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Senior poverty in Canada: A decomposition analysis

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Abstract

Using 1977-1979, 1994-1996, and 2006-2008 data from the SCF and SLID, a decomposition analysis of senior poverty rates is conducted to determine whether changes in seniors' characteristics, and changes in the extent to which characteristics affect senior's likelihood of poverty, can help explain historical changes in senior poverty rates. The results show that changes in characteristics can explain relatively small changes in senior poverty rates, with changes in education levels playing a significant role. Changes in the extent to which characteristics affect seniors' likelihood of poverty are shown to be much more important. Overall, the results confirm the importance of retirement income policy for the structure of senior poverty in Canada.

Executive Summary

Senior poverty in Canada has declined dramatically since the 1970s. In Canada, the introduction and expansion of retirement income programs including Old Age Security (OAS), the Guaranteed Income Supplement (GIS), and the Canada and Quebec Pension Plans (C/QPP) is often credited with improving the well-being of elderly Canadians. Is policy the only factor at play?

In this study I examine the extent to which changes in seniors' characteristics may be associated with changes in senior poverty – measured using the Elderly Relative Poverty Measure (ERPM) and the Low Income Cut-off (LICO). Using the confidential microdata files for the 1977-1979 and 1994-1996 Survey of Consumer Finances (SCF) and the 1994-1996 and 2006-2008 Survey of Labour and Income Dynamics (SLID), a decomposition analysis of changes in senior poverty rates over the two periods is conducted.

Among the characteristics examined, increases in education appear to play a significant role in reducing senior poverty over time. However, the effect is relatively small. The results also suggest that increases in independent living among seniors (as observed over the 1977-1979 to 1994-1996 period) are associated with slightly higher poverty rates.

Any changes in senior poverty associated with changes in senior characteristics, however, are dwarfed by the effects of changes in the extent to which senior's characteristics influenced seniors' likelihood of poverty. For the 1977-1979 to 1994-1996 period, the results confirm the importance of retirement income policy – with results suggesting that market forces became less relevant for the structure of senior poverty over this period.

For the 1994-1996 to 2006-2008 period, however, the results are slightly different. While retirement income policy remains important for maintaining the absolute standard of living among seniors (demonstrated by the reduced importance of factors such as education as a predictor for a senior having income below LICO), market forces appear to be more important again for relative poverty – the living standards of seniors are not keeping up with the working age population.

1. Introduction

The incidence of low income and poverty among seniors has long been a priority for policy makers. The dramatic decline in Canadian senior poverty since the early 1970s has been well documented in the literature (see, for example, Myles (2000), Milligan (2008) and Veall (2008)). In Canada, the introduction and expansion of retirement income programs including Old Age Security (OAS), the Guaranteed Income Supplement (GIS), and the Canada and Quebec Pension Plans (C/QPP) is often credited with improving the well-being of elderly Canadians.

Is policy the only factor at play, or are there other factors that help explain the remarkable reduction in senior poverty? In this study I examine the extent to which changes in seniors' characteristics may be associated with changes in senior poverty. Senior poverty is measured using the Elderly Relative Poverty Measure (ERPM) and the Low Income Cut-off (LICO). Using the confidential microdata files of the Survey of Consumer Finances (SCF, 1977-1979 and 1994-1996) and the Survey of Labour and Income Dynamics (SLID, 1994-1996 and 2006-2008), a decomposition analysis of changes in senior poverty rates over the two periods is conducted. The analysis allows us gauge the relative importance of retirement income policies and individual characteristics as factors contributing to the observed changes in senior poverty.

The results show that changes in seniors' characteristics had only a small effect on senior poverty rates. For example, education appears to play a significant role in the reduction in

senior poverty; however, the effect is relatively small. More important were changes in the extent to which seniors' characteristics influenced their likelihood of being in poverty – which in part reflects changes in the policy environment. Overall, the results suggest that retirement income policy is central to the structure of senior poverty. Over the 1977-1979 to 1994-1996 period, it appears market forces became much less relevant as determinants of poverty, while benefits to seniors became more generous. More recently, it appears that retirement income policy remains important for maintaining the standard of living among seniors (in an absolute sense). However, regarding the relative standard of living among seniors, it appears that market forces have come to play a larger role, so that the living standards of many seniors are not keeping up with those of the working age population.

The study is organized as follows. In the next section, I provide some background and context for this study. In section 3 I outline the decomposition methodology used. In section 4, I describe the data used in this study, the measurement of senior poverty and characteristics, and summarize important trends. In section 5, I provide the results of the decomposition. Finally, I provide some concluding remarks.

2. Background

Changes in Canadian senior poverty rates have been well-documented in previous studies. In this section I outline the results of some of these studies and discuss the extent to which the observed change in senior poverty has related to retirement income policy.

Veall (2008) provides low-income rates (based on the Luxemburg Income Study) for seniors (66 and over), children, and the total population based on the Low Income Measures (LIM, see Statistics Canada 2010) in 1970, 1980, 1990, and 2000. According to his estimates, senior below-LIM rates fell from 37 percent in 1970 to only 6 percent in 2000. In contrast, child low-income rates have been steady at 15 percent since 1980. Canadian senior low-income rates are substantially lower than in Australia, the UK and the US (with low income rates at 20 percent or more in 2000). Canadian senior low-income rates are comparable to several European countries, although the Netherlands is quite low at only 2 percent in 2000. An important point made by Veall (2008) , however, is that slight adjustments in the threshold used to define low income will matter – if the LIM is set at 40 percent (rather than 50 percent) of median income, the Canadian senior low income rate in 2000 is only 1 percent.

Veall (2008) examined the characteristics of low income seniors using 2004 data from the Longitudinal Administrative Database. The results demonstrate that recent immigrants and unmarried women are those most likely have low income.[1] He also provides some evidence that seniors that are considered to have a low income are not likely to have wealth they can draw on to maintain a standard of living that is above the poverty thresholds. More specifically, they are unlikely to have capital gains or rental income.

Milligan (2008) documents trends in elderly poverty in Canada using several data sources, including the SCF, SLID, the Survey of Family Expenditures, and the Survey of Household Spending.[2] He presents elderly poverty rates based on the Low-Income Cut Off (LICO), LIM,

and also proposes the measure used in this study – the Elderly Relative Poverty Measure (ERPM). The ERPM is a headcount measure similar to LIM. Unlike LIM, which uses a measure of income based on the broader population that includes the elderly, the ERPM uses a threshold that is set at 50 percent of the median after-tax income among the working age population. According to Milligan (2008) , all poverty measures indicate a reduction in elderly poverty rates until 1990, as the incomes of low-income seniors rose faster than the incomes of the general population. Since 1990, the incomes of seniors have continued to increase, however lower incomes among seniors have not increased as fast as the incomes of the working age population. As a result, we can see a small increase in LIM and ERPM measures of elderly poverty.

Milligan (2008) suggests the large decline in elderly poverty in the 1970s and 1980s can be attributed to policy changes. First, he documents the incidence of poverty by the age of the economic family head and finds an increase in the likelihood of poverty as the head approaches the age of 65. That likelihood drops significantly after age 65 in the 1980s. Milligan's results correspond to large increases in Guaranteed Income Supplement (GIS) and Canada Pension Plan (CPP) benefits until 1986 (see Figure 1). The GIS is an income-tested benefit available to Old Age Security (OAS) recipients age 65 and over.[3] The GIS benefit amounts were increased substantially in 1971-72, followed by steady increases over the 1979-85 period. Thereafter, the benefit amount increases with the Consumer Price Index. Recently, the GIS benefit was increased beyond inflation for 2006 and 2007. CPP benefits had increased at fixed increments between 1973 and 1985 (having been indexed to inflation until 1973). In 1986 and 1987, the Year's Maximum Pensionable Earnings (which

