

# Government and Retirement Incomes in Canada\*

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# 1.0 Introduction

Direct provision of retirement income to Canadians takes up 21 cents of every dollar spent by the federal government, excluding transfers to other levels of government and interest payments. The \$32 billion spent by Ottawa on pensions exceeds the total *combined* non-transfer non-interest spending in 24 of the 27 ministries listed in the Public Accounts.<sup>1</sup> Moreover, another \$24 billion of retirement and survivor benefits are paid by the Canada Pension Plan (CPP), although off the federal budget. In short, pension spending dominates federal expenditure. These facts are not unique to Canada. In fact, public pensions capture an even larger share of national expenditure in most other industrialized countries.<sup>2</sup>

In this paper, we pursue two goals. First, we explore the justifications and motivations for government involvement in retirement income provision. Second, we assess the retirement incomes of Canadians with a particular focus on incomes deriving from government. In doing so, we address the measurement and the evidence on the adequacy of these incomes.

Many arguments for a strong role for government in retirement income focus on redistribution and equity. While these factors may justify some government involvement,

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<sup>1</sup> In 2007-08, National Defence, the Canada Revenue Agency, and Public Safety and Emergency Preparedness spent \$32.653 billion in total. The other 24 ministries listed spent a combined \$28.174 billion. Data are taken from Receiver General of Canada (2008) using the 2007-08 year, which is the most recent version of the Public Accounts that is available.

<sup>2</sup> According to the OECD, the public pension share of GDP in Canada is 3.6% for 2006. This ranks Canada fifth lowest among the 23 countries listed. The United Kingdom spends 7.5% of GDP on public pensions, while Germany spends 11.7%. See OECD (2009a).

we argue that efficiency provides an even more compelling rationale. Both market failures and decision-making failures contribute to the case for government. When markets cannot provide appropriately priced insurance against major pitfalls such as outliving one's savings, government can improve on market outcomes. Moreover, if life-changing and irreversible decisions are made by people without good information or lacking strong facility to make those decisions, some kind of government intervention may help.

In the data, the elderly have made undeniable progress over the last 35 years. The relative income growth of elderly families has been dramatic, and well in excess of the income growth experienced by non-elderly families. Correspondingly, the rate of low income among the elderly has dropped significantly over this same period. In stark contrast, the rate of low income among younger families has remained relatively constant, and now is higher than the rates experienced by older families. A decomposition of the sources of income among the elderly identifies the pivotal roles played by public pensions and private savings.

These relative comparisons skirt the question of the adequacy of seniors' incomes. While an absolute answer to this question would involve delving into the thorny issue of defining a minimally acceptable consumption level, examining income replacement ratios at retirement provides a somewhat informative perspective. However, we argue that simple income replacement ratios do not adequately convey the levels of well-being experienced in the senior years. For example, work-related expenses are no longer

incurred on retirement, and retirement income receives preferential income tax treatment. The most recent evidence suggests that replacement rates in Canada compare favourably internationally, especially for families at low income levels.

In what follows, we first explore the arguments for government involvement in the provision of pension income. We then take a brief excursion into the structure of Canada's public pension programs to provide the vocabulary for the empirical analysis that follows. The empirics document some long-run time trends in the incomes of the elderly, then decompose observed incomes into their component pieces. Finally, we offer a thorough discussion of the challenges in assessing income adequacy before reviewing recent evidence of these measurements. The conclusion closes the paper and relates the limitations of our analysis.

## **2.0 Role of government in retirement income**

Most discussions of the justifications for government income support start with questions of need and fairness. The case of older Canadians is no different in that respect—if the elderly are poor then they should receive income support like any other poor Canadian. However, elderly Canadians are much *less* likely than young Canadians to be poor.<sup>3</sup> Moreover, many existing public pension programs have little impact on poor elderly

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<sup>3</sup> See Milligan (2008). Using the Low Income Cut Off (or other measures of low income), the highest rates of low income by age group are found for those in their 20s. Those over age 65 have the smallest low-income rates of any age group. This is a stark reversal from the situation prevailing into the 1970s, when elderly poverty was higher than other age groups.

Canadians, so a focus solely on redistribution could not account for the observed government involvement in pensions in Canada or other industrialized countries.

We therefore proceed to describe an efficiency case for government involvement in retirement income provision. By efficiency we mean that government involvement can, potentially, improve on a hypothetical ‘laissez-faire’, decentralized environment in which individual firms and families make their own decisions. While concerns about equity and social solidarity may *enhance* the argument for government involvement, they are not *necessary* to make the case.<sup>4</sup> This is important because attitudes about equity vary substantially across the population, so an argument founded on a particular concept of equity may fail to yield broad support. In contrast, efficiency improvements can—at least potentially—make all better off, and thus carry broad support.

Economists have a very well-defined and clear core model of what a perfectly functioning market economy would look like. In practical policy applications, this model is useful not as a descriptive of how the world is, but as a diagnostic tool. By comparing what is observed in the real world to its model counterpart, an economist can refine a description of the problem—and better find policies that may improve on what is observed.

We take this approach here by first considering a standard model where people have perfect information on their abilities, preferences, and incomes now and into the future. Markets function flawlessly and efficiently. In such a world, rational people would

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<sup>4</sup> Our argument here follows that of Feldstein (2005).

consume some of their incomes, but also save for retirement. These savings would be invested appropriately and yield a level of consumption both in the working years and in retirement that aligns with the person's plans. In such a laissez-faire world, government involvement in savings and retirement income provision might do more harm than good. Even well-intentioned interventions would at best be negated by offsetting changes in people's own savings and consumption plans, and at worst would distort those plans, resulting in worse outcomes.

But, this decentralized laissez-faire model is unlikely to capture important aspects of the economy in which Canadians actually live. There are two potential sources of discord between the model world and the world we actually inhabit. First, markets for goods and services do not always operate efficiently. Most important for the case of retirement income, insurance markets for the risks faced by savers can be particularly troublesome. Second, the assumption of rational and well-informed decision making seems to fail systematically in important ways for retirement savings.

To a large degree, differing opinions on the role governments should assume go hand in hand with differing assessments of the importance of market and decision-making failures. If one believes these imperfections to be relatively unimportant, then perhaps the role of government ought to be limited. On the other hand, if these factors are prevalent and important, then government solutions to the problems can improve individuals' retirement outcomes. We therefore proceed to discuss these two types of failures in detail in order to elucidate their potential importance.

## **2.1 Insurance market failures**

Insurance markets allow individuals to trade risk for certainty.<sup>5</sup> By pooling together large numbers of individuals, insurance companies can provide insurance to individuals at prices that make the individuals better off and still allow a return for the shareholders of the insurance company. However, certain features of risk environments can weaken the efficiency of insurance markets. In this section we discuss the problem of adverse selection and its impact on retirement income decisions. The core of the argument is quite simple to grasp: when ‘expensive’ customers are the only ones interested in buying an insurance contract, these contracts will only be offered at very high prices, if at all, by for-profit companies.

If an insurance company cannot distinguish in advance between who will be an expensive customer and who will not, then the riskiness of the individual cannot be priced into the contract. If the insurance company charges a low price, it will attract too many of the expensive customers and will lose money. But, if the company charges a high price many customers will choose to go without insurance. This “under-insurance” is an outcome of insurance markets characterized by adverse selection.<sup>6</sup>

Adverse selection affects many decisions related to retirement incomes. For example, the span of one’s life is at once vital to individuals’ savings calculations yet not known with

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<sup>5</sup> The discussion here draws in part on Kotlikoff (1987). The importance of adverse selection in market economies was emphasized in Akerlof (1970). The role of mandatory participation in solving adverse selection is attributed to Wilson (1977).

<sup>6</sup> If a company can charge different prices for different amounts of insurance, it might be able to offer two contracts that separate the good and the bad risks. In these separating equilibria, however, there will still be underinsurance among higher risk types.



certainty. For this reason, many individuals might be interested in buying insurance against the possibility of outliving their savings. This insurance could take the form of an annuity that, starting at retirement, pays a certain amount of income in each subsequent month of life. However, in practice these sorts of annuities are not widespread.<sup>7</sup> One explanation for this market weakness comes from adverse selection—insurance companies cannot determine an individual’s riskiness, and perhaps only those who suspect they will live a long time will buy these annuities, leading insurers to charge prices too high for most to find insurance useful.<sup>8</sup>

A second example is the risk of having low lifetime earnings. Perhaps someone believes that their earnings later in life will be high, so saving when young is not necessary. However, if later-life earnings turn out to be low, such a person will arrive at retirement without adequate savings. In theory, one might want to buy insurance against such a possibility when young. In practice, however, this sort of insurance contract might attract those without good career prospects (adverse selection). In practice the absence of insurance against low lifetime earnings means that some will arrive at retirement with less savings than they expected.

The net result of these considerations is that individuals are stuck holding many risks they might like to trade for certainty through insurance, but cannot. This excessive risk-holding by individuals generates a case for government involvement. One solution for

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<sup>7</sup> Mitchell, Poterba, Warshawsky, and Brown (1999) characterize the market for individual annuities in the United States as “small.” See also the review in Brown, Mitchell, Poterba, and Warshawsky (2001).

<sup>8</sup> See Finkelstein and Poterba (2002) for evidence on adverse selection in annuity markets. Mitchell, Poterba, Warshawsky, and Brown (1999) calculate that adverse selection accounts for about half the difference between the price of an annuity and the expected present value of the stream of payments.

adverse-selection problems is to disallow any kind of selection—make insurance participation mandatory. By forcing the good risks into the risk pool with the bad risks, insurance becomes cheaper. In this way, annuities and implicit insurance against poor lifetime earnings might be provided to all at a price that, from a population-average perspective, is fair. This makes many better off by providing insurance when, in the absence of the government intervention, they had none. Of course, a cost of mandatory participation is that some might be forced to annuitize more than they prefer. This tradeoff between the benefits and costs of mandatory participation renders the case unclear, in theory. Recent evidence finds that details of the structure of a mandate can determine whether it improves or worsens welfare.<sup>9</sup>

One way to make insurance mandatory is to install a full public pension program. For example, public pension programs effectively allow individuals to insure against low earnings in later in life, trading current consumption (through mandatory contributions to public pension programs) for a stream of pension benefits from the time of first benefit receipt until death. However, the distinct problems of the annuity market might not require a full public pension program. Retirement funds that have been invested privately can be subject to mandatory annuitization at retirement, which brings the benefits of greater risk pooling.<sup>10</sup> The provision of long-life insurance through mandatory annuitization can, in principle, improve on the laissez-faire market outcome.

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<sup>9</sup> Einav, Finkelstein, and Schimpf (forthcoming) study the mandatory annuitization of tax-preferred savings in the United Kingdom. These savings must be annuitized with a guaranteed minimum period of annuity payout. Whether the guarantee is for zero, five, or ten years makes a critical difference to determining the size and existence of a welfare gain from the mandatory annuitization. If the government makes the wrong choice, the situation may become worse than with no mandate. In this way, a blanket recommendation for mandatory annuitization must be treated with caution.

<sup>10</sup> See Mackenzie (2006) for a thorough discussion of the role of mandatory annuitization.

Must mandatory insurance be provided by or through government? An alternative would be to leave the support of the elderly who suffer adverse outcomes to charity. However, there is the real possibility that charitable donations will fall short of need either because of free-riding among donors, or that likely beneficiaries go uninsured in order to position themselves for larger charity payouts. Governments, by forcing mandatory participation, can avoid both problems.<sup>11</sup> To be clear, the insurance need not be provided by government directly—there could simply be a legal mandate to purchase insurance from private companies, just as there is a mandate for auto insurance by car drivers.

