in their pension systems, such as raising the retirement age, in an effort to improve their financial sustainability. Such changes are also discussed in Canada. However, public pensions may play an important role in seniors' financial health. Thus, in the context of pension reforms, it becomes very important to study the financial consequences of retirement, and more specifically, of public pensions, on the financial well-being of older Canadians.¹

Our paper is motivated by earlier work in the literature, which has highlighted that the financial well-being of older adults is determined both by their labor market opportunities and by social safety nets provided by the welfare system. Adjusting public pensions, for instance, is a direct policy intervention capable of impacting the financial well-being of seniors, as well as reducing poverty rates among seniors (for instance Engelhardt & Gruber, 2004). Research has also shown that average lifetime earnings and the level of integration in the labor market during work years are important determinants of older adults' poverty (for instance Valetta, 2006). Our research on the effect of public pensions on poverty among seniors contributes to deepening the understanding of older adults' poverty and its dynamics.

The goal of our paper is to identify the role of public pensions in alleviating poverty among senior Canadians. We pay particular attention to their effect on poverty dynamics, i.e. whether they reduce the probability of entry into poverty or increase the probability of exit from it. To understand whose risk of poverty is affected most by public pensions, we also analyze how lifetime earnings affect individuals' old age financial well-being. Moreover,

¹In Canada, the average income of those aged 65 and older is 90% of the national average, and 85% for those aged 75 and more, which ranks below countries like France, Italy, Spain and the United States. With respect to poverty rates, Canada ranks in the middle of the pack among OECD countries (OECD, 2017).

we also analyse the causal effect of pensions on poverty at senior ages by taking into account the unobserved heterogeneity of individuals in a state dependence model.

While there is a vast literature that studies poverty in Canada in the general population, until now, very few studies have focused on poverty among Canadian seniors. We do know, for instance, that poverty rates have declined in the general population since the 1960s, as we will show in the next section. Several studies have argued that this decline occurred as a consequence of the expansion of public and earnings-related pensions, which reduced poverty rates among seniors (see Kangas & Palme, 2000, Myles, 2010, Osberg, 2001, among others). These studies base their conclusions on time series trends in aggregate data. When surveying the studies that approach the question using micro data, it becomes apparent that most of them also focus on the evolution in time of poverty rates following the increase in generosity of the public pension system (such as Milligan, 2008, Schirle, 2013, Veall, 2008, among others). The present paper differs from these studies by analyzing the effect of individual receipt of a public pension on the probability of being poor, as well as that of entering or exiting poverty.

Results from several previous studies have pointed out the importance of poverty dynamics. They find that poverty is more likely to recur for some individuals. Finnie & Sweetman (2002), for example, find a strong “occurrence dependence” for poverty entry and incidence, while Hansen et al. (2006), Lamman & MacIntyre (2016) and Morissette & Zhang (2001) find that endogenous initial conditions and unobserved heterogeneity play an important role in explaining social assistance participation. In his study of many countries for the period 1999-2001, including Canada, Biewen (2014) finds that looking at the poor in only one period provides an incomplete picture of poverty because a considerable part of the measured poverty is transitory rather than persistent. In a cross-country analysis, Valetta (2006) finds for the period 1993-1998 that Canada has a high share of chronically poor individuals relative to those who are ever poor.² Our results show that one particularly important aspect of poverty among the older adults is its persistence, and we carefully take that into account in our analysis.

In this paper we use recently released individual-level data with an administrative data component, the Canadian Longitudinal and International Study of Adults (LISA). This dataset allows us to observe individuals for a period of more than a decade, with very accurate measurements of income, thanks to the administrative data. This means that we are able to measure poverty and its persistence accurately. The administrative data also

²More studies analyse poverty for other specific groups. For instance, Dooley (1994) focuses on poverty among women and children, Hatfield (1996) discusses the roles of institutions, and McWatters & Beach (1990), Sharif & Phipps (1994), and Zyblock (1996*a,b*) focus on the study of child poverty.

enable us to distinguish in detail among different types of pension income: public pensions, private pensions, and occupational-related pensions. We are therefore able to estimate the direct impact of receiving public pension benefits on the risk of poverty and poverty dynamics. Finally, the unique combination of survey and administrative data allows us to combine the administrative information with information typically only available in surveys, such as detailed demographic characteristics and life events. Relative to existing research, our main contributions thus are (i) the use of a long and recent panel of data for Canada, (ii) the direct examination of the impact of public pensions on older individuals and seniors, (iii) the analysis of how information on past earnings and poverty can help us understand the current situation of seniors living in poverty, (iv) the analysis of the impact of changes in the family structure and employment status on poverty transitions and persistence among the older adults, and (v) to determine the state dependence and the persistence of poverty among older adults in a dynamic model taking into account unobserved heterogeneity of individuals.

Our results confirm that poverty among seniors is highly persistent, i.e. exit rates from poverty are lower, and poverty spells last longer. Entry into poverty is driven by health shocks, job loss, or marital separations, with health shocks being relatively more important for older individuals. Our key findings show that for those individuals over 50 who enter poverty, receiving public pension benefits is crucial for avoiding poverty later on in life, because these benefits increase the probability of exiting poverty. Therefore, public pension benefits help to explain the lower overall incidence of poverty among older adults. By estimating a dynamic probit model and controlling for individuals' unobserved heterogeneity, we are able to measure the importance of state dependence and persistence for older adults. Moreover, new evidence shows individuals with low past average earnings during their careers have a higher probability of being poor when they are older than 65. While public pensions do not completely eliminate poverty among older adults, they help to alleviate it by reducing persistence and increasing exit.

This paper is structured as follows. Section 2 summarizes related literature on Canadian public pensions and poverty. Section 3 describes the data set and the main variables, with stylized facts on poverty. Section 4 estimates the role of public pensions on poverty at older ages. Section 5 estimates whether public pensions affect the probabilities of entry into and exit from poverty. Section 6 analyzes the results with a dynamic random effects model. Finally, Section 7 offers a conclusion.

2 Canadian Public Pensions and Poverty

At the international level, a significant part of the literature on income and poverty among the elderly has focused on economic well-being as a function of different pension systems. Indeed, several studies have confirmed the negative relationship between public pension spending and the probability of being poor among the elderly at the aggregate level (see Lefebvre & Pestieau, 2006). At the micro level, other cross-sectional and cross-country studies such as those of Smeeding (2006) and Smeeding & Williamson (2001) have also associated public pension spending to the alleviation of poverty at elderly ages. Zaidi et al. (2006) find similar results for European countries. Moreover, Fonseca et al. (2011) find that being older than key public pension cutoff ages makes people less likely to be poor in continental Europe, the UK, and to a lesser extent, the US. Engelhardt & Gruber (2004) also highlight the important role that Social Security has had in reducing U.S. poverty rates, and Engelhardt et al. (2005) predict that a cut in Social Security benefits would cause more elderly households to move into shared living arrangements.

In our study, we focus on Canadian public pensions and poverty. We first describe briefly the public pension system in Canada that consists of four components: the Old Age Security (OAS); the Guaranteed Income Supplement (GIS); the Allowance; and the Canada/Quebec Pension Plan (CQPP). The CQPP is earnings-based while the three others are income-tested benefits. The CQPP belongs to the second pillar in the pension system, and is an occupational pension. For working families, it provides the bulk of the pension (the QPP for Quebec residents and the CPP for individuals in the Rest of Canada). It is funded by payroll taxes paid by both employees and employers. Benefits are taxable and depend on an individual's earnings history.

In this paper we define public pensions as the sum of the OAS, GIS, and the Allowance. We exclude in our first analysis the CQPP because it is an occupational pension, meaning that one needs to have worked to receive it. Given the interrelated nature of the pension system components, we will later introduce the CQPP in our analyses.

The OAS provides a taxable uniform monthly grant to anyone aged 65 and over with some residency criteria. The payment is reduced by 15 cents for each dollar of income, including CQPP income, in excess of a certain threshold. This means that everyone except for individuals with high levels of income can receive this benefit. The GIS is a non-taxable monthly grant to individuals aged 65 and over. It depends on household composition. The amount of the grant is a decreasing function of the level of family income. Finally, the Allowance is paid to 60-64 year old spouses of OAS recipients and to 60-64 years old

widowers. It equals the OAS plus a fraction of the GIS for married individuals. Both OAS and GIS represent a replacement ratio around 32% for who receive the full amount (OECD, 2017). We provide more detailed explanation of the pension system in Canada in the appendix B.³

As we observe in Figure 1, Canada has experienced an important decline in poverty among the elderly since the seventies. Several studies have also argued that this decline occurred in consequence of the expansion of public and earnings-related pensions. This is in line with Heisz (2016), who shows for this population that the rate decreased from 30.4% in 1977 to 5.2% in 2011 when using to the low-income cut-off (LICO). With the alternative LIM-based poverty measure, the poverty rate similarly fell to a low of 3.9% in the mid-nineties, only to subsequently increase.

Myles (2010), Osberg (2001), and Kangas & Palme (2000) among others, have investigated the effect of the pension system reforms on the alleviation of poverty among the elderly. Osberg (2001) and Myles (2010) both argue that the introduction of the Old Age Security in 1952 and Guaranteed Income Supplement in 1968 as well as the maturing of the Canada/Quebec Pension Plan regimes established in 1966 contributed to alleviating poverty among the elderly since the beginning of the seventies. Osberg (2001) considers the reduction of poverty among senior citizens as being the major success of Canadian social policy in the twentieth century. Myles (2010) also claims that these reforms have helped reduce income inequality among seniors, since they benefited lower income individuals more than anyone else. Kangas & Palme (2000) examine to what extent poverty cycles along the individual's life are still apparent in OECD countries (including Canada). In most countries, poverty among the elderly has declined, and the young have replaced the old as the lowest income group.

Other studies using micro data, such as Schirle (2013), Milligan (2008) and Veall (2008), similarly relate the evolution of poverty among the elderly to the increase in generosity of the public pension system and to variation in income growth over time. In particular, Milligan (2008) computes several measures of poverty among the elderly and studies their evolution during the period 1969-2004 with several data sets; the Survey of Consumer Finances (SCF), and the Survey of Labour and Income Dynamics (SLID). He finds that incomes of the elderly have grown more rapidly than those of the working-age population from 1973 to 1990. Poverty rates have been constant afterwards, although some relative measures of poverty increased after 1997, as also seen in Heisz (2016). This could reflect

³You can also read more about Canada's public pensions and their reforms in Béland & Marier (2019), Milligan & Schirle (2013), Finnie et al. (2013), LaRochelle-Cote et al. (2008), and Baker et al. (2009), among others.

the interaction between the evolution of pensions and gains in income in other groups of the population. In fact, Baker et al. (2009) show that individuals adjust their behaviours, such as employment and savings, based on expected retirement conditions. In a study of 19 countries, Raquel Fonseca & Feeney (2014) also find that individuals with a higher risk of poverty tend to opt for earlier retirement. Bernard & Li (2006) and Veall (2008) use data from Longitudinal Administrative Database (LAD) to describe poverty among seniors in Canada. Bernard & Li (2006) focus on the impact of the death of the spouse, and find that this can affect poverty rates because there is a reduction in the public pension receipts (for instance, OAS and GIS). Veall (2008) compares relative poverty rates for groups of seniors with different characteristics, e.g. by living arrangement or immigrant status, and relate their results to the design of public pension plans, in order to understand which adjustments to the pension system (for example, increasing GIS benefits for single persons) would be most effective in helping seniors exit poverty. In contrast with our study, these previous studies, however, base their conclusions on time series trends or aggregated characteristics. The present paper differs from the above-mentioned studies by analyzing the effect of individuals receiving public pension benefits on the probability of being poor, entering or exiting poverty, and by using dynamic econometric models to analyse poverty at the micro level taking into account past earning history and/or unobserved heterogeneity.

3 Data and Stylized Facts

In our analysis we use three waves of LISA (Longitudinal and International Study of Adults): wave 1 (2012), wave 2 (2014), and wave 3 (2016). LISA is a longitudinal survey conducted every two years by Statistics Canada that contains information on individuals' income, health status and demographics (such as education or marital status).⁴ The data has been linked with administrative data sources (T1 and T4 files) starting from 1982. This retrospective component of the data is particularly important for us, since it allows us to study how changes in individual's earnings are related to poverty entry, exit and poverty persistence for the older adults.

⁴Detailed information about the survey can be found in: <https://www.statcan.gc.ca/eng/survey/household/5144>

3.1 Measures of poverty and characteristics of the poor

We use mainly one relative measure of poverty that is called LIM (Low Income Measure). It is defined by a threshold set at 50% percent of the median income. However, other indicators of poverty are used for robustness: Two "absolute" measures of poverty called LICO (Low Income Cutoff) and MBM (Market Basket Measure), and LIM with size adjustments.⁵ Relative poverty measures take into account the social conventions and the contemporary living standards of a particular society. The absolute measures of poverty consider poverty to be a situation of income deprivation that does not depend on the income distribution in a society.⁶

Since we do not have information on the size of the economic family in the retrospective component of the administrative data, we can only compute the poverty measures for the survey years: 2012, 2014, and 2016. On the other hand, the dataset provides the LIM from 2001 using the census family adjustment. Therefore, the results shown in the main text were computed using the relative measure of poverty (LIM), and when in the analysis we include measures of poverty persistence we will restrict our sample to those years.⁷

Table 1 shows the poverty rates for individuals over 50 using the three previously discussed measures. The first two columns show poverty percentages calculated using the LIM. This measure can be calculated at the level of census family (reported in the survey), economic family or household. Results change according to which of those three measures we use. For instance, when we use the economic family or household instead of the census family, the poverty levels increase⁸. Since the administrative data only provides the historical LIM variable at the level of census family, we use results for census families throughout. As we can see in the table, this measure implies lower levels of poverty than those that use the economic family or the household. We thus consider the measure conservative and appropriate to analyse lower income elders living independently (see Engelhardt & Gruber (2004)). Note that the economic family or household might in some cases also include other persons apart from the elderly individuals or couple, for example adult children or other adults living in the same household.⁹

⁵More detail about how these variables are constructed can be found in Appendix A.

⁶In the United States, the official poverty line is absolute. In the European context, a relative poverty line is more common. It is usually set at 60% of the median income (OECD, 2008), while in Canada it is set at 50% percent of the median income (usually after tax family income, adjusted by family size).

⁷Results with the other measures are shown in Appendix C for 2012-2014 as robustness of our analysis.

⁸Census family is defined as single or married couple with or without children. Economic family is defined as a group (or a person living alone) of two or more individuals related to each other by blood, marriage, common-law or adoption. A household is defined as the group of individuals living in the same dwelling. For more detail about the three definitions see Appendix A.

⁹It is well known in the literature of poverty that the living arrangements affect the sensibility of the

In Table 2 we break down poverty statistics by individual and family characteristics. The results show that levels of poverty are lower for men, for individuals with higher levels of education, for those who self-report having an excellent or very good health, and for those living with a partner. They are higher for lone parent families, which are mostly headed by women.¹⁰ Age is an equally important correlate of poverty: poverty rates are lower for those over 65. The poverty rates of the elderly shown in Table 2 are in line with those found by Smeeding & Weaver (2002) using data from the Luxembourg Income Study. These authors also show that the poverty rate in Canada is substantially lower than in some other countries, in particular the United States, Australia and the United Kingdom, and lies between those in Continental European and Scandinavian economies.

The poverty rate for those who are unemployed at the time of the survey is high, at 19%. In particular for middle aged and older individuals, whose unemployment spells last longer, unemployment implies a substantial hit in income, putting them at risk of poverty. In line with this, results show that compared to the non-poor, a much larger fraction of the poor is unemployed at the time of the survey. Table 2 also shows that there are no important differences in poverty rates by retirement status (self-reported).

