

Income Security During Retirement in Ontario

Prepared for

The Ontario Expert Commission on Pensions

by

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Executive summary

The results outlined in this summary are from a special report made by Statistics Canada, which was commissioned by the OECF to examine the economic welfare of Ontario workers following retirement. More specifically, the report uses a rich source of longitudinal data to track the income levels of workers who had at least \$10,000 in earnings at age 55 over a period of more than 20 years as they enter retirement and provides a number of statistics about the degree of financial well-being enjoyed by workers long after retirement (mainly by focusing on family income after taxes – i.e., family disposable income).

Results indicate that, on average, family income peaks at around age 60, then declines to around age 68, and remains stable thereafter. However, this pattern varies tremendously depending upon where one is located in the income distribution. There is little change, on average, in the income levels of lower income people as they move through retirement, while individuals near the top of the income distribution experience significant declines in income through retirement, on average.

Regarding the role of the various income components, earnings not surprisingly account for the majority of the family income around age 55. This is true for both higher- and lower-income individuals.

By their late 60s, public pensions (including the C/QPP, the OAS and the GIS) accounted for about half of the income among the bottom quintile individuals, and private pensions and RRSPs accounted for only 20%. Among top quintile individuals, public pensions accounted for a small part of total income, while private pensions, investments and capital gains together accounted for about 60%.

More recent cohorts of retirees (say those aged 54 to 56 in 1998) have higher family income levels than their earlier counterparts (say those aged 54 to 56 in 1983) as they enter retirement, largely because of higher levels of private pension benefits received by these more recent cohorts. Whether these increased benefit levels will continue for future cohorts is unknown, because private pension coverage has been falling among younger workers.

A replacement rate is an individual's income at any age, say 65, compared with his income at age 55. Among individuals aged 55 in 1983, median replacement rates started falling below 1.0 at around age 62, fell to about 0.8 by their late 60s and then remained stable.

However, these results were quite different for low-income and high-income individuals. Among poorer individuals (in the bottom quintile) median replacement rates remained at about 1.0 throughout their retirement. Individuals in the top quintile experienced a larger drop in replacement rates, to around 0.7 by their middle 60s, since they were starting from a much higher income base at age 55.

In addition to variation in replacement rates *across* the income distribution, there is variation in rates *within* income quintiles. Individuals with virtually identical family incomes at age 55 can obviously have very different replacement rates in retirement. Focusing on the middle income quintile, analysis indicates that high replacement rate individuals are distinguished from low

replacement rate individuals (from the same income quintile at age 55) by employment earnings early in retirement, plus investment and capital gains, and in later retirement, access to private pension income.

The evidence suggests that there has been little change in the pattern of replacement rates across cohorts. More recent cohorts (e.g., those age 54 to 56 in 1995) appear to have similar patterns of replacement rates as they age as retirees in the 1983 cohort.

In addition to income level and replacement rates, income instability can be an issue for retirees. Income instability can be defined as the amount of year to year variation in income levels for any individual. High levels of income instability can lead to consumption issues in some years, and possibly emotional stress.

With respect to income instability, two main conclusions can be drawn from this report. First, poorer individuals have higher levels of income instability than richer individuals during their late 50s and early 60s, but as the pension income kicks in and stabilizes incomes, the gap in income instability between the rich and poor disappears. Secondly, income instability declines for all groups as they age, largely because of the stabilizing effect of public pension income sources.

1. Introduction

In Ontario, as well as in all other major industrial economies, the aging of the population poses a number of challenges to the pension system. One of these challenges is whether defined benefits plans will continue to guarantee a minimum level of financial well-being to seniors, as the proportion of retirees under occupational pension plans will dramatically increase relative to active wage earners. In order to examine these questions, the Ontario minister of Finance recently appointed an expert commission—the Ontario Expert Commission on Pensions (OECF). The mandate of the commission includes a review of the legislation related to the pension system and a review of the economic and social developments that are related to the pension system.

One particular issue of interest to the commission is the extent to which the pension system guarantees a minimum level of financial security to Ontario seniors. Therefore, we have been asked to produce a number of indicators that can be related to the degree of financial preparedness for retirement, with a special focus on Ontario residents. These indicators include (1) an examination of income levels after retirement for various cohorts of Ontarians; (2) a description of the relative contributions made by earnings, public pensions, private pensions, investment income and other sources in providing income security during retirement; (3) retirement income replacement rates; and (4) an examination of the degree of income instability experienced by Ontario seniors.

This paper is a replica of a very similar paper written by the same authors about income security during retirement among all Canadians. By and large, the results obtained at the Ontario level do not differ from the Canadian results as a whole, yet this paper is useful for the Commission as it contains precise numbers for Ontarians.

In this paper, we proceed as follows. In Section 2, we review some of the literature associated with financial security during retirement years. Section 3 describes the data and the methodology we use in this paper. In Section 4, we examine income levels and the evolution of income sources after retirement. Section 5 discusses the results associated with replacement rates. Finally, Section 6 provides some information about income instability at various stages of the retirement period, or the degree of year-over-year variation in income levels.

2. Background

In Canada, the pension system has two major objectives: alleviate poverty among the elderly, and prevent a significant fall in living standards between pre-retirement and post-retirement (Task Force on Retirement Income Policy, 1979). In order to achieve these objectives, the government intervened by establishing public pension regimes and by helping to finance private pension regimes by using an array of tax incentives. The public pension schemes took the form of Old Age Security programs, which pays a basic amount of money to all eligible Canadians aged 65 or more; and the Canada Pension Plan, which pays benefits to workers who made contributions during their working years. Private pension schemes took the form of employer-sponsored Registered Pension Plans (RPPs) and individually based Registered Retirement Saving Plans (RRSPs). These tools have remained largely unchanged over the past 25 years and are likely to become important sources of revenue for an increasing number of Canadians (and Ontarians) in the near future (Myles 2006).

Is our pension system effective in achieving the two objectives mentioned above? With respect to the first objective, it appears that Canada (and Ontario) is doing well. For example, other studies have shown that the pension system has been relatively effective in keeping seniors out of low income (Myles 2000) and in improving the purchasing power among the elderly (Baldwin 2006).

However, much less is known about the second objective, or the extent to which pre-retirement lifestyles can be maintained for a long time after retirement. In the United States, it is possible to find some longitudinal studies that have investigated the degree of income security among seniors by using the concept of income replacement rates. Replacement rates are based on income earned during retirement, expressed as a percentage of the level of income earned by individuals during their working years. This concept has been used on several occasions in the United States to evaluate the degree of income security during retirement, most notably by a seminal piece by Smith (2003), who calculates retirement income replacement rates over a period of 25 years. Smith shows that (1) replacement rates change over the course of the retirement years; (2) replacement rates are very sensitive to the position in the income distribution; and (3) that the pension system offered high replacement rates for low-income households.

What about Canada? Originally, the pension system was designed to provide income replacement corresponding to 60% or 70% of the level of earnings enjoyed prior to retirement, and public pensions were intended to pick up approximately 40% of the tab (Li 2006, Department of Finance 2005). Until very recently, however, it was not possible to verify if the Canadian pension system was up to the task. The lack of information about the degree of financial well-being after retirement partly stemmed from the absence of a dataset that could provide the opportunity to observe the income levels of a specific cohort of seniors over a sufficiently long period of time. This obstacle is now removed with the development of a rich longitudinal income dataset—Statistics Canada’s longitudinal administrative databank—that makes it possible to track individuals for two decades as they enter retirement.

In a short article, Gower (1998) made a courageous attempt to evaluate the degree of income security during retirement in Canada, using data from a LAD that was only 14 years old at the time. Gower selected a cohort of individuals who were aged at least 55 in 1992, who obtained at least 50% of their income from employment sources in that year, and who had no employment income by 1995. He computed income replacement rates among these, corresponding to the income level of 1995 expressed as a share of the income level they earned in 1992. He found an average income replacement ratio of 58% among all individuals, and also found that those that were in the bottom part of the income distribution in 1992 had much higher replacement rates in 1995 than those who were in the middle and in the top of the income distribution. However, Gower could not examine income replacement rates in the long run, and did not examine the sources of income that contribute the most to the income security of seniors. To our knowledge, our paper is the first Canadian study that investigates income security over a long period of time following retirement—and it is certainly the only one that does so with a focus on Ontario.

In our paper, we develop a number of statistics related to the degree of income security during retirement among Ontario residents, very much in the spirit of Smith (2003). These include income replacement rates over two decades for all individuals and at various points of the income distribution, but also an examination of the *distribution* of replacement rates, which may

also vary considerably across individuals. We also provide insightful information about changes in the sources of income over the course of retirement years.

Another important aspect of income security is the degree of income instability, or year-over-year variation in income levels experienced by seniors. Indeed, Morissette and Ostrovsky (2005) have shown that income instability could vary across the working lives of individuals, with younger workers experiencing more instability, and older workers experiencing more stability. Morissette and Ostrovsky also demonstrated that working individuals in the bottom of the earnings distribution experience more instability than other workers. This is important, as it suggests that seniors—and most especially low-income seniors—may also experience some form of income instability, which may create a good deal of anxiety and stress among them. Hence, we use the variance decomposition techniques used in Morissette and Ostrovsky to investigate the degree of income instability experienced by seniors at various stages of the retirement period. We also investigate if instability is higher among individuals that, prior to retirement, were in the bottom of the income distribution.

3. Data

The Statistics Canada's longitudinal administrative database (LAD) is a random 20% sample of the T1 family file, a yearly cross-sectional file of all taxfilers. Individuals selected for the LAD are linked across years to create a longitudinal profile of each individual. The LAD contains demographic, income, and other taxation information for the period 1982 to 2005, which makes it possible to track individuals for a maximum of 23 years. As a result, it is possible to follow the evolution of the financial situation of individuals after retirement over a long period. Our focus is on six cohorts of Ontarians who were aged from 54 to 56 years old in 1983, 1986, 1989, 1992, 1995 and 1998 and who earned at least \$10,000 at this age (in 2004 constant dollars). It was necessary to exclude individuals with less than \$10,000 in earnings because low-income individuals were less likely to be selected in the early years of the LAD, since many of them did not file a return at the time.¹ This implies that our focus is on individuals who had a significant degree of attachment to the labour market when they were in their mid-fifties.

Our six samples (one for each cohort) were constructed as follows. First, individuals who were still alive in 2005 were included if they filed an income return for every year of the period of analysis. For instance, individuals from the 1983 cohort were included in the sample if a return was filed every year from 1983 to 2005. Second, individuals who died before 2006 were also included if a return was filed for all years until the year before they died. For instance, consider an individual who was aged 55 in 1983 and who died in 1995 at the age of 67. To be included in our first sample, a return must have been filed for each of the years 1983 to 1994, that is, until the last complete year in which he was alive. Finally, since our focus is on the province of Ontario, our sample is made of individuals who were Ontario residents during the entire period of analysis.

¹ With the introduction of the GST in 1986 and the Child Tax Credit in 1992, low income individuals became more likely to file an income tax return in order to apply for various tax credits. Prior to 1992, low income individuals had fewer incentives to file. We get similarly defined cohorts by excluding all individuals with less than \$10,000 in earnings, which is close to the basic exemption amount that was used for most years in federal tax returns and above which most individuals should be expected to file.

As a result of this process, we obtain six samples with a number of observations ranging from approximately 19,425 in 1983 to 36,810 in 1998 (see Table 1 for more information). The share of women in the sample rose from 38.6% in 1983 to 43.7% in 1998, which is consistent with the higher rates of labour market participation seen among younger cohorts of women. In this paper, we use our first cohort of 1983 most often because it covers the longest time period (20 years). The other samples are used only to examine differences across cohorts.

Our measure of income is based on adult-equivalent adjusted (AEA) family income (on a constant basis), which includes the income of the spouse and all other family members in the Census family unit. For the most part, we use family income after tax because this measure of income is the best possible approximation of the level of financial well-being experienced by individuals. Our family income values are then adjusted by dividing total family income by the square root of family size, because it can be assumed that certain economies of scale accrue to people who live together in families.² Finally, income levels by age are also calculated on a ‘permanent’ basis, in order to account for temporary fluctuations that might not be representative of the true financial situation of the family. For example, the permanent income of someone aged 54 was calculated by dividing the sum of income levels reported at age 53, 54 and 55 by three.³ All income figures are expressed in 2005 dollars and have been transformed by using the consumer price index (CPI) of Statistics Canada.

Finally, this paper includes a measure of retirement income replacement rates. The concept of replacement rate has been used largely in the retirement literature, both as an indicator of welfare loss associated with retirement and as a summary index of income accumulation required to maintain basic levels of consumption during senior years. We compute replacement rates by age, using permanent income at the beginning of the period (age 54 to 56) as a benchmark because earnings are typically at their peak near this age⁴. In addition to median replacement rates by cohort, we also compute replacement rates across key points in the income distribution, again using permanent income at the beginning of the period as a benchmark to classify individuals across income groups. This is necessary because replacement rates may vary considerably across the income distribution.

4. Trends in income levels after retirement

We begin by examining the evolution of income levels among a single cohort of Ontario residents over two decades. For this purpose, we use our first cohort of workers aged 54 to 56 in 1983 and we examine the evolution of their average family adult-equivalent adjusted (AEA) income after taxes over two decades. We also calculate separate results for individuals that were in the bottom, middle and top quintile of the ‘permanent’ income distribution in 1983. The objective is to provide a sense of whether the same levels of living standards enjoyed prior to retirement can be maintained in subsequent years.

2. Changes in the family composition over time are taken into account in our calculations.

3. Individuals with less than \$1,000 in permanent AEA income were excluded from our sample, but these amounted to a very tiny portion of our sample (less than 0.1%).

4. Earnings peak at age 55, but total family income peaks around 60 years of age (see Figure 5).

The results associated with this cohort are shown in Figure 1 and indicate that income fell considerably after retirement among these. Average family income reached a peak of \$52,500⁵ around 60 years old, and then fell sharply to \$43,000 around 64 years old. Average income levels briefly came up the next year, then fell again over the next three years, and finally remained stable after age 67 to 69.

In contrast, income did not decline among individuals that were in the bottom quintile of the income distribution during retirement (Figure 2), but it should be noted that income levels in the bottom quintile were relatively low to begin with (at \$22,500 around age 55). Thus, individuals in the bottom quintile earned between \$25,000 and \$30,000 on average per year after age 59 to 61.

Unsurprisingly, individuals in the middle quintile had higher family income levels than those in the bottom quintile (Figure 3), but differences in income levels between the two quintiles became smaller over time, mainly because income fell among individuals that were in the middle quintile. In their case, income remained stable until age 59 to 61 (to \$44,800), then fell to \$38,100 at age 63 to 65, rose again the next year, and fell to approximately \$35,000 in subsequent years. As a result, differences in average income levels between individuals in the bottom and the middle quintile shrank from \$19,000 at age 54 to 56, to \$10,600 at age 75 to 77.

Family income levels declined even faster with age among individuals in the top quintile (Figure 4). The average family income of Ontario residents in the top quintile peaked to \$98,200 (equivalent to an after-tax family income of \$196,000 for a family of four) around age 60, then declined to \$74,600, rose significantly the next year (around age 65), then fell to a low of \$64,400 before rising again to reach \$78,200 at age 71 to 73. Individuals aged 54 to 56 in the top quintile typically earned 3.6 times more money than individuals in the bottom quintile (which translated into an income differential of \$60,100), but the same individuals, when aged 74 to 76 years old, earned 3.0 times more than their counterparts in the bottom quintile (an income differential of \$48,200). These results are important because they point to a significant reduction in income inequality over the course of retirement years—at least among individuals aged 54 to 56 years old in 1983.

Understanding variations in income levels requires a close examination of income sources after retirement. For this purpose, we shift our attention from AEA income after tax to AEA income before tax⁶, and we examine the share of income that came from earnings, private pensions (including RRSPs), OAS and GIS, CPP benefits, investment and interest income, capital gains, and other income sources⁷ in every year, for all individuals and for all quintiles. Results are shown in Table 2 for Ontario (among individuals aged 54 to 56 in 1983) and in Tables 3 to 5 for Ontario residents in the bottom, middle and top quintile of the income distribution.

Unsurprisingly, income largely came from earnings at age 54 to 56 (Table 2). But over the following decade, earnings were gradually replaced by other sources of income—including private pensions (including RRSPs), public pensions (including OAS/GIS) and CPP benefits—that eventually became the main sources of income during retirement. To take the full measure of

5. It is important to note that this is adult equivalent adjusted (AEA). To convert this to a number more easily recognizable, an AEA family income of \$52,500 is equivalent to a family income of \$105,000 for a family of 4.