Finally, another cost of increased insurance coverage is the possibility that individuals will change their behaviour, knowing that they are insured against bad outcomes. This ‘moral hazard’ might arise through lower savings or lower lifetime work effort, since the insurer will cover some or all of the difference in retirement. Mandatory participation does not solve the moral hazard problem. So, to the extent that savings and lifetime earnings respond to the existence of more insurance, increased insurance coverage through government intervention may be more costly.

## ***2.2 Decision-making failures***

Even if insurance market failures could be solved, the standard economic framework may break down because of decision-making failures.<sup>12</sup> These decision-making failures may occur for one of two reasons. First, individuals may simply not have access to sufficient

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<sup>11</sup> This is often referred to as the ‘Samaritan’s dilemma’. See Coate (1995) for analysis.

<sup>12</sup> For an overview of the relationship between decision-making failures and retirement issues, see Aaron (1999). The discussion in this section draws in part on the chapters of this book.

information about patterns of lifetime earnings, investment returns, and mortality to make wise decisions. Second, even if all information were present, some people might simply choose poorly among available options.

While incomplete information and unwise decisions no doubt exist, few would take this as sufficient grounds on which to advocate the wholesale replacement of individual decision making in the economy with government. However, two aspects of retirement savings decisions combine to make a stronger case for government involvement.

First, the decision to save adequately (or not) for retirement is temporal; irreversible. Surely, people make many mistakes in their daily economic lives. In picking a brand of breakfast cereal, perhaps someone chooses one that doesn't satisfy his or her taste. Or, someone might buy a car that doesn't turn out to meet one's needs. In both cases, such a mistake is soon realized. For breakfast cereal, it can be effectively reversed by buying a different brand the next week. For the car purchase, one might be able to return it to the dealer or resell it for a small loss. However, for the case of retirement savings, a 55 year old who discovers he has made a mistake by not having saved since age 20 cannot reverse this decision. When the mistake has become obvious, it may be too late to undo. The difference in time between the 'purchase' of savings and the 'consumption' of the savings may be decades. This distinguishes the decision to save from other decisions.

Second, the decision to save adequately has vital consequences. Many decisions may be difficult and irreversible. However, it is only when these decisions have large

consequences that these difficulties matter for one's long-run economic welfare. Arriving at retirement with inadequate resources means either an unintended extension of working life or making do with a lower level of consumption than had been foreseen. Years of extra work combined with spending one's last years in poverty make for drastic consequences.

Leaving people on their own for decisions with consequences that are both very large and difficult to foresee at the time of the decision making means accepting that some proportion of people will choose poorly and end up in unenviable circumstances. If this is not acceptable to members of society, then government intervention might be warranted—especially if government will be the residual provider of income in the case of inadequate preparation. The best form of this intervention, however, depends on the source of the problem.

If the decision-making problem derives from a lack of information, government assistance could take the form of information provision. Recent Canadian survey evidence suggests that around one third of Canadians do not seek financial advice, and about the same proportion do not have a good understanding of the public pension system.<sup>13</sup> Increasing government provision of information could occur through government websites, mailings, on-line calculators, mandatory financial education, and media campaigns.<sup>14</sup> It is likely, however, that the decision-making problem is deeper than

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<sup>13</sup> See Schellenberg and Ostrovsky (2008). The information shortfall is largest among low-income Canadians and more recently arrived immigrants.

<sup>14</sup> Bernheim and Garrett (2003) provide evidence on the efficacy of work-place financial literacy programs.

a lack of information. Recent research in economics has focused on systematic deviations from rational decision making. These deviations include behaviour such as:

- Myopia: if people exhibit present-biased preferences, they may place too little weight on benefits received in the future and too much weight on costs borne in the present. This may lead people to procrastinate and under save or retire too early.
- Salience focus: Things which are salient receive undue attention. Retirement consumption is likely not salient for many young people.
- Endowment effects / status quo bias: People put too much weight on the status quo. If they are not presently saving, this can generate a long-run savings deficit.
- Framing: choices depend on the way they are presented.
- Excessive optimism: People may put too high a probability on the possibility of high investment returns or high future earnings.

As emphasized earlier, the irreversible and consequential nature of retirement savings decisions combine to make these cognitive biases important for retirement savings policy.

However, even if cognitive biases are prevalent and important factors for retirement planning decisions, the policy implications are not immediately clear. If individuals make systematically poor decisions, one solution would be to remove these decisions from individuals and let government decide; a paternalist solution. Such a move, however, may trade one set of problems for another. While government decision making may have the

potential to improve on flawed individual decision making, government decisions are made by politicians and bureaucrats who have a different—yet possibly equally flawed—set of biases.

Recently, a new approach combining the paternal and the laissez-faire approaches has emerged. The idea of ‘libertarian paternalism’ attempts to take the best of both approaches by using government to provide suggestions or hints, but allowing individuals to opt away from the guidance at low cost.<sup>15</sup>

An example is the idea of a ‘default option.’ Research has found that the initial setting of a choice has a large influence on the outcome of the decision-making process. In one well-known study, new employees who were by default registered in their firm’s pension plan had a substantially higher participation rate than those who instead had to actively choose to opt in to plan.<sup>16</sup> In this way, the default option was pivotal to the outcome.

In this framework, the role of government might be to set wise default options for pension savings. This could involve, for example, automatic enrollment in a savings plan, but with the possibility of opt-out. Expanding this kind of ‘soft’ paternalism may be criticized, however, in the same way as ‘hard’ paternalism—those setting the default option may be self-interested or biased. However, even the critics of libertarian

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<sup>15</sup> Thaler and Sunstein (2008) provide a full treatment of their ‘libertarian paternalism’ concept.

<sup>16</sup> See Madrian and Shea (2001) for the original study, and Beshears, Choi, Laibson, and Madrian (2009) for further developments and an update of the literature on pensions and default options.

paternalism acknowledge that in situations of large consequence and where learning-from-experience is absent, the argument for ‘soft’ paternalism is strongest.<sup>17</sup>

## **2.3 Summary**

The role of government in the provision of retirement income goes beyond a desire to redistribute to the poor. The efficiency case for government involvement in retirement savings and income decisions revolves around imperfections in insurance markets and in individual decision making. How large a role government must play to solve these imperfections is an open question. However, we argue that any proposals for reform should incorporate adequate and sensible resolutions to the failures both of markets and individual decision making discussed in this section.

## **3.0 Overview of the Public System in Canada**

Retirement income in Canada is a diverse, multi-layered concept. On one level, calling the combination of different programs, tax preferences, and regulated private pensions a ‘system’ seems a contrivance. However, the ability of different components to meet different goals is the key strength of such a system.

Some context for interpreting the Canadian retirement income system comes from the World Bank, which proposed a ‘three pillar’ framework for old age income security.<sup>18</sup> In

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<sup>17</sup> See Glaeser (2006) for an extensive criticism of libertarian paternalism.

<sup>18</sup> See World Bank (1994) for a full description of the ‘Three Pillar’ approach.



this framework, the first pillar targets poverty alleviation. It is financed out of general tax revenues, is mandatory, publicly managed, and could be universal or means-tested. The second pillar is also mandatory, but aims to be a vessel for savings and core income replacement among the population. It is pre-funded and invested, but could be managed publicly or privately. The final pillar is voluntary, and aims to support more savings for those with high tastes for saving or high incomes. Public involvement in this pillar might take the form of regulation and tax incentives. The advantage of this three pillar approach is matching targets with instruments—achieving all goals with one scheme is more difficult.

An alternative, but complementary, taxonomy comes more recently from Whitehouse (2007). He provides a typology of public pensions around the world. A first tier seeks to redistribute and influence poverty. The second tier provides insurance and a vehicle for income replacement. This typology is focused only on the thoroughly public parts of retirement income systems, which contrasts with the ‘three pillar’ focus on the whole of savings for retirement.

In the description that follows, we line up the Canadian system with the ‘three pillar’ approach, but also note how components fit into the Whitehouse typology.<sup>19</sup>

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<sup>19</sup> Some history of the development of Canada’s public pensions is in Baker, Gruber, and Milligan (forthcoming). More detail on the program benefit calculations is in Baker, Gruber, and Milligan (2003).

### **3.1 First pillar programs in Canada**

The Old Age Security suite of public pensions provides the ‘poverty alleviation’ pillar in Canada. There are four distinct programs covered in the *Old Age Security Act*, each with a slightly different target and history.<sup>20</sup>

The Old Age Security (OAS) pension was introduced in 1952, replacing an older means-tested program dating from 1927. It was funded in part by employer and employee contributions until 1971. It pays a flat benefit (\$516.96 per month as of October 2009) to Canadian citizens and residents upon application, which may occur when one turns age 65.<sup>21</sup> The pension is updated quarterly for consumer price inflation. Since 1989, higher-income Canadians have been subject to a ‘clawback’ of 15% of income exceeding a threshold.<sup>22</sup> Nearly 4.6 million Canadians receive the OAS pension. In the Whitehouse typology, this is a ‘basic redistributive’ pension.

A second pension in the OAS suite is the Guaranteed Income Supplement (GIS) program introduced in 1967. This pension is a ‘targeted’ pension in the Whitehouse typology, meaning that it aims specifically to increase incomes of the elderly poor. It is paid at a monthly rate of \$652.51 for single recipients, and \$430.90 (each) for those with a partner. This pension is reduced by 50 cents for each dollar of income, however, meaning that by

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<sup>20</sup> Rules and program details can be found at <http://www.servicecanada.gc.ca/eng/isp/oas/oastoc.shtml>. Statistics on the dollar amount and number of recipients come from the October-December 2009 Quarterly Report available at <http://www.servicecanada.gc.ca/eng/isp/statistics/rates/octdec09.shtml>.

<sup>21</sup> There is a 10 year residency requirement for newcomers to Canada. Those in Canada between 10 and 40 years receive a partial pension, in proportion to the number of years divided by 40 that the person has been in Canada.

<sup>22</sup> In 2009, this threshold is \$66, 335. We calculate that 6.4% of Canadian seniors had incomes exceeding the threshold in place in 2006, using data from the 2006 Survey of Labour and Income Dynamics.

\$15,672 of income this Supplement is reduced to zero for a single person, and \$20,688 for someone with a partner. There are currently about 1.6 million recipients, representing 35% of OAS recipients.

The third and fourth pensions are the Allowance and the Allowance for Survivor. These are paid to partners of OAS recipients (Allowance) and surviving partners (Allowance for Survivor) who are between the ages of 60 and 64. The amounts are comparable to a combined OAS and GIS pension, and are clawed back with each dollar of income. These pensions are paid to fewer than 100,000 recipients.

These programs have achieved a high degree of success in alleviating extreme poverty among the elderly. While there remain pockets of elderly who are missed by these programs, they appear quite successful in achieving the goals of a poverty-alleviation pillar.<sup>23</sup>

### ***3.2 Second pillar programs in Canada***

The second pillar in Canada is formed by the Canada Pension Plan (CPP) and its Quebec counterpart the Quebec Pension Plan (QPP).<sup>24</sup> The CPP operates as a joint initiative of the federal and provincial governments (except Quebec)—it required special constitutional negotiations and arrangements between the levels of governments when it

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<sup>23</sup> Milligan (2008) shows the evolution of measures of income poverty among the elderly through time, showing a drastic decrease from the 1970s to the 2000s. Veall (2008) finds that low income seniors are concentrated among recently arrived immigrants, seniors caring for children, and unmarried seniors.