3.2 Measures of persistence and characteristics of the persistently poor

There are different ways to account for poverty persistence.¹¹ In the present paper, we use the number of years spent in poverty in the past as a continuous measure indicating the degree of poverty persistence for an individual. We also account for both the number of poverty spells and the length of these spells.

In addition, we use what has been called an ‘at-risk-of-poverty’ measure. This measure considers a person who was poor in a given year and in at least two of the three preceding years to be persistently poor. Moreover, we account for the ‘average-income poverty’, computing the past average earnings of the individual. Since we can estimate 14 years, we will use this information in our regressions as an estimate of permanent income.¹²

different measures of poverty (see Engelhardt & Gruber (2004)).

¹⁰This echoes findings for other countries. For example, Gjonca et al. (2011), OECD (2008) or Antolín et al. (1999) find higher poverty rates for respondents who are divorced, single, or widowed compared to those who are married or cohabiting.

¹¹One natural measure of persistence is to count the number of years spent in poverty over the studied period. Some studies classify a person as being persistently poor if he or she has spent a certain number of years in poverty. Usually, the studies analyzing this aspect have a short data panel, of around 3 to 5 years. Our data covers a much longer period.

¹²This measure has been used in Rodgers & Rodgers (1993), Valetta (2004) and OECD (2001). This

Figure 2 shows that poverty exit rates are lower for older than for younger individuals. This means that poverty is more persistent for the elderly.¹³ For the retired, it may be difficult to exit poverty. High spell lengths for the non-retired over 50, in contrast, are more likely to capture difficulties in finding a job again. Results are similar if we only consider the longest spell for each individual. These are indications of higher persistence of poverty. Although we do not have a unique measure of persistence that could summarize duration, recurrence and intensity, the incidence of poverty is lower among the elderly while persistence is higher. This implies that those among the elderly who ever enter poverty can expect to stay poor significantly longer than the young who enter poverty.

4 The Effect of Public Pensions on Poverty Persistence among the Older Adults

4.1 The Prevalence of Poverty among the Older Adults

We use a probit model to estimate the probability of being poor as a function of different characteristics that were found relevant and were documented in the literature on poverty at older ages. However, since cohorts may differ in their characteristics—older cohorts, for example, have systematically lower levels of education—it is important to verify that the differences in the incidence and persistence of poverty documented above are not driven by these confounding variables. Table 3 shows marginal effects from these regressions. We include different variables in the regression: socio-demographic factors, labor market arrangements, living arrangements and health outcomes. We also include a dummy that controls for whether a respondent is retired¹⁴. For these regressions, we pool the data for 2012, 2014, and 2016.

In the first column of the table, we pool all age groups. The results indicate that the

measure is based on an estimate of permanent income. In that case, one would use a poverty line based on the estimated permanent income. To be able to obtain this measure we would need to use information on the income by family size across periods.

¹³We confirm this result in Table C.1 in the appendix C, older people spent more years in poverty over the sample (top panel), and account for a disproportionate share of those who have spent a lot of time in poverty (bottom panel). Older people not only spend more time in poverty, but also have longer spells of poverty (See table C.2 in Appendix C).

¹⁴Retirement status is self-declared, which means that it is up to the individual to interpret and decide what it means to be retired. It could be an exit from the labour force, a reduction in work hours or earnings, claiming one's retirement pension or other retirement income, exiting or changing one's job from the main employer, or some combination of these definitions. Among individuals 50 and older who consider themselves retired, only 5% are working. Out of these, 80% work less than 35 hours per week.

probability of being poor is significantly lower for individuals older than 35 compared to individuals 34 and younger. The probability of being poor, already lower for those between 35 and 49, declines even further for those aged 50 to 64, and even more for those over 65. The coefficients on most of the other demographics are in line with the bivariate results shown in Table 2 above. Each additional level of schooling reduces the probability of poverty. For individuals who live alone, having children is associated with a greater incidence of poverty. This is not the case for couples. In addition, couples have a lower incidence of poverty compared to single households, no matter the number of children. Fair or poor health (as opposed to good, very good or excellent health) is associated with a higher incidence of poverty. Finally, the unemployed and those not in the labor force are also noticeably more likely to be poor.

The remaining columns show results for the same regression, broken down by age category (50 years old and above or below) and retirement status. Qualitative results are very similar, but point estimates differ. For instance, we see that the higher risk of poverty for lone parent families is driven by those under 50. While the effects of unemployment and non-participation on the incidence of poverty are higher for younger individuals, they remain substantial for those above 50. Finally, comparing retirees to non-retired older individuals reveals that those who are retired are significantly less likely to be poor. Clearly, the results on retirement cannot be interpreted as causal, given that retirement is a choice such as for example, people may choose to work longer if retirement would imply poverty. Nevertheless, it is important to note that the negative effect of retirement relative to working on the probability of poverty is strongly significant and large.

4.2 The Persistence of Poverty

We now analyse the probability of being poor controlling for demographics and for time spent in poverty. These regressions use data for 2014 only and we compute for how long the individual has been poor between 2001 and 2013. We define the variable "years poor" as the length of the ongoing spell of poverty for those who are poor in 2014. We then group individuals depending on whether this spell was a one, two to three years long, or four or more years long. Table 4 (Panel A) shows the marginal effects of these categorical variables on 2014 poverty status. It reports a much higher probability of being poor in 2014 for those who were previously already poor, thus showing poverty is persistent. When considering all age groups, the probability of being poor in 2014 increases with the length of an ongoing poverty spell. In other words, those who have been poor for some years already are more likely to remain poor and the longer the poverty spell, the

more likely they are to remain poor. This corresponds to a declining hazard for exit from poverty. For those aged 65 and over, the length of any ongoing spell of poverty does not play a role. This is in line with the flat exit hazard from poverty for this group shown in Figure 2 above. The effect of even a single year in poverty on the likelihood of subsequent poverty is much stronger for this group. This is in line with higher persistence of poverty for the seniors.

Table 5 shows regressions analyzing how demographics affect the probability of ever being poor (at least one year) or being poor for a long time (5 years or more). In the last two columns we restrict the sample to individuals who have been poor for at least one year and we look at the probability of being poor for 5 years or more. When we analyze the effect of age in these regressions, we first see that older individuals are less likely to have been poor at any point in the sample. This is in line with their lower probability of being poor at any point in time. As the sample covers the years 2001 to 2016, so those who are older in 2016 have also been older throughout the sample. Second, older individuals are more likely to have been poor for more than five years if they have ever been poor (last two columns). This is in line with the longer poverty spells observed for older people shown above. Finally, the combination of these two countervailing effects implies that the probability of suffering a long poverty spell (compared to none or a short one) hardly varies with age for those over 25. For these results, demographics matter: while the probability of a long poverty spell (conditional on ever being poor) increases monotonically in age when only age is included in the regression, the relationship with age is flat for those over 35 once we also control for education, gender, family composition, health, and labor force status. The reason is that when including these controls, we account for the fact that the higher probability of a long poverty spell is not due to age itself, but to the associated variables of lower education, worse health, and lower probability of labor force participation. Older cohorts have “worse” characteristics in terms of these variables, partly because education levels were lower in the past, partly in relation to their current age. This exposes them more to the risk of long poverty spells. As a result, when controlling for demographics, the unconditional probability of a long spell declines in age (column 4). Again, part of the risk of a long spell attributed to age when not controlling for demographics is absorbed by the other characteristics of the old. Taken together, these results suggest that the old face a lower probability of ever being poor, but longer spells if they are poor. However, the latter is not attributable to age directly, but to characteristics that are associated with age or with earlier birth cohorts: lower education, worse health, and lower rates of labor force participation.

4.2.1 The Effect of Past Earnings

In Figure 3, we can observe that the share of the labor income in total income during the life cycle is different for poor and non poor individuals. The results in the last section suggest that for the older adults, current poverty is closely related to prior experience of poverty. Only a small fraction of poor retirees (11%) have never been poor before. Figure 4 shows the distribution of average earnings over a career (25 to 64 years of age) for the individuals in our sample. We show the distribution separately for the poor (panel a) and the non-poor (panel b). The seniors poor on average had career earnings that were \$18,600 per year lower than the non poor. Among the older adults poor, 50% had average career earnings below \$10,600, compared to 16% among the non-poor.

Table 4 (Panel B) shows the effect of past average earnings on the probability of being poor. Results show that past average income is a powerful predictor of current poverty status. This is in line with previous work done other contexts which has shown that individuals who have spent more time in poverty are more likely to be poor at any given moment.¹⁵

To summarize, older people are less likely to be poor. At the same time, poverty is more persistent for them, and therefore they have a higher probability of undergoing a longer spell of poverty if they are ever poor. However, the multivariate approach reveals that the relatively higher risk of longer spells is driven by other characteristics of older people/cohorts, and not by their age. This is in line with the effect of career earnings on the risk of poverty.

4.3 The Role of Public Pensions in Reducing Poverty among the Older Adults

Although we have shown that poverty rates and risk of poverty are lower among older individuals, in particular those over 65, we have also shown the persistence of poverty at those ages. Previously cited literature shows the importance of the role of public pensions in reducing poverty at senior ages. In this section, we investigate the extent to which the public pension system drives these findings. To do so, we use the same model as in Table 3 including a dummy that indicates if the head of the household is receiving a public pension¹⁶ as well as an interaction of this variable with the dummy “retired”.

¹⁵See for example Biewen (2009) and Valetta (2006).

¹⁶For this definition, we consider any of three types of public pensions: the Old Age Security Pension, the Guaranteed Income Supplement and the Spouse’s allowance. Unlike the Canada Pension Plan and

The results, in columns 3 and 4 of Table 6, show that the lower poverty rate among individuals over 65 is entirely driven by the receipt of public pension benefits. Thus, it is the receipt of a public pension (for which those over 65 are eligible) that leads to lower levels of poverty among the older adults. For someone who is retired, receiving a public pension, reduces the probability of being poor by 11%. Once the receipt of public pension benefits is controlled for, retirement maintains a small additional negative effect on the probability of being poor. This remaining effect could be explained by retirement decisions of those who are between 60 and 65 and have low incomes, are unemployed, or out of the labour force. If they made sufficient contributions to the CQPP or an occupational pension plan, beginning to draw on the pension plan can increase their incomes.

In Panel A of Table 7, we perform the same exercise, but now we control for the number of years spent in poverty just before the survey year (our measure of persistence) as well as the logarithm of average past earnings. Results indicate a strong effect of past poverty on the risk of poverty today (columns 3 and 4). The risk of poverty is also closely related to career earnings. In all of these specifications, the effect of public pensions on the risk of poverty is still negative, significant, and of similar magnitude. For someone who is retired, receiving public pensions reduced the probability of being poor by 8%.

Finally, we analyze not only how "universal" pension income¹⁷, but also income-linked pensions affect the risk of poverty. For most pensioners, the main component of their pension consists in payments from the Canada and Quebec Pension Plans (CQPP), which are a function of lifetime earnings. Those are supplemented by payments from public pension plans (except for high income earners). To analyze their interaction, we add to the previous model a full set of dummies and interactions of indicator variables for retirement, public pension receipt, and CQPP pension receipt.¹⁸ Results are shown in Panel B of Table 7. It is clear that both CQPP and public pension receipt are both associated with a significantly lower risk of poverty. The final columns also show that average career earnings (which lead to higher CQPP income for retirees) continue to reduce the risk of poverty in this setting. As we expected (discussed above), retirement loses significance when CQPP payments are included.

Québec Pension Plan pensions, these are not positively linked to lifetime earnings. For more detail on the Canadian pension system, see the Appendix B.

¹⁷Most of the population is eligible for the public pensions, except for some groups, such as immigrants, who have been living in Canada for a short period of time

¹⁸Note that CQPP is a dummy that takes the value 1 if the individual receives payments from the Canada or Quebec pension plans.

Who are those for Whom Public Pensions Make the Difference? Up to now we have seen that, for many old people, poverty is persistent and explained by their characteristics, namely lower labour market participation, a higher probability of unemployment and lower levels of education compared to other cohorts. We have also seen that public pension benefits can play an important role in reducing poverty at older ages.

We want to investigate more closely for which individuals these benefits have the most important effect in terms of reducing the risk of poverty. To do so, we again regress poverty status on individual characteristics, but now interact the dummy “presence of public pension” with the past average income of the individual. We repeat this regression by interacting the dummy “presence of public pensions” with the amount of CQPP income. Figure 5 shows the marginal effects of the variable “presence of public pensions” evaluated at different levels of the individual career average income (Figure 5a) and at different levels of CQPP income (Figure 5b). It is very clear from the figures that public pensions have the strongest negative effect on the risk of poverty for individuals with average career incomes below \$30,000, and with CQPP, income below \$20,000. For example, receiving benefits does not reduce the risk of poverty in a statistically significant way for individuals with average career income of \$50,000, while it reduces it by 20 percentage points for individuals with average career income of \$10,000. Similarly, receiving a large pension of \$50,000 does not reduce the risk of poverty, while receiving a pension of \$10,000 reduces this risk by almost 10 percentage points. This occurs because individuals with high career earnings tend to have more resources when in old age, including higher pensions, and therefore are hardly at risk of poverty to begin with. Individuals with low career earnings have fewer resources, so that receipt of a public pension can significantly reduce their probability of being poor.

Robustness We repeat the analysis using different measures of poverty. Instead of the Low Income Measure (LIM) used above, we use the Low Income Cutoff (LICO) and the Market Basket Measure (MBM).¹⁹ Results generally are qualitatively similar. For the sake of brevity, our discussion here focuses on the role of age and public pensions.²⁰

Table 15 summarizes the results for both measures in the last two columns. As in the results using the LIM, the negative effect of retirement on the probability of poverty is significant at the 5% level. Receiving public pensions decreases the probability of being poor when using LICO as our measure of poverty. The effect is not significant but negative when using the MBM. However when we control for the interaction between retirement

¹⁹Note that the LICO and MBM measures can be built in LISA only for 2012 and 2014.

²⁰Completed tables are available upon request.

and public pension benefits, the probability of being poor decreases in both measures. This is still the case when controlling for past earnings or the number of years spent in poverty. For all measures of poverty, the effect of past average income is negative and strongly significant. Moreover, the effect of the number of years in poverty is positive and significant. The magnitude of the coefficients of these two variables do not vary much across the different measures.²¹

Results above were obtained using the LIM as a measure of poverty. They are robust to using the LICO or the MBM measures. That is, public pensions do not significantly affect the probability of entering poverty, but raise that of exiting poverty. (Statistical significance is slightly lower than above when the LICO is used.) Once the sample is restricted to older individuals, the coefficient on public pensions remains similar, but loses statistical significance due to the small sample. We also control by the presence of CQPP. See that the results change slightly. The interaction of retired, public pensions and CQPP is significantly different from zero, even when we control by poverty persistence (the number of years spent in poverty).²²

5 Do Public Pensions Help to Exit Poverty?

The previous section focused on the incidence and duration of poverty spells. These quantities are, in turn, determined by flows in and out of poverty. In this section, we analyze how these flow probabilities depend on age and individual characteristics, in particular the role of receiving public pension benefits. Since entry and exit may be triggered by other events, we also include life events that occur in the year of poverty entry or exit.

The data allow defining the following events: becoming a widow or a widower, divorcing, forming a couple, worsening and improving health, entering unemployment or finding a job, retiring, and beginning to draw a pension.

We estimate probit regressions using data from 2012 and 2014. For the regressions on exit, the sample consists of individuals who were poor in 2012 or in 2014, and the dependent variable is an indicator variable that takes the value one if they were not poor in 2014 or in 2016 respectively, and zero otherwise. That is, a value of one denotes exit from poverty.