is the reference point defining monthly benefits) was defined as a moving average of the average industrial wage. Since 1988, the YMPE has been indexed to average weekly earnings (of the Industrial Aggregate).[4]
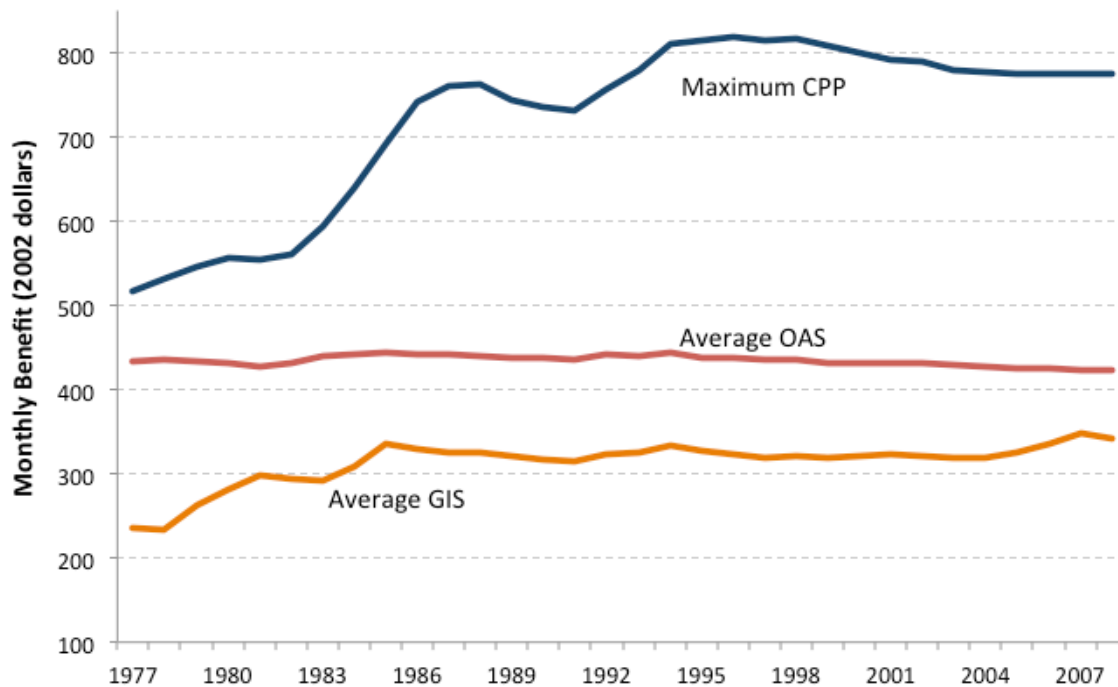
Figure 1. Monthly Benefit Rates, 1977-2008, 2002 Constant Dollars.
Source: Author's tabulations based on HRSDC (2011), OSFI (2011), and Cansim Table 326-0021.

Other studies have also pointed to the historical importance of public pensions for senior's income. For example, Myles (2000) documents trends in income inequality, and provides a decomposition of the Gini index. He finds that inequality declined significantly among the elderly over the 1980s and early 1990s. The decomposition of the Gini index describes the extent to which the decline in inequality can be attributed to (i) the changes in each source of income as a share of total income and (ii) the concentration (or inequality in the

distribution) of each source of income. Results show the concentration of each source did not change over time. He shows that income inequality falls over the period as a result of the shift from highly concentrated income sources (such as employment or investment income) toward those less concentrated, particularly C/QPP income and higher taxes. According to Myles (2000), C/QPP became a larger share of individuals' income, representing only 8 percent of income in 1980 and 20 percent in 1995.

Overall, the literature demonstrates a general consensus that Canada's retirement income policy is central to understanding the historical decline in elderly poverty. However, few studies have examined how other factors may have played a role. Schirle (2009) used 1996 and 2006 SLID data to investigate various factors that drove changes in the distribution of income among married seniors. She found that the incomes at the high end of the distribution increased much faster than those at the low end over the 1996-2006 period. Her results show that a large part of increases in income can be attributed to increases in senior men's and women's education levels, large increases in women's C/QPP take-up rates, large increases in the receipt of pension income, and large increases in the employment of senior men. Many of these factors, however, drove greater increases in seniors' incomes at the top of the income distribution than at the lower part of the income distribution.

Apart from income sources, characteristics such as immigrant status appear important. Consistent with Veall's (2008) results, Hum and Simpson (2010) compared the retirement prospects of male Canadian immigrants with those of the Canadian born and found large

gaps in private pension incomes and coverage rates. They also found that the gap appears to be wider for more recent cohorts of immigrants. This is consistent with documented declining relative earnings for more recent immigrant cohorts (see for example Aydemir and Skuterud (2005)). While characteristics such as gender have demonstrated to be good predictors of elderly poverty at a given point in time, it is not clear from the literature to what extent these characteristics, or their influence on an individual's likelihood of poverty, have changed over time.

3. Methods

We are interested in taking a closer look at changes in senior poverty rates and in gauging the extent to which these changes over time can be attributed to changes in seniors' characteristics. The analysis here takes the standard approach associated with Oaxaca-Blinder decompositions, whereby regression methods are used to predict the likelihood of poverty conditional on the characteristics of interest at two points in time (*t=1,2*). The regression results are then broken down to describe (i) the portion of the total change in poverty accounted for by changes in average characteristics and (ii) the portion of the total change in poverty accounted for by changes in the extent to which the characteristics influence the likelihood of poverty. Explained in more detail below, these will be referred to as (i) composition effects and (ii) structure effects, respectively.[5]

The standard Oaxaca-Blinder decomposition begins with estimation of the following linear model

$$y_{it} = \beta_{0t} + X_{it}\beta_t + \varepsilon_{it}, (t = 1,2) \tag{1}$$

for each time period (*t*) separately. In equation (1), y_{it} represents an indicator variable set equal to one when individual *i* at time *t* has income below a specified low-income threshold. The vector X_{it} represents the characteristics of individual *i* at time *t*. In this analysis, X_{it} includes the individual's age, education, immigrant status, mother tongue, sex, marital status, urban residency, independent living status, and province of residence. These characteristics are expected to be good predictors of a senior individual's low-income status as they are standard variables used to predict individuals' income and labour market

activity earlier in the life cycle.

The decomposition analysis examines changes in senior poverty over time, from an earlier time period ($t = 1$) to a later time period ($t = 2$). As a first step, equation (1) is estimated within each time period t using a linear probability model (LPM). The poverty rate in each period (ie. the sample's mean value of $y_{it,}$ $\bar{y}_t$) can then be represented as a predicted value based on estimated coefficients ($\hat{\beta}_t$) and the mean characteristics of individuals in the sample ($\bar{X}_t$).

$$\bar{y}_t = \hat{\beta}_{0t} + \bar{X}_t\hat{\beta}_t$$

Differencing between the two time periods, we can derive the following to describe changes in poverty rates

$$\bar{y}_2 - \bar{y}_1 = \left(\hat{\beta}_{02} - \hat{\beta}_{01}\right) + \bar{X}_2\hat{\beta}_2 - \bar{X}_1\hat{\beta}_1 + \bar{X}_2\hat{\beta}_1 - \bar{X}_2\hat{\beta}_1$$

$$= (\bar{X}_2 - \bar{X}_1)\hat{\beta}_1 + \left(\hat{\beta}_{02} - \hat{\beta}_{01}\right) + \bar{X}_2\left(\hat{\beta}_2 - \hat{\beta}_1\right) \tag{2}$$

where the first term in equation (2) represents the change in poverty rates over time due to changes in the composition of the sample. In the literature on decompositions the term 'composition' is often referred to as characteristics or endowments of the sample, with this portion of the change in outcomes 'explained'. The second and third terms in equation (2) represent the change in poverty rates due to changes in the income structure. In this context, the income structure reflects how each characteristic is correlated to individuals' likelihood of having low income. In the literature on earnings and wages, income structure is often referred to as 'returns' to characteristics or simply 'coefficients', and this portion of the total change is referred to as 'unexplained'. Given the linear structure of equation (2), a

detailed decomposition of each characteristics' contribution to the composition effects is easily derived.