<sup>24</sup> The QPP is almost identical in most ways to the CPP, so the discussion will continue with a focus on the CPP.

was introduced and requires similar cooperation to enact reforms. Both the CPP and QPP are mandatory, contributory programs. The plans are funded by a tax on earnings up to a threshold, with a small disregard (\$3,500) for low earnings. The threshold in 2009 is \$46,300 and this is updated annually for earnings growth. The contribution rate is 4.95% for both the employer and employee. Since 1999 benefits have been partially pre-funded in the CPP. The QPP has been partially pre-funded for longer, but the degree of pre-funding has increased in recent years. The funds in both cases are managed in a public sector central fund.<sup>25</sup>

The benefit formula depends on earnings between age 18 and the year of benefit claiming. Benefits may be claimed at age 60, with an adjustment of 0.5% of benefits per month before or after age 65 to a maximum of 30%.<sup>26</sup> Certain earnings are disregarded from the earnings formula—when there is a child under age 7 present, and the bottom 15 percent of remaining months. Also, work after age 65 is effectively only included when it increases the benefit. Only earnings up to the threshold are covered. This threshold currently sits at \$46,300 and is indexed annually to earnings growth. While career-long earnings are used, the formula updates to prevailing wages at the time of retirement. In contrast to Social Security in the United States, the replacement rate formula is a flat 25% of adjusted lifetime earnings, meaning that there is no explicit redistribution in the plans.<sup>27</sup> In addition to retirement benefits, there are also benefits for survivors, lump-sum

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<sup>25</sup> The Canada Pension Plan Investment Board for the CPP, and the Caisse de dépôt et placement du Québec for the QPP.

<sup>26</sup> Someone claiming at age 60 would receive a  $0.5 \times 60$  months = 30% discount off full benefits, while someone claiming at age 70 would receive  $0.5 \times 60$  months = 30% bonus on full benefits.

<sup>27</sup> Social Security features replacement rates of 90% for the first tranche of earnings, 32 percent for the middle tranche, and 15% for the rest. This entails redistribution toward low earners, since the contribution rates are flat proportions of earnings. This structure reflects the fact that Social Security effectively

death benefits, and children of deceased contributors. Both plans also feature substantial disability insurance components which we do not discuss here.

These plans are geared to earnings replacement. Those who do not work, do not receive benefits on their own—although they still may be eligible for survivor benefits if their partner was a worker. In this way, the CPP/QPP are 2<sup>nd</sup> tier defined benefit plans in the Whitehouse typology.

In 2008-2009, \$34.7 billion was contributed to the CPP by 12.5 million contributors and \$9.9 billion to the QPP by 3.8 million people. The accumulated account balance stood at \$108 billion for the CPP, and \$26 billion for the QPP. The maximum age 65 retirement benefit in 2009 is \$908.75 per month, but the average is \$500.64 over the 3.7 million CPP beneficiaries. There are also more than one million survivor benefit recipients and 80 thousand children of contributor beneficiaries.

In the mid 1990s, the CPP was out of long-run balance, with expected benefits far exceeding expected contributions. However, the reforms of 1996-98 have righted this deficit. These reforms slightly lowered benefits and substantially increased contributions, which combined to initiate a path to the pre-funding of benefits, managed by the Canada Pension Plan Investment Board.<sup>28</sup> The latest actuarial projections suggest that the current path is sustainable at current contribution rates to the horizon of 2075.<sup>29</sup>

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attempts to perform the functions of both first and second pillars, while in Canada, the OAS/GIS and the CPP perform these functions separately.

<sup>28</sup> See Little (2008) for an account of the reform.

<sup>29</sup> See Office of the Superintendent of Financial Institutions (2007).

### ***3.3 Third pillar programs in Canada***

The third pillar in the World Bank framework is voluntary. Into this category go employment-based pensions and private savings. In Canada, unlike many industrial countries, this pillar is a very important component of retirement incomes for a large proportion of the population, as will be seen in the next section.

Employment-based pensions must register with the Canada Revenue Agency to be eligible for special tax treatment, which gives rise to the appellation of Registered Pension Plans (RPPs) for these arrangements. Employee contributions are deductible for tax purposes and income accrues tax exempt. Upon retirement, benefits are taxed as regular income.<sup>30</sup> Among paid workers, 38.3% of Canadians were covered by a RPP in 2007. The coverage rate for females was slightly higher than males.<sup>31</sup> However, the coverage for males trended downward through the 1990s.<sup>32</sup> The total amount accumulated within all types of RPPs as of 2003 was \$847 billion.

Certain types of retirement saving receive special tax treatment. Contributions to Registered Retirement Savings Plans (RRSPs) are deductible from income up to a certain limit, income accrues tax-exempt, and withdrawals are taxable as regular income.<sup>33</sup>

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<sup>30</sup> There is, however, a credit for pension income of \$2,000 as well as the ability for elderly couples to split pension income.

<sup>31</sup> Statistics Canada Pension Plans in Canada summary table:  
<http://www40.statcan.gc.ca/101/cst01/labor26a-eng.htm>.

<sup>32</sup> See Morissette and Drolet (2001) for an account of the decline in pension coverage for males.

<sup>33</sup> The contribution limit for 2009 is \$21,000, with an adjustment downward for members of RPPs. Unused contribution limit room can be carried forward for future use indefinitely.

Participation in these accounts grew tremendously in the 1980s and early 1990s, but growth has leveled off in recent years.<sup>34</sup> The total accumulated amount as of 2003 in RRSPs was \$403 billion. As of 2009, Canadians also have access to Tax-Free Savings Accounts (TFSAs) for contributions of up to \$5,000 annually. Contributions to these accounts are not deductible, but withdrawals are not taxable. The tax benefit comes from tax-exempt accrual of funds while in the account.

The most conspicuous feature of these components of the retirement income system is the distribution of use—higher income Canadians are more likely to have funds in RRSPs and in RPPs. However, viewed in context as a voluntary, supplementary pillar to the rest of the system, this is perhaps less surprising or concerning.

Before closing the discussion of the third pillar, it is worth mentioning other components of household wealth. Housing equity and non-pension financial savings, though not formally earmarked for retirement, can and do form an important part of many retirement plans—for many Canadians the value of their home exceeds the value of their pensions and financial assets combined.<sup>35</sup> Although there is some reluctance of homeowners to treat their primary residence like other assets, it is important not to ignore these assets when assessing the well-being of the elderly.<sup>36</sup>

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<sup>34</sup> Again, see Morissette and Drolet (2001) for an analysis of these trends. Milligan (2002) also documents and explains trends in participation.

<sup>35</sup> Milligan (2005) demonstrates the importance of both housing equity and financial assets in the wealth holdings of Canadian households.

<sup>36</sup> For example, Coile and Milligan (2009) show that few senior families sell their home in the absence of a major shock such as the death of one of the spouses.

### **3.4 Summary**

This section has briefly reviewed the components of the retirement income system in Canada, making reference to the World Bank ‘three pillar’ framework. In the next section of the paper, we present original findings on the level and makeup of retirement incomes in Canada that will build on this description.

## **4.0 Incomes of elderly Canadians**

We now turn to the data. In this section, we examine the incomes of elderly Canadians both through time and cross-sectionally. The goal is to assess the contribution and importance of the government in retirement incomes.

For the analysis, we use Statistics Canada survey data; primarily the Survey of Labour and Income Dynamics. These data are nationally representative, with approximately 55,000 individuals grouped into 30,000 families per year in the survey. The data are available annually from 1997 to 2006. For years before 1997, we use the Survey of Consumer Finances which provides comparable coverage.

We present information on the level and composition of income. Our measure of income captures most elements considered by the income tax. An exception is our measure of private pension income which includes private retirement pensions, RRSP annuities and Registered Retirement Income Fund (RRIF) withdrawals, but excludes RRSP withdrawals.



In addition to the level and composition, we examine a dimension of the distribution of income as captured by a low-income rate based on the Statistics Canada “low income cut off” (LICO). While our income information is at the level of the individual, we calculate low income rates at the level of the “economic family.”<sup>37</sup> By moving to the level of the economic family we attempt to capture the economic resources an individual may have access to within the household.

There is no widely accepted single measure of poverty or low income for Canada. Our use of the LICO definition is more a reflection of common practice than of its superiority to other measures. A LICO identifies levels of income at which a family unit spends a larger fraction of its income on the basic necessities of food, shelter and clothing than does the average Canadian family. This fraction is set at the proportion that the average family spends plus 20%. The standard has been rebased several times since the 1950s, most recently in 1992. The current standard is 55% of *pre tax* income (35% plus 20%). There is also a *post tax* LICO which identifies those families that spend more than (roughly) 64% of their *after tax* income for the specified purposes.

The LICO is open to many criticisms. For example, because it is a relative measure some families will always be identified as low income no matter how high average income rises. However, this said the alternatives also have weaknesses. One, the low-income measure (LIM), simply identifies those living with incomes less than 50% of the median,

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<sup>37</sup> Statistics Canada defines an economic family as “a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law or adoption. A couple may be of opposite or same sex. Foster children are included.” See [http://www.statcan.gc.ca/concepts/definitions/economic\\_family-familles\\_economiques-eng.htm](http://www.statcan.gc.ca/concepts/definitions/economic_family-familles_economiques-eng.htm)

adjusted for family size and composition. Like the LICO this is a relative measure, and some families will inevitably have incomes less than 50% of the median, no matter how high the median income is. A more “absolute” alternative is the Statistics Canada Market Based Measure (MBM), which is defined by the disposable income necessary to purchase a specific basket of goods and services. The controversy for this approach is that not everyone views the goods and services included in the basket as necessities—and this basket may be especially inappropriate for the elderly. As common conveniences are included in the basket, the MBM becomes more a measure of relative living standards and subject to the same criticisms as the LICO and the LIM.<sup>38</sup>

#### ***4.1 Elderly incomes through time***

To provide context for the present situation, we present three graphs showing the evolution of elderly incomes between 1973 and 2006.<sup>39</sup> We define elderly here as being in a family headed by someone age 65 or older. Figure 1 displays the level of family income for different percentiles of the elderly income distribution through time. P10 refers to the 10<sup>th</sup> percentile, P50 to the median, and P90 to the 90<sup>th</sup> percentile.<sup>40</sup> We also include the median ‘prime age’ (ages 25-55) for comparison.