6. In this case, it is necessary to use income before taxes because not all components of income are taxable.

7. Other income sources include employment insurance benefits and refundable tax credits.

changes in income sources and the short period of time over which these changes are taking place, the reader should note that earnings typically accounted for 82.6% of all income before taxes in 1983, when individuals were aged 54 to 56 years old. Thirteen years later, in 1996 (when the same individuals were aged 67 to 69), earnings accounted for only 20.7% of total income before taxes, while private pensions accounted for 30.3%, CPP benefits for 17.3%, OAS and GIS for 13.2%, investment gains for 14.3%, and capital gains for 3.8%.

Of note, capital gains were unusually high at ages 64 to 66, 65 to 67 and 66 to 68 (corresponding to the years 1993, 1994 and 1995). This is because there was a change in the legislation whereby individuals could no longer claim a deduction for gains realized after February 1994. As a result, individuals could report all or part of their capital gains accrued before February 23, 1994 so that they could benefit from any unused part of their \$100,000 capital gain exemption. Since capital gains can be used to offset the losses in other years, the levels of capital gains reported in 1993 were also affected, which is the year corresponding to the sudden increase in income levels observed in Figure 1.

Among individuals that were in the bottom quintile of income⁸ in 1983 (Table 3), earnings also accounted for a very high fraction of income levels at age 54 to 56 (85.6%). However, the OAS, GIS and CPP benefits accounted for a much larger portion of income during retirement. Taking 1996 (when individuals were aged 67 to 69) as an example, CPP benefits and the OAS and GIS accounted for 49.3% of income before taxes, whereas income from private pensions and RRSPs accounted for only 18.3% of income among bottom quintile individuals.

While the composition of income sources for individuals in the middle quintile closely resembled that of the cohort as a whole (Table 4), the decomposition of income sources among those that were in the top quintile of the income distribution in 1983 was different in many ways (Table 5). First, top quintile individuals derived a much larger portion of their income from investment, interest and capital gains in every year of the panel. Second, income from private sources accounted for a much larger portion of income during retirement, while income from public sources only accounted for a small portion of their post-retirement income. Again taking 1996 as an example, income from OAS, GIS and CPP benefits jointly accounted for 16.5% of total income before taxes, while income from private pensions, investments and capital gains jointly accounted for 57.2% of their total income. Finally, earnings accounted for a larger portion of income after age 65, possibly reflecting higher rates of labour market participation among highly-educated individuals.

While it is useful to look at the financial evolution of those aged 55 years in 1983, it is also important to examine the evolution of income trends by cohort. According to Myles (2000), the share of income received from private pensions rose considerably among recent cohorts of retirees, with the continued maturation of registered pensions plans (RPPs) and personal retirement accounts (RRSPs). Other studies also indicate that the labour market participation of seniors is on the rise (Horner 2007, Turcotte and Schellenberg 2007), which suggests that younger cohorts might be more likely to receive income from employment sources. These changes are fundamental and clearly underscore the need to look at various cohorts of retirees to understand the dynamics of income security after retirement.

8. Recall that individuals earning less than \$10,000 at age 54 to 56 were excluded from the sample (see Section 3). Hence, individuals with very low earnings have been excluded.

We begin with the evolution of earnings (shown in Figure 5) among Ontario residents. Earnings include all income from paid jobs, but also income from self-employment jobs and all other possible sources of employment income (at the family level, AEA adjusted). As Figure 5 indicates, earnings fell rapidly after age 54 to 56 among seniors, but some interesting differences could be noted across cohorts. For instance, average earnings levels at the beginning of the period were slightly higher among individuals from the 1998 cohort, and remained higher after age 54 to 56 among more recent cohorts of seniors—possibly reflecting higher rates of labour market participation among recent cohorts. Also, it should be noted that earnings fell faster in the early years of retirement among individuals in the 1989 cohort, who have been most affected by the recession of 1990–1992.

Figure 6 reports the levels of income received from private pensions, including income received from registered pension plans (RPPs) and private retirement accounts (RRSPs). The key finding is that the three most recent cohorts (1992, 1995 and 1998) received larger amounts of money from private pensions than the other cohorts, reflecting the important increase in pension coverage that took place among workers from the 1950s to the 1970s and the maturation of employer pensions. How much will be received from private pensions by future cohorts of retirees and from RRSPs remains to be seen, but recent declines in occupational pension coverage among younger workers may impact income received from these sources in the future (Morissette and Drolet 1998).

Another interesting fact is that the amount in benefits received for private pensions rises after age 70, which coincides with the age limit for RRSP contributions (69 years old). After the age of 69, individuals must transfer the property of an RRSP to a registered retirement income fund (RRIF), or must buy an eligible annuity. The benefits from these plans are fully taxable and must be reported in the income return as pension income, which explains why pension income from private sources suddenly rises after age 70. However, this rise is not equally shared by everyone, because high-income individuals typically receive a lot more money through these channels (see Table 5). This is consistent with the higher rates of RRSP contributions observed among high-income earners (Palameta 2003).

According to Figure 7, all cohorts similarly benefited from Old Age Security (OAS) and the Guaranteed Income Supplement (GIS) programs. The OAS/GIS provides a basic flat-rate benefit (the OAS portion) to all persons with net income below a specified amount. A supplementary benefit (the GIS portion) is allocated to those with little or no other income and an allowance provided to the spouse of OAS pensioners and widows aged 60 to 64 with limited income. The objective of the OAS/GIS is to guarantee a minimum income to all persons 65 or older.⁹ No contributions are required to benefit from these programs. The OAS and GIS programs were not affected by major policy changes in recent years, and benefits are adjusted every year by using the consumer price index (CPI). As a result, OAS and GIS benefits remained stable across cohorts and provided more than \$6,000 in benefits to its older beneficiaries.

Figure 8 shows average income received from the Canada Pension Plan (CPP). These plans were designed specifically to replace a portion of earnings that cease after retirement or disability, and

9. The OAS in its current form was implemented in 1952 and replaced the *Old Age Security Act*, which provided a flat-rate benefit to all persons aged 70 or over meeting the residency requirements. In 1967, the GIS program was implemented to improve the quality of life of low-income seniors (Maser 2003).

the objective is to provide employees with a basic retirement benefit.¹⁰ Just like the OAS/GIS, the CPP changed little over the years. As a result, the amount received from these pension plans did not change substantially across cohorts, which typically yield more than \$7,000 to its beneficiaries after age 68.

Investment gains¹¹ are important sources of income to many retired individuals and are shown in Figure 9. Interestingly, average investment gains were unusually high at age 61 to 63 for individuals in the 1983 cohort, at age 58 to 59 for individuals in the 1986 cohort and at age 55 to 56 for individuals in the 1989 cohort—all three situations corresponding to the year 1990. Because investment gains generally follow the evolution of interest rates, these results are not surprising, because interest rates were very generally high during that period—even reaching their peak in 1990. This explains why older cohorts of retirees showed higher levels of investments during that period. Of note, individuals from the 1983 cohort benefited the most from rising interest rates because investment gains also tend to rise with age.

Net capital gains are shown in Figure 10. For all cohorts, average income received from capital gains was generally low. The only exception was during the years 1993 to 1995, when there was a change in the legislation that restricted deductions for gains realized after February 1994 (as discussed earlier). As a result, all cohorts showed a boost in capital gains during the period corresponding to these three years. Finally, income received from other sources was quite low across all cohorts (results not shown).

Figure 11 shows the evolution of family income after taxes across cohorts (adult equivalent adjusted). Unfortunately, the temporary increase in capital gains induced by the change in the legislation makes it difficult to identify clear differences across cohorts in income trends. One way to deal with this is to examine total income after taxes without capital gains. This is appropriate because Figure 10 has shown that income received from capital gains is relatively low and does not vary considerably across cohorts. Results are shown in Figure 12.

Generally speaking, income levels have been higher among more recent cohorts than among earlier cohorts. Around age 60, AEA family income (without capital gains) was \$48,800 among the 1983 cohort, rising to \$54,000 among the 1998 cohort. More recent cohorts are entering retirement with higher income levels, on average. As well, income declined faster after age 55 among the older cohorts of retirees. These results are not surprising, since Figures 5 to 10 have shown that younger cohorts enjoyed similar levels of public pension benefits than earlier cohorts of retirees, but received more money from private pensions and more money from employment sources.

We also examined the evolution of family income after taxes separately for men and women. The results are shown in Figure 13 for all individuals in the first cohort, and results for the bottom, middle and top quintile are shown in Figures 14 to 16. With the possible exception of individuals in the top quintile—where men enjoyed higher income levels than women—trends in income levels did not differ much by gender. Differences in the sources of income between men and women were also quite small (results not shown). Since our focus is on family income levels

10. These plans are directed at the employed, cover all workers in Canada and are compulsory for those aged 18 or more. Contributions are made to a specified maximum level by both employees and employers with a maximum possible benefit of 25% of the average wage (up to a maximum benefit of about \$800 per month).

11. Investments include any income received from bank deposits, corporate bonds, trusts, mortgage, notes and Canada Saving Bonds. Investments also include income from dividends and net rental income.

and not on individual income levels, this is not a surprise. However, this does not necessarily mean that all aspects of income security are gender-neutral. For instance, women may be more likely than men to suffer the adverse consequences of a separation or widowhood—a situation that cannot be properly assessed by taking the methodology we use in this paper. More research will be needed to understand the impact of widowhood on income security.

5. Trends in replacement rates

As indicated in Section 3, family income replacement rates can be interpreted as the fraction of permanent family income at age 55 ‘replaced’ by the sources of income that are available during retirement (at the family level) and can be used as an indicator of welfare ‘loss’ associated with retirement. If replacement rates stay close to one, this would suggest that individuals are able to secure the same level of income year after year. Conversely, declining retirement rates would indicate that fewer financial resources are available for consumption (and saving) during retirement. We begin with a description of median replacement rates by cohort, which are shown in Figure 17.

Figure 17 shows that the evolution of median replacement rates after age 54 to 56 is remarkably similar across cohorts. Generally speaking, median replacement rates remain close to 100% until around age 60, then decline to about 80% around age 65. Furthermore, longer time series from older cohorts indicate that replacement rates remain around 80% until late in life. The main implication of this is that the Canadian pension system appears to be doing relatively well in ensuring basic standards of well-being among seniors, at least for individuals near the median.

However, some individuals could have replacement rates well below the median, and others could have replacement rates well above the median, for at least two reasons. First, the denominator itself is highly unequal, with some individuals having low permanent income at the beginning of the period, and others having very high permanent income levels. As a result, individuals with low initial income levels may enjoy higher replacement rates due to the support of public pension systems. Conversely, individuals in the top echelons of the initial income distribution may have lower replacement rates if their retirement income does not match the high level of income they enjoyed prior to retirement. Second, retirees do not necessarily have access to all sources of retirement income. For instance, individuals not covered by a registered pension plan might have lower replacement rates than others (all else equal). Hence, it is useful to examine the distribution of income replacement rates at ages 59 to 61, 64 to 66, 69 to 71 and 74 to 76 across six categories: below 40%, 40% to 60%, 60% to 80%, 80% to 100%, 100% to 150%, and more than 150%. The results are based on our first (1983) cohort of workers¹² and are shown in the first panel of Table 6.

Fully 58.1% of individuals had a replacement rate above 100% at age 59 to 61, but this proportion fell to 38.3% at age 64 to 66 and to 25.1% at age 69 to 71. Conversely, the share of individuals with a replacement rate of 60% or less increased from 6.2% around age 60 to 17.9% around age 75, indicating a movement from the top to the bottom categories of replacement rates. Nevertheless, 26.1% of all individuals aged 74 to 76 still had replacement rates above 100%, which clearly shows that the fall in replacement rates was not experienced by everyone.

12. Results for the other cohorts are not shown, but showed similar results.

Are these results a cause for concern? In other words, do individuals have low replacement because of limited access to retirement income, or simply because their permanent income was initially high? If low-income individuals aged 54 to 56 consistently had replacement rates above 100% in the following years, this would suggest that the pensions system is relatively effective in preserving the living standards of low-income seniors. Conversely, if low-income individuals had lower and lower replacement rates as they age, this would raise serious questions about the ability of the pensions system in preventing seniors from falling into abject poverty. One way to deal with this is to control for initial income levels. We do so by dividing our population into five quintiles (for each cohort) based on their permanent AEA income at age 54 to 56 and by examining the distribution of replacement rates in the bottom, middle and top quintiles of permanent income. Results for individuals in the bottom quintile are shown in Figure 18.

For most cohorts, median replacement rates were generally high among the lesser earners,¹³ and remained close or above 100% most of the time—with the exception of the 1989 cohort, which was probably more affected by the recession of 1990–1992.¹⁴ These are encouraging results, but they are not entirely reassuring. If many low-income seniors had replacement rates much below the median, this would mean that many low-income individuals cannot achieve income security during retirement, and could even face a major drop in their living standard after they retire. Hence, it is also important to examine the distribution of individuals across categories of replacement rates *within* the bottom quintile as well.¹⁵

The results are shown in the second panel of Table 6 and largely confirm that the vast majority of individuals with lesser earnings enjoyed full replacement rates until late in retirement. Indeed, about 50% of individuals that were in the bottom quintile of the income distribution still had replacement rates above 100% at age 75, and almost four out of five had replacement rates above 80% at this age. This suggests that most individuals that were in the lower echelons of the income distribution enjoy nearly full income replacement rates (or more), largely because of the importance of public pensions to low-income seniors.

One potential source for concern is the fact that many in the bottom quintile had low replacement rates. Table 6 indicates that more than 20% of bottom quintile seniors aged 70 had replacement rates below 80%, which suggests that a sizeable number of low-income seniors may be under financial duress. More research will be needed to understand why these low-income seniors experience such difficulty.

Figures 19 and 20 show median replacement rates among individuals in the third and the top quintile, respectively. Median replacement rates among individuals in the middle quintile closely resembled that of the cohort as a whole (with replacement rates above 70% for most cohorts after age 65), while replacement rates among individuals in the top quintile declined faster but also stabilized around 70% after age 65.

The results for the distribution of replacement rates among high-income individuals (shown in the bottom panel of Table 6) indicate that a certain number of top-quintile seniors have low replacement rates in old age. Only 9.4% of high-income individuals had replacement rates

13. Recall that we have excluded persons earning less than \$10,000 around age 55.

14. These results are consistent with Gower (1998), who also finds higher replacement rates among low-income Canadians.

15. The distribution of replacement rates within quintiles are also based on our first cohort of individuals aged 54 to 56 (in 1983). The distributions were similar for other cohorts (results not shown).

below 60% at age 59 to 61, but as many as 28.1% had replacement rates below 60% at age 74 to 76. Almost 60% of high-income individuals had replacement rates below 80% at the end of the period. However, it should be noted that many high-income individuals were still able to achieve full replacement rates around age 70 (about 20%).

Finally, all replacement rates results were also calculated separately for men and women, using data from the 1983 cohort. Results are shown in Figure 21 for all individuals and in Figures 22 to 24 for individuals in the first, middle and top quintile. By and large, the trends were similar for men and women. Both men and women had higher replacement rates if they were in the bottom quintile of the income distribution and lower replacement rates if they were in the top. Similar results were also found in terms of the distribution of replacement rates (results not shown). If anything, replacement rates were perhaps slightly lower for women in the bottom quintile (Figure 22). Again, the small differences between men and women are likely due to the use of family income instead of individual income.

6. Income instability during retirement

Another aspect of income security during retirement relates to the relative stability, or instability, of income sources during retirement. Instability in family income may affect the well-being of individuals in many ways, most notably by affecting consumption levels and by creating uncertainty. As a result, high income instability may create a good deal of stress and anxiety among seniors. In this section, we attempt to provide some insights about income instability, or the degree of year-over-year variation in income levels, at various stages of the retirement years. We also examine whether individuals with lesser earnings experience higher income instability.

We examine the progressiveness of income instability over six periods of time, that is, when individuals are aged 55 to 59 years, 60 to 64, 65 to 69, 70 to 74, 75 to 79, and 80 to 84. Our focus is on two cohorts of individuals from the LAD. The first cohort was aged 55 years old in 1985, and can be used to examine the degree of income instability during the first four periods mentioned above. The second cohort of individuals was aged 65 years old in 1985, which can be used to describe income instability from the age of 75 to 84.¹⁶ We still use AEA family income after taxes, but since the objective is to quantify the degree of year-over-year variation in income levels, we make use of annual income values instead of permanent income. Furthermore, we also compute instability by income tertile. Individuals were classified across tertiles by using their average family income in 1982, 1983 and 1984, in order to minimize the influence of unusually good or bad years, a problem that would plague the classification of individuals if a single year of observation was used.¹⁷

16. The use of two separate cohorts to compare the evolution of income instability might cause a problem, as it ignores the possibility of cohort effects. The use of two cohorts is necessary to examine income instability over the long run. This is because the LAD starts in 1982, which implies that income instability can be analysed just over two decades (we use the three first years of data to classify individuals across tertiles). However, cohort effects are likely to be small, and this due to two reasons: (1) individuals from the first cohort are only 10 years older than individuals in the second cohort; and (2) when comparisons could be made across the two cohorts, the trends from the first cohort did not differ significantly from those of the second.