In the derivation of equation (2), I have used the earlier time period as the reference time period for coefficients. Alternatively, the more recent time period could be used as the reference period (or an average of the two), which would affect the magnitudes and interpretation of decomposition results. This is an important consideration in cases where the magnitude of coefficients changes substantially over time. It is more important when the sign of the coefficient changes. In the present study, the choice was made not to use an average coefficient in the decomposition, as the interpretation of the coefficients that change sign was less clear.

It is important to recognize that probit or logit models are generally preferred in predicting the effects of variables on a binary dependent variable. The difficulty here, however, is that a probit model is a non-linear function of the covariates and cannot be as easily manipulated as the linear model for the purposes of a decomposition. There does not appear to be an obvious consensus among researchers on the best way to approach this problem, as many decomposition methods are unsatisfactory (see Fortin, Firpo, and Lemieux, 2011, pages 51-52). Probit model estimates are also provided and the robustness of the linear model's results will be discussed further in section 5.

4. Data, Measurement, and Trends

The SCF and SLID

In this study I use of data from various years of the Survey of Consumer Finances (SCF, 1977-1997) and the Survey of Labour and Income Dynamics (SLID, 1993-2008).[6] The confidential microdata files of each survey are used. Since 1977, the SCF has been fairly consistent in its sampling and variable construction. Also since 1977, it is possible to link the confidential SCF individual and economic family files. [7] The SLID files begin in 1993 and the design of SLID was intended (in part) to replace the SCF.[8] Throughout the analysis, survey weights (provided by Statistics Canada in the microdata files) are used.

The decomposition analyses will focus on the years 1977-1979, 1994-1996 and 2006-2008. The three-year intervals allow for larger sample sizes in the decomposition analysis, which is particularly important when using SLID and narrowly defined demographic groups. The years 1994-1996 were chosen as a mid-point for the analysis for various reasons. First, 1994-1996 are years for which both the SCF and SLID are available. This allows me to avoid difficulties that would be associated with pooling observations from two different surveys while permitting a comparison of model results across the two surveys. Second, as presented later in this section, there are various changes to senior's experiences in terms of their income and income sources over time. Note that important trends in senior poverty stabilized in the 1994-1996 period, with slightly different trends in senior income thereafter. A direct comparison between the late 1970s and the late 2000s is avoided in

this study because a direct comparison would mask the important changes in trend that happen in the mid-1990s.

Measurement

The SCF files provide fairly detailed information regarding individual's income and their family's income. Unless stated otherwise, I examine the after-tax-and-transfer income of economic families.[9]   This will include most forms of income but will not include capital gains income or lump-sum withdrawals from pension plans or RRSPs.[10] An economic family includes all individuals related to each other and residing within the same household. Unless stated otherwise, I measure the equivalent economic family income when describing individual's income and identifying low-income individuals. Following the convention adopted by Statistics Canada (2010), I divide the economic family income by the square root of the number of members in the economic family to obtain equivalent family income.

The sample used for the main analysis of this study represents all individuals aged 65 and over. The ability to use the individual as the unit of observation is one of the main benefits of using the confidential files of the SCF. Previous studies have been based on the economic family and are limited to examining the family head's characteristics. I exclude any individuals for whom demographic or income information is missing, which results in very few observations being dropped.

This paper makes use of two thresholds for low (after-tax) income – one that provides a purely relative measure of poverty and another that provides a slightly more absolute measure of poverty. First, I use the Elderly Relative Poverty Measure (ERPM) developed in Milligan (2008), which is measured as one half the level of the median equivalent economic family after-tax income among individuals aged 25-54. Unlike LIM (which is based on the median income of the population including the elderly), the ERPM threshold does not increase in response to increases in the incomes of seniors.[11] The ERPM poverty rate is simply the portion of seniors that have equivalent economic family after-tax income below the ERPM threshold. The ERPM poverty rate is then a purely relative measure of poverty – reflecting the incomes of seniors relative to those aged 25-54.

Second, I use the After-tax Low Income Cut-Off (LICO, 1992 basket) as defined by Statistics Canada (2010). I matched individuals in the survey to the appropriate LICO based on the year, their economic family size and the size of their community. The LICO poverty rate is then the portion of seniors that have economic family after-tax income below the LICO threshold. The LICO threshold is defined in a way that makes it both a relative and absolute measure of low income. LICO is a relative measure in the sense that it depends on the population's (1992) average share of income spent on a basket of consumption goods deemed necessities (food, shelter, and clothing).[12] LICO is an absolute measure in the sense that the basket of consumption goods does not expand or contract over time with general increases in the average family's consumption.

The characteristics of seniors examined in this study are limited to those available in both the SCF and SLID and efforts are made to define variables to be as comparable as possible over time. The definitions for age differ slightly between the SCF and SLID. In the SCF, age represents years of age at the time the individual entered the Labour Force Survey (December – March) preceding the SCF survey month (April). In the SCF, age is top-coded at age 99. In SLID, age is not top-coded in the confidential files and represents the individual's age as of December 31 of the reference year. Note these definitions imply that someone coded as age 65 may have been age 64 for part or all of the reference year.

Years of education are imputed based on the categories of highest level of education attainment available in each survey. For the SCF, I assign 8 years to those reporting Grade 8 or less, 10 years for 'some secondary', 11 years for 'some or completed high school', 12 years to those who graduated from high school, 13 for 'some post-secondary', 14 for a 'post-secondary certificate or diploma', and 16 years for a university degree. Information in SLID allowed for finer categories: I assigned 0 years to those reporting they never attended school, 4 years for 1-4 years elementary school, 8 years for 5-8 years elementary school, 10 years for 9-10 years of elementary and secondary school, and 11 years for 11-13 years of elementary and secondary school (but did not graduate). I further assigned 12 years to those who graduated from high school, 13 years to those with some post-secondary (no certificate) 14 to those with a post-secondary certificate below a Bachelor's, 16 years for a University degree below Masters, 17 years for a master's degree, 18 for professional degrees and 20 years for a doctorate. Note the decomposition analysis had also been conducted using categorical variables for educational attainment, and qualitatively the

results are very similar. Difficulties in interpreting decomposition results in the context of categorical variables with more than one category, however, limited the usefulness of the results.[13] As such, the choice was made to construct a continuous education variable.

Most indicator variables used in this study are self-explanatory, including indicators for whether the individual is Canadian born, male, or married (which includes common-law relationships). An indicator for having English as a mother tongue is set to zero for any language reported other than English, including French.[14] An indicator variable for urban status is set equal to one for residence in any urban area regardless of size and set to zero for rural residence. When necessary, provincial variables are collapsed, reflecting small sample sizes within some demographic groups. In this study, the 'Atlantic provinces' group together Newfoundland, Nova Scotia, Prince Edward Island, and New Brunswick. I have created a variable indicating whether the individual lives independently, which is set to one if an individual lives in an economic family of size one, or if a married couple lives in an economic family of size two. That is, the variable is intended to capture whether the elderly individual or couple is living independently or with their adult children or other family members.