²¹Note that to perform the analysis in panel C we had to compute the number of years spent in poverty. Since we do not have enough information to know if the individual was poor in the past, based on the definitions of the MBM or the LICO, we compute the number of years spent in poverty using our measure of LIM for census families.

²²The robustness tables are available upon request.

Definitions are analogous for entry.

Results of marginal effects of the probit regressions for exit from poverty are reported in Tables 8 to 10. The last column in Table 8 shows that when we analyse individuals of all ages, we find that employment and higher education leads to a very large increase in the exit rate. Other life events, whether related to health or retirement, do not significantly affect the exit probability, with one exception: beginning to receive public pension benefits. Beginning to draw from a public pension program is associated with a much larger exit rate from poverty. If we restrict the sample to individuals 50 and older (see Table 9), the probability of exit is higher for those who are 65 and older compared to the individuals aged 50-64. For this age group, in column 2, finding a job is a more important determinant of poverty exit. However, when we control for past income or poverty persistence, finding a job becomes insignificant, while the earnings history of individuals plays a determinant role in their poverty status. At the same time, more years in poverty makes one less likely to exit poverty. Having had lower incomes in the past has the same effect. Finding a partner, conditional on being poor, reduces the probability to exit poverty. This may be the case even if the spouse has low income as well, or is poorer than the respondent. Our key variable—receiving a public pension benefit—is still significantly positive. Receiving a benefit increases the probability of exiting by 30%. When we control for years in poverty, the interaction of the retirement status with receiving public pension benefits is positive and significant.

In this table 10, we also control for the importance of occupational pensions. More specifically, we include a dummy that indicates the receipt of occupational pensions. We have also interacted this dummy with the variables for retirement and receipt of public pension benefits. Receiving CQPP benefits does not increase the probability of exiting poverty. However, the importance of public pensions for exiting poverty among individuals older than 50 is highlighted again. This gives additional support to a previously mentioned result: those individuals for whom public pensions make a difference are those who had very low income earnings during their working life and therefore were not able to contribute much to their private pensions.

Results of marginal effects for entry to poverty are reported in Tables 11 and 12. For all age groups, regressions show that entry into poverty is less likely at older ages and for more educated individuals, but more likely for women although the marginal effect is only 0.06 percentage points at a significance level of 10%. These results persist when we control for life events. Divorce raises the probability of entering poverty, in particular for women. Negative health events and job loss also significantly increase the probability

of entering poverty. Leaving the labor force is associated with a lower rate of entry into poverty. Finally, receiving public pension benefits does not significantly affect the rate of entry into poverty.

Table 12 shows that similar patterns hold when we restrict the analysis to individuals aged 50 and over, with a few differences. First, the effect of education is slightly weaker and women do not face a higher probability of entering poverty. In contrast, the effect of a health shock seems to be stronger. The magnitude of the effect of a job loss seems to be similar but the marginal effect is not significant. Columns 3 and 4 show that the number of years spent in poverty in the past increases the rate of entry into poverty and that higher past average earnings reduce the entry rate into poverty. The effect of receiving public pensions remains insignificant in this setting. Figure 4a, which plots the marginal effect of the variable “presence of public pension” as a function of the past average earning of the individual, shows that the effect of pension benefits is insignificant for all levels of past income.

It is clear that entry into poverty is less likely for older and for more educated individuals, but more likely for women (columns 1 and 2). These results persist when we control for life events. Divorce raises the probability of entering poverty, in particular for women. Negative health events and job loss also significantly increase the probability of entering poverty. Retirement is associated with a higher probability of entry, but the coefficient is not statistically significant. Leaving the labor force, in contrast, is associated with a lower rate of entry into poverty. Finally, receipt of a public pension does not significantly affect the entry rate into poverty.

Table 12 shows that similar patterns hold when we restrict the analysis to older individuals, with a few differences. First, the effect of education is slightly weaker and women do not face a higher probability of entering poverty. In contrast, the effect of a health shock seems to be stronger. The magnitude of the effect of a job loss seems to be similar but the marginal effect is not significant in the smaller sample covering only those over 50 in 2014. Columns 3 and 4 show that the number of years spent in poverty in the past increases the entry rate into poverty and that higher past average earnings reduce the entry rate into poverty. The effect of public pensions remains insignificant in this setting. As we saw in Figure 4a, which plots the marginal effect of the variable “presence of public pension” as a function of the past average earning of the individual, the effect is insignificant for all levels of past income.²³ The number of years spent in poverty in the past strongly affects

²³Results are similar for a variable indicating whether the individual receives CQPP income (see Table C.11 in the appendix).

the probability of entering poverty.

Figure 6 summarizes the marginal effects of the probabilities of exiting and entering poverty as a function of age. The probability of exit, shown in Figure 6a, peaks at 65. Afterward, the probability of exit is stable. Figure 6b shows that the probability of entry decreases in age, up to age 65. Past this age, it increases slightly. Older individuals have lower rates of poverty. Although they are less likely to leave it once they enter, the key difference is that their entry rates are lower. Hence, differences in entry rates across age groups dominate those in exit rates in terms of their impact on poverty rates. Given the lower exit rates from poverty for senior citizens, this points to the importance of understanding who among the elderly are poor and why. In terms of poverty exit, public pensions play an important role, but also having a higher average past earnings and fewer years spent in poverty. For entry into the poverty, however, negative health events, lower past average earnings and more years spent in poverty are very important. Although public pensions do not provide a safety net that prevents poverty entry, in Figure 6b, the probability of entering into poverty is reduced before the normal retirement age of 65.

6 Dynamic Random Effects Models

The previous sections investigated the effect of individual and household characteristics as well as public pensions on the dynamics of poverty. Some of these specifications also included proxies for past experiences of poverty. In this section, we employ a dynamic random effects probit model with unobserved heterogeneity. This allows estimating the causal effect of poverty in any given year on the probability of being poor in the next year, by accounting for the confounding effect of unobserved heterogeneity in a random effects formulation.²⁴

The estimating equation is

$$p_{it}^* = \rho p_{i,t-1} + \beta X_{it} + c_i + u_{it}, \quad (1)$$

where i indexes individuals, and t time. The coefficient ρ captures the causal effect of poverty in period $t - 1$, $p_{i,t-1}$, on the latent poverty variable for period t , p_{it}^* , conditional on a set of time-varying explanatory variables X_{it} . We control both for constant variables like gender and education and for time varying variables like employment status, marital

²⁴The exposition in the next paragraph follows Grotti & Cutuli (2018), whose Stata command `xtpdyn` we use. See also Biewen (2009)

status, health status and the presence of public pensions. We also include a dummy indicating if the individual is older than 65. The term c_i captures the individual's unobserved characteristics, which are fixed over time, and u_{it} is the idiosyncratic error term. Under the assumption that the unobserved effect c_i completely captures unobserved heterogeneity, this approach solves both the problem of unobserved heterogeneity and the initial condition problem (Heckman, 1981*a,b*, Wooldridge, 2005).

Marginal effects from the regression are shown in Table 13. The results show that state dependence is important. Even after controlling for observed and unobserved household heterogeneity, poverty in the previous period increases the risk of continuing to be poor. Being poor at the beginning of the period (initial condition) also appears to be an important predictor of poverty in the current period (large and significant positive effect), indicating that there are households with time-constant observable characteristics that have a higher probability of being poor. Adding the lag dependent variable and controlling for individuals' heterogeneity has had a significant effect on the results. Compared to the results from the static model shown in table 6, the effect of public pensions has strengthened (the coefficient increases from 0.15 to 0.83) and the lower probability of poverty of those over 65 (first column) is entirely attributable to the fact that individuals over that age can receive public pensions, since the effect of being over 65 turns positive once public pensions are included in the regression.

Regression results also allow computing expected transition probabilities and poverty persistence for different groups. The probability of entering poverty for an individual receiving public pensions in 2012 is estimated like

$$Prob(p_{it} = 1 | p_{i,t-1} = 0, pens = 1, Z) = \Phi(\rho + \alpha + \beta Z), \quad (2)$$

where Φ stands for the standard normal *cdf* and Z contains X as well as unobserved heterogeneity. This estimate is an average across individuals in the sample, taking the distribution of characteristics into account. where α is the parameter associated to the dummy variable indicating the presence of public pensions. Results are shown in table 14. The probability of entering poverty is 1.9% for those receiving public pensions in 2012, whereas it is twice as high, at 4%, for those not receiving public pensions. Those who receive public pensions thus are less likely to enter poverty, as well as less likely to be poor. The estimated persistence of poverty then is

$$Prob(p_{it} = 1 | p_{i,t-1} = 1, Z) = \Phi(\rho + \beta Z), \quad (3)$$

Results indicate that those receiving public pensions are less likely to remain poor (14%) than those not receiving public pensions (26%). The probability of exit is simply $1 - Prob(p_{it} = 1 | p_{i,t-1} = 1, Z)$.

In sum, these results on entry differ from those obtained with the static model and presented in table 12. When in our regression we control for lagged poverty and unobserved heterogeneity, presence of public pensions has a significant effect on reducing entry into poverty. The results obtained with this model confirm the robustness of our results for exit. Public pensions increase the probability of exiting poverty.

7 Conclusion

In this paper we have documented that poverty rates are lower for older adults. Entry rates into poverty are lower for older individuals, while, conversely, poverty is more persistent for this group. In addition, retirement appears to mark a watershed: poverty before retirement is often due to job loss, and exit requires job finding. Poverty after retirement, in contrast, could either follow more or less frequent spells of poverty before retirement, start at retirement, or be a transitory state if it starts later. Our results show that the first is by far the most common scenario. When we analyze the role of public pensions, we see that they can explain the lower level of poverty among senior citizens.

Using a dynamic random effects probit model and controlling for unobserved heterogeneity, we are able to show that state dependence is very important for older adults. Our results on persistence of poverty indicate that the elderly (50+) are less likely to enter poverty, but more likely to have a long poverty spell conditional on entry. This is driven by worse educational, health and unemployment characteristics, which are present more frequently among the elderly. We also show that public pensions raise the probability of exit from poverty and that they reduce the probability of entry.

In conclusion, public pensions matter in alleviating poverty among the elderly but public pensions are far from eliminating poverty among seniors given that after controlling for unobserved heterogeneity, past poverty explains an important part of poverty at older ages. Individuals with low past average earnings during their careers have a higher probability of being poor when they are over 65 years old. This is important in a context where the indexation of the OAS to the consumer price index implies decreasing relative incomes of retirees, where population ageing increases the cost of public pensions, and where a higher age of pension eligibility is being considered. At the same time, changes

in labor markets, in particular automation, could imply lower average earnings and a higher risk of poverty at older ages for some population groups. Basic public pension programs could help those individuals, even if public pension benefits do not fully eradicate poverty at older ages. Moreover more effort should be exerted in improving labour markets throughout each individual’s working life and labour market inclusion.

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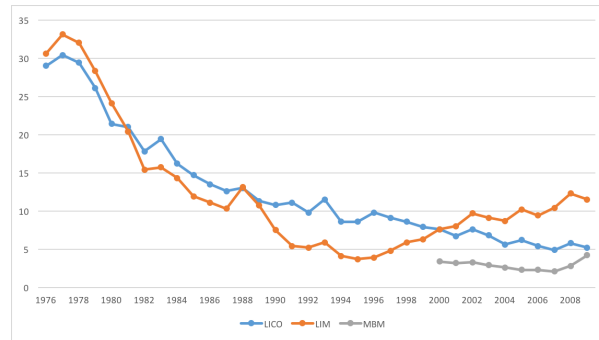
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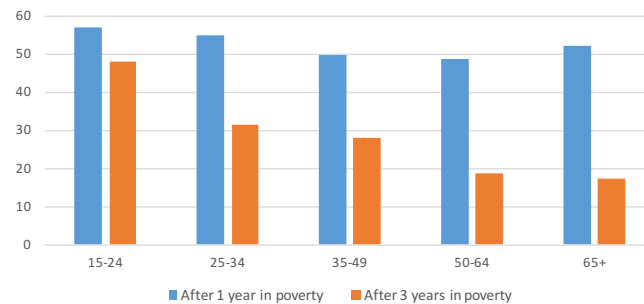
Figures

Figure 1: Low-income rates among seniors 1976 to 2009



Note: Low income rates are calculated using three low income thresholds: the Low-Income Cut-Off (LICO), the Low Income Measure (LIM) and the Market Basket Measure (MBM). Source: Survey of Consumer Finances (1976 to 1995) and Survey of Labour and Income Dynamics (1996 to 2009), Statistics Canada and author's calculations.

Figure 2: Exit rates from poverty by time spent in poverty



Note: Data source: Longitudinal Income Survey of Adults (LISA). Poverty defined using the Low Income Measure (LIM) applied in the survey.

Figure 3: Sources of income by age group

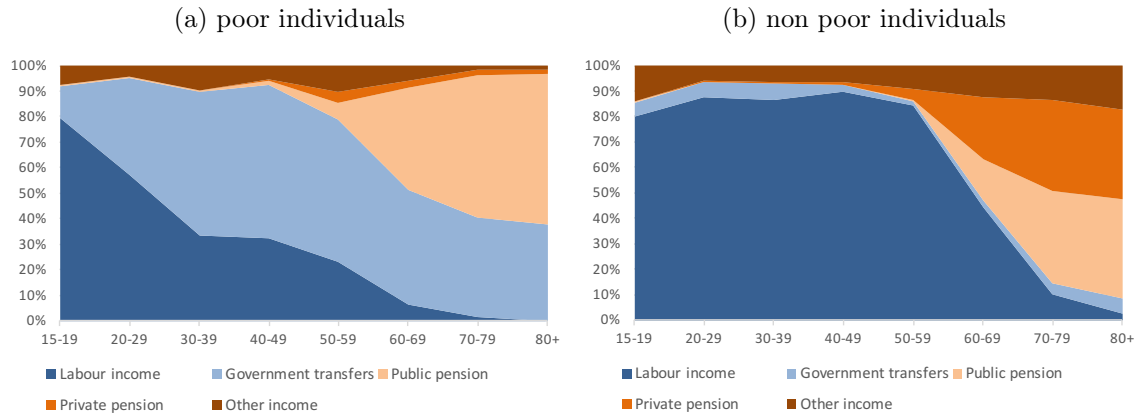
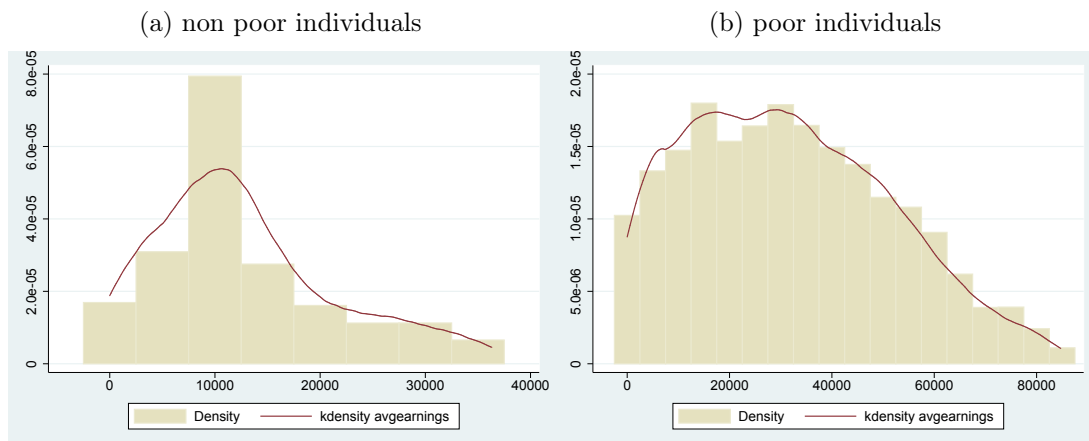


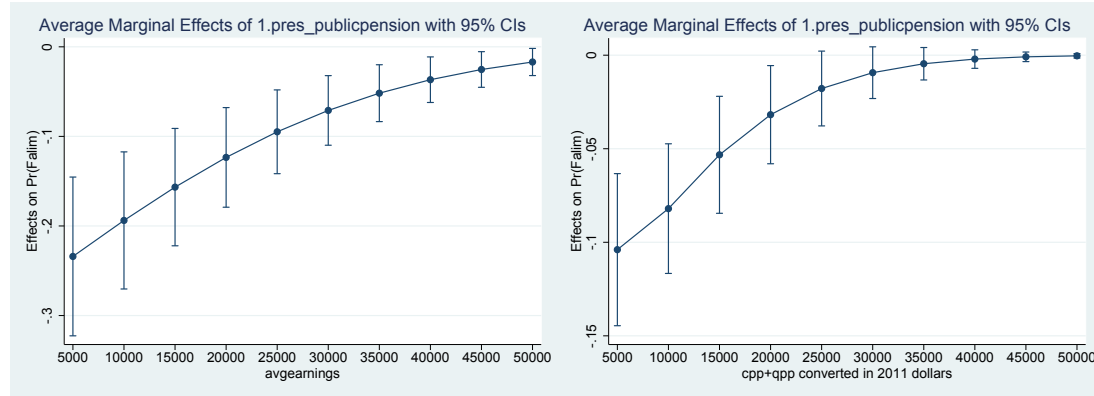
Figure 4: Distribution of average earnings over a career (25-64 years of age)



Note: We use individuals older than 65 in 2014. Annual earnings expressed in 2011 dollars, adjusted using the CPI, and smoothed using a nonparametric lowess estimator. Source: Statistics Canada and authors' calculations.