17. We keep individuals who reported positive income levels in all years until their death (or until 2004). In the previous section, we kept individuals who reported at least \$10,000 in the first year of their respective panels to obtain equivalent samples. This precaution was not necessary for the analysis of income instability, because our sample was entirely selected in 1985. Individuals who died during the period are also kept in the sample for all completed age intervals. For instance, if an individual dies at age 67, he will be included in instability measures produced for the analysis of the age period 55 to 59, the age period 60 to 64, but not the age period 65 to 69.

We use a relatively intuitive measure to evaluate instability at the individual level; the mean absolute deviation (MAD). It can be expressed as follows:

$$MAD = \left(\frac{1}{N} \right) \sum_{i=1}^N \left[\left(\frac{1}{T} \right) \sum_{t=1}^T |y_{it} - \bar{y}_i| \right] \quad (1)$$

where:

y_{it} represents income earned by individual i in year t ;

\bar{y}_i represents the average income earned by individual i over a given period of time (for instance, when studying instability among seniors aged 55 to 59, this is the average, for each individual, of the income they earned between 55 and 59 years old).¹⁸

The MAD measures the average deviation, in percentage terms, of actual income from expected income levels during the observation period. For instance, if an individual has a MAD of 0.2, it means that his/her annual income level (over a given period of time) typically deviated from its average income level by 20% on average during that period.

Table 7 shows the levels of income instability experienced by all individuals—as well as for those who were in the bottom, middle and top tertile of the income distribution—using results from the MAD.

There are two major observations: income instability declines as the cohorts age, and lower income individuals experience more income instability than high-income individuals. Indeed, instability was relatively higher among low-income individuals at the beginning of the period, but became very similar to the instability levels of the other two groups after age 65. Between 55 and 59 years old, individuals in the bottom tertile diverted from their mean income by an average 23.0%, while individuals in the middle and the top tertile typically diverted by 14.9% and by 18.2%, respectively. Annual income deviation became much lower after age 70 (below 10%) and did not vary considerably across income groups. These results suggest that the higher levels of instability experienced by low-income individuals (due to unstable employment earnings) are eventually dampened by the stable influx of cash provided by public pensions. The main implication of this is that the pensions system not only provides income security to low-income individuals, but also strongly contributes to bring their level of income instability to more acceptable levels.

To assess the extent to which the public pensions system (and the tax system) contributes to dampen the income instability of older individuals, we turn to other income concepts: (a) market income, which includes income from earnings, private pensions, investments, and capital gains; (b) market income plus public pensions, which includes benefits from the OAS, the GIS and the CQPP; (c) total income before taxes; and (d) total income after taxes.¹⁹ The results are shown in Table 8.

18. Note that the income is standardized for the effects of age on income. See the Appendix for details.

19. For convenience, Table 5 only includes individuals who had positive market income in all years, but individuals were similarly classified across tertiles (similar boundaries).

Between 55 and 59 years old, instability in market income was relatively high among low-income individuals (mean absolute deviation was 27.0%, compared with 21.9% for all individuals). After adding pension incomes, transfers and taxes to obtain after-tax family income, instability is reduced significantly, particularly among the bottom quintile. Hence, those income sources (and taxes) do tend to reduce income instability. But even after considering the effect of these sources, instability remained marginally higher in the bottom tertile. This is not a surprise, as income mostly comes from earnings at this age.

Between 60 and 64 years old, instability in market income rose significantly, no matter which income concept is used. Higher instability in market income was likely the result of declining earnings, as many individuals choose to retire during this period. Furthermore, not everyone has access to a well-defined set of benefits from private pensions—which may also cause instability to rise. At this point, public pensions reduced instability substantially among individuals in the bottom tertile, but even after considering the effect of public pensions, low-income individuals still faced higher instability in their income than individuals in the other tertiles. With the effect of transfers and taxes, however, instability among individuals in the bottom tertile became similar to that of individuals in the other tertiles, at approximately 20%.

Instability in market income among 65 to 69 years olds remained similar to what it was for 60 to 64 years olds, but during this period, public pensions contributed more to reduce instability, especially among individuals in the bottom tertile. With the effect of public pensions, the income instability of seniors in the bottom tertile became similar to the income instability of the other two tertiles, at approximately 15%. At this point, taxes contributed little to reduce instability. Similar trends were found for the other two periods above age 70. By and large, these findings suggest that the pension system contributes to reduce income instability among seniors, in addition to providing minimum levels of income security, especially among low-income seniors.

7. Conclusion

This study is concerned with the economic welfare of individuals following retirement, and hence we use a family-income concept, usually family income after taxes (i.e., disposable family income). To account for the effect of family size on purchasing power, we adult equivalent adjust all income measures.²⁰ Adult equivalent adjusted (AEA) family income provides us with an estimate of the economic resources available to each individual in the family, assuming all individuals have equal access to the family income, and after accounting for the economies of scale associated with larger families.

Using longitudinal data to track cohorts as they age, we find that average family income peaks at around age 60, then declines to around age 68, and remains stable thereafter. However, this pattern varies tremendously across the income distribution. People at the bottom of the distribution experience relatively little change in their incomes as they age, while those at the top witness a significant decline, on average. Hence, the income gap between the poorer and richer individuals falls as the cohorts age; income inequality falls as cohorts enter and move through older retirement ages.

Regarding the role of the various income components, earnings not surprisingly account for the majority of the family income at age 55. This is true for both higher- and lower-income individuals. This latter result is, in part, due to the fact that it was necessary to exclude individuals who earned less than \$10,000 (i.e., had lower levels of attachment to the labour force) at age 55, and hence the study may miss the very poor.

By their late 60s, CPP, OAS and GIS accounted for about half of the income among the bottom quintile individuals, and private pensions and RRSPs accounted for only 18%. Among top quintile individuals, CPP, OAS and GIS accounted for only 16% of income, while private pensions, investments and capital gains accounted for 57% by the time they were in their late 60s.

Are more recent cohorts better off than their earlier counterparts as they enter retirement? Generally speaking, the answer is yes. The 1998 cohort (i.e., those who were 55 in 1998) had higher family incomes over the first few years following age 55 than the 1983 cohort. This increase is largely related to the higher levels of private pension benefits received by the more recent cohorts. Whether these increased benefit levels will continue for future cohorts is unknown. However, private pension coverage has been falling among younger workers, and could affect their benefits levels at retirement.

While private pension benefits rose among more recent cohorts of retirees, investment income fell; the decline is likely related to the fall in interest rates in recent years.

20. As a result of the AEA adjustment, the income values reported in this paper are an estimate of the economic resources available to each individual in the family, and are not the raw family income values. To interpret AEA (adult equivalent adjusted) family income in a more intuitive manner, simply multiply the AEA-adjusted value by two. The result is the disposable income for a family of four. For example, average AEA-adjusted family income for the 1983 cohort peaked at around \$52,500 at age 60. This is the equivalent of a disposable family income of \$105,000 for a family of four.

A replacement rate is an individual's AEA family income at any age, say 65,²¹ compared with their income at age 55.²² Hence, a replacement rate of 0.9 means that the individual has an AEA family income at age 65 that is 90% of that at age 55.

For the 1983 cohort, median replacement rates started falling below 1.0 at around age 60, fell to about 0.8 by their late 60s and then remained stable. However, this pattern varies tremendously, depending upon where the individual is in the income distribution. Generally speaking, among poorer individuals (in the bottom quintile) median replacement rates remain at about 1.0 throughout their retirement. Public pensions and other income sources maintain their income levels. However, as always, there are some individuals that do better than others, even in the bottom quintile. About 20% of this group had replacement rates below 0.8 by the time they were 70. Given the low base from which they were starting at age 55, this could be an issue.

Individuals in the top quintile experience a larger drop in replacement rates, since they are starting from a much higher income base at age 55. For this group, median replacement rates fall to around 0.7 by their middle 60s, and remain at that level as they age. Again, there is variation within this group, so that about 20% were able to maintain a replacement rate of 1.0 or more into their 70s.

The evidence suggests that there has been little change in the pattern of replacement rates across cohorts. More recent cohorts (e.g., those age 55 in 1995) appear to have similar patterns of replacement rates as they age as retirees in the 1983 cohort.

In addition to income level and replacement rate at any point in time, income stability can be an issue for retirees. By income stability, we mean the amount of year-to-year variation in income levels. High levels of instability can lead to consumption issues in some years, as well as emotional stress.

Generally speaking, we find that poorer individuals have higher levels of income instability than richer individuals during their late 50s and early 60s, largely because of higher levels of earnings instability (from employment) among poorer individuals. As the cohorts age, however, and the more stable benefits levels from the public pension system lead to more income stability among the poorer individuals, the gap in income stability between the rich and the poor disappears.

As a general rule, income instability declines as cohorts of retirees age, largely due to the effect of more stable pension income.

21. Actually, the average income over ages 64, 65 and 66—i.e., their permanent income at around age 65.

22. Actually, their average income over the ages of 54, 55 and 56.

Appendix: Adjustment to account for the age-earning profile of individuals

To abstract from income mobility associated with the life-cycle (because income typically falls after age 55 for all individuals), we replace the actual reported log family income by the life-cycle adjusted (log family) income. This adjustment is made as follows.

First, suppose that log earnings of individual i in period t , y_{it} , are generated by the following random-effects model:

$$y_{it} = \beta_0 + \beta X_{it} + e_i + \mu_{it} \quad (\text{A-1})$$

Where X_{it} is a vector of observable characteristics, e_i is an error term specific to the individual, μ_{it} is a general error term and where $\text{cov}[e_i, \mu_{it}] = \text{cov}[e_i, X_{it}] = \text{cov}[\mu_{it}, X_{it}] = 0$. While equation 1 assumes a common slope for the age-income profile of individuals, equation 1 allows a distinct intercept for each family (e_i). This is useful because it allows low-income individuals to have a lower ‘permanent’ income levels than high-income individuals.

We capture the age-income profile of a group of individuals by including in X_{it} a quadratic term for the age. We abstract from mobility associated with the life cycle by replacing the actual log of individual incomes y_{it} by the life-cycle adjusted (log) individual incomes derived from equation (1):

$$y_{it}^* = y_{it} - (\hat{\beta}_0 + \hat{\beta}X_{it}) = \hat{e}_i + \hat{\mu}_{it} \quad (\text{A-2})$$

Hence, all indicators we use in Section 6 can be interpreted as the extent to which individuals vary from what they should normally experience during each period.

Table 1: Sample characteristics

Cohort	Aged 54 to 56 in...	Number of observations	Men	Women
1	1983	19,420	11,925 (61.4%)	7,495 (38.6%)
2	1986	23,510	14,490 (61.6%)	9,025 (38.4%)
3	1989	26,160	15,435 (59.0%)	10,725 (41.0%)
4	1992	27,385	15,805 (57.7%)	11,580 (42.3%)
5	1995	29,755	16,810 (56.5%)	12,945 (43.5%)
6	1998	36,815	20,720 (56.3%)	16,095 (43.7%)

Source: Longitudinal Administrative Data.

Note: The numbers might not add up, due to rounding.

Table 2: Share of total AEA income before tax across various categories of income (Ontario)

Year	Age	Income before tax (\$)	Share of income by category (%)						
			Earnings	Private pensions	Investment gains	Capital gains	OAS/GIS	CPP	Other
1983	54 to 56	56300	82.6	3.7	10.7	0.9	0.0	0.4	1.6
1984	55 to 57	57600	81.1	4.9	10.2	1.6	0.2	0.5	1.6
1985	56 to 58	59400	78.5	6.2	10.6	2.4	0.2	0.7	1.5
1986	57 to 59	61400	74.9	8.0	10.7	3.6	0.2	1.1	1.3
1987	58 to 60	63800	71.2	9.9	11.0	4.9	0.3	1.9	1.1
1988	59 to 61	66100	66.7	11.5	12.0	5.6	0.5	2.7	0.9
1989	60 to 62	65700	61.8	13.5	13.9	5.2	0.6	4.0	1.1
1990	61 to 63	62100	56.8	16.1	15.3	4.3	0.8	5.5	1.3
1991	62 to 64	57100	50.8	19.6	15.6	3.5	1.6	7.4	1.6
1992	63 to 65	53400	43.6	22.7	14.2	4.5	3.2	9.9	1.9
1993	64 to 66	54400	33.8	24.1	12.1	11.0	5.7	11.8	1.7
1994	65 to 67	52300	27.0	26.0	12.2	10.9	8.8	14.0	1.1
1995	66 to 68	51000	22.4	27.5	12.9	10.0	11.0	15.3	0.8
1996	67 to 69	46900	20.7	30.3	14.3	3.8	13.2	17.3	0.6
1997	68 to 70	47400	18.4	31.6	13.7	4.9	13.5	17.3	0.4
1998	69 to 71	48400	16.5	33.5	13.8	5.2	13.4	17.1	0.4
1999	70 to 72	50300	15.1	34.4	13.9	6.6	13.1	16.5	0.4
2000	71 to 73	51200	13.9	35.2	15.0	6.3	12.9	16.2	0.4
2001	72 to 74	50600	13.2	36.0	14.4	6.1	13.2	16.6	0.4
2002	73 to 75	48600	12.6	37.2	14.6	3.9	14.0	17.3	0.4
2003	74 to 76	47400	12.0	38.0	13.5	4.0	14.3	17.7	0.4
2004	75 to 77	47700	10.9	37.9	13.6	5.2	14.5	17.8	0.4

Source: Longitudinal Administrative Data.

Note: Based on a cohort of individuals aged 54 to 56 in 1983. The percentages might not add up, due to rounding.

Table 3: Share of total AEA income before tax across various categories of income (bottom quintile, Ontario)

Year	Age	Income before tax (\$)	Share of income by category (%)						
			Earnings	Private pensions	Investment gains	Capital gains	OAS/GIS	CPP	Other
1983	54 to 56	25000	85.6	2.8	6.0	0.4	0.0	1.2	4.0
1984	55 to 57	25900	85.7	3.1	5.8	0.8	0.0	1.5	3.5
1985	56 to 58	27600	83.3	3.6	6.2	1.4	0.4	1.8	3.3
1986	57 to 59	29500	81.4	4.1	6.4	2.4	0.3	2.4	2.7
1987	58 to 60	31400	78.3	5.1	6.7	3.5	0.3	3.5	2.5
1988	59 to 61	33100	74.3	6.0	7.6	4.8	0.6	4.5	2.1
1989	60 to 62	33600	69.6	7.4	8.9	5.1	0.9	6.0	2.4
1990	61 to 63	32300	65.3	9.0	9.6	4.0	1.2	7.7	3.1
1991	62 to 64	30400	59.5	11.2	9.2	2.6	2.6	10.5	3.9
1992	63 to 65	29200	50.7	13.4	7.9	3.4	6.2	14.0	4.5
1993	64 to 66	30100	38.5	15.0	6.3	8.3	11.3	16.9	3.7
1994	65 to 67	29400	29.6	16.0	6.5	7.8	17.0	20.1	3.1
1995	66 to 68	28700	24.0	16.7	7.0	6.6	21.6	22.0	2.1
1996	67 to 69	26800	21.3	18.3	7.5	1.9	25.0	24.3	1.9
1997	68 to 70	26800	19.4	19.0	6.7	2.6	25.7	24.6	1.5
1998	69 to 71	26700	18.0	19.9	7.1	2.6	26.6	25.1	1.5
1999	70 to 72	26800	16.8	20.1	7.5	2.6	26.9	25.4	1.1
2000	71 to 73	26700	15.7	20.6	7.9	2.2	27.3	25.5	1.1
2001	72 to 74	26600	15.0	20.7	7.5	2.3	27.8	25.6	1.1
2002	73 to 75	26300	14.1	20.9	7.2	1.9	28.5	25.9	1.1
2003	74 to 76	26000	13.1	20.8	6.9	2.3	29.2	26.5	1.2
2004	75 to 77	25700	11.7	21.0	6.6	2.7	29.6	27.2	1.2

Source: Longitudinal Administrative Data.

Note: Based on a cohort of individuals aged 54 to 56 in 1983. The percentages might not add up, due to rounding.