Trends

Trends in senior poverty rates are presented in Figure 2. Between 1977 and the mid-1990s, the ERPM and LICO poverty rates show similar downward trends. ERMP poverty rates fell from 40 percent in 1977 to only 23 percent in 1982, reaching a low of only 7

percent in 1995 (based on SCF data). Similarly, the LICO poverty rates fell from 30 percent

in 1977 to 18 percent in 1982, reaching 8.6 percent in 1995. Thereafter, the ERPM poverty

rate changes trend – rising to 17 percent in 2008. This reflects a relative increase in the

incomes of the working age population. In contrast, LICO poverty rates continued to

decline and reached 5.6 percent in 2008.[15]
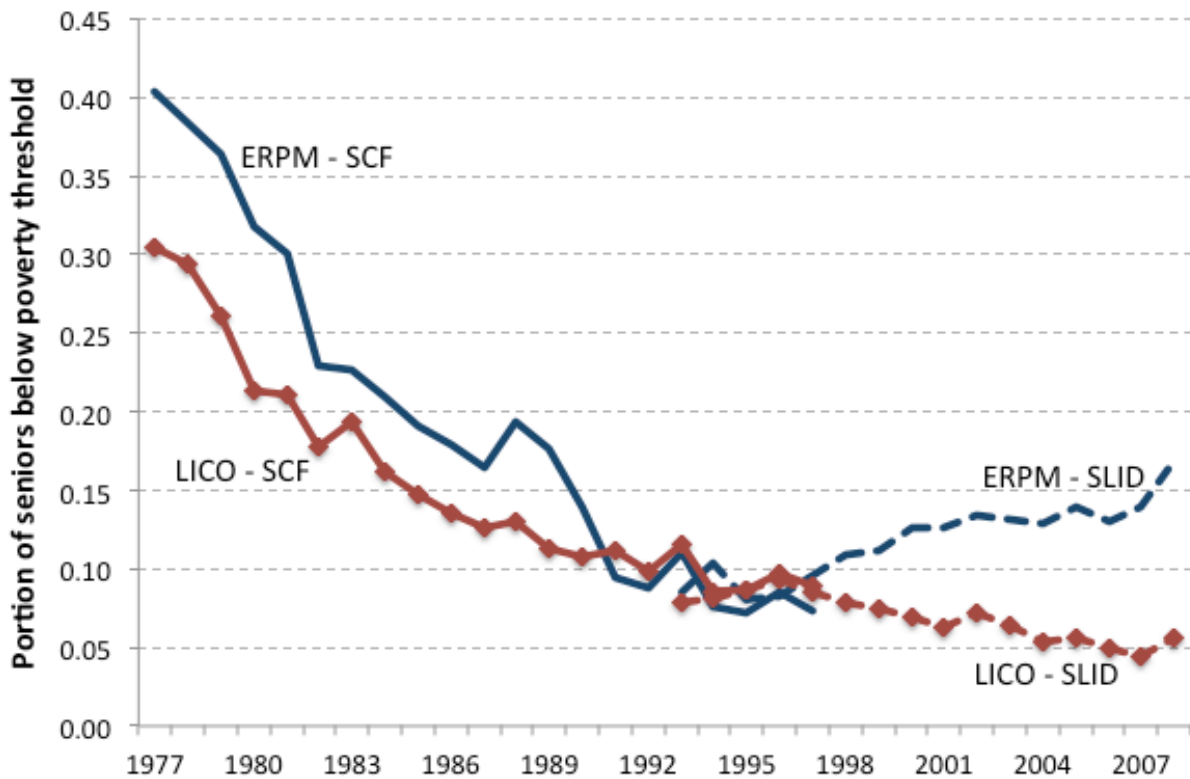
Figure 2. Senior poverty rates, 1977-2008, by low income threshold.
Note: Sample of individuals age 65 and over. Poverty indicates an individual's equivalent
economic family after-tax income is below the specified threshold.
Source: Author's tabulations based on the SCF and SLID.

In many ways, the trends in senior poverty rates in Figure 2 correspond to the changes in

the benefits available from C/QPP, OAS and GIS (Figure 1). Some of the largest increases in

GIS benefits occurred between 1977 and 1985. CPP benefits increased steadily until 1987,

with the sharpest increase between 1982 and 1987. Further reductions in poverty after 1988, however, did not correspond to large changes in CPP, OAS or GIS generosity. In fact, maximum CPP benefits eroded slightly from 1988-1991 as the real value of the YMPE (indexed to the average industrial wage) fell over this period. After 1994, there were not substantial changes in benefit generosity that might help explain changes in poverty rates.

As a comparison, there have not been any notable changes in the poverty rates within younger age groups over this period that would clearly correspond to the changes in poverty rates for those aged 65 and older. For individuals aged 60-64 there was a slight decrease in poverty rates – as ERPM (LICO) poverty rates fell from 25 (19) percent in 1977 to 18 (14) percent in 1983.[16] This may reflect the introduction of the Allowance and the Allowance for the Survivor. After 1983, poverty rates for 60-64 year olds are fairly steady. It is perhaps surprising that poverty rates among individuals aged 60-64 did not decline after the introduction of early retirement benefits in the CPP (1987) and QPP (1984). Baker and Benjamin (1999) examined this expansion of the C/QPP and found a significant increase in CPP and QPP benefit take-up once early retirement benefits became available. They did not, however, find a corresponding decrease in labour force participation of 60-64 year olds. They suggest the increase in take-up was among those least attached to the labour market. The lack of change in poverty rates suggests many 60-64 year-olds merely switched from other government transfers (such as social assistance) to C/QPP once possible.[17]

Similarly, the ERPM poverty rates of 55-59 year olds averaged 15 percent over the 1977-2008 period with no distinct changes in trend. Poverty rates for 25-54 year olds tended to

be lower, and there appears a slight increase after 1990. The 'ERPM' (LICO) poverty rate for 25-54 year olds averaged 12 (9) percent over the 1976-1989 period and 14 (11) percent over the 1990-2008 period.[18]

An interesting distinction to make between seniors (65+) and younger individuals is the extent to which individuals have income that is just above or below the poverty thresholds. A closer examination of the ERPM poverty rates in Figure 3 exemplifies this. Here, the ERPM poverty rate thresholds are varied slightly. For example, the standard for the ERPM threshold is set at 50 percent of the median working age income, resulting in a 1977-1979 senior poverty rate of 38 percent. Alternatively, if we set the ERPM threshold slightly lower at 45 percent of median income (to represent relatively 'deep' poverty) the 1977-1979 senior poverty rate is 31 percent . Setting the ERPM threshold higher at 55 percent of median income would raise the 1977-1979 senior poverty rate to 45 percent. Using these figures as a metric for the portion of seniors with income near the ERPM, there were 14 percent of seniors with income near the ERPM in 1977-1979.
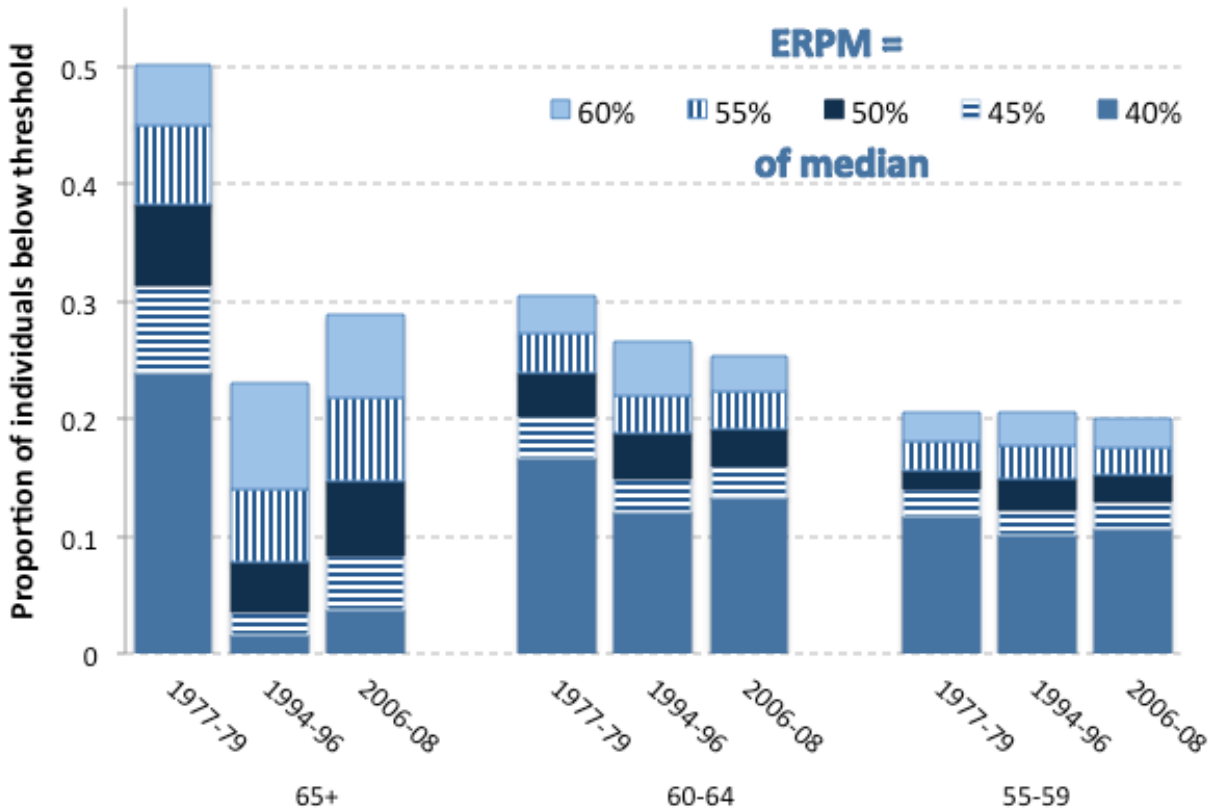
Figure 3. ERPM poverty rates, by age group, years, and threshold choice.
Note: The ERPM threshold is defined as 50% of the median income of 25-54 year olds.
Thresholds used here modify this standard, from 40% to 60% of the median income of 25-54 year olds.
Source: Author's tabulations, SCF (1977-1979 and 1994-1996) and SLID (2006-2008).