Figure 5: Heterogeneity in the effect of public pensions on the probability of being poor

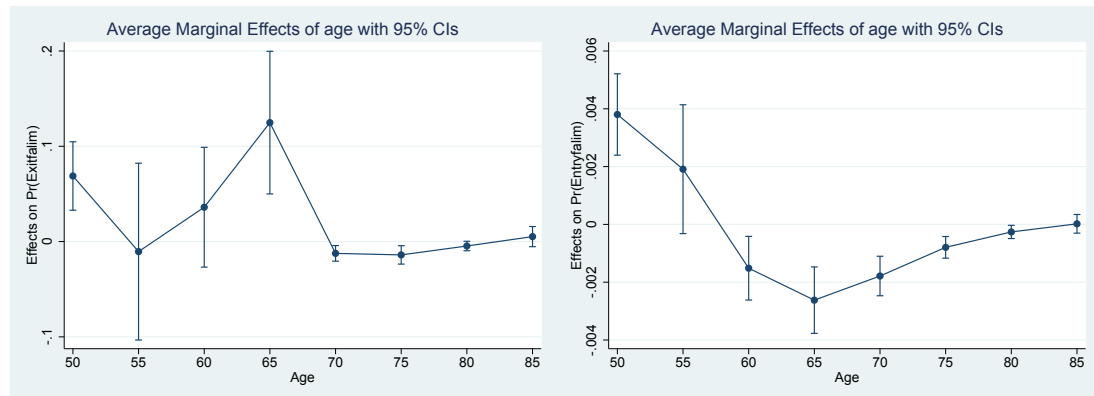
- (a) The effect of public pensions on the probability of being poor as a function of average earnings over a career
- (b) The effect of public pensions on the probability of being poor as a function of payments from the Canada and Quebec Pension Plans (CQPP)



Note: We run a regression of poverty status on individual characteristics (as in Table 3), adding an interaction of the dummy “presence of public pension” with the past average income of the individual. For these regressions we restrict the sample to individuals over 50 in 2014. The figure shows marginal effects of the interaction, evaluated at different levels of average career income. Annual earnings are expressed in 2011 dollars, adjusted using the CPI. Results reported are for an individual who is a male head of the family, younger than 65, has no diploma, is living alone, reports having an excellent or very good health, is employed and therefore non retired. The bands show the 95% confidence interval of the estimates.

Figure 6: The marginal effect of age on the probability of entering and exiting poverty

- (a) The probability of exit
- (b) The probability of entry



Note: For the left panel, we run a regression of on the probability of entering poverty on individual characteristics (as in Table 3), adding age non linearly. For the right panel, we run the same regression on the probability of exiting poverty. For these regressions we restrict the sample to individuals over 50 in 2014. The figure shows the marginal effects of age. Results reported are for an individual who is a male head of the family, younger than 65, has no diploma, is living alone, reports having an excellent or very good health, is employed and therefore non retired. The bands show the 95% confidence interval of the estimates.

Tables

Table 1: Poverty rates for individuals 50 or older in Canada using different poverty measures (2012-2014)

| | LIM | LICO | MBM | MBM |
|-------|---------------|-----------------|-----------------|-----------|
| Age | census family | economic family | economic family | household |
| 50-60 | 0.084 | 0.088 | 0.112 | 0.104 |
| 60-69 | 0.075 | 0.090 | 0.111 | 0.108 |
| 70-79 | 0.033 | 0.050 | 0.069 | 0.068 |
| 80+ | 0.042 | 0.063 | 0.078 | 0.076 |

Note: Low Income Measure (LIM) is calculated as the percentage of families with income lower than the 50% of the median income (adjusted by family size). Low Income Cutoff (LICO) and Market Basket Measure (MBM) are calculated using the cut-offs estimated and reported by Statistics Canada. All the rates are constructed using after tax income.

Table 2: Summary statistics: poverty rates by demographic group, individuals 50 or older (2012-2014)

| <i>Age</i> | | <i>Province</i> | |
|--------------------------|-------|------------------------|-------|
| 50-54 | 0.080 | Atl provinces | 0.070 |
| 55-59 | 0.087 | Quebec | 0.077 |
| 60-64 | 0.093 | Ontario | 0.061 |
| 65-69 | 0.056 | Prairies | 0.040 |
| 70+ | 0.036 | British Columbia | 0.054 |
| <i>Sex</i> | | <i>Pop Size</i> | |
| Male | 0.053 | Rural area | 0.060 |
| Female | 0.070 | Pop 1,000 to 29,999 | 0.065 |
| <i>Education</i> | | Pop 30,000 to 99,999 | 0.051 |
| No diploma | 0.122 | Pop 100,000 to 499,000 | 0.068 |
| High school | 0.066 | Pop 500,000 or greater | 0.073 |
| Some college | 0.043 | <i>Family type</i> | |
| University | 0.035 | Living alone | 0.148 |
| <i>Health</i> | | Lone parent | 0.168 |
| Excellent or very good | 0.031 | Couple w/o kids | 0.025 |
| Good | 0.076 | Couple with kids | 0.034 |
| Fair or poor | 0.162 | <i>Worker status</i> | |
| <i>Retirement status</i> | | Employed | 0.032 |
| Retired | 0.060 | Unemployed | 0.180 |
| No retired | 0.069 | Not in LF | 0.089 |

Note: Retirement Status and health are self-reported. Population size refers to the size of the place where the family lives. Family type refers to the type of census family. Four different options are possible: a married couple and the children, if any, of either and/or both spouses; a common law couple and the children, if any, of either and/or both partners; or a lone parent of any marital status with at least one child living in the same dwelling and that child or those children.

Table 3: Probability of being poor conditional on demographic characteristics (2012-2014)

| sample: | <i>Dependent variable: poor today</i> | | | | |
|---------------------|---------------------------------------|----------------------|----------------------|----------------------|----------------------|
| | all | -50 | +50 | +50 ret | +50 non ret |
| 25-34 | -0.020* (0.010) | -0.016* (0.009) | | | |
| 35-49 | -0.049*** (0.009) | -0.038*** (0.008) | | | |
| 50-64 | -0.081*** (0.009) | | | | |
| 65+ | -0.158*** (0.008) | | -0.078*** (0.009) | -0.116*** (0.016) | -0.034*** (0.008) |
| High school | -0.041*** (0.007) | -0.038*** (0.010) | -0.030*** (0.009) | -0.026** (0.012) | -0.038*** (0.013) |
| Some college | -0.063*** (0.007) | -0.066*** (0.011) | -0.048*** (0.009) | -0.037*** (0.013) | -0.061*** (0.013) |
| University | -0.072*** (0.007) | -0.078*** (0.011) | -0.048*** (0.009) | -0.053*** (0.013) | -0.050*** (0.014) |
| Female | -0.002 (0.004) | -0.002 (0.006) | 0.000 (0.006) | 0.002 (0.008) | 0.002 (0.007) |
| Lone parent family | 0.027** (0.013) | 0.049*** (0.018) | 0.010 (0.021) | 0.053 (0.036) | -0.031 (0.024) |
| Couple w/o kids | -0.116*** (0.007) | -0.109*** (0.012) | -0.095*** (0.009) | -0.080*** (0.011) | -0.123*** (0.014) |
| Couple w/ kids | -0.103*** (0.007) | -0.103*** (0.011) | -0.089*** (0.010) | -0.076*** (0.014) | -0.110*** (0.014) |
| Just Good Health | 0.026*** (0.004) | 0.016** (0.006) | 0.027*** (0.006) | 0.031*** (0.008) | 0.024*** (0.008) |
| Fair or poor Health | 0.069*** (0.007) | 0.070*** (0.014) | 0.052*** (0.009) | 0.058*** (0.012) | 0.043*** (0.012) |
| Unemployed | 0.088*** (0.010) | 0.112*** (0.015) | 0.054*** (0.015) | | 0.082*** (0.022) |
| Not in LF | 0.106*** (0.006) | 0.154*** (0.011) | 0.099*** (0.009) | | 0.140*** (0.016) |
| Retired | | | -0.050*** (0.010) | | |
| N | 49,489 | 24,877 | 15,117 | 6,303 | 8,814 |

Note: We have estimated a probit model where the dependent variable is an indicator function that takes the value one if the individual lives in a poor family (defined as having an income below 50% of the median income adjusted by family size). The base category corresponds to a male head of the family who is 15-24 years old, has no diploma, is living alone, reports having an excellent or very good health, is employed and therefore not retired. For those columns where the sample has been restricted to individuals over 50 years old, the base category corresponds to heads of the family who are younger than 65 years old. Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table 4: Characteristics of the poor - controlling for time spent in poverty

| Panel A | <i>Dependent variable: poor today controlling for time spent in poverty</i> | | | |
|--------------------|---|----------------------|----------------------|----------------------|
| | all | less 50 | 50-65 | 65+ |
| poor only 1 year | 0.321*** (0.041) | 0.329*** (0.056) | 0.411*** (0.074) | 0.224** (0.091) |
| poor only 2-3 y | 0.513*** (0.095) | 0.525*** (0.124) | 0.756*** (0.097) | 0.330 (0.221) |
| poor 4 y or more | 0.631*** (0.041) | 0.546*** (0.061) | 0.735*** (0.067) | 0.709*** (0.090) |
| Retired | -0.023*** (0.007) | -0.009 (0.024) | -0.020*** (0.007) | -0.040* (0.024) |
| N | 12,009 | 4,977 | 4,342 | 2,677 |
| Panel B | <i>controlling for past average earnings</i> | | | |
| | all | less 50 | 50-65 | 65+ |
| Ln Avg Past Income | -0.038*** (0.003) | -0.061*** (0.006) | -0.018*** (0.003) | -0.016*** (0.003) |
| Retired | -0.029*** (0.007) | 0.040 (0.048) | -0.041** (0.017) | -0.026** (0.012) |
| N | 24,774 | 10,205 | 5,439 | 4,907 |

Note: For the exercise shown in Panel A we use data from 2014 only, in Panel B we use data from 2012 and 2014. We have estimated a probit model where the dependent variable is an indicator function that takes the value one if the individual lives in a poor family (defined as having an income below 50% of the median income adjusted by family size). All these regressions control by education, household composition, self-reported health, labour market status and a dummy that indicates if the individual is retired. In column 1 we also include age dummies. In columns 2 to 4 we separate the sample based on the age of the head of the household. Age is then not included in the regression. The base category corresponds to a male head of the family who is 15-24 years old, who has no diploma, is living alone, reports having an excellent or very good health, is employed and therefore non retired. In panel A, we include as explanatory variable an indicator function that takes the value one if in the last 14 years the family has been poor only 1 year, only 2 or 3 years or 4 years or more. In panel B we include the log of the average past income. Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table 5: Poverty persistence and age: demographics matter

| years poor | >=1 | >=1 | >=5 unconditional | >=5 | >=5 conditional | >=5 1 year poor |
|------------|----------------------|----------------------|----------------------|---------------------|---------------------|---------------------|
| 25-34 | 0.121*** (0.027) | 0.179*** (0.026) | 0.051*** (0.011) | 0.094*** (0.014) | 0.092*** (0.024) | 0.166*** (0.029) |
| 35-49 | 0.000 (0.024) | 0.052** (0.022) | 0.046*** (0.009) | 0.077*** (0.011) | 0.129*** (0.023) | 0.179*** (0.026) |
| 50-64 | -0.119*** (0.022) | -0.078*** (0.022) | 0.055*** (0.008) | 0.058*** (0.009) | 0.260*** (0.026) | 0.203*** (0.026) |
| 65+ | -0.169*** (0.023) | -0.146*** (0.025) | 0.040*** (0.008) | 0.007 (0.009) | 0.269*** (0.029) | 0.079** (0.031) |
| Controls | no | yes | no | yes | no | yes |
| N | 12,179 | 12,135 | 12,179 | 12,135 | 3,317 | 3,305 |

Note: The first two columns the dependent variable is an indicator variable that takes the value one when the individual has spent at least one year in poverty during its entire time in the sample. In column 1 we only include age dummies and in column 2 we also control for other demographic characteristics. Columns 3 and 4 look at the probability of being poor for a long time (5 years or more). In the last two columns we restrict the sample to individuals who have been poor for at least one year and we look at the probability of being poor for 5 years or more. Demographic characteristics are measured in 2014. The base category corresponds to a male head of the family who is 15-24 years old, who has no diploma, is living alone, reports having an excellent or very good health, is employed and therefore non retired. Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table 6: The role of public pensions on the probability of being poor

| sample: | <i>Dependent variable: poor today</i> | | | |
|------------------------------|---------------------------------------|----------------------|----------------------|--------------------------|
| | all + retired | +50 + retired | all +int ret pp | + 50 + int ret pub pp |
| 25-34 | -0.013 (0.013) | | -0.009 (0.010) | |
| 35-49 | -0.033*** (0.011) | | -0.025*** (0.009) | |
| 50-64 | -0.052*** (0.012) | | -0.040*** (0.009) | |
| 65+ | -0.116*** (0.012) | -0.078*** (0.009) | -0.017 (0.025) | 0.022 (0.020) |
| Retired | -0.034*** (0.008) | -0.050*** (0.010) | -0.030** (0.012) | -0.063 (0.018) |
| Pub Pension | | | -0.090*** (0.023) | -0.127*** (0.036) |
| Retired \times Pub Pension | | | -0.119*** (0.017) | -0.176*** (0.031) |
| N | 27,700 | 15,117 | 27,700 | 15,117 |