Table 4: Share of total AEA income before tax across various categories of income (middle quintile, Ontario)

Year	Age	Income before tax (\$)	Share of income by category (%)						
			Earnings	Private pensions	Investment gains	Capital gains	OAS/GIS	CPP	Other
1983	54 to 56	49400	86.8	3.0	7.3	0.4	0.2	0.6	1.8
1984	55 to 57	50400	85.3	4.2	7.1	0.6	0.2	0.6	2.0
1985	56 to 58	51700	83.2	5.4	7.4	1.2	0.2	1.0	1.7
1986	57 to 59	52900	79.6	7.4	7.6	2.3	0.2	1.3	1.5
1987	58 to 60	53700	75.6	9.5	7.8	3.0	0.4	2.2	1.3
1988	59 to 61	54500	70.3	12.1	8.8	3.5	0.6	3.5	1.3
1989	60 to 62	53700	64.8	14.7	10.6	2.8	0.7	5.0	1.3
1990	61 to 63	51400	58.6	17.7	11.7	2.5	1.0	6.8	1.6
1991	62 to 64	48300	51.8	21.1	11.6	2.5	1.9	9.1	2.1
1992	63 to 65	45400	43.2	25.1	10.6	2.9	4.0	12.1	2.4
1993	64 to 66	45900	32.0	27.0	8.9	8.9	6.8	14.4	2.2
1994	65 to 67	44000	23.9	29.5	8.9	8.9	10.5	17.0	1.6
1995	66 to 68	43100	18.8	30.6	9.3	8.6	13.0	18.6	1.2
1996	67 to 69	39800	16.6	33.4	10.1	2.8	15.6	20.6	0.8
1997	68 to 70	39900	14.8	34.6	9.8	3.0	16.0	21.1	0.5
1998	69 to 71	40100	13.0	36.4	9.5	3.2	16.5	21.2	0.5
1999	70 to 72	41200	11.9	37.1	9.5	4.4	16.3	20.6	0.5
2000	71 to 73	41600	10.8	37.7	10.1	4.3	16.3	20.4	0.2
2001	72 to 74	41200	10.2	38.1	9.7	4.1	16.7	20.9	0.2
2002	73 to 75	40100	9.7	38.9	9.5	2.7	17.2	21.4	0.2
2003	74 to 76	39700	9.8	38.8	8.8	2.8	17.6	21.7	0.3
2004	75 to 77	40000	9.5	38.3	8.8	4.0	17.5	21.8	0.3

Source: Longitudinal Administrative Data.

Note: Based on a cohort of individuals aged 54 to 56 in 1983. The percentages might not add up, due to rounding.

Table 5: Share of total AEA income before tax across various categories of income (top quintile, Ontario)

Year	Age	Income before tax (\$)	Share of income by category (%)						
			Earnings	Private pensions	Investment gains	Capital gains	OAS/GIS	CPP	Other
1983	54 to 56	106600	76.5	4.9	16.2	1.8	0.1	0.2	0.6
1984	55 to 57	108700	74.6	6.1	15.5	2.8	0.1	0.2	0.7
1985	56 to 58	112400	71.6	7.7	15.7	4.0	0.1	0.3	0.6
1986	57 to 59	116800	68.2	9.2	15.5	5.9	0.2	0.5	0.6
1987	58 to 60	124700	64.6	10.7	15.6	7.7	0.2	0.9	0.4
1988	59 to 61	132500	61.4	11.5	16.5	8.5	0.2	1.4	0.4
1989	60 to 62	132400	57.5	13.4	18.7	7.6	0.3	2.1	0.3
1990	61 to 63	123000	53.4	15.6	21.0	6.2	0.5	3.0	0.3
1991	62 to 64	109400	48.4	19.2	21.9	5.1	0.8	4.3	0.5
1992	63 to 65	100900	42.9	21.7	20.7	6.7	1.7	5.7	0.5
1993	64 to 66	103500	35.0	22.7	17.6	14.9	2.7	6.9	0.5
1994	65 to 67	99200	30.2	24.6	17.8	14.7	4.1	8.2	0.3
1995	66 to 68	96800	27.0	26.1	19.0	13.4	5.1	9.1	0.2
1996	67 to 69	88600	26.3	29.1	21.3	6.8	6.2	10.3	0.1
1997	68 to 70	90600	23.3	31.0	20.8	8.4	6.2	10.3	0.1
1998	69 to 71	94700	20.9	33.1	21.5	8.6	6.0	9.9	0.1
1999	70 to 72	101100	18.8	34.3	21.2	10.8	5.5	9.3	0.1
2000	71 to 73	104400	17.2	35.2	23.0	10.2	5.4	9.0	0.0
2001	72 to 74	102200	16.6	36.7	21.9	10.0	5.5	9.3	0.0
2002	73 to 75	95900	16.2	39.0	22.8	6.2	5.9	9.9	0.0
2003	74 to 76	92300	15.7	40.6	21.1	5.9	6.3	10.3	0.0
2004	75 to 77	93300	13.6	40.7	21.1	8.0	6.1	10.2	0.0

Source: Longitudinal Administrative Data.

Note: Based on a cohort of individuals aged 54 to 56 in 1983. The percentages might not add up, due to rounding.

Table 6: Percent distribution of individuals across replacement rate categories (Ontario)

	Distribution of replacement rates by age (%)				
	54 to 56	59 to 61	64 to 66	69 to 71	74 to 76
<i>All individuals</i>					
<= 0.4	0.0	1.2	2.2	1.7	1.9
> 0.4 and <=0.6	0.0	5.0	12.3	15.4	16.0
> 0.6 and <=0.8	0.0	12.8	25.7	34.3	32.1
> 0.8 and <=1.0	100.0	23.0	21.5	23.5	23.9
> 1.0 and <=1.5	0.0	45.4	26.3	18.8	19.6
> 1.5	0.0	12.7	12.0	6.3	6.5
<i>Bottom quintile</i>					
<= 0.4	0.0	1.5	1.2	0.1	0.1
> 0.4 and <=0.6	0.0	4.1	4.6	1.8	2.2
> 0.6 and <=0.8	0.0	8.4	15.1	18.8	19.6
> 0.8 and <=1.0	100.0	14.9	21.1	27.4	28.2
> 1.0 and <=1.5	0.0	46.5	34.5	35.8	34.4
> 1.5	0.0	24.6	23.6	16.1	15.6
<i>Middle quintile</i>					
<= 0.4	0.0	1.0	1.5	0.9	0.9
> 0.4 and <=0.6	0.0	3.7	12.6	17.9	20.4
> 0.6 and <=0.8	0.0	13.5	30.4	39.9	36.1
> 0.8 and <=1.0	100.0	25.9	22.0	23.0	22.7
> 1.0 and <=1.5	0.0	47.9	24.7	15.2	16.2
> 1.5	0.0	7.9	8.8	3.1	3.7
<i>Top quintile</i>					
<= 0.4	0.0	1.8	4.9	5.8	5.5
> 0.4 and <=0.6	0.0	7.3	18.1	23.2	22.5
> 0.6 and <=0.8	0.0	15.6	25.0	36.1	31.3
> 0.8 and <=1.0	100.0	23.4	18.8	17.1	19.8
> 1.0 and <=1.5	0.0	38.7	23.3	12.5	15.1
> 1.5	0.0	13.1	9.9	5.3	5.8

Source: Longitudinal Administrative Data.

Note: Based on a cohort of individuals aged 54 to 56 in 1983.

Table 7: Evolution of income instability across income tertiles, Ontario¹

Mean absolute deviation in income during five-year intervals

	All	Bottom Tertile	Middle Tertile	Top tertile
	<i>MAD</i>			
During:				
55 to 59*	0.188	0.230	0.149	0.182
60 to 64*	0.209	0.237	0.185	0.205
65 to 69*	0.124	0.133	0.114	0.125
70 to 74*	0.096	0.098	0.086	0.104
75 to 79**	0.076	0.076	0.070	0.082
80 to 84**	0.087	0.081	0.082	0.099

Source: Longitudinal Administrative Data.

1: Includes all individuals with positive income after taxes in all 5 years of the interval studied.

*: Results based on a cohort of individuals aged 55 in 1985.

** : Results based on a cohort of individuals aged 65 in 1985.

Table 8: Evolution of income instability using various income definitions, Ontario¹

	<i>MAD</i>			
	All	Bottom tertile	Middle tertile	Top tertile
<i>55 to 59*</i>				
Market income	0.219	0.270	0.186	0.202
Market income + public pensions	0.200	0.239	0.167	0.193
Total income before taxes	0.193	0.226	0.160	0.190
Total income after taxes	0.179	0.204	0.148	0.182
<i>60 to 64*</i>				
Market income	0.293	0.355	0.275	0.253
Market income + public pensions	0.223	0.247	0.209	0.214
Total income before taxes	0.209	0.225	0.193	0.208
Total income after taxes	0.198	0.206	0.182	0.204
<i>65 to 69*</i>				
Market income	0.272	0.356	0.256	0.212
Market income + public pensions	0.140	0.151	0.132	0.139
Total income before taxes	0.138	0.148	0.130	0.138
Total income after taxes	0.122	0.128	0.113	0.124
<i>70 to 74*</i>				
Market income	0.214	0.296	0.186	0.169
Market income + public pensions	0.108	0.116	0.096	0.112
Total income before taxes	0.107	0.114	0.095	0.112
Total income after taxes	0.097	0.101	0.085	0.104
<i>75 to 79**</i>				
Market income	0.190	0.262	0.172	0.141
Market income + public pensions	0.088	0.090	0.083	0.091
Total income before taxes	0.087	0.088	0.082	0.091
Total income after taxes	0.077	0.077	0.070	0.082
<i>80 to 84**</i>				
Market income	0.202	0.264	0.186	0.164
Market income + public pensions	0.098	0.094	0.090	0.107
Total income before taxes	0.097	0.092	0.089	0.107
Total income after taxes	0.088	0.083	0.080	0.099

Source: Longitudinal Administrative Data.

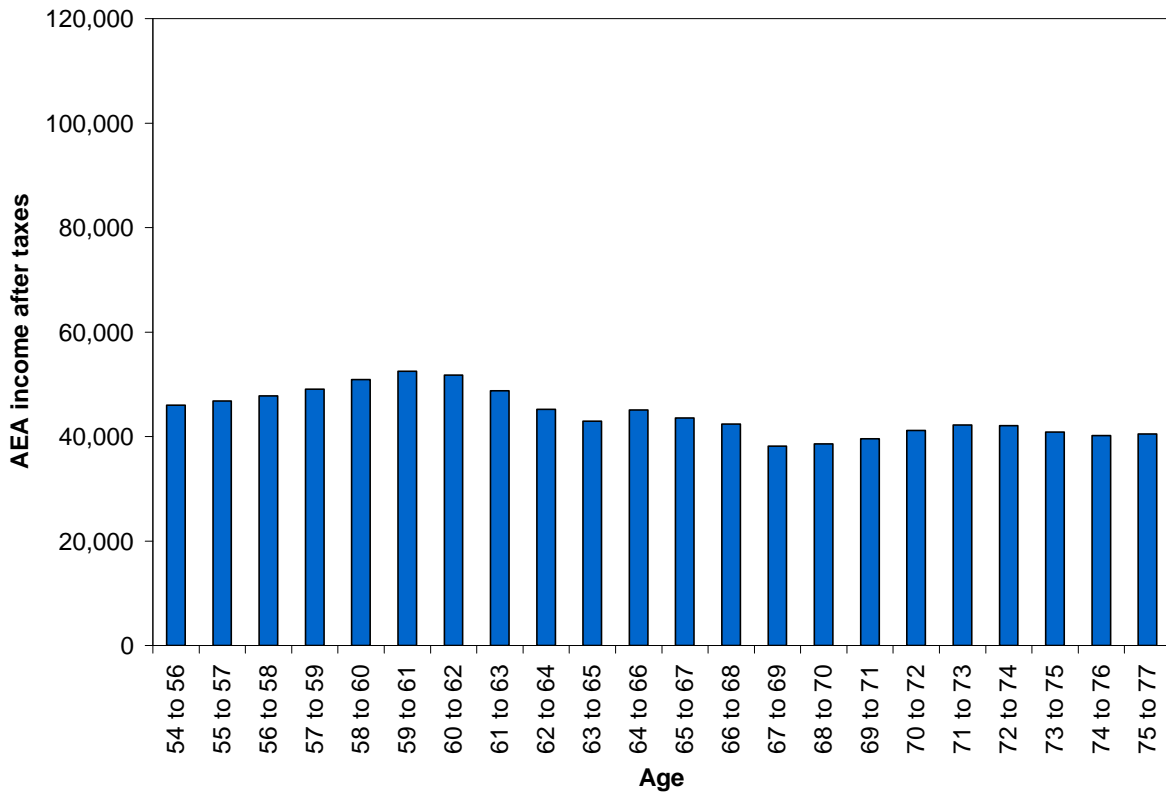
Market income includes earnings, private pensions (inc. RRSPs), investment and interest gains, and capital gains.

1: Includes all individuals with positive market income in all five years of the interval studied.

*: Results based on a cohort of individuals aged 55 in 1985.

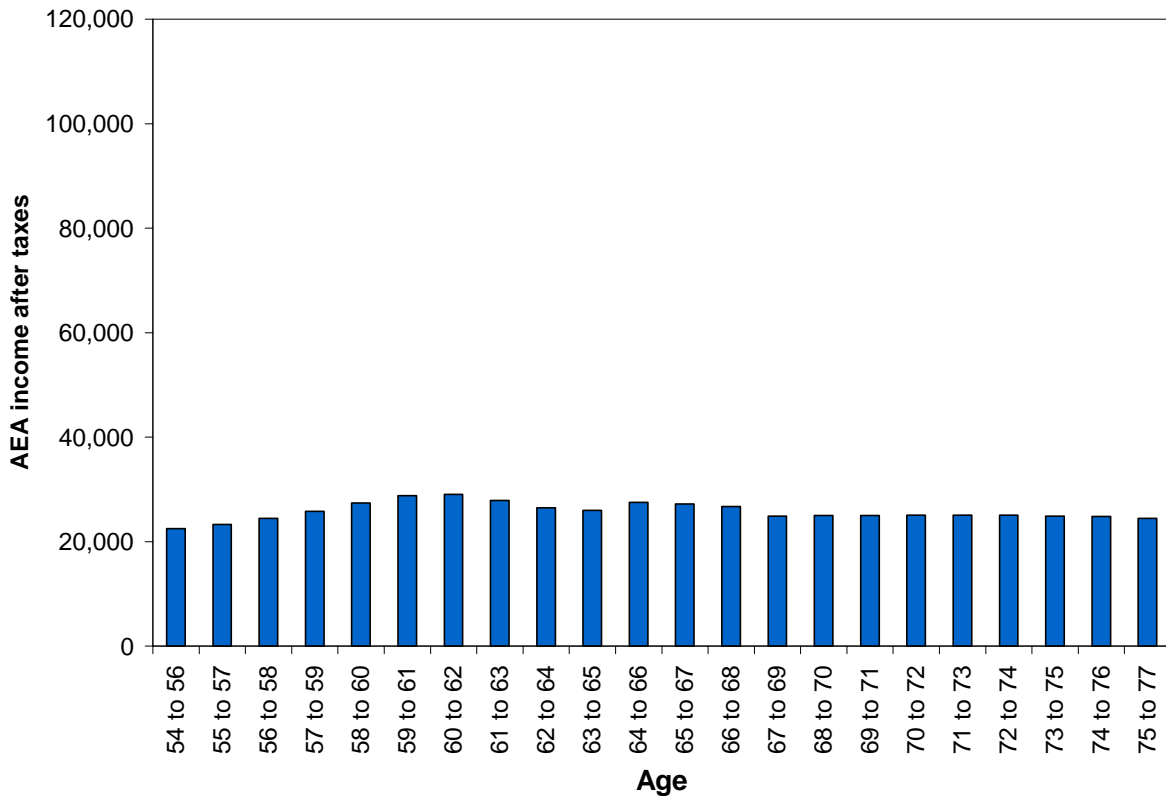
** : Results based on a cohort of individuals aged 65 in 1985.