In 1994-1996 and 2006-2008, we see a very different scenario for seniors. When the ERPM is set at 40 percent of median income, the senior poverty rate in 1994-1996 is only 1.5 percent. This senior poverty rate is more than doubled (to 3.6 percent in 1994-1996) by raising the threshold to 45 percent of median income and more than doubled again (to 7.8 percent) when the ERPM is set at 50 percent of median income. At 55 percent of median income, the senior poverty rate in 1994-1996 is 14 percent. Here, more than 10 percent of seniors appear to have incomes very close to the ERPM threshold in 1994-1996, despite the very low poverty rates among seniors. The patterns for younger age groups are more in

line with what we expect – the income distribution is such that slight changes in the poverty threshold will change poverty rate estimates in a more uniform manner.

The large number of seniors with income near the ERPM threshold (50 percent of median income) in part represents those who largely rely on OAS and GIS income. For example, the October-December 2008 maximum OAS and GIS benefit amounted $14,034 annually for an unmarried individual age 65 and $22,749 (or $16,085 in equivalent family income) for a married couple (both age 65). The 2008 ERPM threshold was $19,721 (in 2008 dollars). If set at 45 percent of the median income, the ERPM threshold would be $17,749.

While the trends presented here would lead the reader to reasonably conclude that retirement income policy plays an important role when explaining senior poverty rates, it is also clear that other factors must be at play – especially after the mid-1990s. In Table 1, mean characteristics of seniors (for the time periods analyzed more closely in the next section) are presented.

Table 1. Characteristics of Seniors (Age 65+)

	SCF		SLID	
	1977-1979	1994-1996	1994-1996	2006-2008
Years education	9.72	10.64	10.45	11.35
Portion with:				
Junior high and less	0.561	0.385	0.385	0.275
High school	0.312	0.359	0.322	0.329
Some post sec.	0.034	0.034	0.054	0.065
Post secondary	0.059	0.159	0.180	0.222
University	0.034	0.063	0.059	0.109
Age	72.9	73.5	73.5	73.9
Male	0.442	0.432	0.426	0.448
Married	0.561	0.582	0.588	0.619
Independent	0.723	0.785	0.801	0.799
Canadian born	0.701	0.774	0.754	0.729
English mother tongue	0.604	0.578	0.549	0.516
Urban	0.817	0.830	0.835	0.796
Province				
Atlantic	0.097	0.083	0.090	0.081
Quebec	0.241	0.240	0.247	0.256
Ontario	0.370	0.381	0.357	0.374
Manitoba	0.052	0.043	0.039	0.036
Saskatchewan	0.050	0.041	0.047	0.034
Alberta	0.067	0.075	0.083	0.083
British Columbia	0.123	0.136	0.137	0.137
Portion below ERPM	0.384	0.078	0.089	0.145
Portion below LICO	0.286	0.090	0.087	0.049
N	23231	32443	17509	27834

Note: Sample of individuals age 65 and over.
Source: Author's tabulations based on the SCF and SLID.

In Table 1, we see that the educational attainment of seniors has clearly increased over time, as the average number of years of education increased by nearly two from 1977-1979 to 2006-2008. This reflects a large increase in the portion of seniors that had obtained a university degree and other post-secondary education. This also reflects the fact that substantially fewer individuals dropped out of school before reaching high school. As education is an important predictor of career earnings, we should expect education and retirement income also to be closely related.

The population of seniors has 'aged' with increases in life expectancy – with the average age in this sample rising from 72.9 in 1977-1979 to 73.9 in 2006-2008. Interestingly, there have been important gender differences in the change in life expectancy. In 1979, male and female life expectancy at age 65 was 14.6 and 19.0 years, respectively.[19] In 2006, life expectancy at age 65 had increased to 18.2 and 21.4 years for men and women, respectively. The gender differences in life expectancy may not, however, help explain the variation in the portion of seniors that are male. Despite men's greater increase in life expectancy, there appears a slight decrease in the portion of seniors that are male from 1977-1979 to 1994-1996. From 1994-1996 to 2006-2008, the portion of seniors that are male increases.[20]

The increase in life expectancy has coincided with changes in senior family composition. The portion of seniors that are married has increased over time, despite stable divorce rates and declining marriage rates in Canada (see Ariizumi et al. 2012) – we might relate

this in part to the gender differences in increased life expectancy. There was also a substantial increase in the portion of seniors living independently of their extended families over the 1977-1979 to 1994-1996 period, with no significant change thereafter. There could be many factors underlying this trend – the central candidate being the increased generosity of Canada's public pension system, providing many low-income seniors with a base level of financial independence. It could also reflect increases in healthy life expectancy, as more seniors were able to independently care for themselves longer in 1994-1996 than in 1977-1979. However, there is not a continued increase in independence after the mid-1990s.

The ethnic composition of Canadians also appears to change over time, however the nature of immigration and language trends is not easily summarized given the history of immigration policies and immigrant source countries in Canada (Green and Green 1999). The majority of seniors are Canadian born, and there was an increase in the portion of seniors that were Canadian born over the 1977-1979 to 1994-1996 period. However, there was a decline in the portion of seniors who declared English as their mother tongue over the same period. Over the 1994-1996 to 2006-2008 period, both the portion of seniors that are Canadian born and the portion who declared English as their mother tongue declined.

There have been a few changes in the geographic composition of seniors. From 1977-1979 to 1994-1996, there was an increase in the portion of seniors that lived in urban areas. From 1994-1996 to 2006-2008, however, the portion of seniors that lived in urban areas actually declined – despite general increases in the portion of the general population living

in urban areas.[21] The provincial composition of seniors varies slightly over time, but there are no clear patterns from Table 1.

5. Model Results

We are interested in examining the changes in senior poverty rates and gauging the extent to which these changes can be associated with the changes we've seen in seniors' characteristics, as discussed in the previous sections. The analysis takes the standard approach associated with Oaxaca-Blinder decompositions, whereby a linear probability model (LPM) is used to predict the likelihood of poverty conditional on the characteristics of interest. The regression results are then broken down and used to describe (i) the portion of the total change in poverty associated with changes in average characteristics and (ii) the portion of the total change in poverty accounted for by changes in the extent to which the characteristics influence the likelihood of poverty. In what follows, these will be referred to as (i) composition effects and (ii) structure effects, respectively.

Given the change in poverty and other trends in the mid-1990s, it is practical to break the analysis into two parts. In this study, the reduction in senior poverty from 1977-1979 to 1994-1996 will be analyzed separately from the change in senior poverty from 1994-1996 to 2006-2008. The results from the 1977-1979 to 1994-1996 period will be the focus of the discussion, since there are the much larger changes in poverty and policy over this period than in the 1994-1996 to 2006-2008 period. The results from the 1994-1996 to 2006-2008 period are intriguing because different measures of poverty indicate different trends over

this period. Recall that on one hand, the portion of seniors with income below LICO fell slightly after the mid-1990s. On the other hand, the portion of seniors with income below the ERPM threshold increased. Comparisons over the two periods' results will help us better understand how poverty changes and the relative importance of factors contributing to those changes. It is worth emphasizing that if, for example, we were to examine the change in ERPM poverty rates from 1977-2008, the change in trend in the mid-1990s would be completely masked. This reversal in trend could reflect changes in many factors and changes in each factor's influence on poverty; only a separate analysis of the two time periods would be able to capture such changes.