Note: All these regressions control by education, household composition, self-reported health, labour market status and a dummy that indicates if the individual is retired. In column 1 we also include age dummies. In columns 2 and 4 we consider only individuals above 50 years old and age is then not included in the regression. The base category corresponds to a male head of the family who is 15-24 years old, who has no diploma, is living alone, reports having an excellent or very good health, is employed and therefore non retired and not receiving public pension. Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table 7: The role of public pensions and occupational pensions (CQPP) on the probability of being poor controlling for persistence and past average earnings

| Panel A | <i>Dependent variable: poor today (individuals 50+)</i> | | | |
|--|---|----------------------|----------------------|----------------------|
| | baseline | +pub pension | +persistence | + past income |
| 65+ | -0.078*** (0.009) | 0.022 (0.020) | 0.008 (0.010) | -0.001 (0.021) |
| Retired | -0.050*** (0.010) | -0.176*** (0.031) | -0.068*** (0.017) | -0.125*** (0.030) |
| Pub Pension | | -0.127*** (0.036) | -0.046** (0.019) | -0.081** (0.036) |
| Retired \times Pub Pension | | -0.176*** (0.031) | -0.068*** (0.017) | -0.125*** (0.030) |
| Number of years poor | | | 0.013*** (0.001) | |
| Ln Avg Past Inc | | | | -0.029*** (0.003) |
| N | 24,612 | 24,612 | 24,612 | 23,035 |
| Panel B | <i>Dependent variable: poor today (individuals 50+)</i> | | | |
| | +pub pension | + CQPP | +persistence | + past income |
| 65+ | 0.016 (0.018) | 0.019 (0.018) | 0.009 (0.009) | -0.007 (0.019) |
| Retired | | -0.006 (0.018) | -0.004 (0.009) | -0.004 (0.015) |
| Pub Pension | | -0.086*** (0.031) | -0.049*** (0.012) | -0.056* (0.030) |
| Retired \times Pub Pension | | -0.094*** (0.032) | -0.061*** (0.012) | -0.078*** (0.028) |
| CQPP | | -0.040*** (0.013) | 0.004 (0.007) | -0.019* (0.010) |
| Retired \times CQPP | | -0.075*** (0.016) | -0.018** (0.009) | -0.039*** (0.014) |
| Pub Pension \times CQPP | | -0.157*** (0.024) | -0.047*** (0.012) | -0.099*** (0.023) |
| Retired \times Pub Pension \times CQPP | | -0.162*** (0.023) | -0.055*** (0.011) | -0.104*** (0.022) |
| Number years poor | | | 0.015*** (0.000) | |
| Ln Avg Past Inc | | | | -0.030*** (0.003) |
| N | 24,612 | 24,612 | 24,612 | 23,035 |

Note: For this exercise we use data for 2014 only. All these regressions control by education, household composition, self-reported health and labour market status. The base category corresponds to a male head of the family who is 15-24 years old, who has no diploma, is living alone, reports having an excellent or very good health, is employed and non retired and not receiving public or occupational pension. Clustered standard errors are reported in parentheses. Nb yrs in poverty measures the number of years that the individual has been poor during the period 2001-2011. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table 8: Poverty dynamics: exit poverty

| | <i>Dependent variable: exiting poverty in 2014 for those poor in 2012</i> | | | |
|--------------------------------------|---|----------------------|----------------------|----------------------|
| | + age | + demographics | + events | + public pension |
| 25-34 | 0.060 (0.041) | 0.030 (0.045) | 0.031 (0.056) | 0.030 (0.055) |
| 35-49 | -0.063* (0.037) | -0.064 (0.042) | -0.038 (0.047) | -0.033 (0.046) |
| 50-64 | -0.180*** (0.032) | -0.160*** (0.038) | -0.163*** (0.044) | -0.185*** (0.045) |
| 65+ | 0.112** (0.048) | 0.093* (0.053) | 0.087 (0.058) | 0.105* (0.061) |
| High school | | 0.058 (0.036) | 0.049 (0.037) | 0.043 (0.036) |
| College | | 0.164*** (0.044) | 0.159*** (0.048) | 0.150*** (0.047) |
| University | | 0.174*** (0.045) | 0.132*** (0.050) | 0.131*** (0.048) |
| Find couple | | 0.088 (0.102) | 0.084 (0.101) | 0.098 (0.094) |
| Female | | -0.018 (0.029) | 0.014 (0.031) | 0.015 (0.030) |
| Female × find couple | | 0.008 (0.124) | -0.001 (0.125) | -0.001 (0.122) |
| Better Health | | | 0.060 (0.039) | 0.063 (0.039) |
| Find job | | | 0.122** (0.050) | 0.120** (0.050) |
| Event Retired | | | | -0.081* (0.043) |
| Event Pub Pension | | | | 0.326*** (0.084) |
| Event Retired × Event Pub Pension | | | | 0.265*** (0.088) |
| N | 3,894 | 2,854 | 1,874 | 1,874 |

Note: For this exercise we use data for 2014 and 2012 and we restrict the sample to individuals that are older than 50. The base category corresponds to a male head of the family who has no diploma, has not found a couple between 2012 and 2-14, reports not having better health than in 2012, has not found a job during this period, has not retired between 2012 and 2014 and has not started receiving public or occupational pension during 2012 and 2014. Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table 9: Poverty dynamics: exit poverty (restricting the sample to individuals 50 and older)

| | <i>Dependent variable: exiting poverty in 2014 for those poor in 2012</i> | | | |
|--------------------------------------|---|----------------------|----------------------|---------------------|
| | baseline | + public pensions | + persistence | + past income |
| 65+ | 0.238*** (0.055) | 0.267*** (0.053) | 0.183*** (0.046) | 0.370*** (0.060) |
| High school | 0.050 (0.053) | 0.041 (0.051) | 0.009 (0.044) | 0.033 (0.053) |
| College | 0.162** (0.072) | 0.150** (0.069) | -0.022 (0.052) | 0.152** (0.069) |
| University | 0.006 (0.079) | 0.023 (0.078) | -0.053 (0.055) | 0.023 (0.080) |
| Male Find couple | -0.284*** (0.087) | -0.284*** (0.070) | -0.273*** (0.063) | -0.223** (0.094) |
| Female × Not find couple | -0.022 (0.046) | -0.017 (0.044) | 0.026 (0.035) | 0.007 (0.047) |
| Event better health | 0.072 (0.048) | 0.078* (0.046) | 0.047 (0.036) | 0.037 (0.046) |
| Find job | 0.210** (0.106) | 0.223** (0.100) | 0.207** (0.086) | 0.214** (0.103) |
| Event Retired | | -0.039 (0.042) | 0.006 (0.037) | -0.010 (0.044) |
| Event Pub Pension | | 0.347*** (0.096) | 0.322*** (0.079) | 0.352*** (0.097) |
| Event Retired × Event Pub Pension | | 0.266*** (0.096) | 0.198*** (0.074) | 0.230** (0.095) |
| Num years poverty | | | -0.049*** (0.003) | |
| ln avg past inc | | | | 0.111*** (0.031) |
| N | 762 | 762 | 762 | 697 |

Note: For this exercise we use data for 2014 and 2012 and we restrict the sample to individuals that are older than 50. The base category corresponds to a male head of the family who has no diploma, has not found a couple between 2012 and 2-14, reports not having better health than in 2012, has not found a job during this period, has not retired between 2012 and 2014 and has not started receiving public or occupational pension during 2012 and 2014. Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table 10: Poverty dynamics - Probability of exiting poverty with public pensions and CQPP (restricting the sample to individuals 50 and older)

| | <i>Dependent variable: exiting poverty in 2014 for those poor in 2012</i> | | | |
|---------------------------------------|---|----------------------|----------------------|---------------------|
| | public pension | +CQPP | + persistence | +past avg earnings |
| 65+ | 0.267*** (0.053) | 0.264*** (0.054) | 0.181*** (0.046) | 0.366*** (0.061) |
| High school | 0.041 (0.051) | 0.039 (0.051) | 0.008 (0.044) | 0.031 (0.053) |
| College | 0.150** (0.069) | 0.151** (0.069) | -0.025 (0.052) | 0.151** (0.069) |
| University | 0.023 (0.078) | 0.024 (0.078) | -0.056 (0.056) | 0.022 (0.080) |
| Find couple | -0.284*** (0.070) | -0.278*** (0.072) | -0.274*** (0.063) | -0.216** (0.096) |
| Female | -0.017 (0.044) | -0.014 (0.044) | 0.024 (0.035) | 0.012 (0.047) |
| Better Health | 0.078* (0.046) | 0.081* (0.046) | 0.045 (0.036) | 0.039 (0.046) |
| Find job | 0.223** (0.100) | 0.224** (0.101) | 0.207** (0.087) | 0.216** (0.104) |
| Event Retired | -0.039 (0.042) | | | |
| Event Pub Pension | 0.347*** (0.096) | | | |
| CQPP | | -0.024 (0.104) | -0.016 (0.079) | 0.001 (0.104) |
| Event Retired × Event Pub Pension | 0.295*** | 0.167** (0.096) | 0.254*** (0.069) | (0.096) |
| Event Retired × CQPP | | -0.027 (0.111) | -0.024 (0.083) | -0.026 (0.108) |
| Event Retired × Pub Pension × CQPP | | 0.164 (0.238) | 0.274 (0.167) | 0.149 (0.246) |
| Num years poor | | | -0.050*** (0.003) | |
| Ln Avg past Inc | | | | 0.112*** (0.032) |
| N | 762 | 757 | 757 | 693 |

Note: For this exercise we use data for 2014 and 2012 and we restrict the sample to individuals that are older than 50. The base category corresponds to a male head of the family who has no diploma, has not found a couple between 2012 and 2-14, reports not having better health than in 2012, has not found a job during this period, has not retired between 2012 and 2014 and has not started receiving public or occupational pension during 2012 and 2014. Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table 11: Poverty dynamics: entry into poverty

| | <i>Dependent variable: entering poverty in 2014 for those non poor in 2012</i> | | | |
|-----------------------------|--|----------------------|----------------------|----------------------|
| | + age | + demographics | + events | + public pensions |
| 25-34 | -0.026*** (0.007) | -0.019*** (0.007) | -0.012 (0.008) | -0.015 (0.010) |
| 35-49 | -0.039*** (0.005) | -0.034*** (0.006) | -0.025*** (0.007) | -0.030*** (0.010) |
| 50-64 | -0.038*** (0.005) | -0.037*** (0.005) | -0.034*** (0.007) | -0.042*** (0.011) |
| 65+ | -0.053*** (0.005) | -0.054*** (0.005) | -0.051*** (0.007) | -0.073*** (0.021) |
| High school | | -0.019*** (0.005) | -0.008 (0.005) | -0.007 (0.005) |
| College | | -0.027*** (0.005) | -0.020*** (0.005) | -0.019*** (0.005) |
| University | | -0.035*** (0.005) | -0.028*** (0.005) | -0.027*** (0.005) |
| Female | | | 0.009*** (0.003) | 0.009*** (0.003) |
| Widow | | | 0.000 (.) | 0.000 (.) |
| Divorce | | | 0.121** (0.054) | 0.121** (0.054) |
| Female × widow | | | 0.106* (0.063) | 0.101* (0.061) |
| Female × divorce | | | 0.052* (0.029) | 0.049* (0.028) |
| Event worse health | | | 0.015*** (0.005) | 0.015*** (0.005) |
| Job loss | | | 0.044*** (0.016) | 0.044*** (0.016) |
| Leave LF | | | -0.007 (0.006) | -0.007 (0.006) |
| Event retired | | | 0.009 (0.006) | 0.008 (0.006) |
| Receiving public pension | | | | 0.033 (0.033) |
| N | 50,849 | 50,812 | 25,560 | 25,560 |

Note: For this exercise we use data for 2014 and 2012. The base category corresponds to a male head of the family who has no diploma, has not divorced or become widow, reports not having worse health than in 2012, has not lost his job or left the labour force, has not retired between 2012 and 2014 and is not receiving public or occupational pension. Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table 12: Poverty dynamics: entry into poverty (restricting the sample to individuals 50 and older)

| | <i>Dependent variable: entering poverty in 2014 for those non poor in 2012</i> | | | |
|-----------------------------|--|----------------------|---------------------|----------------------|
| | baseline | + public pension | + persistence | + past income |
| 65+ | -0.020*** (0.004) | -0.040* (0.021) | -0.019 (0.012) | -0.036* (0.020) |
| High school | -0.009 (0.006) | -0.008 (0.006) | 0.001 (0.004) | -0.000 (0.005) |
| College | -0.014** (0.006) | -0.013** (0.006) | -0.001 (0.005) | -0.004 (0.006) |
| University | -0.021*** (0.005) | -0.020*** (0.005) | -0.007 (0.004) | -0.011** (0.005) |
| Widow | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) |
| Divorce | 0.157** (0.067) | 0.156** (0.066) | 0.121* (0.062) | 0.137** (0.068) |
| Female | 0.005 (0.003) | 0.004 (0.003) | 0.002 (0.003) | -0.002 (0.004) |
| Female \times divorce | 0.048 (0.034) | 0.043 (0.032) | 0.045 (0.031) | 0.031 (0.028) |
| Event worse health | 0.017** (0.007) | 0.016** (0.007) | 0.009* (0.006) | 0.012* (0.006) |
| Job loss | 0.031 (0.022) | 0.032 (0.022) | 0.025 (0.017) | 0.034 (0.022) |
| Leave LF | -0.014*** (0.004) | -0.014*** (0.004) | -0.011** (0.004) | -0.014*** (0.004) |
| Event Retired | 0.006 (0.004) | 0.005 (0.004) | 0.008** (0.004) | 0.004 (0.004) |
| Receiving public pension | | 0.022 (0.022) | 0.001 (0.013) | 0.018 (0.022) |
| Number years poor | | | 0.009*** (0.001) | |
| Ln Avg Past Inc | | | | -0.009*** (0.001) |
| N | 13,049 | 13,049 | 13,049 | 12,571 |

Note: For this exercise we use data for 2014 and 2012 and we restrict the sample to individuals that are older than 50. The base category corresponds to a male head of the family who has no diploma, has not divorced or become widow, reports not having worse health than in 2012, has not lost his job or left the labour force, has not retired between 2012 and 2014 and is not receiving public or occupational pension. Clustered standard errors are reported in parentheses. Note the interaction Female \times widow is not included because we do not have women becoming widows during these two years in our sample of individuals over 50. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table 13: Dynamic Probit Estimates of Poverty Persistence

| | baseline | public pension | past earnings |
|-----------------------|----------------------|----------------------|----------------------|
| Lagged poverty status | 1.352*** (0.045) | 1.302*** (0.045) | 1.562*** (0.061) |
| > 65 | -0.105* (0.043) | 0.166** (0.051) | 0.278* (0.131) |
| High school | -0.032 (0.050) | -0.078 (0.050) | -0.110 (0.064) |
| College | -0.105 (0.060) | -0.151* (0.061) | -0.038 (0.076) |
| University | -0.153* (0.064) | -0.208** (0.065) | -0.105 (0.088) |
| Female | -0.047 (0.046) | 0.099* (0.050) | -0.073 (0.056) |
| Just good health | 0.045 (0.078) | 0.056 (0.080) | 0.019 (0.092) |
| Fair or poor health | 0.191 (0.111) | 0.197 (0.114) | 0.149 (0.130) |
| Unemployed | 0.615*** (0.149) | 0.626*** (0.150) | 0.368 (0.188) |
| Not in LF | 0.464*** (0.103) | 0.510*** (0.102) | 0.440*** (0.118) |
| Lone parent family | 0.051 (0.066) | -0.079 (0.068) | -0.150 (0.095) |
| Couple w/o own kids | -0.440*** (0.052) | -0.468*** (0.053) | -0.511*** (0.063) |
| Couple w/ own 2 kids | -0.321*** (0.053) | -0.461*** (0.054) | -0.559*** (0.075) |
| Initial Conditions | | | |
| Poverty status | 2.484*** (0.043) | 2.481*** (0.044) | 1.953*** (0.060) |
| Unemployed | -0.592*** (0.153) | -0.587*** (0.153) | -0.311 (0.187) |