Figure 1: Average AEA income after taxes, all individuals aged 54 to 56 years old in 1983, Ontario



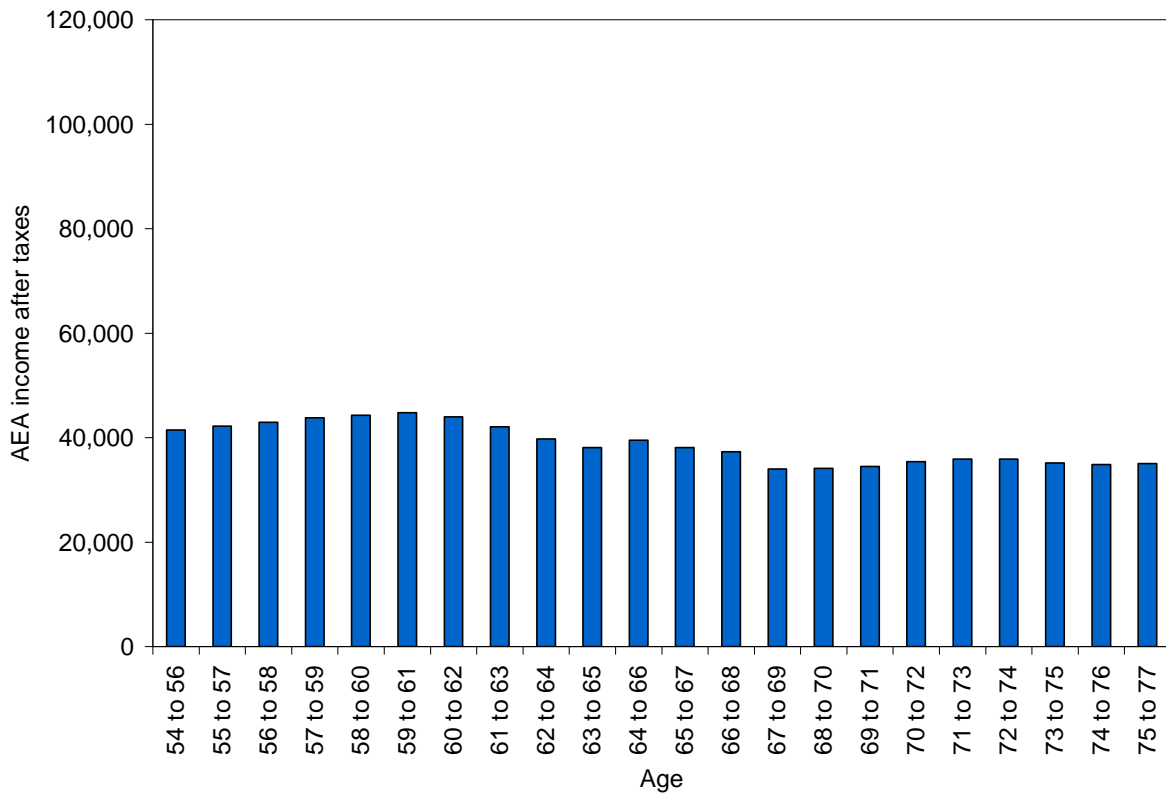
Source: Longitudinal Administrative Data.

Figure 2: Average AEA income after taxes, individuals aged 54 to 56 years old in 1983, bottom quintile, Ontario



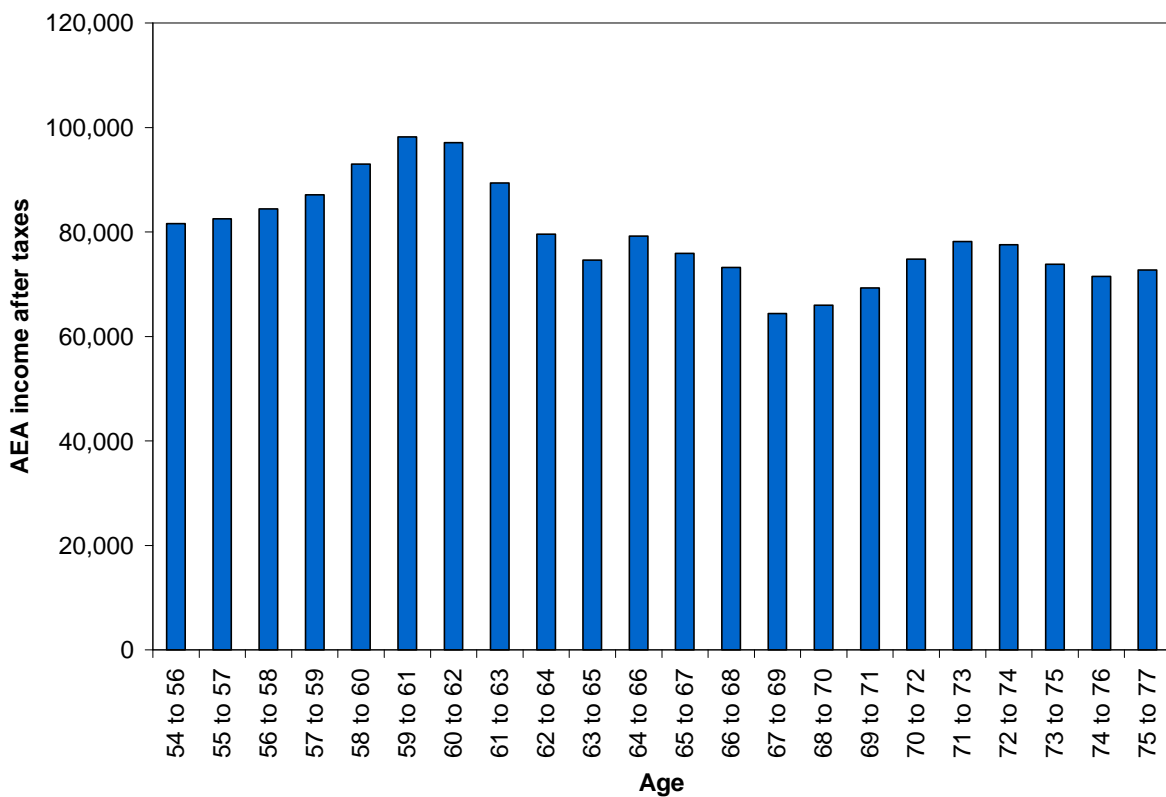
Source: Longitudinal Administrative Data.

Figure 3: Average AEA income after taxes, individuals aged 54 to 56 years old in 1983, middle quintile, Ontario



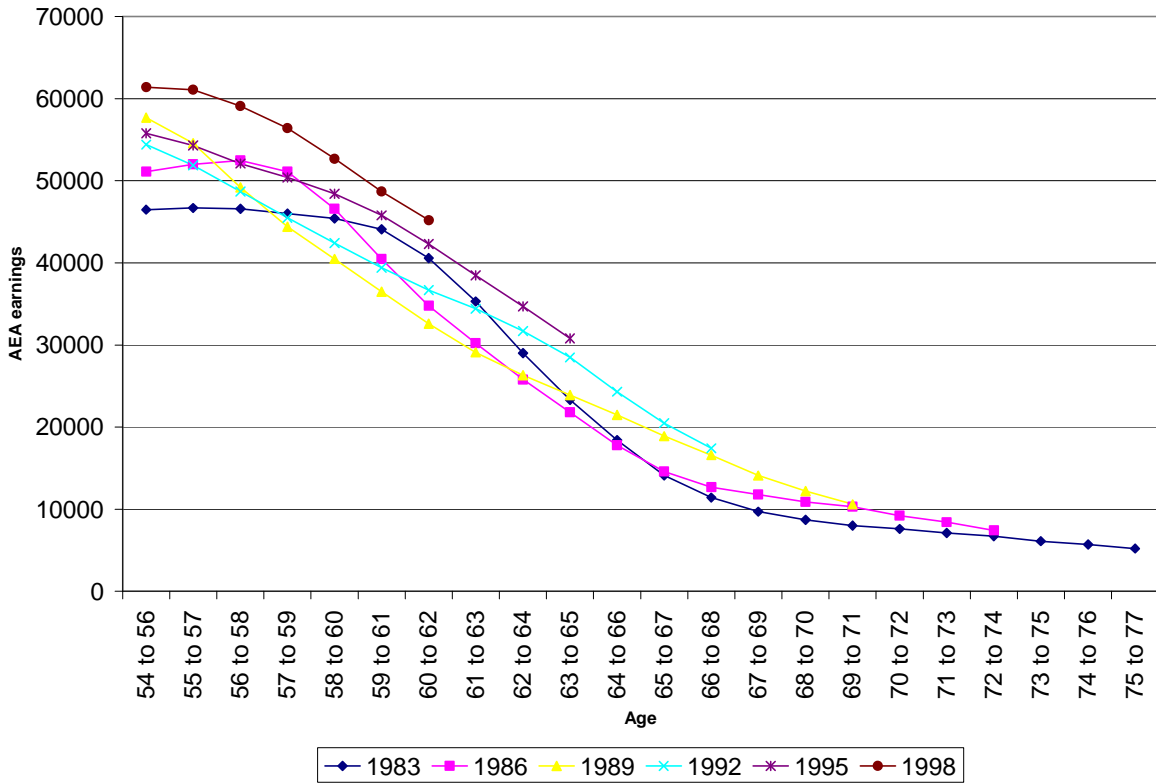
Source: Longitudinal Administrative Data.

Figure 4: Average AEA income after taxes, individuals aged 54 to 56 years old in 1983, top quintile, Ontario



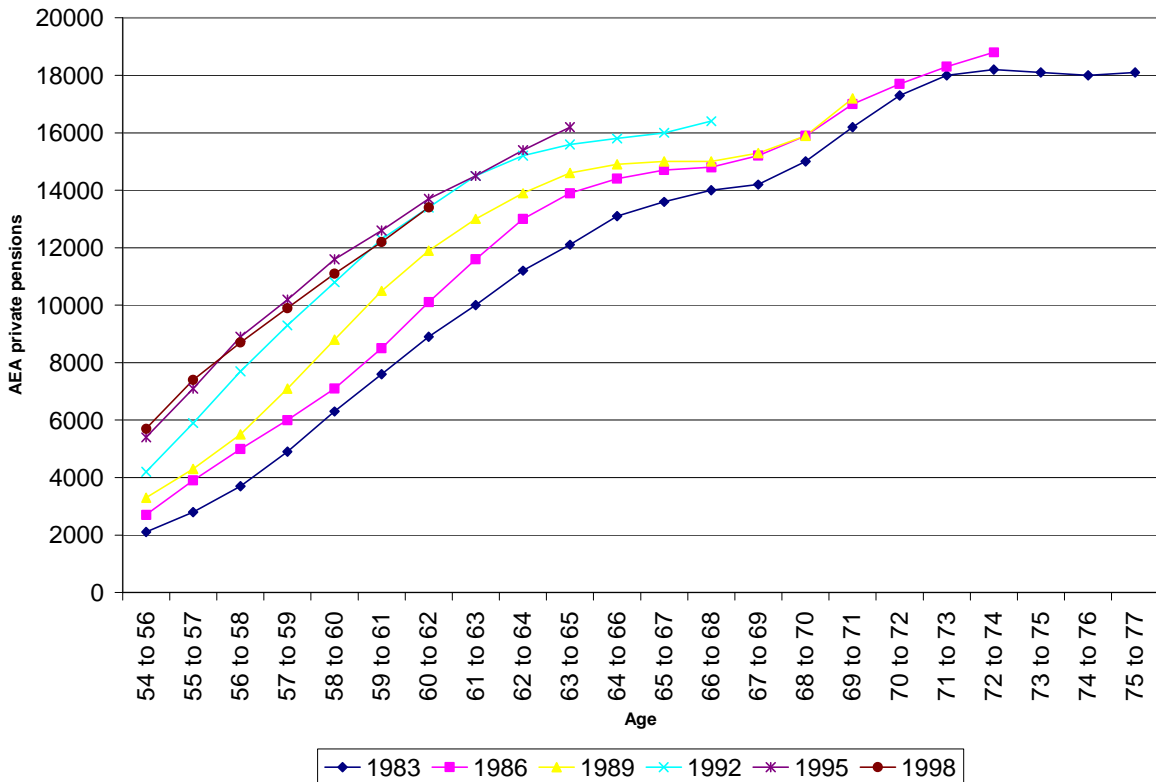
Source: Longitudinal Administrative Data.

Figure 5: Earnings by cohort (\$ per year, constant dollars), AEA adjusted, Ontario



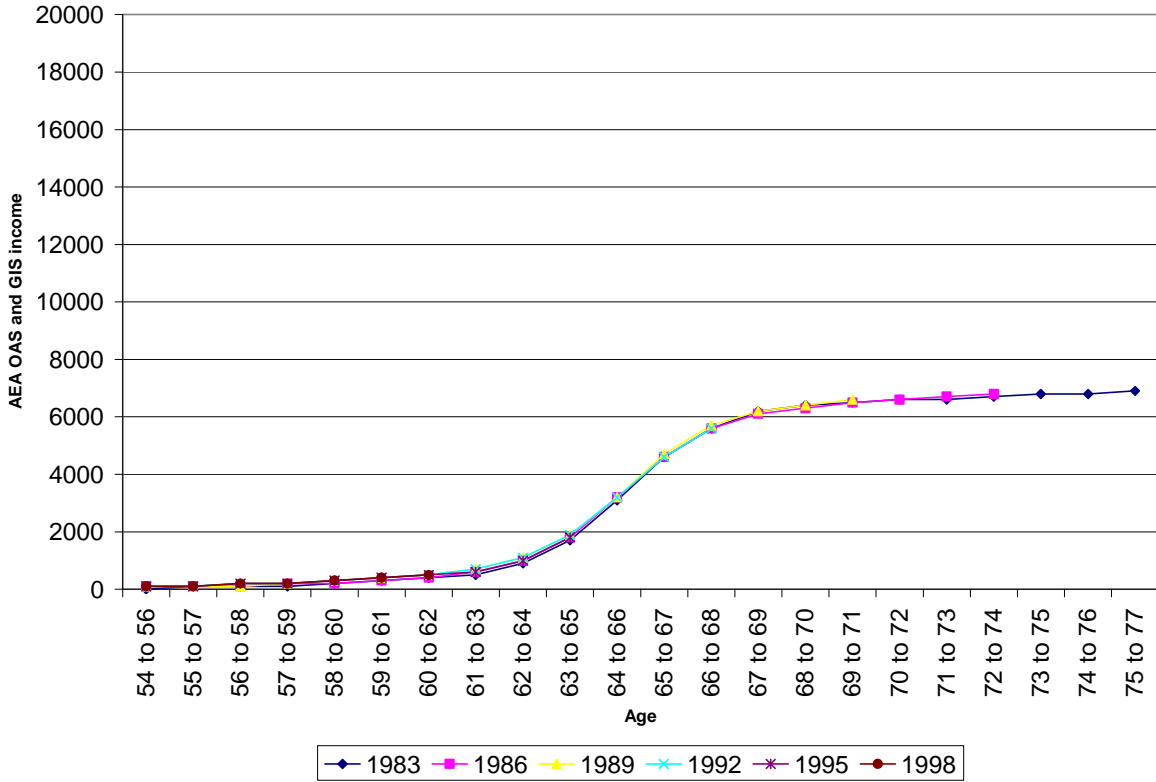
Source: Longitudinal Administrative Data.

Figure 6: Income from Private pensions by cohort, including RRSPs (\$ per year, constant dollars), AEA adjusted, Ontario



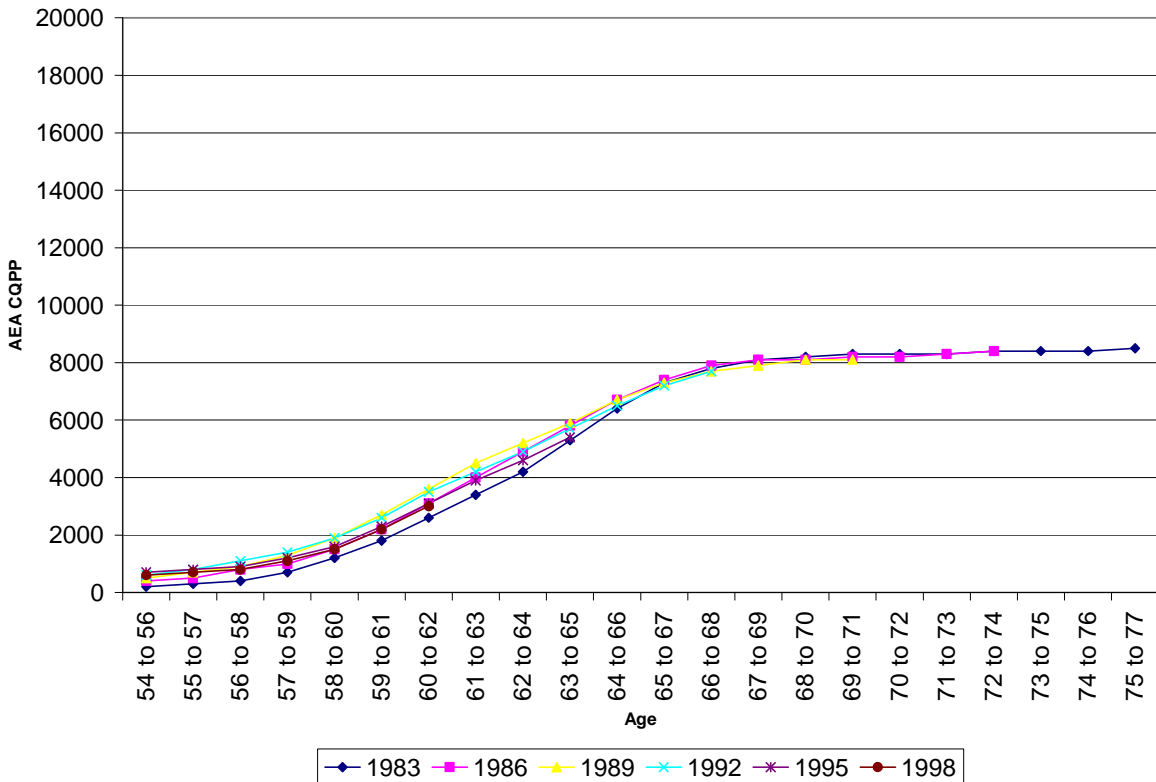
Source: Longitudinal Administrative Data.