In what follows, I begin with a description of the LPM results in Tables 2 and 3, emphasizing temporal changes in the estimated effect of each covariate on the likelihood of poverty. Differences across poverty measures are also considered. This is followed by a discussion of decomposition results.

The effect of covariates on the likelihood of poverty

The LPM results are presented in Table 2 (ERPM poverty) and Table 3 (LICO poverty). Probit model estimates (marginal effects) are presented alongside the LPM estimates for comparison. Note that there are few differences between the models' results.

Table 2. LPM and Probit Estimates, ERPM Poverty

	Dependent Variable: After Tax Income Below the ERPM							
	Linear Probability Model (coefficients)				Probit Model (marginal effects)			
	SCF		SLID		SCF		SLID	
	1977-79	1994-96	1994-96	2006-08	1977-79	1994-96	1994-96	2006-08
Years education	-0.0305	-0.0071	-0.0078	-0.0161	-0.0362	-0.0065	-0.0061	-0.0144
	(0.0014)	(0.0006)	(0.0007)	(0.0006)	(0.0023)	(0.0007)	(0.0009)	(0.0008)
Age	0.0051	-0.0010	-0.0005	-0.0014	0.0060	-0.0009	-0.0005	-0.0012
	(0.0005)	(0.0002)	(0.0003)	(0.0003)	(0.0007)	(0.0002)	(0.0004)	(0.0004)
Male	-0.0037	-0.0127	-0.0094	-0.0086	-0.0083	-0.0108	-0.0083	-0.0125
	(0.0062)	(0.0031)	(0.0045)	(0.0041)	(0.0098)	(0.0030)	(0.0057)	(0.0055)
Married	-0.2253	-0.1230	-0.1347	-0.1937	-0.2509	-0.1145	-0.1254	-0.1864
	(0.0065)	(0.0032)	(0.0046)	(0.0044)	(0.0102)	(0.0042)	(0.0072)	(0.0073)
Independent	0.3712	0.0574	0.0610	0.1494	0.3742	0.0375	0.0415	0.1116
	(0.0067)	(0.0035)	(0.0053)	(0.0051)	(0.0081)	(0.0027)	(0.0053)	(0.0044)
Canadian born	-0.0186	-0.0100	-0.0030	-0.0240	-0.0200	-0.0100	-0.0094	-0.0226
	(0.0069)	(0.0039)	(0.0053)	(0.0052)	(0.0110)	(0.0047)	(0.0092)	(0.0083)
English	-0.0325	-0.0182	-0.0286	-0.0148	-0.0359	-0.0145	-0.0244	-0.0139
	(0.0074)	(0.0039)	(0.0054)	(0.0052)	(0.0115)	(0.0040)	(0.0077)	(0.0070)
Urban	-0.1211	-0.0183	-0.0211	-0.0484	-0.1479	-0.0180	-0.0202	-0.0528
	(0.0078)	(0.0039)	(0.0058)	(0.0050)	(0.0116)	(0.0037)	(0.0059)	(0.0065)
Atlantic	0.1118	0.0530	0.0711	0.1134	0.1347	0.0547	0.0865	0.1225
	(0.0108)	(0.0056)	(0.0081)	(0.0079)	(0.0142)	(0.0063)	(0.0136)	(0.0101)
Quebec	0.0599	0.0497	0.0306	0.0738	0.0737	0.0416	0.0338	0.0682
	(0.0090)	(0.0046)	(0.0066)	(0.0063)	(0.0156)	(0.0066)	(0.0125)	(0.0102)
Manitoba	0.0953	0.0222	0.0588	0.0143	0.1110	0.0244	0.0689	0.0163
	(0.0136)	(0.0073)	(0.0111)	(0.0108)	(0.0184)	(0.0068)	(0.0160)	(0.0101)
Saskatchewan	0.0422	0.0272	0.0556	0.0687	0.0471	0.0280	0.0626	0.0708
	(0.0139)	(0.0075)	(0.0104)	(0.0113)	(0.0153)	(0.0066)	(0.0139)	(0.0114)
Alberta	0.0147	-0.0099	0.0234	-0.0515	0.0175	-0.0082	0.0347	-0.0597
	(0.0121)	(0.0057)	(0.0080)	(0.0075)	(0.0159)	(0.0061)	(0.0142)	(0.0073)
British Columbia	-0.0137	0.0160	0.0351	0.0358	-0.0130	0.0183	0.0406	0.0447
	(0.0095)	(0.0045)	(0.0066)	(0.0062)	(0.0153)	(0.0062)	(0.0128)	(0.0108)
Constant	0.2691	0.2731	0.2487	0.4711				
	(0.0400)	(0.0194)	(0.0276)	(0.0254)				

Notes: Standard errors are in parentheses. Probit marginal effects are evaluated at the mean values of each covariate. Sample includes individuals age 65 and over. Income refers to the equivalent economic family income and the ERPM is set at 50% of the median equivalent economic family income among 25-54 year olds each year.
Source: Author's tabulations based on SCF and SLID.

Table 3. LPM and Probit Estimates, LICO Poverty

	Dependent Variable: After Tax Income Below the LICO							
	Linear Probability Model (coefficients)				Probit Model (marginal effects)			
	SCF		SLID		SCF		SLID	
	1977-79	1994-96	1994-96	2006-08	1977-79	1994-96	1994-96	2006-08
Years education	-0.0188	-0.0067	-0.0069	-0.0035	-0.0217	-0.0047	-0.0040	-0.0019
	(0.0013)	(0.0006)	(0.0006)	(0.0004)	(0.0021)	(0.0006)	(0.0007)	(0.0004)
Age	0.0029	-0.0001	0.0004	-0.0008	0.0035	-0.0003	0.0003	-0.0004
	(0.0004)	(0.0002)	(0.0003)	(0.0002)	(0.0007)	(0.0002)	(0.0004)	(0.0002)
Male	0.0031	-0.0264	-0.0120	-0.0019	0.0011	-0.0170	-0.0081	-0.0025
	(0.0057)	(0.0032)	(0.0043)	(0.0026)	(0.0090)	(0.0028)	(0.0052)	(0.0029)
Married	-0.3055	-0.1634	-0.1498	-0.0952	-0.3160	-0.1332	-0.1223	-0.0767
	(0.0060)	(0.0033)	(0.0045)	(0.0028)	(0.0094)	(0.0046)	(0.0075)	(0.0054)
Independent	0.3091	0.0894	0.0840	0.0543	0.2905	0.0422	0.0417	0.0249
	(0.0061)	(0.0037)	(0.0051)	(0.0032)	(0.0071)	(0.0021)	(0.0038)	(0.0022)
Canadian born	-0.0390	-0.0284	-0.0259	-0.0306	-0.0427	-0.0207	-0.0223	-0.0210
	(0.0063)	(0.0041)	(0.0052)	(0.0033)	(0.0102)	(0.0044)	(0.0082)	(0.0046)
English	-0.0083	-0.0063	-0.0292	0.0000	-0.0067	-0.0074	-0.0231	-0.0008
	(0.0068)	(0.0040)	(0.0052)	(0.0033)	(0.0107)	(0.0036)	(0.0069)	(0.0035)
Urban	0.0604	0.0754	0.0790	0.0383	0.0689	0.0481	0.0490	0.0242
	(0.0071)	(0.0041)	(0.0056)	(0.0032)	(0.0097)	(0.0024)	(0.0043)	(0.0023)
Atlantic	0.0148	-0.0086	0.0064	0.0002	0.0124	-0.0075	0.0027	-0.0047
	(0.0099)	(0.0058)	(0.0078)	(0.0050)	(0.0123)	(0.0036)	(0.0079)	(0.0036)
Quebec	0.0470	0.0678	0.0593	0.0410	0.0568	0.0411	0.0391	0.0248
	(0.0083)	(0.0048)	(0.0063)	(0.0040)	(0.0147)	(0.0062)	(0.0112)	(0.0058)
Manitoba	0.0884	0.0295	0.0634	0.0211	0.0985	0.0257	0.0585	0.0156
	(0.0124)	(0.0075)	(0.0107)	(0.0069)	(0.0175)	(0.0062)	(0.0149)	(0.0061)
Saskatchewan	-0.0250	-0.0247	-0.0086	-0.0114	-0.0328	-0.0180	-0.0115	-0.0084
	(0.0127)	(0.0077)	(0.0100)	(0.0072)	(0.0125)	(0.0034)	(0.0072)	(0.0037)
Alberta	-0.0324	-0.0080	0.0267	-0.0176	-0.0390	-0.0041	0.0285	-0.0140
	(0.0111)	(0.0059)	(0.0077)	(0.0048)	(0.0134)	(0.0051)	(0.0117)	(0.0033)
British Columbia	-0.0009	0.0207	0.0225	0.0193	0.0014	0.0177	0.0181	0.0129
	(0.0088)	(0.0047)	(0.0063)	(0.0040)	(0.0140)	(0.0051)	(0.0097)	(0.0053)
Constant	0.1720	0.1537	0.1031	0.1437				
	(0.0367)	(0.0201)	(0.0266)	(0.0162)				