Table 13: Dynamic Probit Estimates of Poverty Persistence

| | baseline | public pension | past earnings |
|-----------------------------|----------------------|----------------------|----------------------|
| Not in LF | -0.314** (0.096) | -0.359*** (0.096) | -0.308** (0.110) |
| Just Good Health | 0.011 (0.078) | 0.014 (0.080) | 0.034 (0.092) |
| Fair or Poor Health | -0.021 (0.110) | -0.016 (0.113) | 0.022 (0.129) |
| Presence of Public Pensions | | -0.690*** (0.065) | -0.832*** (0.133) |
| Ln Avg Past Income | | | -0.208*** (0.029) |
| Constant | -2.129*** (0.076) | -2.168*** (0.078) | 0.105 (0.321) |
| N | 33,180 | 33,180 | 21,565 |

Note: For this exercise we use data for 2012-2016 and we restrict the sample to individuals that are older than 50. The base category corresponds to a male head of the family who has no diploma, has not divorced or become widow, reports not having worse health than in 2012, has not lost his job or left the labour force, is not receiving public and is not poor in the previous period. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table 14: Transitions into and out of poverty

| | Prob | Std. Err. | $P > z $ | Lower CI | Upper CI |
|-------------------------|-------|-----------|-----------|----------|----------|
| With Public Pensions | | | | | |
| Pr(1 0) | 0.019 | 0.001 | 0.000 | 0.016 | 0.022 |
| Pr(1 1) | 0.138 | 0.012 | 0.000 | 0.114 | 0.164 |
| Without Public Pensions | | | | | |
| Pr(1 0) | 0.040 | 0.002 | 0.000 | 0.035 | 0.045 |
| Pr(1 1) | 0.267 | 0.018 | 0.000 | 0.232 | 0.302 |

Note: This table shos the transition probabilities calculated with the estimates obrained with the dynamic probit model and presented in table 13. Pr(1|0) indicates the probability of being poor at time t conditional on not having been in the poor at t â 1. Pr(1|1) indicates the probability of being poor at time t conditional on having been in the poor at t â 1. These probabilities are computed under the assumtopn of a steady-state $Z_{it} = Z_i$ for all t. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table 15: Probability of being poor conditional on demographic characteristics using LICO and MBM (Individuals +50)

| poverty measure: | <i>Dependent variable: poor today</i> | | |
|--|---------------------------------------|----------------------|----------------------|
| | LIM | LICO | MBM |
| <i>Panel a - +demographic characteristics</i> | | | |
| 65+ | -0.090 (0.008) | -0.075*** (0.008) | -0.090 (0.009) |
| Retired | -0.032*** (0.007) | -0.033*** (0.009) | -0.047*** (0.011) |
| <i>Panel b - the role of public pensions</i> | | | |
| 65+ | 0.021 (0.021) | -0.016 (0.022) | -0.045* (0.025) |
| Retired | -0.054*** (0.018) | -0.029** (0.014) | -0.035** (0.015) |
| Public Pension | -0.115*** (0.032) | -0.054* (0.031) | -0.020 (0.034) |
| Retired × Public Pension | -0.162*** (0.027) | -0.093*** (0.025) | -0.090*** (0.027) |
| <i>Panel c - controlling for num years poor</i> | | | |
| 65+ | -0.016 (0.015) | -0.013 (0.017) | -0.041** (0.020) |
| Retired | -0.025* (-0.014) | -0.015* (-0.012) | -0.018 (0.013) |
| Public Pension | -0.079*** (0.024) | -0.041** (0.023) | -0.090*** (0.027) |
| Retired × Public Pension | -0.105*** (0.021) | -0.063*** (0.020) | -0.056** (0.022) |
| Num years poor | 0.018*** (0.001) | 0.016*** (0.001) | 0.022*** (0.001) |
| <i>Panel d - controlling for avg past income</i> | | | |
| 65+ | -0.003* (0.020) | -0.029 (0.021) | -0.053** (0.024) |
| Retired | -0.034* (0.015) | -0.017 (0.012) | -0.021 (0.014) |
| Public Pension | -0.090*** (0.028) | -0.032*** (0.029) | -0.010 (0.031) |
| Retired × Public Pension | -0.118*** (0.021) | -0.067*** (0.023) | -0.067*** (0.024) |
| ln avg past inc | -0.036*** (0.003) | -0.029*** (0.003) | -0.038*** (0.004) |

Note: Base category: age 15-24, no diploma, male, living alone, excellent or very good health, employed and non retired. Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Appendix A

How the different measures of poverty have been computed

Low Income Measures (LIMs): For international comparisons, the low income measure is the most commonly used low income measure. The use of the LIM was suggested in 1989 in a paper by Wolfson, Evans, and the Organisation for Economic Co-operation and Development (OECD) which discussed their concerns about the low income cut-offs (LICOs). The low income measure is a fixed percentage (50%) of median adjusted household income. Adjustment for household sizes reflects the fact that a household's needs increase as the number of members increases, although not necessarily proportionally.

The low income measures provided by Statistics Canada are calculated three times; with market income, before-tax income, and after-tax income using the Survey of Labour and Income Dynamics (SLID). They do not require updating using an inflation index because they are calculated using an annual survey of household income. Unlike the low income cut-offs, which are derived from an expenditure survey and then compared to an income survey, the LIMs are both derived and applied using a single income survey.

To calculate the low income measures, we first calculate the 'equivalent household income' for each household by dividing household income by its 'adjusted size', that is the square root of the number of persons in the household. Next, we assign this adjusted household income to each individual in the population. We then determine the median of this 'equivalent household income' over the population of individuals, that is the amount where half of all individuals will be above it and half below. The low income measure for a household of one person is 50% of this median 'equivalent household income', and the low income measures for other sizes of households are equal to this value multiplied by their 'equivalent household size'.

As explained earlier, the LIM used in Statistics Canada is calculated based on the household size and not the family. The logic behind it is that costs are usually shared within the household, even if you live with people outside of your family.

The LIM reported in our data is the LIM using census family. The reason is that this is the only measure available (or computable) in the administrative data.

Low Income Cut-Offs (LICOs): The low income cut-offs (LICOs) are income thresholds below which a family will likely devote a larger share of its income on the necessities of food, shelter and clothing than the average family. The approach consists in estimat-

Table A.1: Low income measures (LIMs) by income source and household size in current dollars

| Household size | 2011 | 2012 | 2013 | 2014 | 2015 |
|----------------|-------|-------|-------|-------|-------|
| 1 person | 21146 | 21622 | 21669 | 22016 | 22352 |
| 2 persons | 29905 | 30577 | 30645 | 31136 | 31611 |
| 3 persons | 36626 | 37451 | 37533 | 38134 | 38715 |
| 4 persons | 42292 | 43244 | 43339 | 44033 | 44704 |
| 5 persons | 47284 | 48348 | 48454 | 49230 | 49981 |
| 6 persons | 51797 | 52963 | 53079 | 53929 | 54751 |
| 7 persons | 55947 | 57206 | 57332 | 58250 | 59138 |
| 8 persons | 59810 | 61156 | 61291 | 62272 | 63221 |
| 9 persons | 63438 | 64866 | 65008 | 66049 | 67056 |
| 10 persons | 66870 | 68374 | 68525 | 69622 | 70683 |

Source: Statistics Canada. Table 206-0091 - Low income measures (LIMs) by income source and household size in current dollars and 2015 constant dollars, annual, CANSIM (database).

ing an income threshold at which families are expected to spend 20 percentage points more than the average family on food, shelter and clothing. The first set of published LICOs used the 1959 Family Expenditure Survey to estimate five different cut-offs varying between families of size one to five. These thresholds were then compared to family income from Statistics Canada's major income survey, the Survey of Consumer Finances, to produce low income rates. Today, Statistics Canada continues to use this approach to construct LICOs, with the exception that cut-offs now vary by 7 family sizes and 5 different populations of the area of residence. This additional variability is intended to capture differences in the cost of living amongst community sizes.

In order to account for changing spending patterns, Statistics Canada has in the past recalculated new LICOs after each subsequent Family Expenditure Survey.

After having calculated LICOs in the base year, cut-offs for other years are obtained by applying the corresponding Consumer Price Index (CPI) inflation rate to the cut-offs from the base year—the process of indexing the LICOs. For example, continuing with the 1992 after-tax LICO for a family of four living in an community with a population between 30,000 and 99,999; to calculate the corresponding LICO for 2011, the Consumer Price Index is used as follows:

$$\text{LICO}_{2011} = \text{LICO}_{1992} \times \text{CPI}_{2011} / \text{CPI}_{1992} = 21,359 \times 119.9 / 84.0 = 30,487$$

The choice of after-tax income, total income or market income depends on whether one wants to take into account the added spending power that a family gets from receiving government transfers or its reduced spending power after paying taxes.

Statistics Canada produces two sets of low income cut-offs and their corresponding rates—those based on total income (i.e., income including government transfers, before the deduction of income taxes) and those based on after-tax income. Derivation of before-tax versus after-tax low income cut-offs are each done independently. There is no simple relationship, such as the average amount of taxes payable, to distinguish the two types of cut-offs.

Although both sets of low income cut-offs and rates continue to be available, Statistics Canada prefers the use of the after-tax measure.

The choice to highlight after-tax rates was made for two main reasons. First, the before-tax rates only partly reflect the entire redistributive impact of Canada's tax/transfer system because they include the effect of transfers but not the effect of income taxes. Second, since the purchase of necessities is made with after-tax dollars, it is logical to use people's after-tax income to draw conclusions about their overall economic well-being.

Market Basket Measure (MBM): The Market Basket Measure is based on the cost of a specific basket of goods and services representing a modest, basic standard of living. It includes the costs of food, clothing, footwear, transportation, shelter and other expenses for a reference family of two adults aged 25 to 49 and two children (aged 9 and 13). It provides thresholds for a finer geographic level than the low income cut-off, allowing, for example, different costs for rural areas in the different provinces. These thresholds are compared to disposable income of families to determine low income status. Disposable income is defined as the sum remaining after deducting the following from total family income: total income taxes paid; the personal portion of payroll taxes; other mandatory payroll deductions such as contributions to employer-sponsored pension plans, supplementary health plans, and union dues; child support and alimony payments made to another family; out-of-pocket spending on child care; and non-insured but medically prescribed health-related expenses such as dental and vision care, prescription drugs, and aids for persons with disabilities.

The Market Basket Measure thresholds are calculated as the cost of purchasing the following items: A nutritious diet as specified in the 2008 National Nutritious Food Basket; A basket of clothing and footwear required by a family of two adults and two children; Shelter cost as the median cost of a two- or three-bedroom units including electricity, heat, water and appliances; Transportation costs, using public transit where available or costs associated with owning and operating a modest vehicle where public transit is not available; Other necessary goods and services.

Appendix B

The CQPP is funded by payroll taxes on employees and employers, and benefits are taxable. Benefits depend on an individual's earnings history via the following formula:

$$\text{monthly benefit} = \text{earnings rating} \times \text{pension adjustment factor} \quad (4)$$

$$\times \text{actuarial adjustment} \times 0.25 / 12. \quad (5)$$

The earnings rating is the average of the ratio of an individual's annual earnings to the Years Maximum Pensionable Earnings (YMPE) over the individual's earnings history, excluding the 15% of years with the lowest earnings, years caring for a child under 7, and years when a disability benefit was received. The average is taken over earnings at ages 18 to 60, or up to 65 if beneficial. For any year entering this average, the ratio is capped at 1. The pension adjustment factor is the average YMPE in the 5 years before retirement, including the year of retirement. The actuarial adjustment adjusts for age of retirement. The lowest age at which benefits can be received is 60. The adjustment reduces benefits by 0.5% for every month of retirement before the age of 65. Retiring later than at age 65 results in an increase of benefits by 0.5% per month. Finally, 0.25 is the replacement rate of the pension system, and the division by 12 results in the monthly benefit.

Old Age Security (OAS) provides a taxable uniform monthly grant to anyone aged 65 and over. The payment (of \$586.66 in Q1 of 2018) is reduced by 15 cents for each dollar of income, including CQPP income, in excess of a threshold of \$74,788 in 2018.

The Guaranteed Income Supplement (GIS) is a non-taxable monthly grant to individuals aged 65 and over. It depends on household composition. For example, in 2018 it was \$876.23 for singles, and \$527.48 for each member of a couple. This grant is also income tested. For each dollar of family income (excluding the OAS), it is reduced by 50 cents for singles, and by 25 cents for each member of a married couple.

Finally, the Allowance is paid to 60-64 year old spouses of OAS recipients and to 60-64 year old widowers. It equals the OAS plus the part of the GIS for a married person.

Payments for all four components are adjusted quarterly for inflation.

Appendix C

Table C.1: Distribution of years spent in poverty for different age groups for those who were poor at least once (as % of row and % of column)

| Age | 15-24 | 25-34 | 35-49 | 50-64 | 65+ | Total |
|------------------------|-------|-------|-------|-------|-------|-------|
| 1 year poor | 45.46 | 39.43 | 40.69 | 31.71 | 30.54 | 38.08 |
| 2-3 years poor | 36.23 | 33.25 | 26.18 | 27.29 | 21.89 | 29.15 |
| 4-5 years poor | 12.95 | 13.69 | 12.65 | 11.02 | 14.42 | 12.82 |
| more than 5 years poor | 5.36 | 13.63 | 20.48 | 29.98 | 33.14 | 19.95 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 |
| 1 year poor | 17.6 | 25.65 | 30.53 | 17.05 | 9.17 | 100 |
| 2-3 years poor | 18.32 | 28.27 | 25.65 | 19.17 | 8.59 | 100 |
| 3-4 years poor | 14.88 | 26.46 | 28.19 | 17.6 | 12.86 | 100 |
| more than 5 years poor | 3.96 | 16.93 | 29.33 | 30.78 | 19.00 | 100 |
| Total | 14.74 | 24.78 | 28.57 | 20.48 | 11.43 | 100 |

Table C.2: Longest spell length (for those who have been poor at least one year)

| Age | 15-24 | 25-34 | 35-49 | 50-64 | 65+ | Total |
|------------------------|-------|-------|-------|-------|-------|-------|
| 1 year poor | 13.89 | 11.57 | 8.08 | 6.47 | 4.92 | 9.17 |
| 2-3 years poor | 48.26 | 44.54 | 37.1 | 25.3 | 24.44 | 36.42 |
| 4-5 years poor | 27.88 | 24.17 | 25.27 | 27.87 | 28.47 | 26.55 |
| More than 5 years poor | 9.96 | 19.72 | 29.55 | 40.36 | 42.16 | 27.87 |