Figure 7: OAS and GIS income (\$ per year, constant dollars), AEA adjusted, Ontario



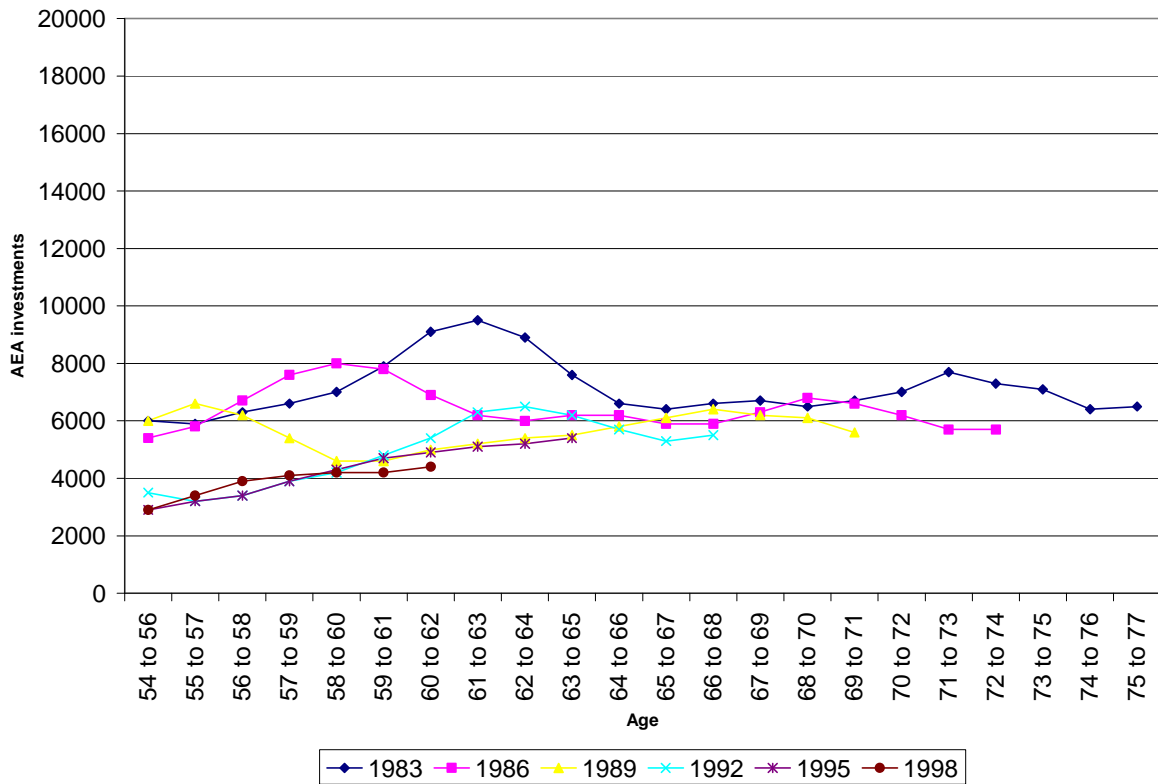
Source: Longitudinal Administrative Data.

Figure 8: Canada Pension Plan Income (\$ per year, constant dollars), AEA adjusted, Ontario



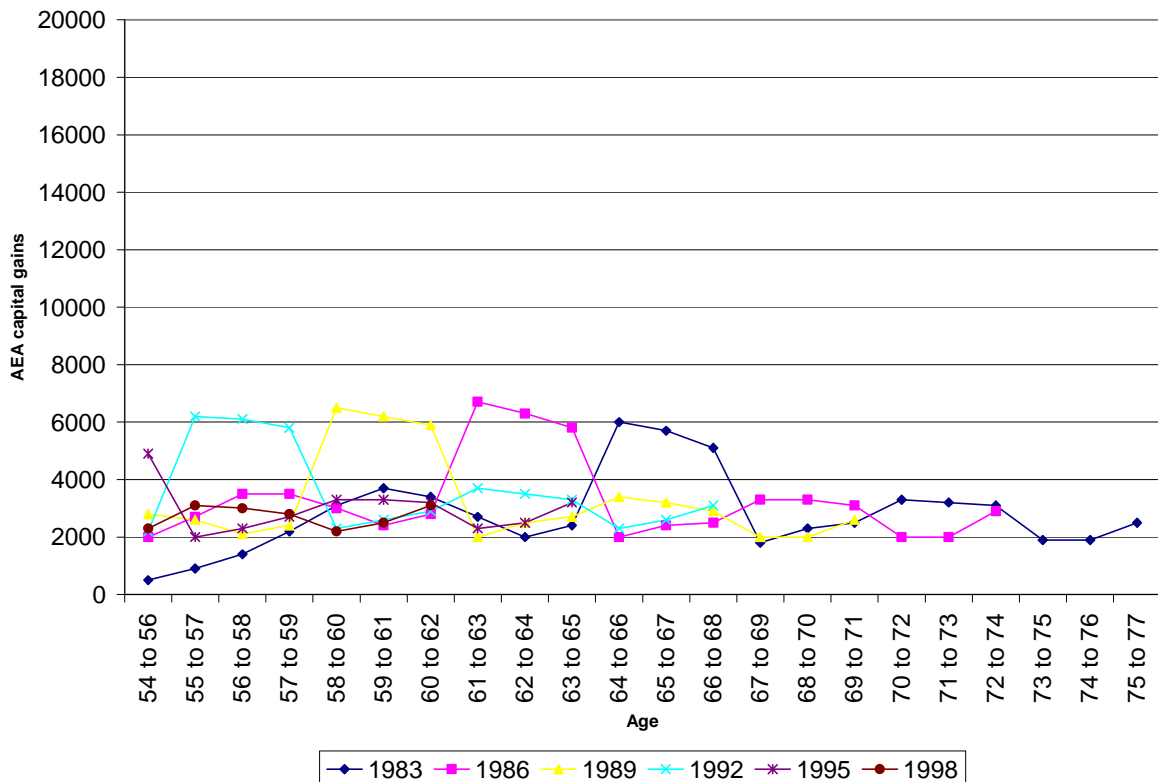
Source: Longitudinal Administrative Data.

Figure 9: Interest and investment income, incl. dividends and rental income (\$ per year, constant dollars), AEA adjusted, Ontario



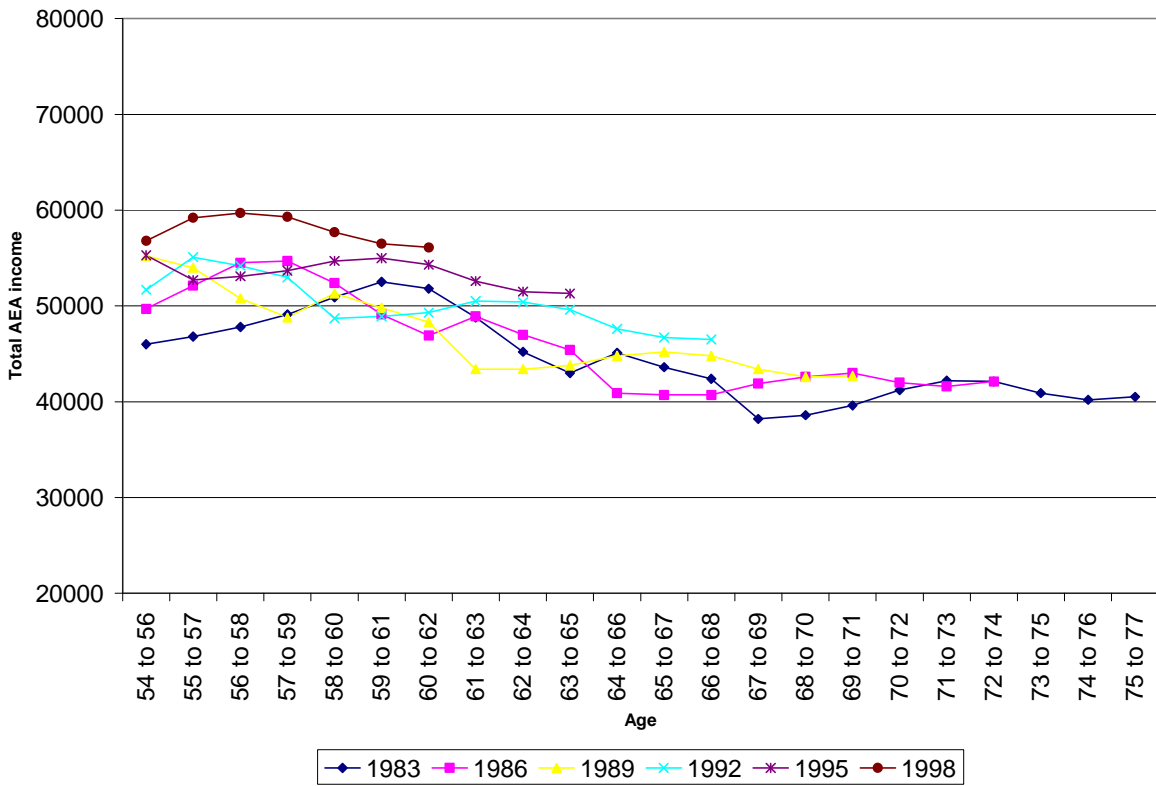
Source: Longitudinal Administrative Data.

Figure 10: Capital gains (\$ per year, constant dollars), AEA adjusted, Ontario



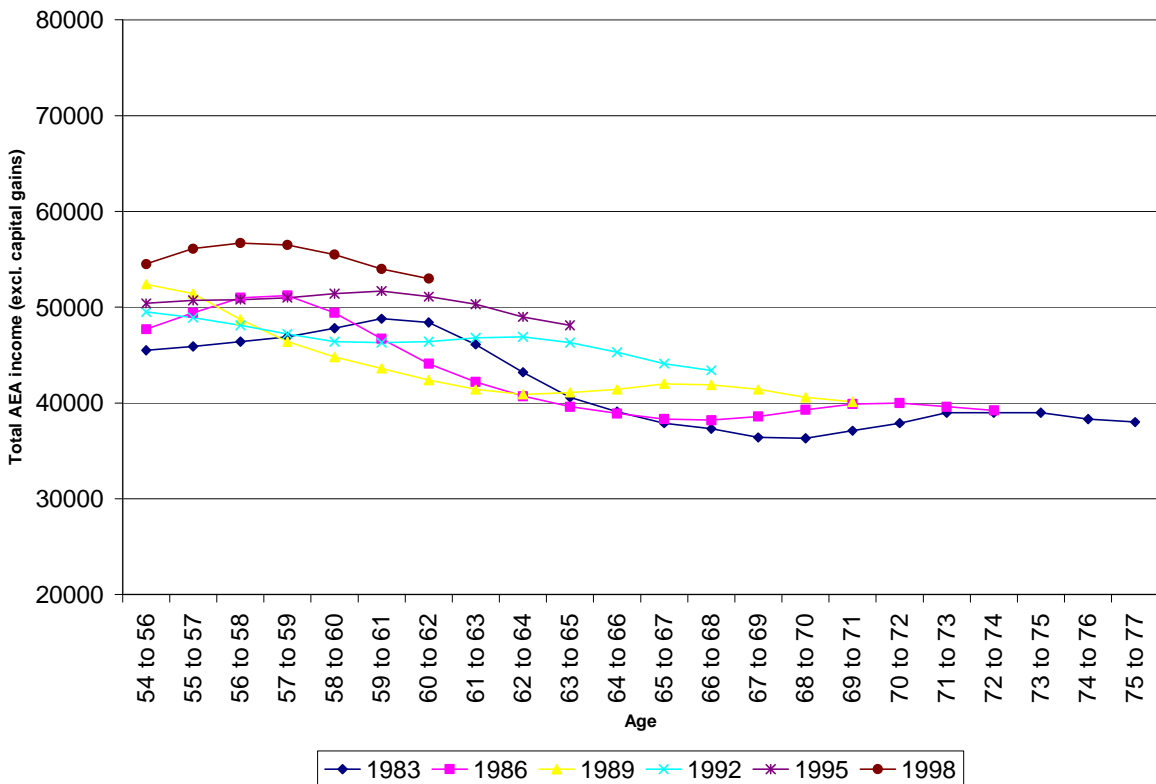
Source: Longitudinal Administrative Data.

Figure 11: Family income after taxes (\$ per year, constant dollars), AEA adjusted, Ontario



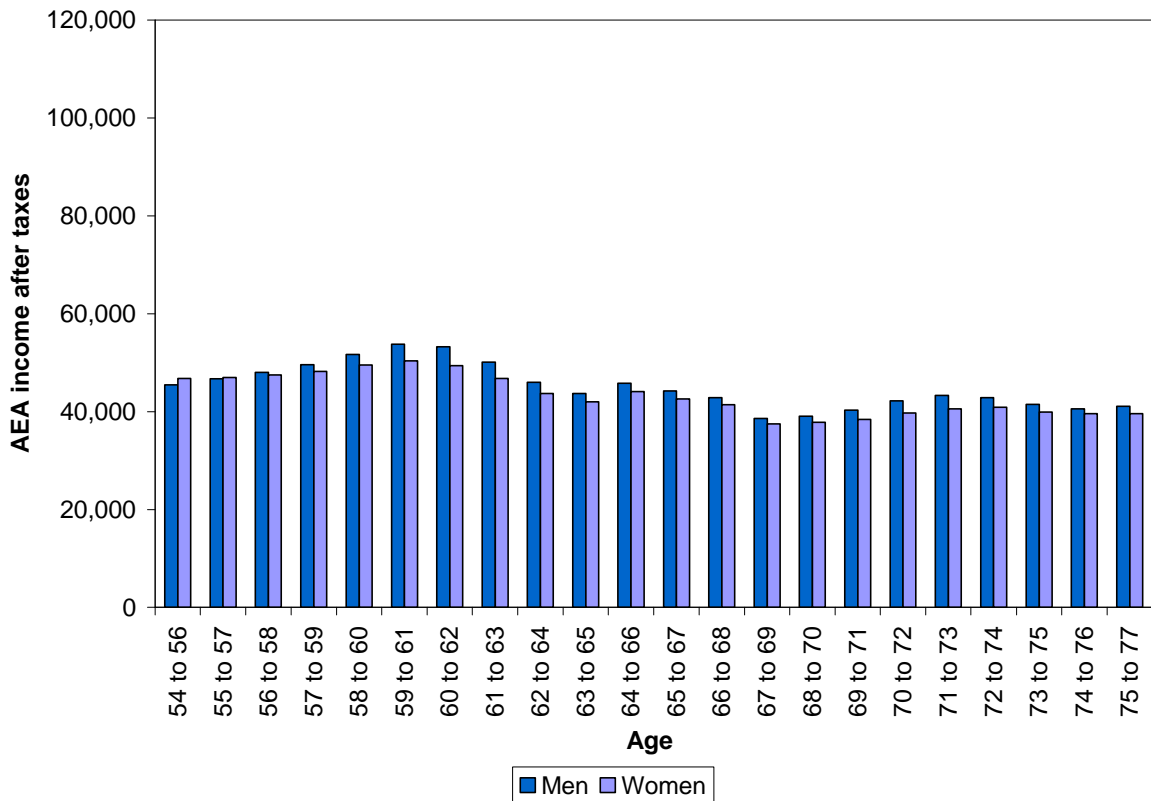
Source: Longitudinal Administrative Data.