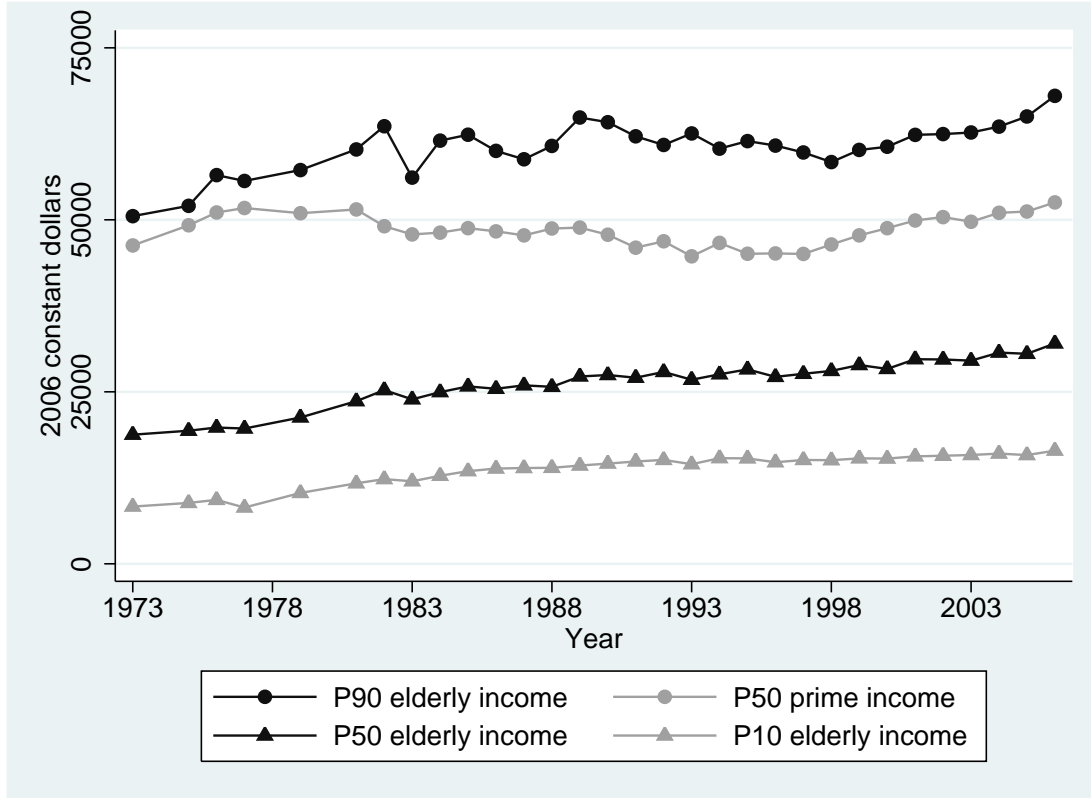
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<sup>38</sup> More detail on these low-income measures and how they perform empirically on the elderly population is available in Milligan (2007).

<sup>39</sup> Similar analyses appeared in Milligan (2008), but data were available only up to 2003 for that paper. The present analysis extends the time period by three years. See Milligan (2007) for an extended discussion on the data sets used here.

<sup>40</sup> The median income means the 50% of individuals have income below this level and 50% have incomes above. The 90<sup>th</sup> percentile is the level of income such that 10% of individuals have incomes that are higher than this level and 90% have incomes that are lower.

**Figure 1: Economic Family Income by Percentile: 1973 to 2006**

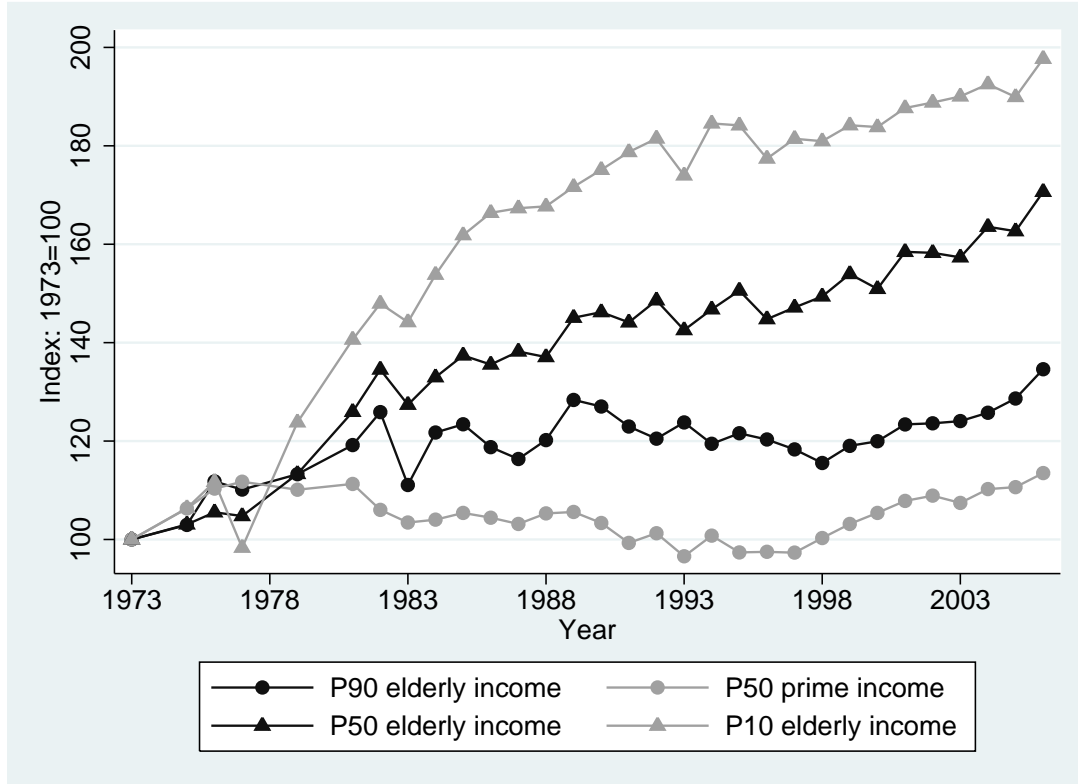


Note: Source is the Survey of Consumer Finances and the Survey of Labour and Income Dynamics.

Incomes across all percentiles have grown, with the largest *absolute* gains appearing for those at P90. Much of the gain happened in the first decade, but some growth continued to 2006. In contrast, the median prime age (non elderly) family income rose slightly in the 1970s, but took 25 years to regain its 1981 level.

In Figure 2, the same data are graphed but this time basing each of the lines at a value of 100 in 1973. This allows us to present more clearly the differences in percentage growth across parts of the income distribution.

**Figure 2: Economic Family Income by Percentile: Gains from 1973**



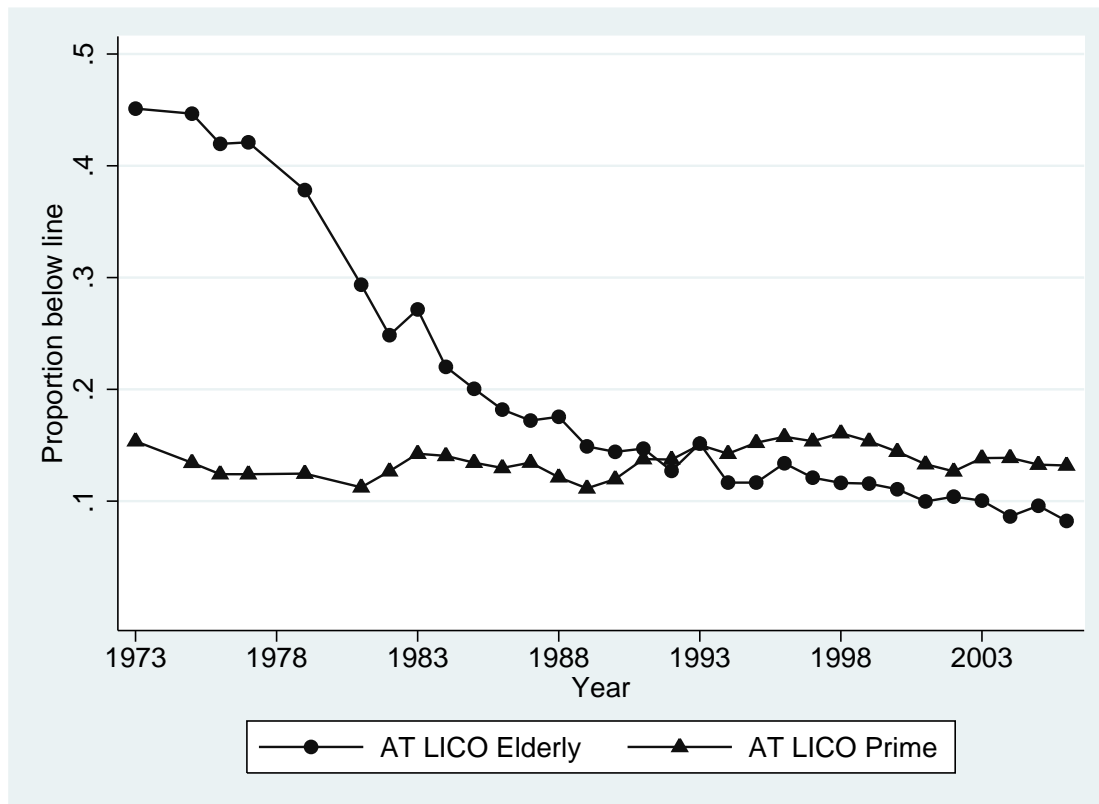
Note: Source is the Survey of Consumer Finances and the Survey of Labour and Income Dynamics.

This graph makes clear that there was a substantial and continued improvement in the incomes of the lowest income elderly. For P10 there is a 50% gain between 1973 and 1984, and a 98% gain by 2006. Gains at the median were also strong, reaching 71 percent above 1973 levels by 2006. Again, the contrast to prime age families is clear: the elderly have enjoyed income gains far in excess of those experienced by non elderly families.

Finally, we turn to a measure of low-income—the LICO. Figure 3 plots the proportion of families falling under the after-tax LICO in each year, using the 1992 cutoffs updated for

inflation for each year in the span 1973 to 2006. Both the elderly and prime-age families are included on the graph.

**Figure 3: After-Tax Low Income Cutoff for Elderly and Prime-Age Families**



Note: Source is the Survey of Consumer Finances and the Survey of Labour and Income Dynamics.

Figure 3 makes clear the great decline in elderly low-income incidence over the past 36 years. Since 1992, the low income rate for elderly families has been lower than that for prime-age families. In contrast, the low income rate for prime-age families moves relatively little over this 34 year period.

This analysis over time has uncovered a strong improvement in elderly incomes over the period from 1973 to 2006 both in absolute terms and relative to prime-age family incomes. This period saw an expansion of the GIS and the maturing of the CPP/QPP. Both of these policy developments almost surely contributed to these trends.<sup>41</sup>

## ***4.2 Elderly incomes in 2006***

We now present a more in-depth analysis of incomes for the most recent year available—2006. We focus first on individuals rather than families because the bulk of the retirement income system targets individuals rather than families.<sup>42</sup> We also show some results for the economic family unit, to contrast the individual results and provide a more complete picture.