Table C.3: Characteristics of the poor - controlling for time spent in poverty

| | <i>Dependent variable: poor today</i> | | | |
|---------------------|---------------------------------------|----------------------|----------------------|---------------------|
| | all | less 50 | 50-65 | 65+ |
| 25-34 | -0.023* (0.012) | | | |
| 35-49 | -0.031*** (0.011) | | | |
| 50-64 | -0.039*** (0.011) | | | |
| 65+ | -0.077*** (0.013) | | | |
| poor only 1 year | 0.335*** (0.035) | 0.331*** (0.043) | 0.293*** (0.061) | 0.635*** (0.106) |
| poor only 2-3 y | 0.420*** (0.057) | 0.350*** (0.073) | 0.526*** (0.092) | 0.600*** (0.129) |
| poor 4 y or more | 0.569*** (0.039) | 0.546*** (0.054) | 0.620*** (0.071) | 0.539*** (0.098) |
| High school | -0.026*** (0.008) | -0.041*** (0.013) | -0.020 (0.014) | -0.016 (0.010) |
| Some College | -0.032*** (0.010) | -0.063*** (0.014) | -0.021 (0.016) | -0.005 (0.013) |
| University | -0.048*** (0.009) | -0.081*** (0.013) | -0.026* (0.015) | -0.024** (0.011) |
| Female | -0.005 (0.005) | -0.009 (0.007) | 0.001 (0.008) | 0.006 (0.008) |
| Lone parent family | 0.037** (0.015) | 0.061*** (0.021) | -0.035 (0.028) | 0.068* (0.035) |
| Couple w/o kids | -0.063*** (0.009) | -0.068*** (0.015) | -0.090*** (0.019) | -0.019** (0.010) |
| Couple w/ kids | -0.052*** (0.009) | -0.053*** (0.013) | -0.081*** (0.018) | -0.006 (0.014) |
| Just Good Health | 0.008 (0.006) | 0.001 (0.008) | 0.004 (0.010) | 0.021** (0.009) |
| Fair or poor Health | 0.027** (0.011) | 0.043* (0.024) | 0.006 (0.012) | 0.016 (0.012) |
| Unemployed | 0.069*** (0.014) | 0.083*** (0.020) | 0.074** (0.029) | -0.032 (0.023) |
| Not in LF | 0.083*** (0.010) | 0.097*** (0.014) | 0.107*** (0.022) | 0.004 (0.016) |
| Retired | -0.024** (0.011) | 0.000 (0.070) | -0.032*** (0.011) | -0.003 (0.013) |
| N | 17153 | 8644 | 5664 | 2845 |

Note: For this exercise we use data from 2014 only. We have estimated a probit model where the dependent variable is an indicator function that takes the value one if the individual lives in a poor family (defined as having an income below the 50% of the median income adjusted by family size) in 2014. As explanatory variables we include an indicator function that takes the value one if in the last 14 years the family has been poor only 1 year, only 2 or 3 years or 4 years or more. The base category corresponds to a male head of the family who is 15-24 years old, who has no diploma, is living alone, reports having an excellent or very good health, is employed and therefore non retired. In columns 2 to 4 we separate the sample based on the age of the head of the household. Age is then not included in the regression. Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table C.4: Poverty persistence and age: demographics matter

| years poor | >=1 | >=1 | >=5 unconditional | >=5 | >=5 conditional 1 year poor | >=5 |
|---------------------|----------------------|----------------------|----------------------|----------------------|--------------------------------|----------------------|
| 25-34 | 0.195*** (0.020) | 0.270*** (0.019) | 0.045*** (0.007) | 0.077*** (0.009) | 0.081*** (0.018) | 0.137*** (0.020) |
| 35-49 | 0.097*** (0.016) | 0.170*** (0.015) | 0.057*** (0.007) | 0.088*** (0.008) | 0.153*** (0.020) | 0.201*** (0.020) |
| 50-64 | -0.006 (0.015) | 0.054*** (0.015) | 0.053*** (0.006) | 0.062*** (0.006) | 0.218*** (0.021) | 0.185*** (0.020) |
| 65+ | -0.049*** (0.016) | -0.003 (0.019) | 0.059*** (0.007) | 0.037*** (0.007) | 0.305*** (0.028) | 0.172*** (0.031) |
| High school | | -0.029** (0.014) | | -0.028*** (0.008) | | -0.022 (0.022) |
| Some College | | -0.074*** (0.016) | | -0.061*** (0.009) | | -0.112*** (0.024) |
| University | | -0.076*** (0.016) | | -0.065*** (0.008) | | -0.124*** (0.023) |
| Female | | 0.043*** (0.009) | | 0.014*** (0.005) | | 0.017 (0.015) |
| Couple w/o kids | | -0.127*** (0.016) | | -0.067*** (0.008) | | -0.132*** (0.023) |
| Couple w/ kids | | -0.099*** (0.016) | | -0.059*** (0.008) | | -0.122*** (0.023) |
| Just Good health | | 0.050*** (0.011) | | 0.024*** (0.006) | | 0.053*** (0.018) |
| Fair or poor health | | 0.167*** (0.018) | | 0.064*** (0.010) | | 0.095*** (0.024) |
| Unemployed | | 0.104*** (0.025) | | 0.036*** (0.012) | | 0.049 (0.035) |
| Not in LF | | 0.108*** (0.015) | | 0.066*** (0.009) | | 0.117*** (0.022) |
| Retired | | -0.096*** (0.019) | | -0.023*** (0.008) | | -0.009 (0.030) |
| N | 18477 | 18408 | 18477 | 18408 | 4928 | 4916 |

Note: The dependent variable in the first two columns is an indicator variable that takes the value one when the individual has spent at least one year in poverty during its entire time in the sample. The last two columns reproduce this exercise but now the dependent variable equals 1 when the individual has spent at least 5 years in poverty during the entire time in the sample. Demographic characteristics are measured in 2014. The base category corresponds to a male head of the family who is 15-24 years old, who has no diploma, is living alone, reports having an excellent or very good health, is employed and therefore non retired. Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table C.5: Characteristics of the poor - probability of spending more than 5 years in poverty for those who are ever poor

| | <i>Dependent variable: poor five years or more</i> | | | | |
|----------------------|--|----------------------|----------------------|---------------------|----------------------|
| | age | age+ch | age+educ | age+lfst | all characteristics |
| 25-34 | 0.081*** (0.018) | 0.105*** (0.019) | 0.106*** (0.018) | 0.107*** (0.021) | 0.137*** (0.020) |
| 35-49 | 0.153*** (0.020) | 0.169*** (0.020) | 0.187*** (0.020) | 0.176*** (0.021) | 0.201*** (0.020) |
| 50-64 | 0.218*** (0.021) | 0.191*** (0.021) | 0.214*** (0.020) | 0.197*** (0.021) | 0.185*** (0.020) |
| 65+ | 0.305*** (0.028) | 0.249*** (0.028) | 0.254*** (0.025) | 0.184*** (0.034) | 0.172*** (0.031) |
| Female | | 0.017 (0.015) | | | 0.017 (0.015) |
| Lone parent family | | 0.037 (0.033) | | | 0.019 (0.030) |
| Couple w/o own kids | | -0.145*** (0.023) | | | -0.132*** (0.023) |
| Couple w/ own 2 kids | | -0.137*** (0.022) | | | -0.122*** (0.023) |
| Just Good | | 0.072*** (0.017) | | | 0.053** (0.018) |
| Fair or poor | | 0.162*** (0.026) | | | 0.095*** (0.024) |
| High school | | | -0.046 (0.024) | | -0.022 (0.022) |
| Some College | | | -0.155*** (0.025) | | -0.112*** (0.024) |
| University | | | -0.191*** (0.024) | | -0.124*** (0.023) |
| Unemployed | | | | 0.098** (0.037) | 0.049 (0.035) |
| Not in LF | | | | 0.191*** (0.023) | 0.117*** (0.022) |
| Retired | | | | 0.002 (0.032) | -0.009 (0.030) |
| N | 4928 | 4927 | 4921 | 4924 | 4916 |

Note: The dependent variable in the first two columns is an indicator variable that takes the value one when the individual has spent at least one year in poverty during its entire time in the sample. The last two columns reproduce this exercise but now the dependent variable equals 1 when the individual has spent at least 5 years in poverty during the entire time in the sample. Demographic characteristics are measured in 2014. The base category corresponds to a male head of the family who is 15-24 years old, who has no diploma, is living alone, reports having an excellent or very good health, is employed and therefore non retired. Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table C.6: Characteristics of the poor - controlling for past average earnings

| | <i>Dependent variable: poor today</i> | | | |
|---------------------|---------------------------------------|----------------------|----------------------|----------------------|
| | all sample | less 50 | 50-65 | 65+ |
| 25-34 | 0.018 (0.018) | 0.016 (0.014) | | |
| 35-49 | 0.016 (0.019) | 0.014 (0.015) | | |
| 50-64 | 0.000 (0.019) | | | |
| 65+ | -0.067*** (0.019) | | -0.059*** (0.019) | |
| High school | -0.018** (0.008) | -0.012 (0.012) | -0.007 (0.009) | -0.004 (0.009) |
| Some College | -0.034*** (0.008) | -0.035*** (0.012) | -0.010 (0.013) | -0.008 (0.013) |
| University | -0.036*** (0.008) | -0.037*** (0.012) | -0.040*** (0.008) | -0.049*** (0.014) |
| Female | -0.024*** (0.005) | -0.022*** (0.007) | -0.025*** (0.009) | -0.022** (0.009) |
| Lone parent family | 0.031** (0.016) | 0.068*** (0.023) | 0.008 (0.028) | 0.011 (0.016) |
| Couple w/o kids | -0.103*** (0.008) | -0.091*** (0.013) | -0.053*** (0.010) | -0.043*** (0.009) |
| Couple w/ kids | -0.091*** (0.008) | -0.072*** (0.013) | -0.048*** (0.014) | -0.031* (0.016) |
| Just Good Health | 0.018*** (0.005) | 0.010 (0.007) | 0.025*** (0.008) | 0.029*** (0.008) |
| Fair or Poor Health | 0.048*** (0.008) | 0.047*** (0.015) | 0.031*** (0.010) | 0.031*** (0.010) |
| Unemployed | 0.070*** (0.013) | 0.080*** (0.018) | -0.010 (0.015) | -0.005 (0.028) |
| Not in LF | 0.092*** (0.009) | 0.084*** (0.014) | 0.016 (0.011) | 0.010 (0.016) |
| Retired | -0.028*** (0.007) | -0.002 (0.037) | -0.029* (0.016) | -0.018 (0.014) |
| Ln Avg Past Income | -0.046*** (0.003) | -0.067*** (0.005) | -0.023*** (0.004) | -0.022*** (0.004) |
| N | 28557 | 12915 | 5361 | 4829 |

Note: In the first two columns, the dependent variable is an indicator variable that takes the value one when an individual has spent at least one year in poverty during its entire time in the sample. (5 years in the last two columns.) Demographic characteristics are measured in 2014. Base category: age 15-24, no diploma, male, living alone, excellent or very good health, employed and non retired. Clustered standard errors are reported in parentheses. *** significant at less than 1%;

** significant at 5%; * significant at 10%.

Table C.7: The role of public pensions on the probability of being poor

| sample: | <i>Dependent variable: poor today</i> | | | |
|------------------------------|---------------------------------------|----------------------|----------------------|--------------------------|
| | all + retired | +50 + retired | all +int ret pp | + 50 + int ret pub pp |
| 25-34 | -0.011 (0.011) | | -0.009 (0.009) | |
| 35-49 | -0.025** (0.010) | | -0.020** (0.008) | |
| 50-64 | -0.043*** (0.010) | | -0.037*** (0.009) | |
| 65+ | -0.106*** (0.011) | -0.079*** (0.009) | -0.015 (0.026) | 0.021 (0.021) |
| High school | -0.036*** (0.008) | -0.037*** (0.009) | -0.040*** (0.008) | -0.042*** (0.010) |
| Some College | -0.057*** (0.009) | -0.047*** (0.011) | -0.060*** (0.009) | -0.054*** (0.011) |
| University | -0.066*** (0.008) | -0.058*** (0.010) | -0.070*** (0.008) | -0.065*** (0.010) |
| Female | 0.001 (0.005) | 0.001 (0.006) | 0.001 (0.005) | 0.002 (0.006) |
| Lone parent family | 0.052*** (0.016) | 0.020 (0.023) | 0.050*** (0.015) | 0.015 (0.022) |
| Couple w/o kids | -0.105*** (0.008) | -0.101*** (0.010) | -0.106*** (0.008) | -0.104*** (0.010) |
| Couple w/ 2 kids | -0.095*** (0.009) | -0.097*** (0.011) | -0.096*** (0.009) | -0.099*** (0.011) |
| Just Good Health | 0.022*** (0.005) | 0.030*** (0.006) | 0.022*** (0.005) | 0.031*** (0.006) |
| Fair or Poor Health | 0.070*** (0.009) | 0.060*** (0.009) | 0.070*** (0.009) | 0.060*** (0.009) |
| Unemployed | 0.099*** (0.013) | 0.056*** (0.020) | 0.099*** (0.013) | 0.056*** (0.020) |
| Not in LF | 0.130*** (0.009) | 0.106*** (0.010) | 0.127*** (0.009) | 0.101*** (0.010) |
| Retired | -0.038*** (0.008) | -0.050*** (0.010) | -0.029** (0.012) | -0.054*** (0.018) |
| Pub Pension | | | -0.081*** (0.021) | -0.115*** (0.032) |
| Retired \times Pub Pension | | | -0.114*** (0.014) | -0.162*** (0.027) |
| N | 32,764 | 15,907 | 32,764 | 15,907 |

Note: Base category: age 15-24, no diploma, male, living alone, excellent or very good health, employed and non retired. Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table C.8: The role of public pensions on the probability of being poor controlling for persistence and past average earnings

| | <i>Dependent variable: poor today (individuals 50+)</i> | | | |
|------------------------------|---|----------------------|----------------------|----------------------|
| | baseline | +pub pension | +persistence | + past income |
| 65+ | -0.079*** (0.009) | 0.021 (0.021) | 0.016 (0.015) | -0.003 (0.020) |
| High school | -0.037*** (0.009) | -0.042*** (0.010) | -0.019** (0.008) | -0.025*** (0.009) |
| Some College | -0.047*** (0.011) | -0.054*** (0.011) | -0.018* (0.009) | -0.032*** (0.010) |
| University | -0.058*** (0.010) | -0.065*** (0.010) | -0.029*** (0.008) | -0.035*** (0.010) |
| Female | 0.001 (0.006) | 0.002 (0.006) | -0.002 (0.005) | -0.025*** (0.007) |
| Lone parent family | 0.020 (0.023) | 0.015 (0.022) | 0.005 (0.017) | -0.006 (0.021) |
| Couple w/o kids | -0.101*** (0.010) | -0.104*** (0.010) | -0.050*** (0.008) | -0.109*** (0.010) |
| Couple w/ kids | -0.097*** (0.011) | -0.099*** (0.011) | -0.054*** (0.009) | -0.108*** (0.010) |
| Just Good Health | 0.030*** (0.006) | 0.031*** (0.006) | 0.015*** (0.006) | 0.025*** (0.006) |
| Fair or Poor Health | 0.060*** (0.009) | 0.060*** (0.009) | 0.024*** (0.008) | 0.048*** (0.009) |
| Unemployed | 0.056*** (0.020) | 0.056*** (0.020) | 0.043** (0.018) | 0.040** (0.018) |
| Not in LF | 0.106*** (0.010) | 0.101*** (0.010) | 0.059*** (0.009) | 0.072*** (0.009) |
| Retired | -0.050*** (0.010) | -0.054*** (0.018) | -0.025* (0.014) | -0.034** (0.015) |
| Pub Pension | | -0.115*** (0.032) | -0.079*** (0.024) | -0.090*** (0.028) |
| Retired \times Pub Pension | | -0.162*** (0.027) | -0.105*** (0.021) | -0.118*** (0.024) |
| Number of years poor | | | 0.018*** (0.001) | |
| Ln Avg Past Inc | | | | -0.036*** (0.003) |
| N | 15907 | 15907 | 15907 | 15642 |