Figure 12: Family income after taxes, excluding capital gains (\$ per year, constant dollars), AEA adjusted, Ontario



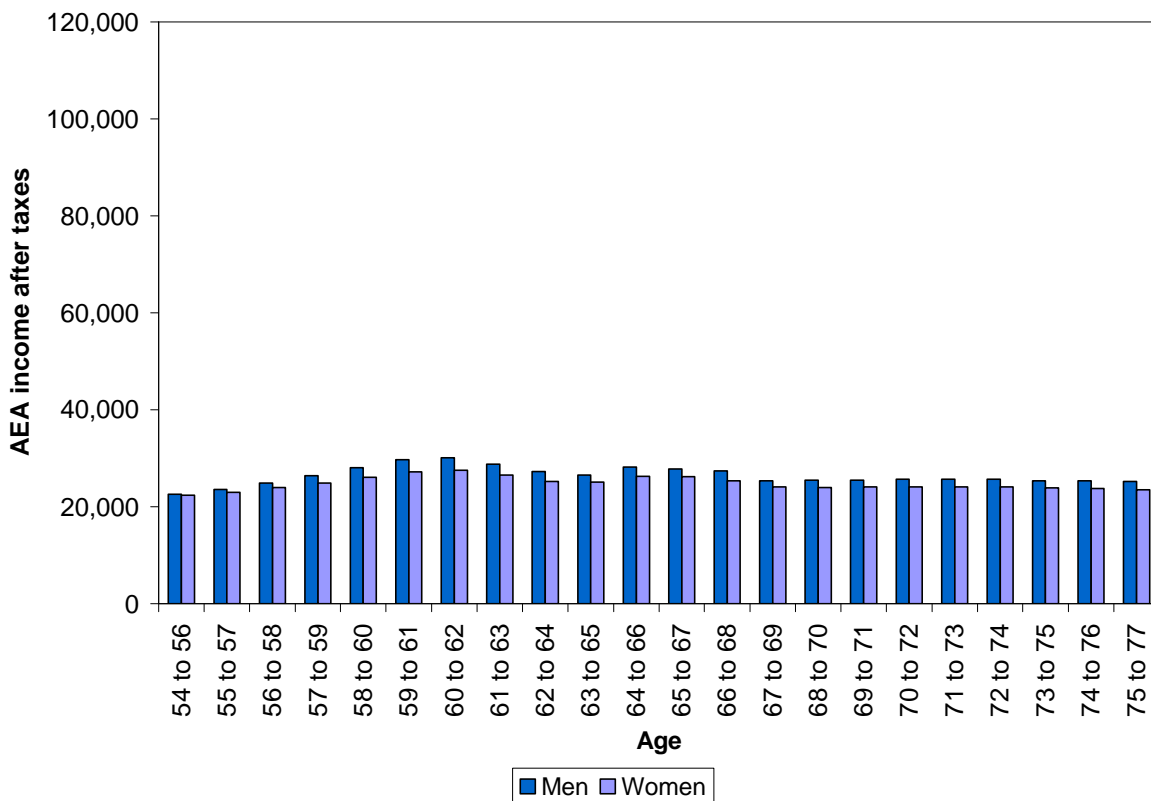
Source: Longitudinal Administrative Data.

Figure 13: Average family AEA income after taxes, men and women aged 54 to 56 years old in 1983, Ontario



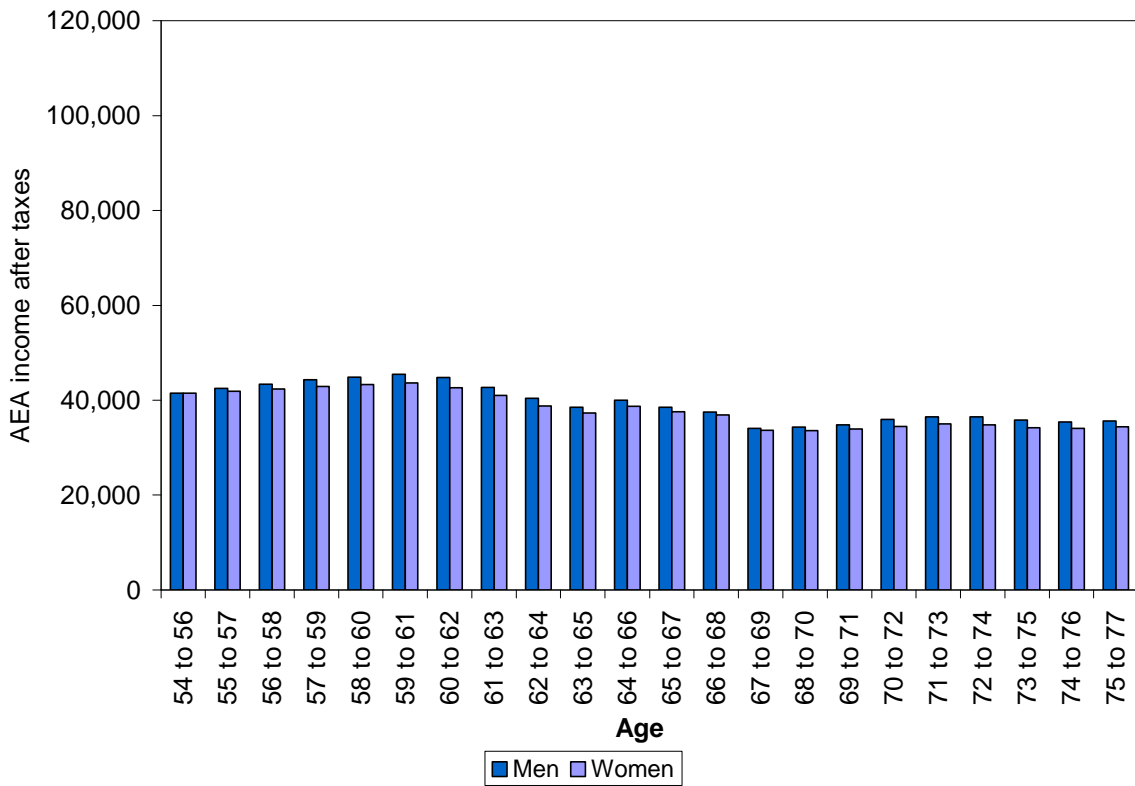
Source: Longitudinal Administrative Data.

Figure 14: Average family AEA income after taxes, men and women aged 54 to 56 years old in 1983, bottom quintile, Ontario



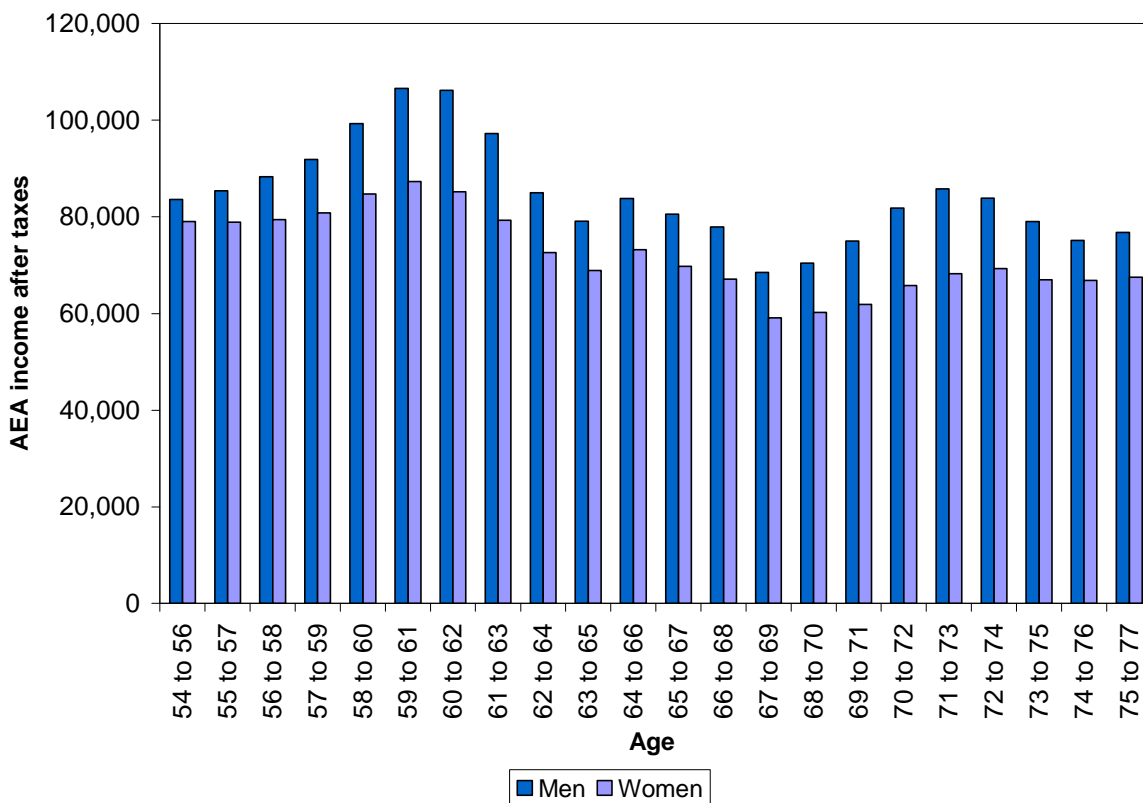
Source: Longitudinal Administrative Data.

Figure 15: Average family AEA income after taxes, men and women aged 54 to 56 years old in 1983, middle quintile, Ontario



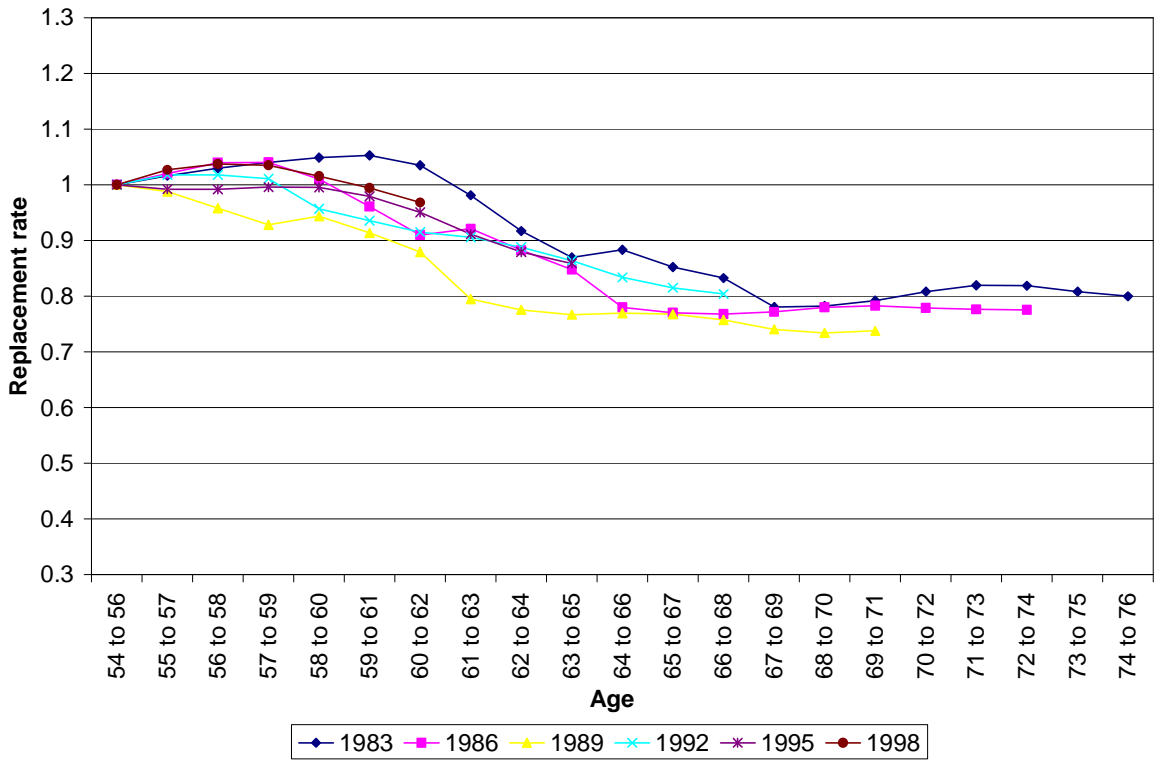
Source: Longitudinal Administrative Data..

Figure 16: Average family AEA income after taxes, men and women aged 54 to 56 years old in 1983, top quintile, Ontario



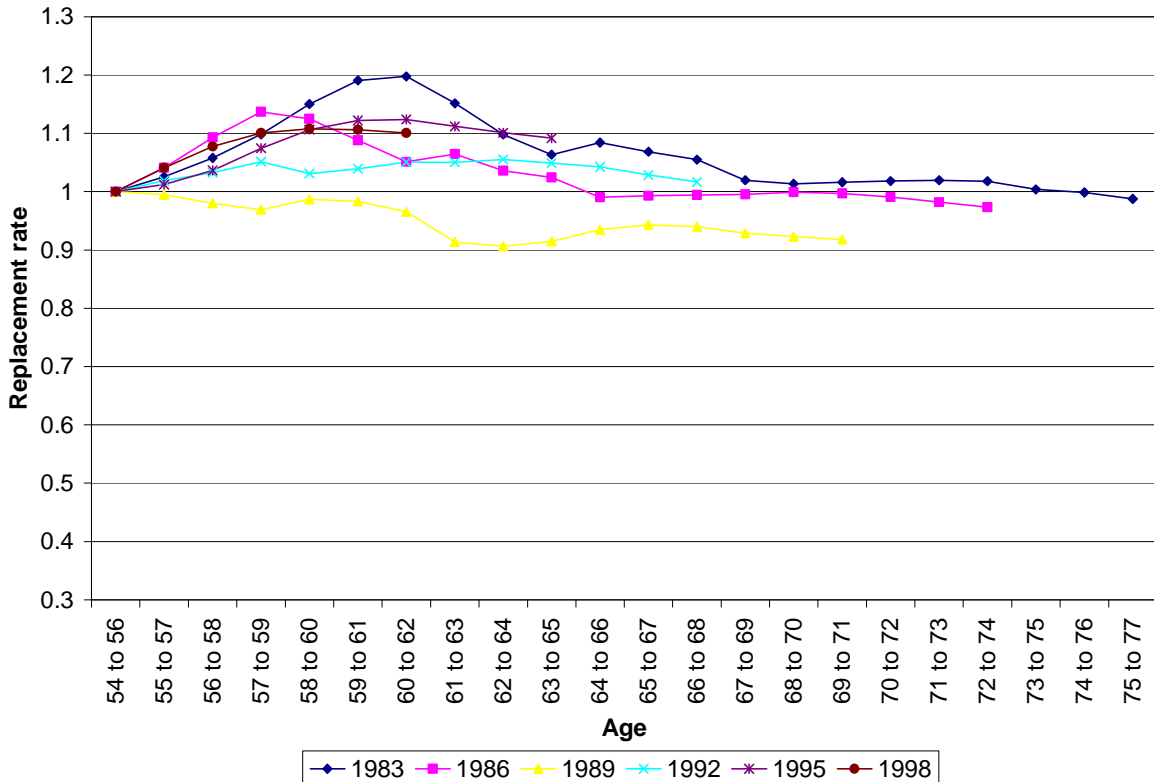
Source: Longitudinal Administrative Data..