Note: Standard errors are in parentheses. Probit marginal effects are evaluated at the mean values of each covariate. Income refers to the economic family income. LICO varies by economic family size and community size.
Source: Author's tabulations based on SCF and SLID.

Not surprisingly, the results clearly demonstrate that education is a significant predictor of senior poverty. There are important changes in the estimated effect of education on poverty over time, which depends on the measure of poverty used. In 1977-1979, one more year of education reduced a senior's probability of having income below the ERPM threshold by 3 percentage points, and the LICO threshold by nearly 2 percentage points. In 1994-1996, however, the effect of an additional year of education on the likelihood of poverty moves toward zero (though remaining significant) – with an extra year of education reducing the likelihood of poverty (ERPM or LICO) by less than one percentage point. In 2006-2008, the effect of education on the likelihood of a senior being below the LICO threshold appears to be even closer to zero. However, the effect of education on ERPM poverty becomes larger – with an extra year of education reducing the likelihood of ERPM poverty by 1.6 percentage points. Note that when the models are estimated using indicator variables for levels of educational attainment, the results are qualitatively similar. For example, model estimates not presented here suggest that seniors with grade 8 education or less were 11.9 percentage points more likely than seniors with high school to have income below the ERPM in 1977-1979; this effect diminishes to 4 percentage points in 1994-1996 and then rises to 8.8 percentage points for 2006-2008.

The estimated effect of age on the likelihood of poverty is an interesting result. In 1977-1979, aging appears to have a significant positive effect on the probability of ERPM or LICO poverty. Note that if the model is estimated using a series of age indicators, the estimated coefficients show a clear age gradient in 1977-1979.[22] In 1994-1996 and 2006-2008, the effect of age becomes negative or insignificantly different from zero. When age indicators

are used in the model, the estimates suggest that the negative effect of age in Table 2 and 3 reflects a lower likelihood of seniors over age 65 to be in poverty relative to those who are age 65. Note that many of the individuals coded age 65 in this sample would have been 65 for only part of the reference year – thus potentially eligible for OAS and GIS benefits for only part of the year.

Being Canadian-born with an English mother tongue appears to reduce a senior's likelihood of poverty. In 1977-1979, Canadian born seniors were 1.9 (3.9) percentage points less likely than immigrants to have income below the ERPM (LICO) thresholds. The effect of being Canadian-born on ERPM and LICO poverty falls slightly (toward zero) for 1994-1996, but then becomes larger again for 2006-2008. Those reporting English as their mother tongue in 1977-1979 were 3 percentage points less likely than those reporting another language as their mother tongue to be below the ERPM threshold. However, having English as a mother tongue did not have a significant effect on LICO poverty. The effect of English on ERPM poverty appears to steadily diminish over time.

Family composition has a significant effect on a seniors' likelihood of poverty, and this effect changes substantially over time. In 1977-1979, married seniors were 22 (31) percentage points less likely than unmarried seniors to have income below the ERPM (LICO) threshold. The negative effect is not surprising, as the combined GIS and OAS benefits available to couples is larger than the benefits available to singles (in total income or equivalent income terms). Those living independently (as individuals or couples) were 37 (31) percentage points more likely than those living with other economic family

members to have economic family after-tax income below the ERPM (LICO) threshold. These effects are substantially diminished by 1994-1996, however they remain fairly large and significant. The estimated effects after 1994-1996 depend on the measure of poverty used in the analysis. For ERPM poverty, the effect of being married or independent becomes larger again. For LICO poverty, however, the effect of being married or independent moves closer to zero (remaining statistically significant).

Finally, the location of residence also appears to be a good predictor of senior poverty – though the effect depends on the measure of poverty used. Living in an urban area has a significant negative effect on the likelihood of ERPM poverty in all years. This suggests that the average urban senior has income that is high relative to the average rural senior. In contrast, living in an urban area has a positive effect on the likelihood of LICO poverty. This in part reflects the fact that LICO thresholds are higher for urban than rural areas – recognizing the higher average costs of necessities in these areas. Despite the cost differential, there are no urban-rural differences in the generosity of OAS and GIS.

Decomposition results

The results presented thus far have demonstrated that (i) several characteristics of seniors have changed over time and (ii) the effect of individual characteristics on an individual's likelihood of poverty has changed over time. In what follows, a detailed decomposition of the change in poverty rates over time allows us to gauge the relative importance of each characteristic – in terms of changes in the sample average (composition effects) and in

terms of changes in each characteristics' effect on the likelihood of poverty (structure effects).

The decomposition results are presented in Table 4. The results demonstrate that most of the changes in senior poverty are related to structure effects. For example, while the total reduction in ERPM senior poverty over the 1977-1979 to 1994-1996 period was 30.61 percentage points, the total structure effects (29.47 percentage points) represent nearly 100% of the total change in the incidence of poverty. Within the detailed decomposition results, however, there are some factors that stand out.

Education appears to have both significant composition and structure effects over both time periods and for each of the poverty measures. The large increases in education observed over the 1977-1979 to 1994-1996 period are associated with a 2.8 percentage point reduction in ERPM poverty and a 1.7 percentage point reduction in LICO poverty. Over the 1994-1996 to 2006-2008 period, continued increases in education are associated with reductions in poverty (ERPM and LICO) of less than one percentage point. These results suggest that had education levels not increased over time, and observed poverty rates among seniors may have been slightly higher.