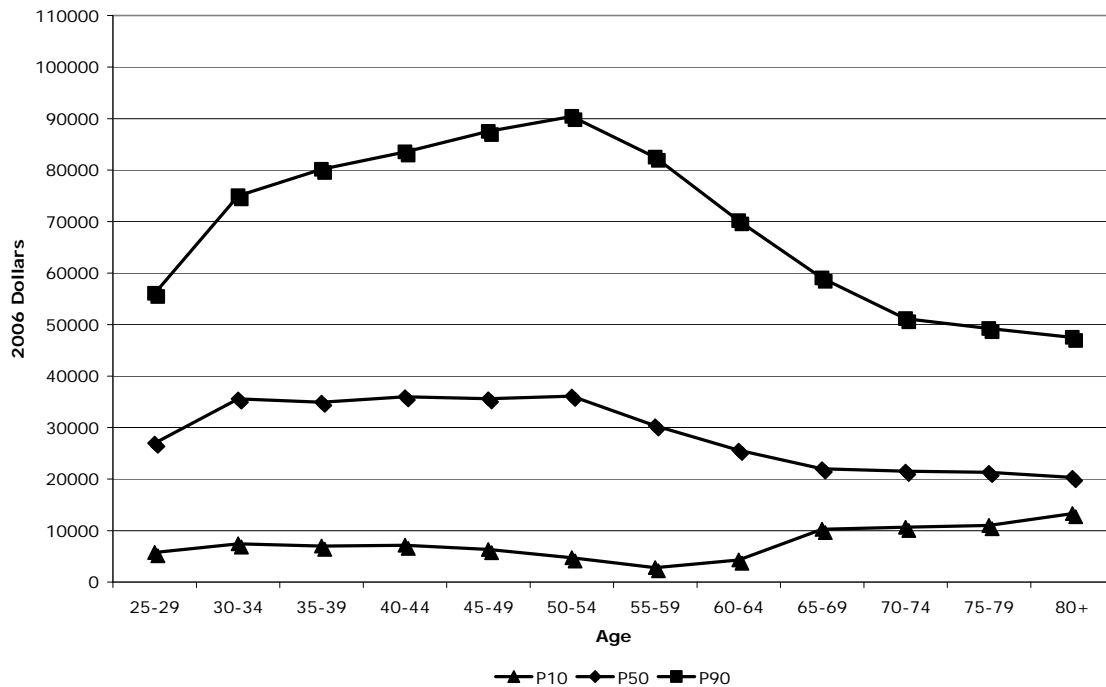
Figures 4 to 6 present some base information on incomes over the lifecycle. In Figure 4 we present the median income as well as the incomes at the P10 and P90 percentiles for all individuals. For example, at age 50-54 P90 income is just over \$90,000, meaning that only 10% of individuals have incomes higher than the \$90,000 level.

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<sup>41</sup> See Milligan (2008) for more discussion of the relationship between these long run trends and policy.

<sup>42</sup> There are of course many family-based measures as well, such as GIS payments, survivor benefits under the CPP, and income splitting for seniors under the income tax. However, the individual still plays a central role.

Figure 4: Incomes of All Individuals, Selected Percentiles



Both the median and P90 incomes in Figure 4 display the widely documented “hump” over the lifecycle, with the highest levels achieved in the prime earnings years, ages 35-55. Starting at age 55 both these statistics start to fall before stabilizing at the retirement ages (in the late 60s). The P10 income presents a very different picture, reaching a minimum around age 55. Also, its highest levels are achieved starting at age 65, the age at which the P90 income and the median reach their lowest levels. The peak levels of the P10 income are, of course, the years in which individuals can access the full array of Canada’s income security benefits.

Figure 5: Incomes of Males, Selected Percentiles

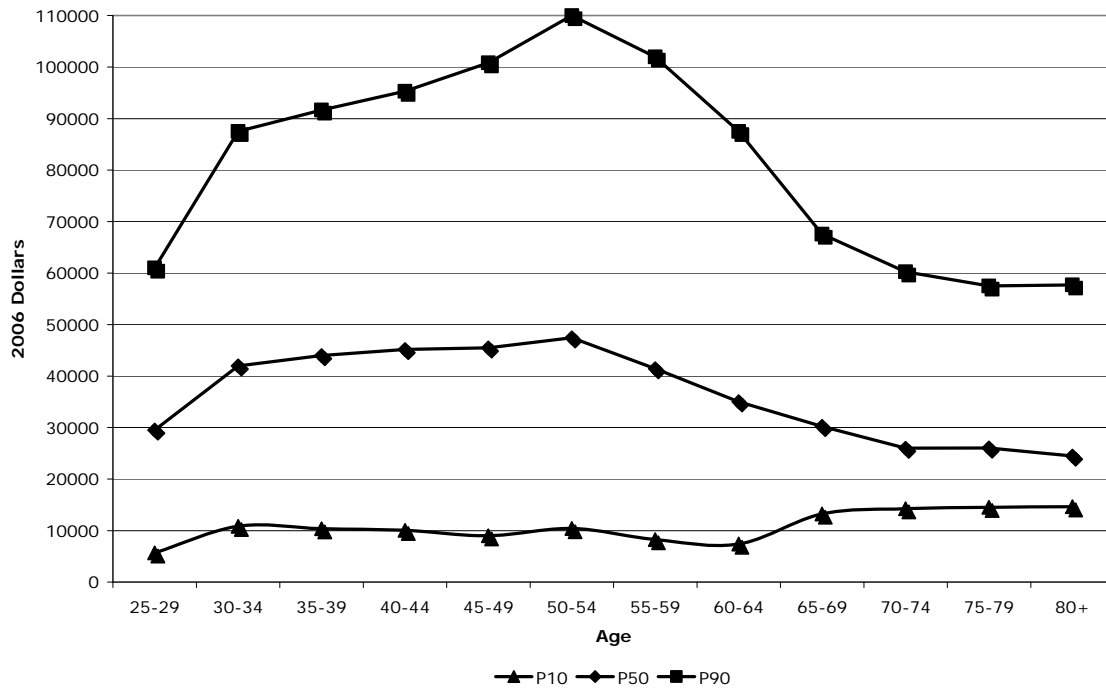
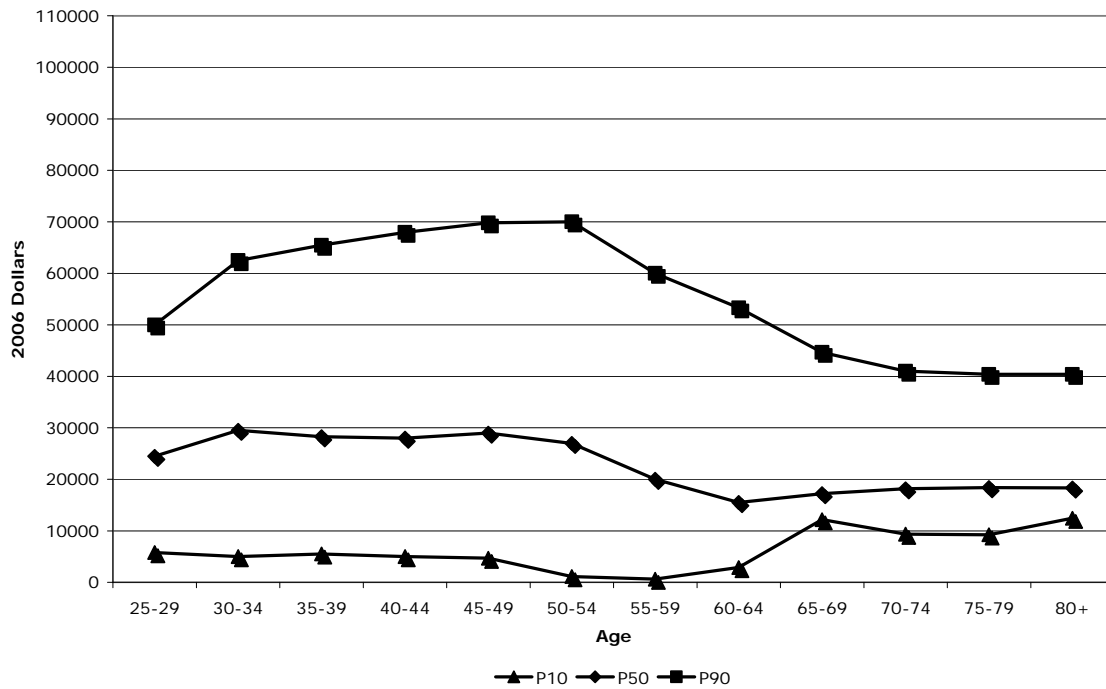


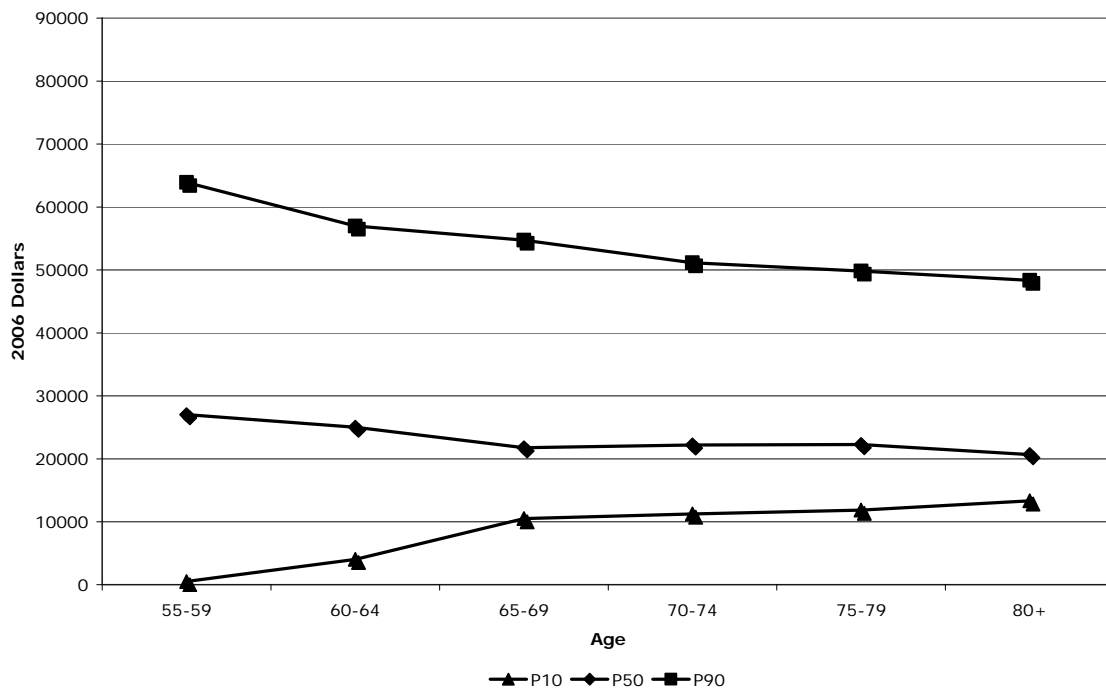
Figure 6: Incomes of Females, Selected Percentiles