Figure 17: Median replacement rates of total AEA income after taxes, Ontario



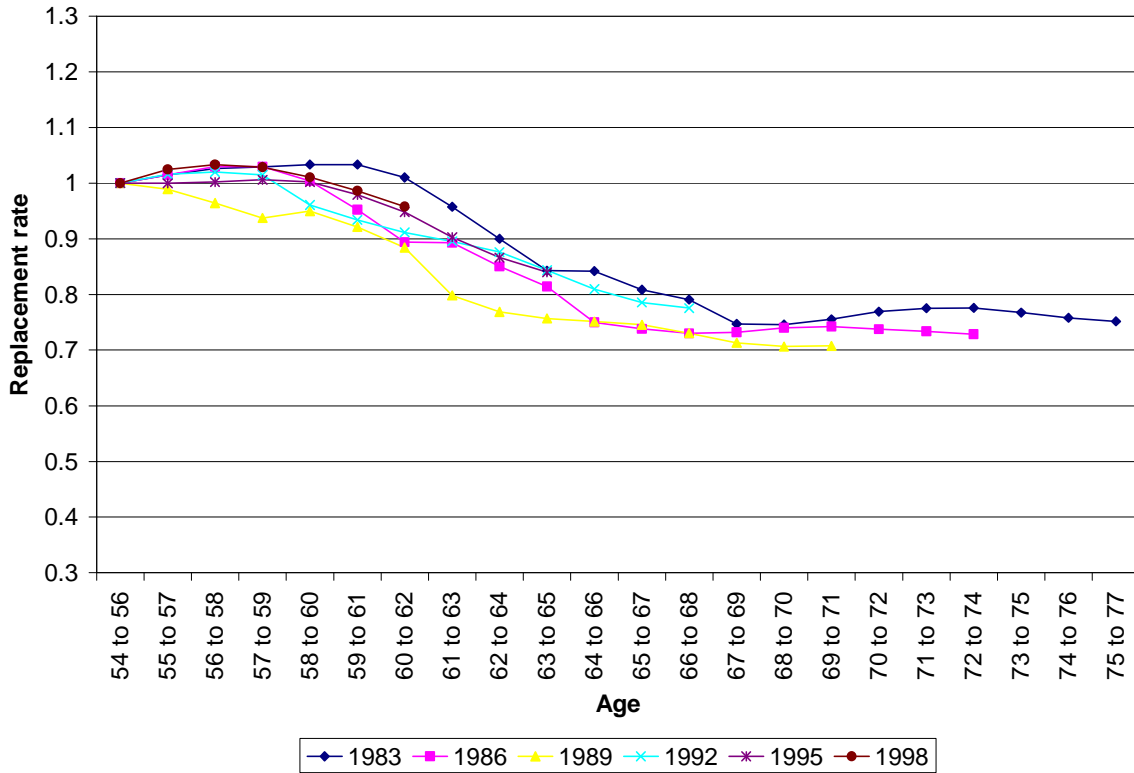
Source: Longitudinal Administrative Data.

Figure 18: Median replacement rates of total AEA income after taxes, bottom quintile, Ontario



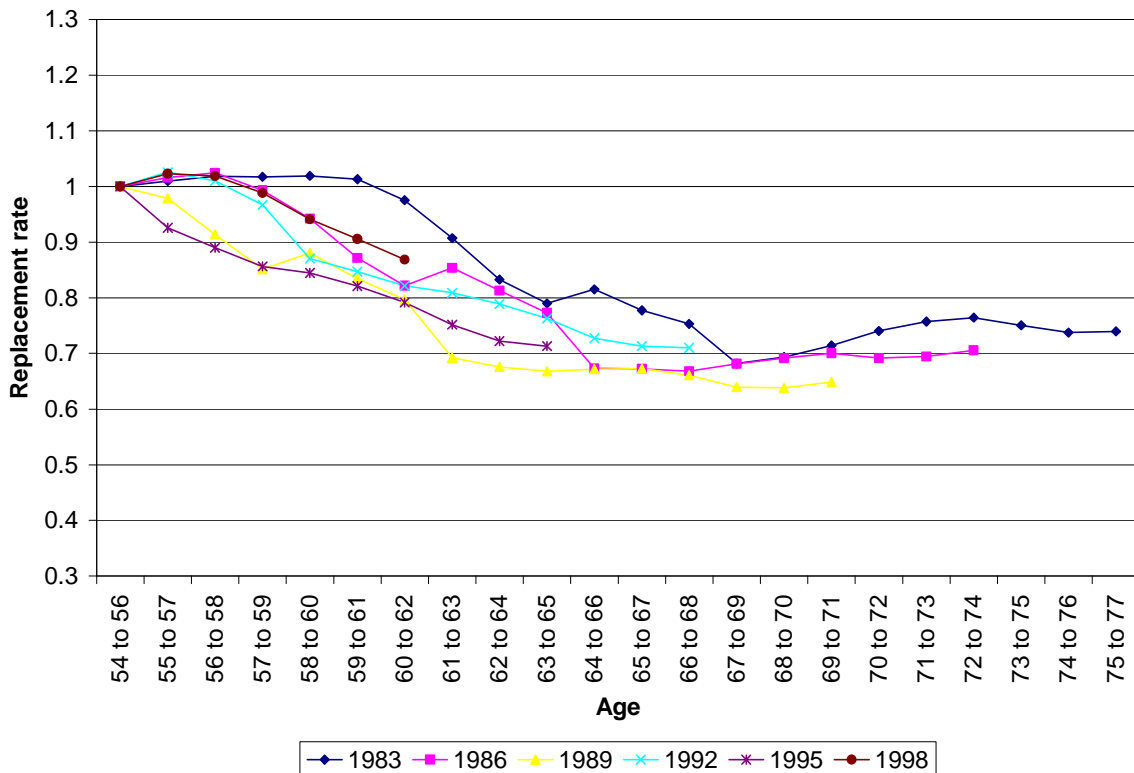
Source: Longitudinal Administrative Data.

Figure 19: Median replacement rates of total AEA income after taxes, middle quintile, Ontario



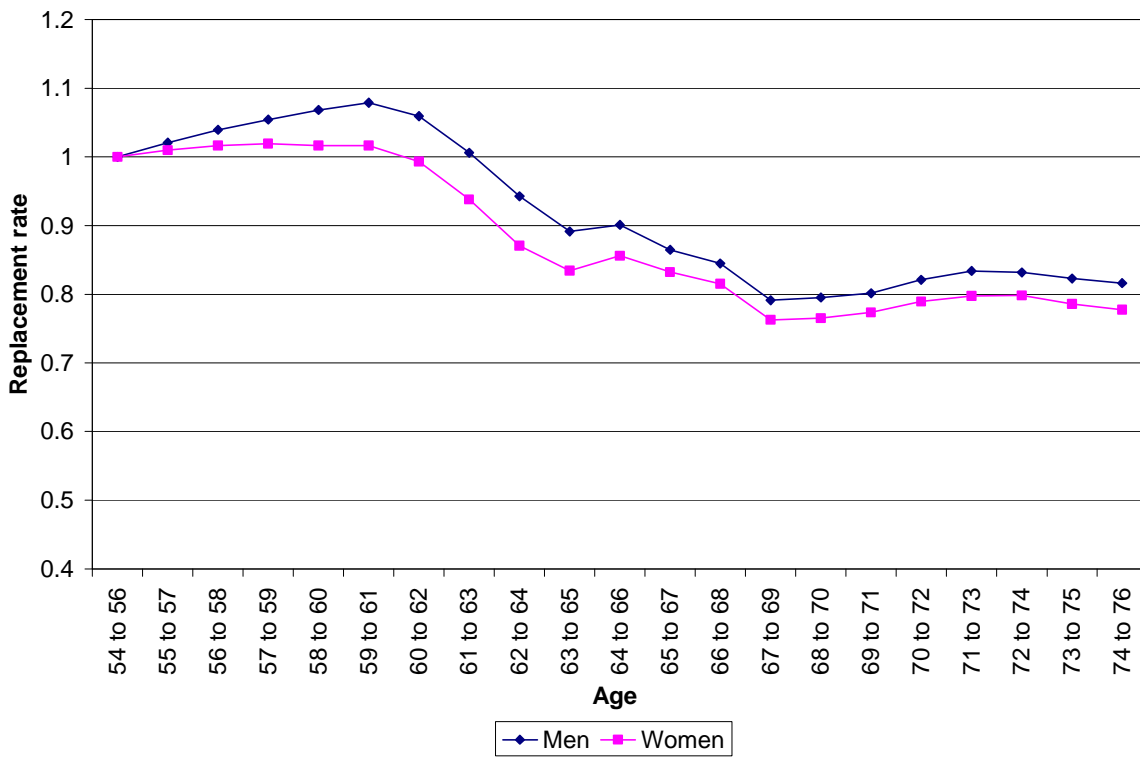
Source: Longitudinal Administrative Data.

Figure 20: Median replacement rates of total AEA income after taxes, top quintile, Ontario



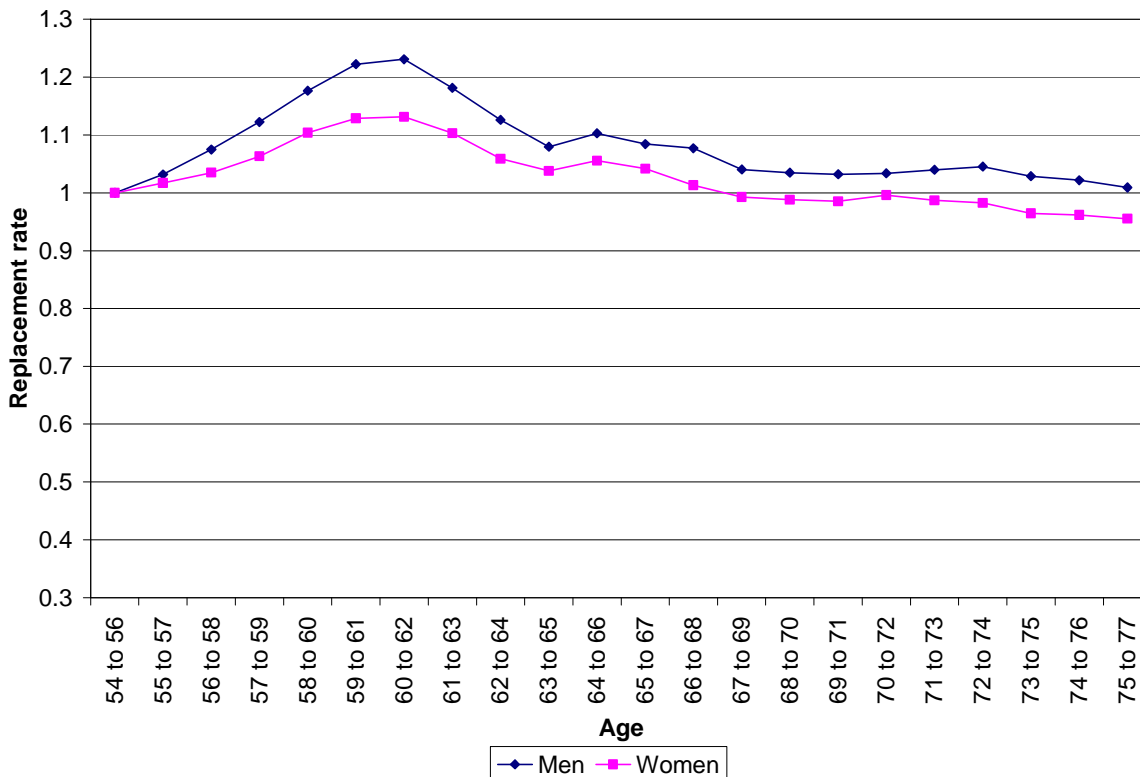
Source: Longitudinal Administrative Data.

Figure 21: Median replacement rates of total AEA income after taxes, men and women, Ontario



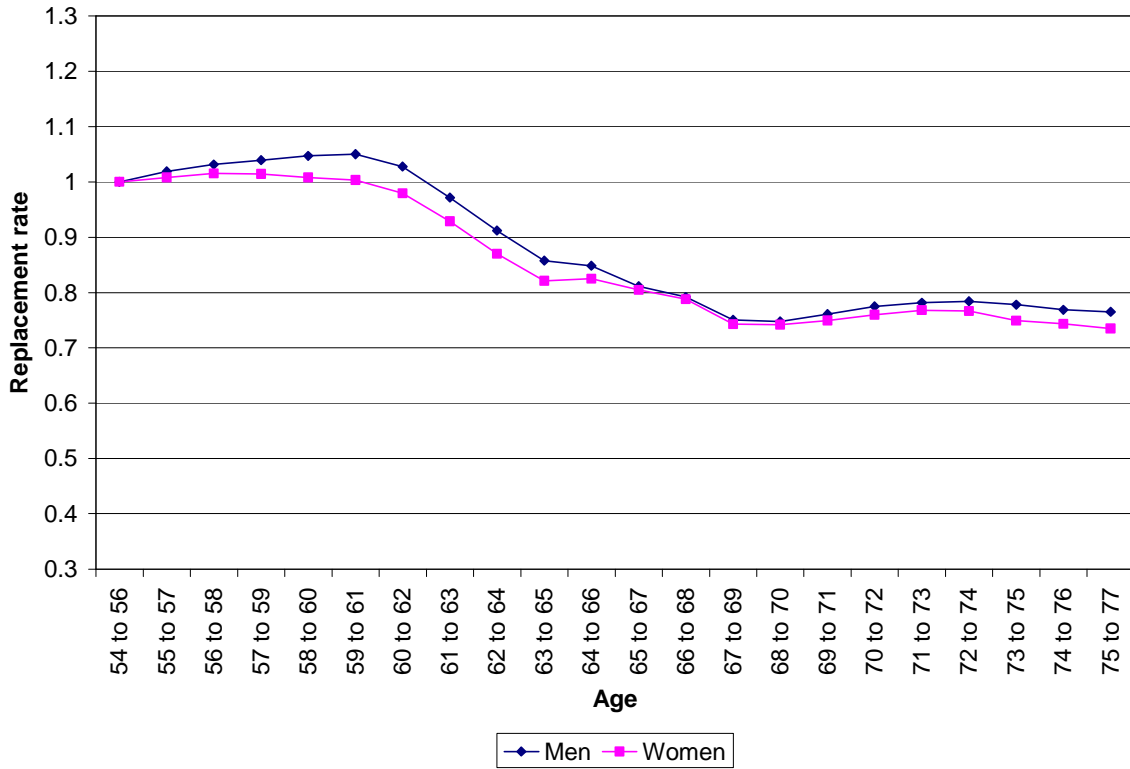
Source: Longitudinal Administrative Data.

Figure 22: Median replacement rates of total AEA income after taxes, men and women, bottom quintile, Ontario



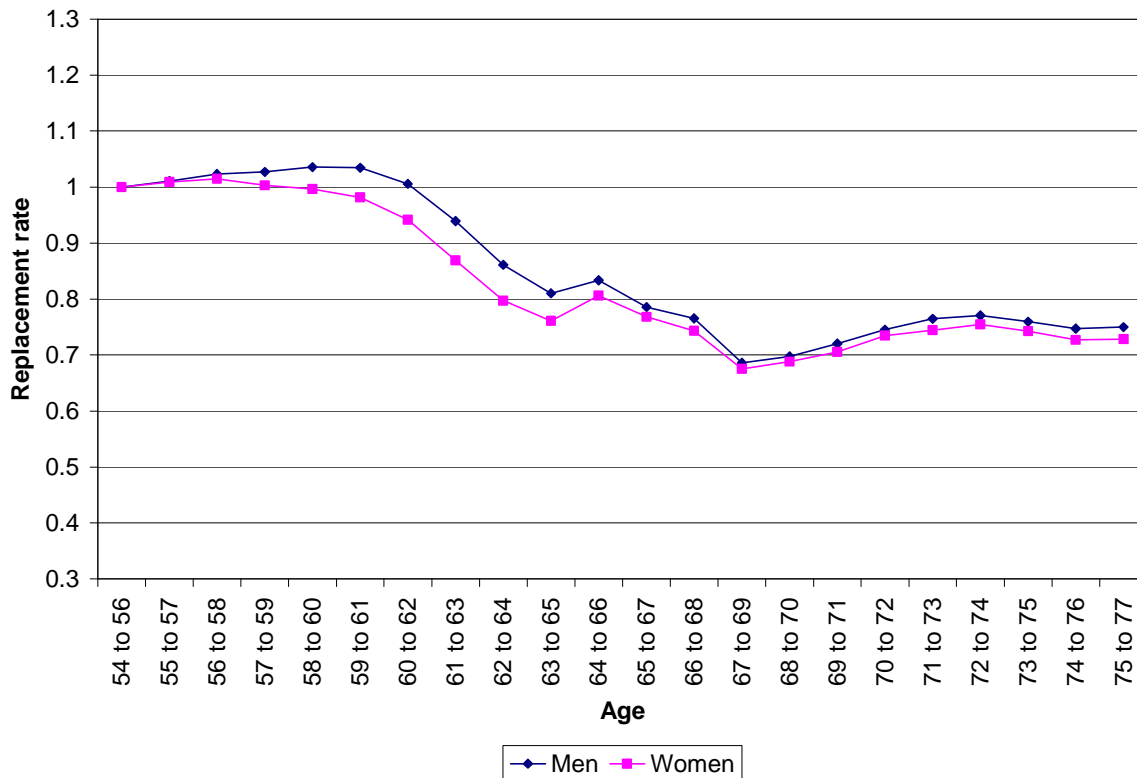
Source: Longitudinal Administrative Data.

Figure 23: Median replacement rates of total AEA income after taxes, men and women, middle quintile, Ontario



Source: Longitudinal Administrative Data.

Figure 24: Median replacement rates of total AEA income after taxes, men and women, top quintile, Ontario



Source: Longitudinal Administrative Data.

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