Table 4. Decomposition Results, Change in Poverty Rates

| | A.1977-79 to 1994-96 | | | | | |
| | ERPM | | | LICO | | |
	Composition	Structure	Overall	Composition	Structure	Overall
Years education	-0.0280**	0.2488**	0.2208	-0.0172**	0.1280**	0.1108
Age	0.0031**	-0.4482**	-0.4451	0.0018**	-0.2249**	-0.2231
Male	0.0000	-0.0039	-0.0039	0.0000	-0.0128**	-0.0128
Married	-0.0048**	0.0596**	0.0548	-0.0065**	0.0827**	0.0763
Independent	0.0232**	-0.2465**	-0.2233	0.0193**	-0.1725**	-0.1532
Canadian born	-0.0014**	0.0067	0.0053	-0.0029**	0.0082	0.0053
English	0.0009**	0.0083	0.0091	0.0002	0.0011	0.0013
Urban	-0.0015**	0.0854**	0.0839	0.0008**	0.0124	0.0132
Province	-0.0029**	-0.0089**	-0.0118	-0.0011**	0.0053	0.0042
Constant		0.0040	0.0040		-0.0183	-0.0183
Total	-0.0113**	-0.2947**	-0.3061	-0.0056*	-0.1908**	-0.1964
	B. 1994-96 to 2006-08					
	ERPM			LICO		
	Composition	Structure	Overall	Composition	Structure	Overall
Years education	-0.0070**	-0.0943**	-0.1013	-0.0062**	0.0392**	0.0330
Age	-0.0002	-0.0726*	-0.0728	0.0002	-0.0879**	-0.0877
Male	-0.0002	0.0003	0.0001	-0.0003*	0.0045*	0.0043
Married	-0.0041**	-0.0365**	-0.0406	-0.0046**	0.0338**	0.0292
Independent	-0.0002	0.0706**	0.0704	-0.0002	-0.0237**	-0.0240
Canadian born	0.0001	-0.0153**	-0.0152	0.0006**	-0.0035	-0.0028
English	0.0009**	0.0071	0.0081	0.0010**	0.0150**	0.0160
Urban	0.0008**	-0.0217**	-0.0209	-0.0031**	-0.0324**	-0.0356
Province	-0.0013**	0.0072**	0.0059	0.0004	-0.0109**	-0.0105
Constant		0.2223**	0.2223		0.0406	0.0406
Total	-0.0111**	0.0672**	0.0560	-0.0122**	-0.0253**	-0.0375

Notes: *, ** denote the effect is statistically different from zero at the 5% and 1% levels respectively.
Source: Author's tabulations based on SCF and SLID.

The education structure effects, however, are associated with increases in senior poverty over the 1977-1979 to 1994-1996 period. As the estimated coefficients in Table 2 and 3 cannot be interpreted as causal effects, it is likely inappropriate to take this result and suggest that poverty rates would have been lower had the coefficients on education not changed over time. Rather, we might say education (reflecting in part the importance of

market factors in determining poverty) became less relevant for poverty over this earlier period given changes in the economic and policy environment. Over the 1994-1996 to 2006-2008 period, there is a negative structure effect of education on the likelihood of being below the ERPM poverty threshold – reflecting an increase in importance for education in determining and individual's likelihood of ERPM poverty. In contrast, there is a positive structure effect of education on LICO poverty over the 1994-1996 to 2006-2008 period, as education became less relevant.

From Table 4, the results for the effect of independent living are also noteworthy. Over the 1977-1979 to 1994-1996 period, the increase in the portion of seniors living independently is associated with a fairly substantial increase in ERPM and LICO poverty rates. Note that the use of 1977-1979 coefficients in evaluating the composition effect (see equation 2) affects their magnitude, as the negative partial effect of living independently was much larger then. In addition, the composition effect associated with changes in independent living would be smaller in magnitude if evaluated using the 1994-1996 coefficients. The structure effects are also quite large, and I expect this result reflects many of the same things that the education structure effects do – independent living became less relevant over the 1977-1979 to 1994-1996 period in determining a senior's likelihood of poverty. With the majority of seniors living independently, this results in the negative structure effect. Also similar to education effects, there are differences between the ERPM and LICO results for structure effects of independent living for the 1994-1996 to 2006-2008 period. Independent living became more relevant as a determinant of ERPM poverty, while for LICO poverty independent living became less relevant over time.

Finally, it is worth noting the structure effects associated with age over the 1977-1979 to 1994-1996 period.[23] The large negative structure effect of age reflects the fact that seniors were no longer more likely to be in poverty as they age. As with the other structure effects, this will in part reflect changes in the policy environment.

6. Concluding remarks

The predominant (and perhaps least surprising) message that can be derived from this study's results is that retirement income policies are central to the structure of senior poverty. Although behavioral factors may have contributed to changes in the effect of characteristics like age, education, or independent living on the likelihood of poverty, the decomposition results for the 1977-1979 to 1994-1996 period clearly align with substantial changes in the generosity of GIS and C/QPP.

More recently, we have not seen substantial changes to these programs and the results for the 1994-1996 to 2006-2008 period suggest that while existing policy continues to be effective for alleviating absolute poverty among seniors, it has not been effective in terms of purely relative poverty. The results suggest that market incomes are becoming increasingly important for retirement income – while many seniors do not see their standard of living decreasing, they aren't keeping up with the working age population either.

It is worth emphasizing the point that human capital investments decisions – typically made early in the life cycle – will in part determine an individual's well-being at later stages of the lifecycle. Education policies put in place several decades ago contributed to the large increases in education levels that we have observed among seniors since the 1970s. Today's policy makers concerned with ensuring seniors' well-being 50 years hence need to place some emphasis on education and training policies directed at today's youth.

Endnotes

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[1] Hum and Simpson (2010) have demonstrated that immigrants are significantly less likely to participate in a employer-provided pension and recent immigrants are significantly less likely than earlier immigrants to make private pension contributions.

[2] Note that Milligan (2008) bases his analysis on public use data files. Given data limitations, he uses elderly families rather than elderly individuals as the unit of analysis.

[3] The Allowance provides income-tested benefits to the age 60-64 spouses of OAS recipients and the Allowance for the survivor provides income-tested benefits to age 60-64 widows and widowers.

[4] Information on YMPE indexing is in part based on OSFI (1988).

[5] This follows the language used in Fortin, Lemieux, and Firpo (2011).

[6] Though the survey is conducted in the spring of each year, throughout this paper survey years refer to the reference year for income which is calendar year prior to the spring survey.

[7] Earlier SCF files are available, however it was impossible to consistently link individuals to their families and there were important differences in sampling and variables for earlier years. As such, I chose not to use files before 1977 for this study.

[8] See Statistics Canada (2000) for a comparison of the two surveys. SLID has a longitudinal design that makes it different from SCF.

[9] Readers should note that the use of economic family income could differ from trends based on senior's census family income if the elderly are moving in with adult children as a way of managing their own low income.

[10] See Frenette et al. (2004) for a discussion of what is included in after tax income. Veall (2008) has suggested that omitting RRSP withdrawals may not be as relevant when studying poverty as lower income seniors have few investments and capital gains.

[11] Note that the bulk of the analysis in this paper had been repeated using a LIM poverty rate. The results were not substantially different than those based on the ERPM. Given the clearer interpretation of the ERPM over the LIM in the context of senior poverty, the decision was made to focus on ERPM poverty rates.

[12] In 1992, the average family (regardless of size) spent 43 percent of their after-tax income on necessities.

[13] See Fortin, Lemieux, and Firpo (2011) for a good discussion of the omitted group problem in decompositions.

[14] Only in the province of Quebec is English a mother tongue for a minority of seniors. Among Quebec's non-English seniors, a significant portion have a language other than French as their mother tongue. Note that residence in Quebec is also accounted for in the analysis that follows.

[15] This poverty figure closely matches the figure published by Statistics Canada (Cansim Table 202-0802).

[16] The ERPM poverty figures for younger age groups are based on the author's tabulations using the SCF, SLID, and a comparable samples of younger individuals.

[17] Attempts were made by the author to identify in the SCF a differential increase in the lower income deciles between Quebec and the rest of Canada when early retirement

benefits were introduced. There were no significant differences or changes in income deciles in 1984 or 1987.

[18] For a sample of 25-54 year olds, 'ERPM' is not really an appropriate term as this group is not elderly and represents the ERPM's reference population. The same ERPM threshold is applied throughout. However, for this age group the term LIM might be more appropriate.

[19] Statistics Canada Cansim Table 102-0025.

[20] This closely matches tabulations based on Statistics Canada Cansim Table 051-0001, whereby the portion of seniors (age 65 and over) male was 43.6% in 1997, 42.2% in 1995, and 44.0% in 2008. It is likely part of the change in trend relates to mortality rates of these birth cohorts at younger ages, given their participation in first and second World Wars.

[21] According to Statistics Canada Census of the Population, 76%, 78%, and 80% of the Canadian population lived in urban areas in 1981, 1996, and 2006, respectively.   See http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/demo62a-eng.htm

[22] Estimates are available from the author upon request.

[23] The positive composition effects are relatively small, and are dependent on the use of 1977-1979 coefficients in equation 2.

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