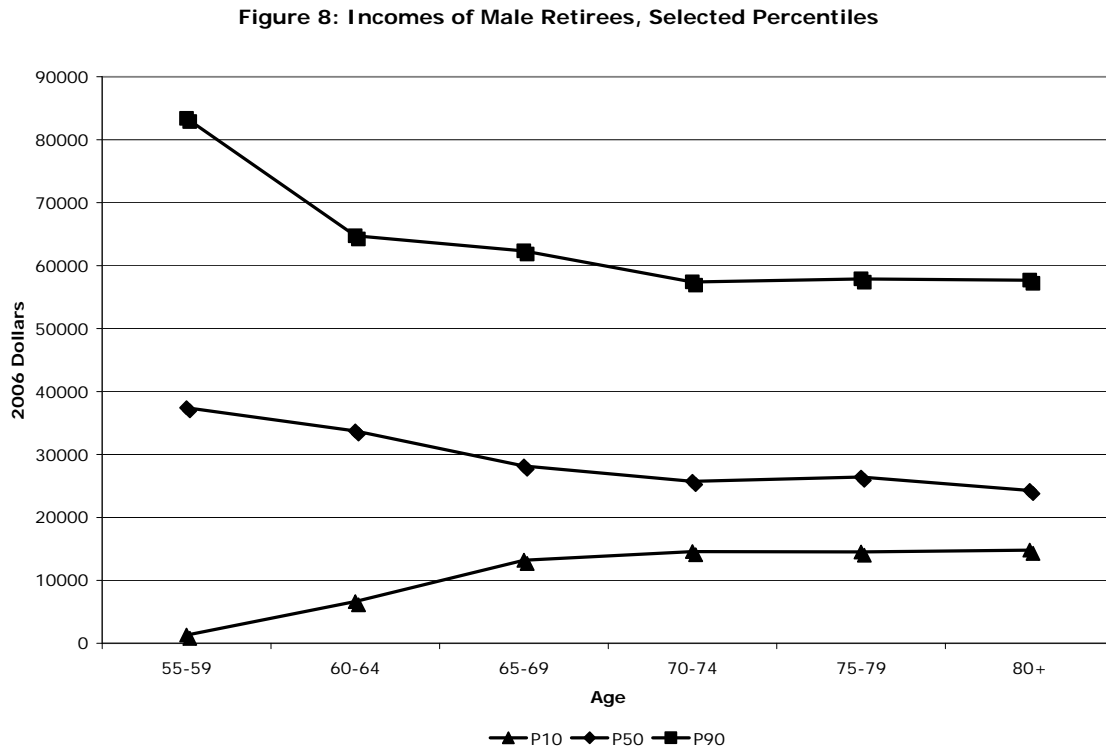


Corresponding information for males and females separately is provided in Figures 5 and 6. In addition to the well known gender difference in the absolute levels of all levels of income, the male/female difference in the P10 income stands out. For males the P10 income is relatively constant at about \$10,000 throughout the life cycle, and the increase in the retirement years is relatively modest. For females the P10 income bottoms out quite dramatically in the 50s before making a notable recovery at age 65. We should stress that the low levels of the P10 income for females do not necessarily imply low levels of economic welfare. We have not taken account of living arrangements in these figures. So, for example, some females with low incomes may belong to single earner, economically well-off, families.

**Figure 7: Incomes of All Retirees, Selected Percentiles**

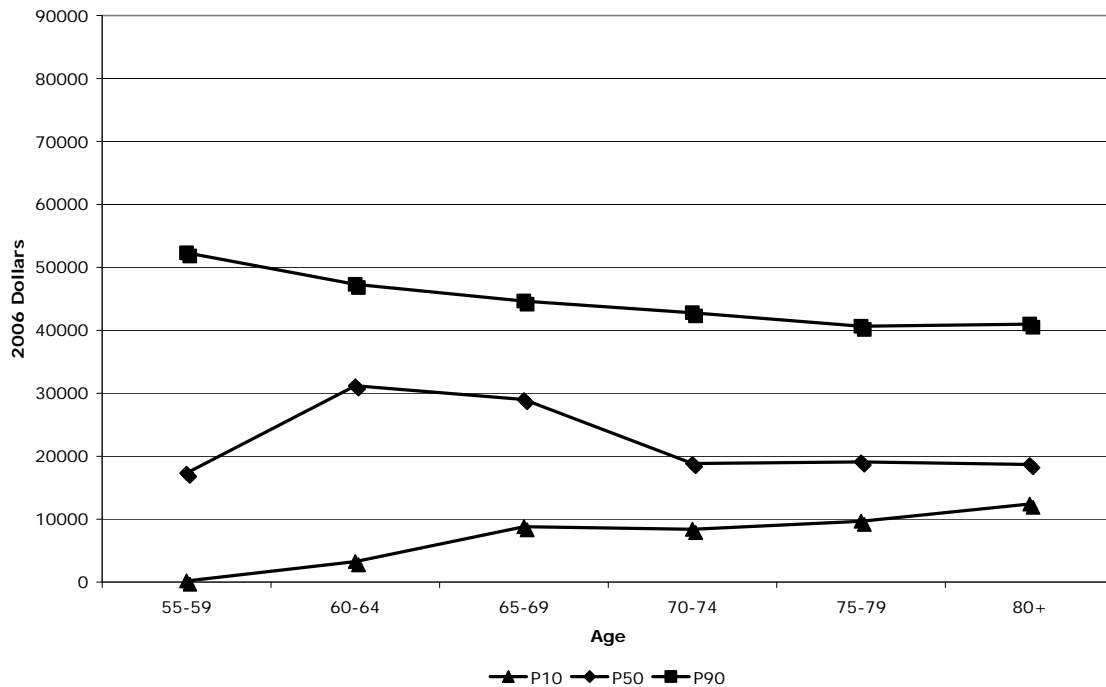


To focus attention on retirement, we now select only individuals who are retired. The results for retirees, starting at age 55, are presented in Figures 7 to 9.<sup>43</sup> The interesting differences in comparison to Figures 4 to 6 are at ages 55-64. Not surprisingly retirees at these ages have lower levels of income than the levels seen in Figures 4 to 6. Perhaps not as expected is that for *both* males and females the P10 income is very low until age 65 when the full benefits from the income security system become available.



<sup>43</sup> Samples at ages younger than 55 are too small to support the analysis.

Figure 9: Incomes of Female Retirees, Selected Percentiles

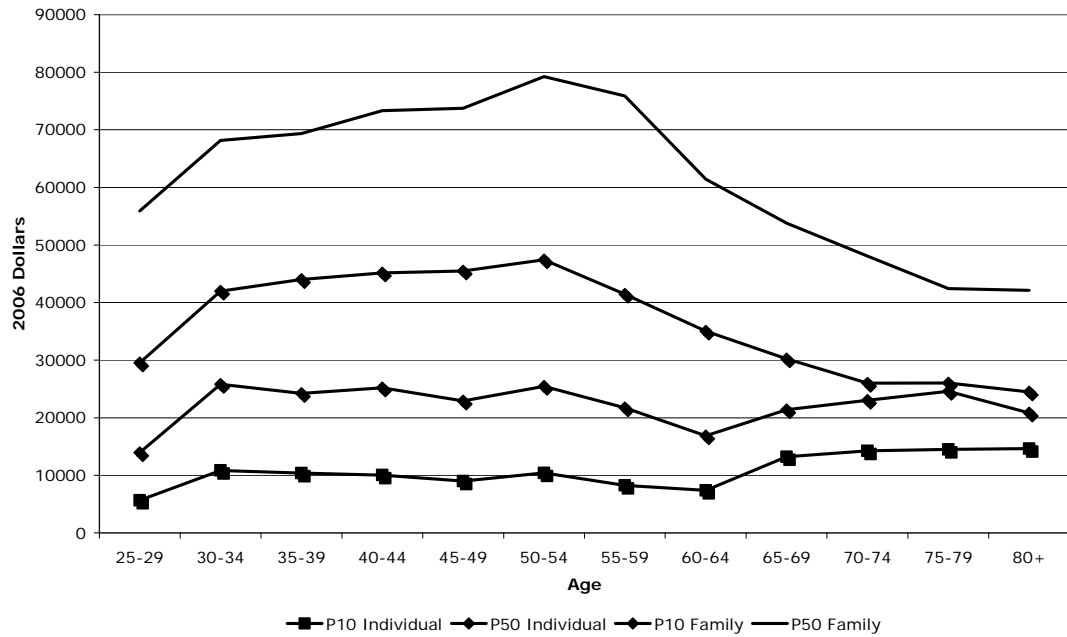


The low levels of P10 income in the preceding figures suggest that 10% or more of Canadian retirees live very perilously. However, as noted above, individuals with low incomes may have access to larger economic resources if they live in high-income households. It is therefore informative to consider levels of economic welfare that take account of living arrangements. To do this we look LICO based low-income rates at the level of the economic family.

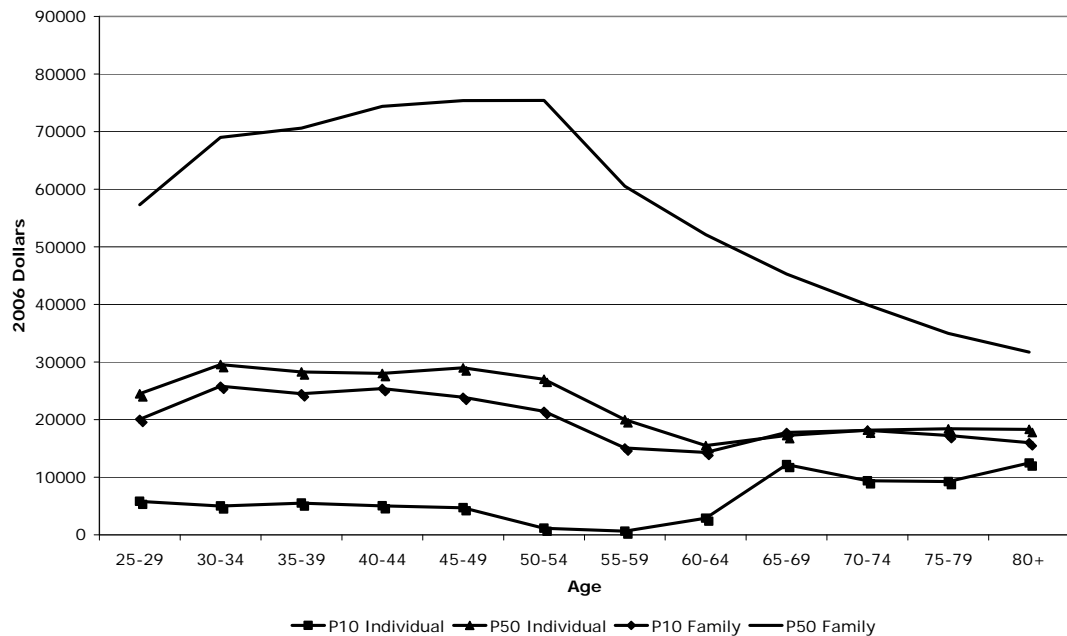
To motivate this switch in focus in Figures 10 and 11 we compare median and P10 income at the individual and economic family level by age for males and females respectively. Taking account of living arrangements makes a significant difference. For both older males and females the 10<sup>th</sup> percentile of family income is approximately equal

to the median of individual income. Clearly, basing a welfare evaluation on individual income could be misleading.