Note: Base category: age 15-24, no diploma, male, living alone, excellent or very good health, employed and non retired. Clustered standard errors are reported in parentheses. Nb yrs in poverty measures the number of years that the individual has been poor since 2001 until 2011. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table C.9: The role of public pensions and occupational pensions (CQPP) on the probability of being poor

| | <i>Dependent variable: poor today (individuals 50+)</i> | | | |
|------------------------------|---|----------------------|----------------------|----------------------|
| | Public | Public + CQPP | +persistence | + past avg earnings |
| 65+ | 0.021 (0.021) | 0.023 (0.021) | 0.015 (0.015) | 0.000 (0.020) |
| High school | -0.042*** (0.010) | -0.039*** (0.009) | -0.018** (0.007) | -0.024*** (0.009) |
| College | -0.054*** (0.011) | -0.050*** (0.011) | -0.017* (0.009) | -0.031*** (0.010) |
| University | -0.065*** (0.010) | -0.062*** (0.010) | -0.029*** (0.008) | -0.035*** (0.010) |
| Female | 0.002 (0.006) | -0.002 (0.006) | -0.004 (0.005) | -0.026*** (0.007) |
| Lone parent family | 0.015 (0.022) | 0.011 (0.022) | 0.003 (0.017) | -0.006 (0.021) |
| Couple w/o kids | -0.104*** (0.010) | -0.105*** (0.010) | -0.052*** (0.008) | -0.110*** (0.010) |
| Couple w/ kids | -0.099*** (0.011) | -0.103*** (0.011) | -0.056*** (0.009) | -0.110*** (0.010) |
| Just Good Health | 0.031*** (0.006) | 0.030*** (0.006) | 0.015*** (0.006) | 0.025*** (0.006) |
| Fair or Poor Health | 0.060*** (0.009) | 0.057*** (0.009) | 0.023*** (0.008) | 0.048*** (0.009) |
| Unemployed | 0.056*** (0.020) | 0.054*** (0.020) | 0.043** (0.018) | 0.040** (0.018) |
| Not in LF | 0.101*** (0.010) | 0.102*** (0.010) | 0.060*** (0.009) | 0.074*** (0.010) |
| Retired | -0.054*** (0.018) | -0.015 (0.022) | 0.001 (0.019) | -0.010 (0.020) |
| Pub Pension | -0.115*** (0.032) | -0.010 (0.053) | -0.044 (0.039) | -0.044 (0.045) |
| Retired × Pub Pension | -0.162*** (0.027) | -0.116*** (0.035) | -0.095*** (0.024) | -0.097*** (0.031) |
| CQPP | | -0.017 (0.021) | -0.000 (0.017) | -0.004 (0.018) |
| Retired × CQPP | | -0.095*** (0.020) | -0.047*** (0.016) | -0.060*** (0.017) |
| Pub Pension × CQPP | | -0.131*** (0.033) | -0.082*** (0.026) | -0.100*** (0.030) |
| Retired × Pub Pension × CQPP | | -0.171*** (0.027) | -0.107*** (0.022) | -0.125*** (0.025) |
| Number years poor | | | 0.018*** (0.001) | |
| Ln Avg Past Inc | | | | -0.034*** (0.003) |
| N | 15907 | 15907 | 15907 | 15642 |

Note: Base category: age 15-24, no diploma, male, living alone, excellent or very good health, employed and non retired. Clustered standard errors are reported in parentheses. CQPP is a dummy variable indicating if the individual receives payments from the Canada and Quebec Pension Plans (CQPP). *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table C.10: Poverty dynamics: entry into poverty controlling for number of years spent in poverty

| | all sample | +50 | all sample | +50 | all sample | +50 |
|------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 25-34 | -0.014 (0.011) | | -0.032** (0.010) | | -0.029** (0.010) | |
| 35-49 | -0.029** (0.010) | | -0.040*** (0.009) | | -0.036*** (0.009) | |
| 50-64 | -0.037*** (0.010) | | -0.043*** (0.009) | | -0.039*** (0.008) | |
| 65+ | -0.058*** (0.015) | -0.025 (0.013) | -0.064*** (0.008) | -0.023*** (0.004) | -0.051*** (0.013) | -0.012 (0.009) |
| High school | -0.022** (0.008) | -0.019* (0.008) | -0.013 (0.007) | -0.013 (0.008) | -0.013 (0.007) | -0.013 (0.008) |
| College | -0.031*** (0.008) | -0.026** (0.008) | -0.019** (0.007) | -0.019* (0.008) | -0.019** (0.007) | -0.020* (0.008) |
| University | -0.038*** (0.008) | -0.031*** (0.008) | -0.025*** (0.007) | -0.023** (0.007) | -0.026*** (0.007) | -0.024** (0.008) |
| Female | 0.006 (0.004) | 0.004 (0.004) | 0.003 (0.004) | 0.002 (0.004) | 0.003 (0.004) | 0.002 (0.004) |
| Female + widow | 0.052 (0.031) | 0.000 (.) | 0.040 (0.029) | 0.000 (.) | 0.040 (0.029) | 0.000 (.) |
| Female + divorce | 0.101** (0.035) | 0.043 (0.033) | 0.095** (0.035) | 0.046 (0.034) | 0.095** (0.035) | 0.047 (0.034) |
| Worse Health | 0.016* (0.008) | 0.018* (0.009) | 0.013 (0.007) | 0.014 (0.009) | 0.013 (0.007) | 0.015 (0.009) |
| EventUnemp=1 | 0.045* (0.019) | 0.036 (0.028) | 0.037* (0.017) | 0.034 (0.026) | 0.037* (0.017) | 0.034 (0.026) |
| EventLeaveLF=1 | -0.016*** (0.005) | -0.016*** (0.003) | -0.016*** (0.004) | -0.017*** (0.003) | -0.016*** (0.004) | -0.017*** (0.003) |
| EventRetired=1 | 0.021 (0.018) | 0.005 (0.009) | 0.016 (0.017) | 0.002 (0.008) | 0.016 (0.017) | 0.002 (0.008) |
| Public Pension | 0.004 (0.020) | 0.002 (0.014) | | | -0.014 (0.010) | -0.012 (0.009) |
| Num years poor | | | 0.010*** (0.001) | 0.006*** (0.001) | 0.010*** (0.001) | 0.007*** (0.001) |
| N | 14354 | 6907 | 14354 | 6907 | 14354 | 6907 |

Note: Base category: age 15-24, no diploma, male, living alone, excellent or very good health, employed and non retired. Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table C.11: Poverty dynamics- Probability of entering poverty. Controlling for CQPP and years spent in poverty

| | all | +50 | all | +50 | all | +50 |
|------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|
| 25-34 | -0.015 (0.012) | | 0.002 (0.016) | | 0.001 (0.016) | |
| 35-49 | -0.030** (0.010) | | -0.010 (0.015) | | -0.010 (0.015) | |
| 50-64 | -0.041*** (0.011) | | -0.018 (0.014) | | -0.021 (0.015) | |
| 65+ | -0.062*** (0.016) | -0.026 (0.014) | -0.040** (0.014) | -0.024*** (0.005) | -0.041* (0.017) | -0.023 (0.012) |
| HS | -0.022** (0.008) | -0.019* (0.008) | -0.012 (0.007) | -0.012 (0.007) | -0.012 (0.007) | -0.012 (0.007) |
| Some College | -0.030*** (0.008) | -0.026** (0.008) | -0.016* (0.007) | -0.016* (0.007) | -0.016* (0.007) | -0.016* (0.007) |
| University | -0.038*** (0.008) | -0.031*** (0.008) | -0.022** (0.007) | -0.021** (0.007) | -0.021** (0.007) | -0.020** (0.007) |
| Widow | 0.002 (0.025) | 0.033 (0.048) | 0.003 (0.028) | 0.036 (0.052) | 0.004 (0.029) | 0.039 (0.054) |
| Divorced | 0.016 (0.024) | 0.001 (0.016) | 0.027 (0.030) | 0.005 (0.022) | 0.027 (0.030) | 0.005 (0.022) |
| Female | 0.006 (0.004) | 0.004 (0.004) | -0.004 (0.004) | -0.005 (0.005) | -0.004 (0.004) | -0.005 (0.005) |
| Female + widow | 0.052 (0.031) | | 0.043 (0.028) | | 0.042 (0.028) | 0.000 |
| Female + divorce | 0.099** (0.035) | 0.043 (0.033) | 0.079* (0.032) | 0.035 (0.033) | 0.078* (0.031) | 0.035 (0.033) |
| Worse health | 0.016* (0.007) | 0.018* (0.009) | 0.017* (0.007) | 0.020* (0.009) | 0.016* (0.007) | 0.019* (0.009) |
| Lost job | 0.046* (0.019) | 0.037 (0.029) | 0.045* (0.020) | 0.035 (0.026) | 0.046* (0.020) | 0.037 (0.027) |
| Leave LF | -0.016*** (0.005) | -0.016*** (0.003) | -0.017*** (0.005) | -0.016*** (0.003) | -0.017*** (0.005) | -0.016* ** (0.003) |
| Retired | 0.020 (0.018) | 0.005 (0.009) | 0.008 (0.014) | 0.001 (0.008) | 0.007 (0.014) | 0.001 (0.008) |
| Public Pension | -0.002 (0.017) | -0.000 (0.013) | | | -0.009 (0.013) | -0.005 (0.012) |
| Can/Qc pp | 0.012 (0.009) | 0.005 (0.006) | | | 0.011 (0.008) | 0.007 (0.005) |
| lnavgearnings | | | -0.018*** (0.002) | -0.010*** (0.002) | -0.018*** (0.002) | -0.010* ** (0.002) |
| N | 14354 | 6907 | 12966 | 6835 | 12966 | 6835 |

Note: Female widow. Base category: age 15-24, no diploma, male, living alone, excellent or very good health, employed and non retired. Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table C.12: Poverty dynamics- Probability of entering poverty. Controlling for CQPP and years spent in poverty (entering step by step)

| | all | +50 | all | +50 | all | +50 |
|------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 25-34 | -0.015 (0.012) | | -0.032** (0.010) | | -0.031** (0.010) | |
| 35-49 | -0.030** (0.010) | | -0.040*** (0.009) | | -0.039*** (0.009) | |
| 50-64 | -0.041*** (0.011) | 0.000 (.) | -0.043*** (0.009) | 0.000 (.) | -0.044*** (0.010) | 0.000 (.) |
| 65+ | -0.062*** (0.016) | -0.026 (0.014) | -0.064*** (0.008) | -0.023*** (0.004) | -0.058*** (0.013) | -0.013 (0.009) |
| HS | -0.022** (0.008) | -0.019* (0.008) | -0.013 (0.007) | -0.013 (0.008) | -0.013 (0.007) | -0.013 (0.008) |
| Some C | -0.030*** (0.008) | -0.026** (0.008) | -0.019** (0.007) | -0.019* (0.008) | -0.019** (0.007) | -0.019* (0.008) |
| Univ | -0.038*** (0.008) | -0.031*** (0.008) | -0.025*** (0.007) | -0.023** (0.007) | -0.025*** (0.007) | -0.023** (0.008) |
| Widow | 0.002 (0.025) | 0.033 (0.048) | 0.002 (0.027) | 0.037 (0.049) | 0.003 (0.028) | 0.040 (0.051) |
| Divorce | 0.016 (0.024) | 0.001 (0.016) | 0.023 (0.027) | 0.003 (0.018) | 0.023 (0.027) | 0.003 (0.018) |
| Female | 0.006 (0.004) | 0.004 (0.004) | 0.003 (0.004) | 0.002 (0.004) | 0.003 (0.004) | 0.002 (0.004) |
| Female + widow | 0.052 (0.031) | 0.000 | 0.040 (0.029) | 0.000 | 0.039 (0.028) | 0.000 |
| Female + divorce | 0.099** (0.035) | 0.043 (0.033) | 0.095** (0.035) | 0.046 (0.034) | 0.093** (0.035) | 0.047 (0.035) |
| Worse Health | 0.016* (0.007) | 0.018* (0.009) | 0.013 (0.007) | 0.014 (0.009) | 0.013 (0.007) | 0.014 (0.009) |
| Lost job | 0.046* (0.019) | 0.037 (0.029) | 0.037* (0.017) | 0.034 (0.026) | 0.038* (0.018) | 0.036 (0.027) |
| Leave LF | -0.016*** (0.005) | -0.016*** (0.003) | -0.016*** (0.004) | -0.017*** (0.003) | -0.016*** (0.004) | -0.017*** (0.003) |
| Retire | 0.020 (0.018) | 0.005 (0.009) | 0.016 (0.017) | 0.002 (0.008) | 0.015 (0.016) | 0.002 (0.008) |
| Public Pensions | -0.002 (0.017) | -0.000 (0.013) | | | -0.018* (0.009) | -0.014 (0.009) |
| Can/Qc pp | 0.012 (0.009) | 0.005 (0.006) | | | 0.016 (0.008) | 0.007 (0.005) |
| Num years poor | | | 0.010*** (0.001) | 0.006*** (0.001) | 0.010*** (0.001) | 0.007*** (0.001) |
| N | 14354 | 6907 | 14354 | 6907 | 14354 | 6907 |

Note: Base category: age 15-24, no diploma, male, living alone, excellent or very good health, employed and non retired. Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Table C.13: Poverty dynamics - Probability of exiting poverty

| | all | +50 | all | +50 | all | +50 |
|----------------------|-------------------|----------------------|--------------------|----------------------|---------------------|----------------------|
| 25-34 | 0.081 (0.066) | | 0.077 (0.064) | | 0.165 (0.101) | |
| 35-49 | -0.028 (0.056) | | -0.028 (0.056) | | 0.055 (0.097) | |
| 50-64 | -0.089 (0.053) | | -0.135* (0.054) | | -0.032 (0.097) | |
| 65+ | 0.082 (0.075) | 0.146* (0.068) | 0.078 (0.075) | 0.185** (0.067) | 0.260* (0.112) | 0.253*** (0.071) |
| High school | 0.016 (0.046) | 0.000 (0.065) | 0.011 (0.045) | -0.017 (0.062) | -0.039 (0.050) | -0.035 (0.063) |
| College | 0.088 (0.061) | 0.002 (0.092) | 0.094 (0.060) | 0.014 (0.086) | 0.095 (0.066) | 0.018 (0.087) |
| University | 0.128* (0.059) | -0.074 (0.092) | 0.136* (0.058) | -0.033 (0.091) | 0.103 (0.062) | -0.055 (0.091) |
| Male + Find couple | 0.051 (0.145) | -0.220 (0.175) | 0.048 (0.140) | -0.227 (0.125) | -0.017 (0.129) | -0.224 (0.123) |
| Female | 0.037 (0.039) | -0.017 (0.059) | 0.049 (0.039) | 0.010 (0.058) | 0.059 (0.043) | 0.037 (0.061) |
| Female + Find couple | 0.019 (0.114) | -0.341*** (0.054) | 0.041 (0.112) | -0.299*** (0.058) | 0.084 (0.138) | -0.289*** (0.060) |
| Better health | -0.019 (0.049) | 0.029 (0.064) | -0.011 (0.048) | 0.043 (0.060) | -0.000 (0.051) | 0.041 (0.059) |
| Find job | 0.135* (0.065) | 0.200 (0.140) | 0.136* (0.064) | 0.225 (0.133) | 0.178* (0.073) | 0.192 (0.133) |
| Retired | -0.018 (0.090) | 0.014 (0.093) | -0.112 (0.094) | -0.087 (0.093) | -0.056 (0.105) | -0.056 (0.105) |
| EvRet+PubPens | | | -0.085 (0.119) | -0.092 (0.108) | -0.102 (0.122) | -0.096 (0.108) |
| EvRet+PubPens+CQPP | | | 0.277** (0.102) | 0.263* (0.105) | 0.258** (0.099) | 0.245* (0.103) |
| EvRet+CQPP | | | -0.006 (0.269) | -0.001 (0.237) | 0.004 (0.247) | 0.007 (0.223) |
| EvRet+PubPens | | | 0.419** (0.130) | 0.442** (0.153) | 0.379** (0.138) | 0.393* (0.159) |
| EvRet+PubPens+CQPP | | | -0.245 (0.155) | -0.202 (0.131) | -0.230 (0.161) | -0.197 (0.140) |
| ln past avg earnings | | | | | 0.110*** (0.032) | 0.084* (0.040) |
| N | 1140 | 439 | 1131 | 430 | 881 | 412 |

Note: Clustered standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.