**Figure 10: Individual and Economic Family Incomes of Males, Selected Percentiles**

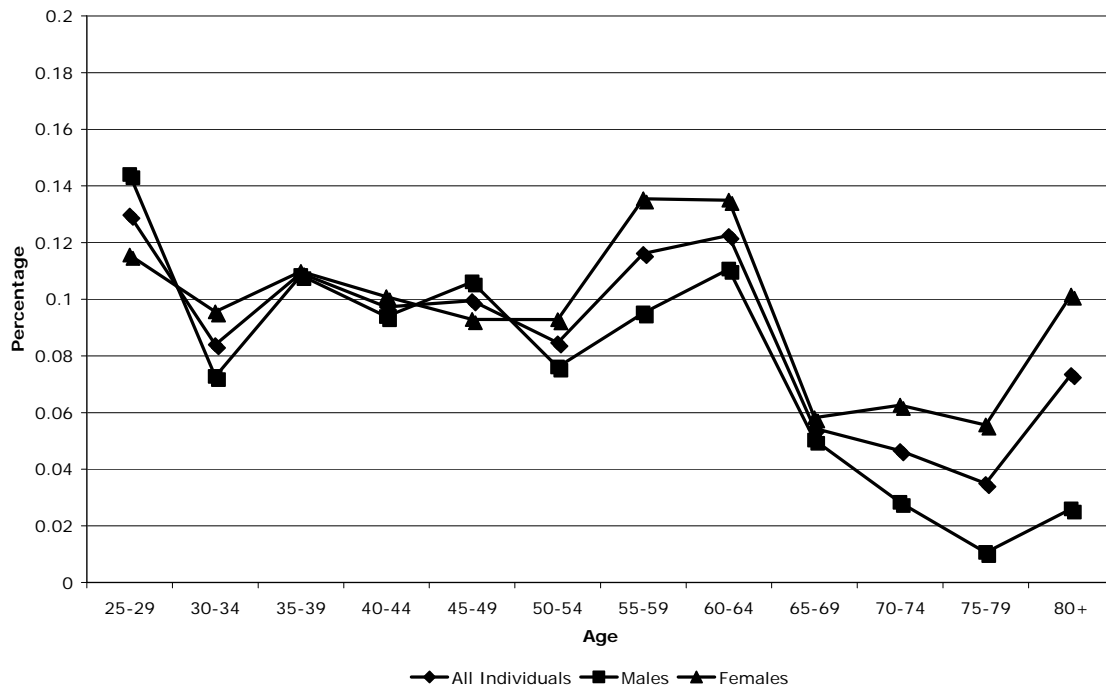


**Figure 11: Individual and Economic Family Incomes of Females, Selected Percentiles**



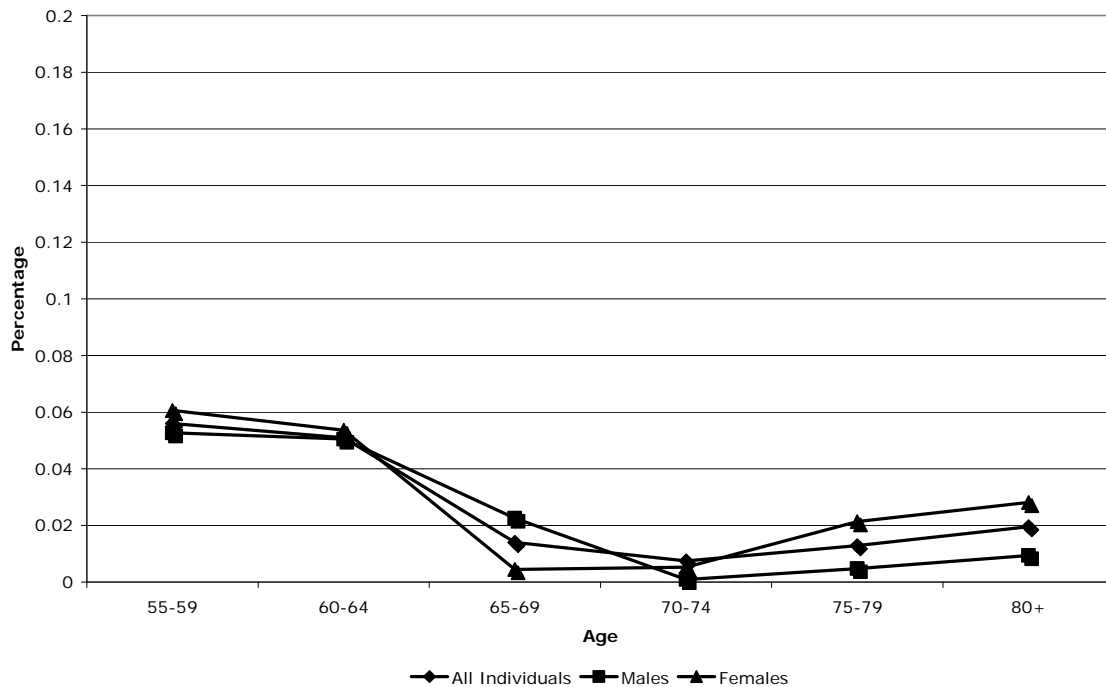
In Figure 12 we present the LICO low-income rates for all individuals and males and females separately. The rates are calculated on the basis of after tax income and so will take account of the equalizing effects of the income tax and transfer systems.

Figure 12: LICO Based Low Income Rates



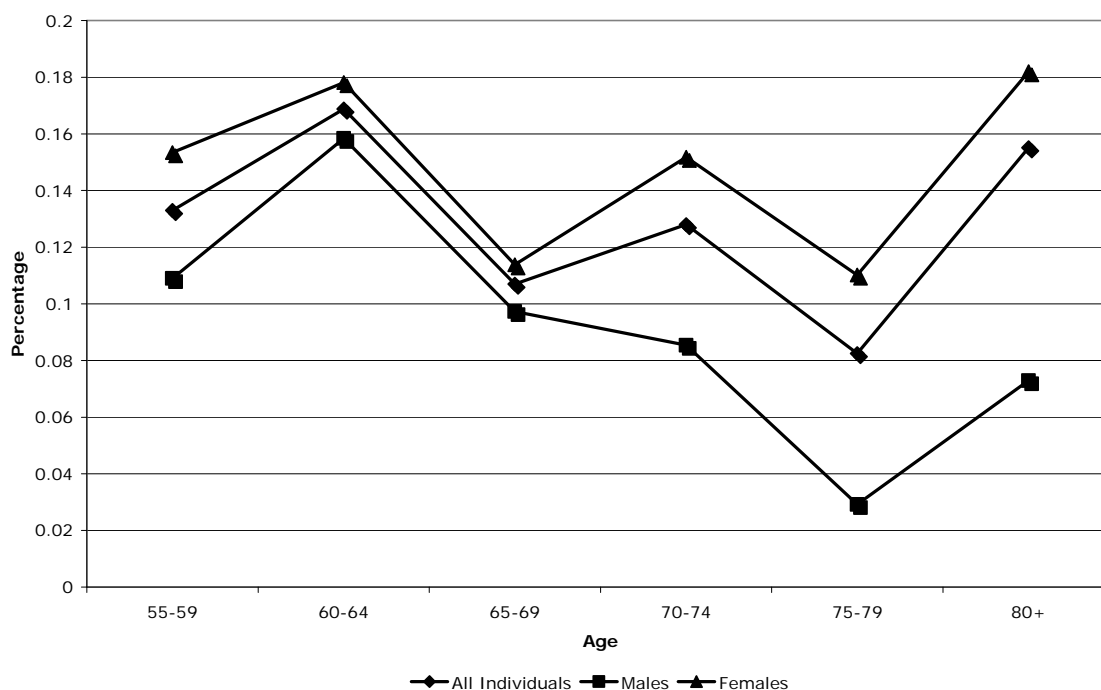
These statistics show the proportions of individuals by age living in economic families with total after-tax incomes below the LICO. Over the prime earning years the low-income rates of all groups average about 10%. In the 50s they trend upwards before falling sharply at age 65 as the complete set of income security benefits becomes available. It is clear in the picture that seniors in Canada have much lower low-income rates than the rest of the population. At age 80 the rates rise again, most notably for females. This may reflect the fact that, because males have shorter life spans than females, females at these ages increasingly live alone with reduced economic resources.

**Figure 13: LICO Based Low Income Rates for Individuals with Private Pensions**



The next two figures provide a comparison of the low-income rates for retirees who do or do not have an employment-based pension or income from a RRIF. Retirees with employment-based pensions or income from a RRIF have low, almost negligible, low-income rates while those without a pension have higher rates particular at ages before 65. In fact at the younger ages the low-income rates exceed those seen in the younger population (Figure 12).

Figure 14: LICO Based Low Income Rates for Individuals Without Pensions



How to interpret these differences is not completely clear. Employment-based pensions are typically associated with better paying jobs, so in one sense the comparison makes the obvious point that richer families have lower rates of low income. Also, viewing pensions as a form of savings, the comparison reveals that those who save more for retirement have more income in retirement, again not a surprising conclusion.

As noted above, one source of income these results do not account for is lump sum RRSP withdrawals.<sup>44</sup> As can be seen in Table 1, these are relatively common for individuals who retire in their 50s. For example, at ages 50-54 one in five male retirees and one in four female retirees report a withdrawal. Income from this source could potentially moderate the high low-income rates of retirees at these ages who do not have a pension.

<sup>44</sup> In some cases, a transfer of an amount into an RRSP (i.e., from another RRSP) shows up as an RRSP withdrawal. This sort of activity may be included in the statistics reported in table 1.

However, calculations not reported reveal that among retirees in their 50s, RSP withdrawals are more prevalent among those who have private pension income. Therefore, accounting for income from this source could accentuate the pension/no pension differences in low income rates observed in Figures 13 and 14.

**Table 1: The Incidence and Amount of RRSP Withdrawals By Age**

Age	Males		Females	
	Incidence	Amount if Positive	Incidence	Amount if Positive
50-54	0.077	5962	0.081	6747
55-59	0.091	7799	0.094	7215
60-64	0.127	7435	0.122	9209
65-69	0.013	3313	0.012	2088
70-74	0.008	2938	0.004	2151
75-79	0.012	3276	0.002	3073
80+	0.009	4444	0.002	3724

Source 2006 SLID. Amounts are in 2006 dollars.

A more general view of income composition is provided in Figures 15 to 17. We divide total income into six sources: CPP/QPP, OAS/GIS, private employment pensions, which include employment-based pension benefits as well RRIF withdrawals and RRSP annuities, investment income, earnings and other income, which is a residual including



all other income sources such as Employment Insurance benefits and other non-pension government benefits.

Figure 15: Income Composition All Individuals

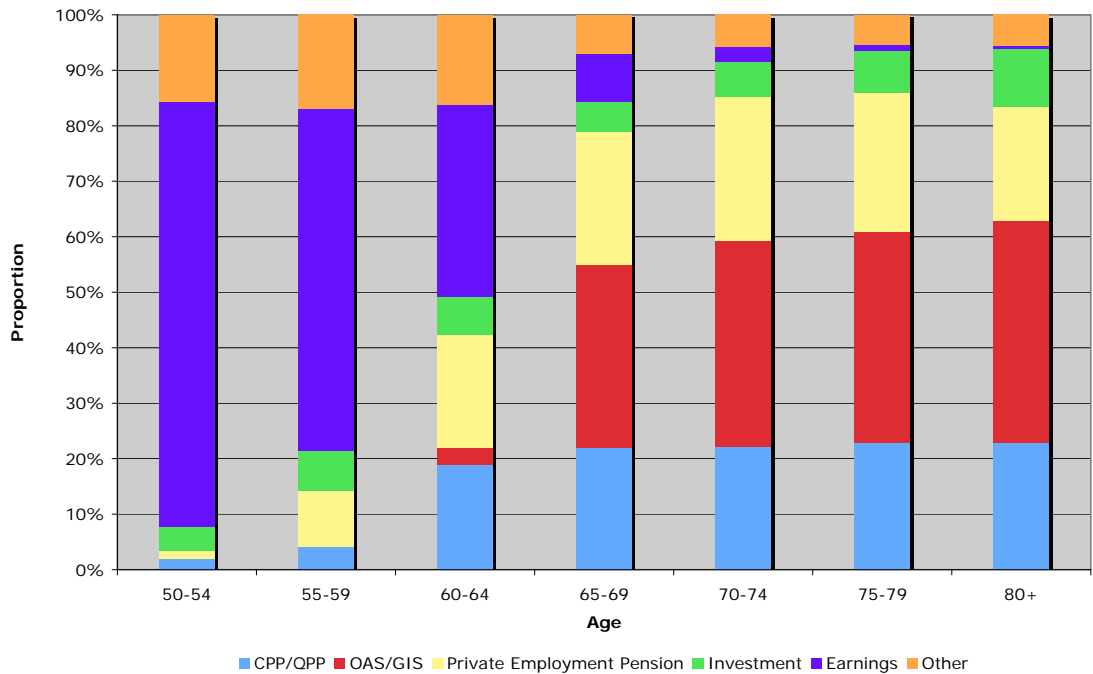


Figure 16: Income Composition Males

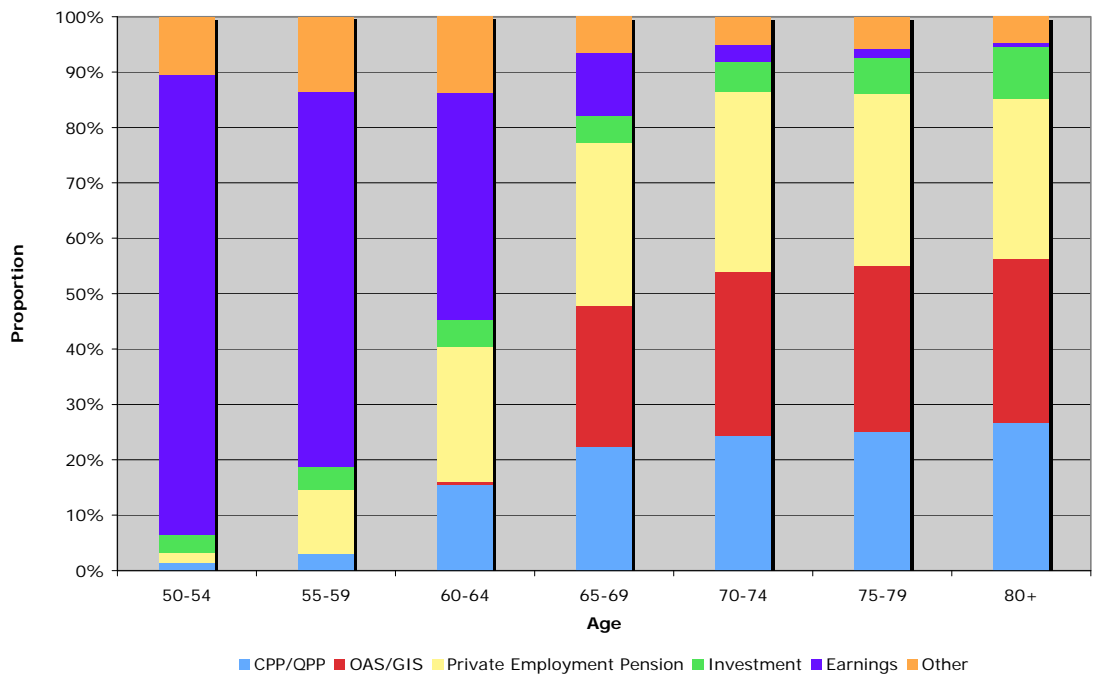
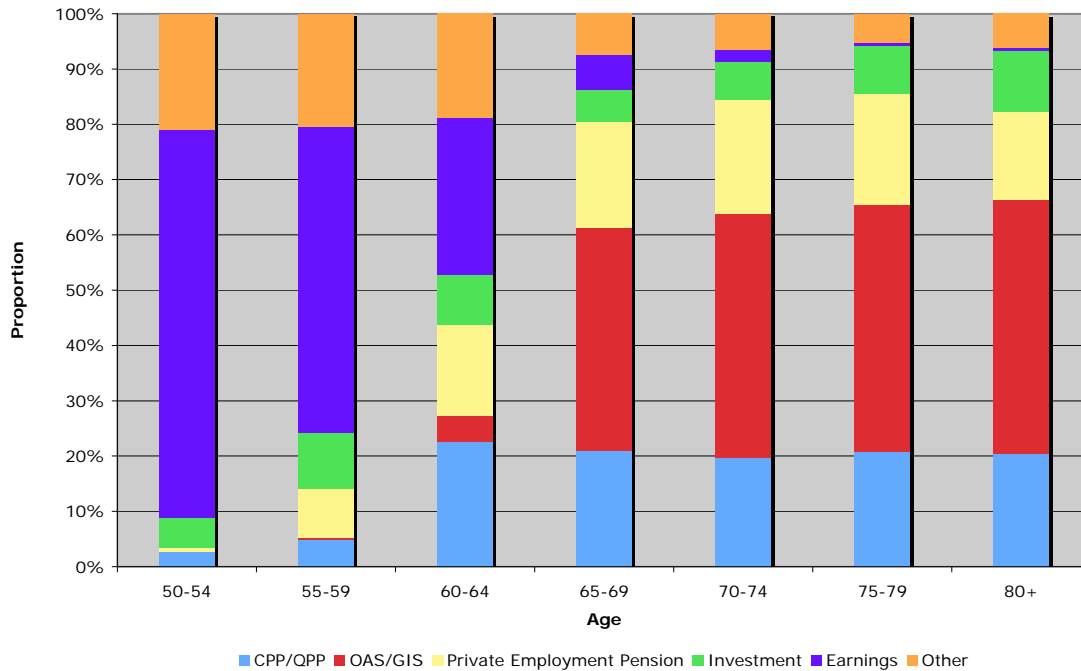


Figure 17: Income Composition Females

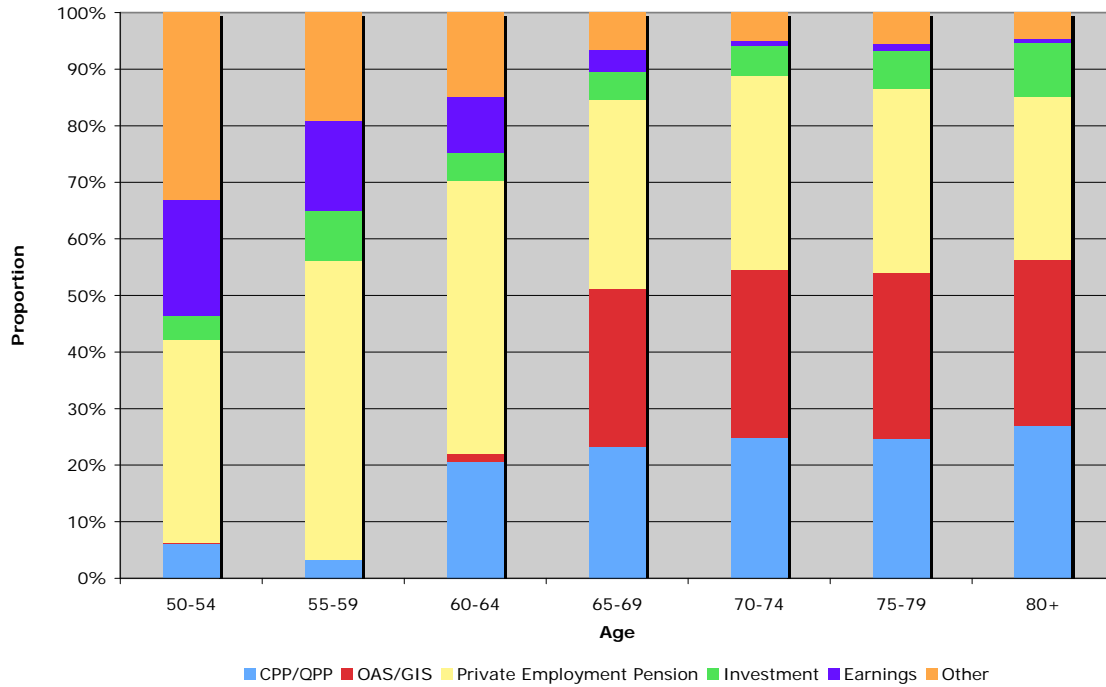


The prominence of income security benefits for the elderly is clear in these figures. Across all individuals these benefits represent 60 percent of income starting at age 65. There is a gender difference of about 10 percentage points (higher for females), but for both genders income security benefits represent more than half of income on average. Another gender difference is in the relative importance of CPP/QPP versus OAS/GIS benefits. For older females CPP/QPP benefits play a marginally smaller role and OAS/GIS benefits a more substantially bigger role. Finally, private employment pensions play a more important role, by about 10 percentage points, for males on average.

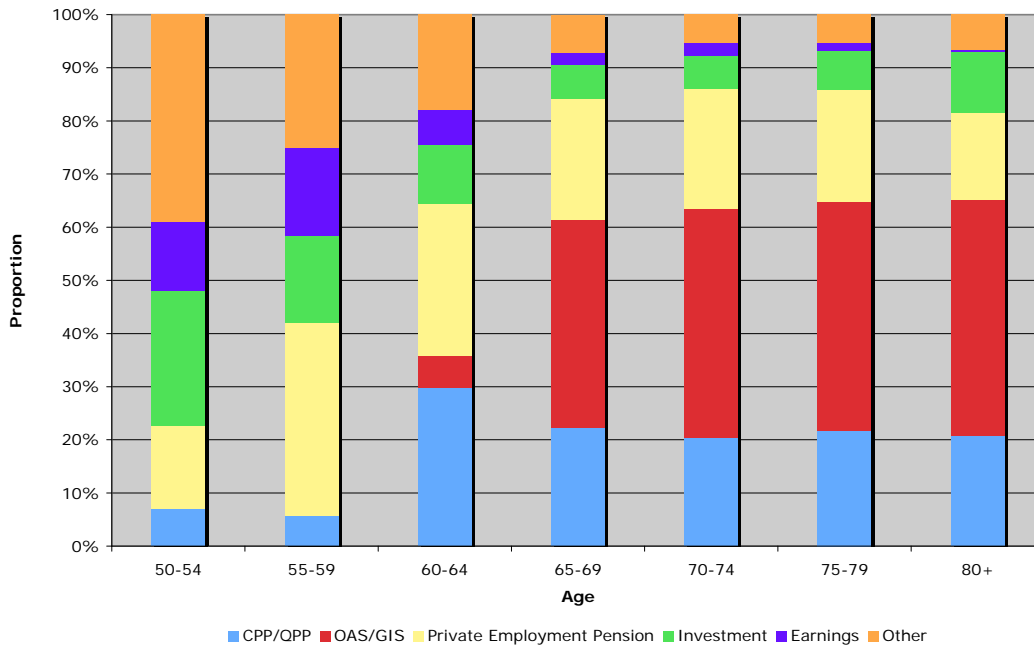
A clear message of these figures is that income security benefits and private pensions make up the vast majority of individuals' income starting at age 65. Also, earnings start

to lose their importance as a source of income by the mid 50s. By ages 60-64, earnings represent just 40 percent of income on average for males and 28 percent for females.

**Figure 18: Income Composition Retired Males**



**Figure 19: Income Composition Retired Females**



Finally in Figures 18 and 19 we provide corresponding information for males and females who are retired. What is new here for males is the importance of private pensions at ages prior to 65. Starting at age 55, pensions represent 50% of income. For females “other” income sources play a more important role at these early ages, and starting at age 60 public pensions emerge to be very important

### **4.3 Summary**

Our analysis of the incomes of elderly Canadians has revealed three primary findings. First, the incomes of the elderly have improved substantially both in absolute and relative terms over the last generation. Second, low-income Canadians depend substantially on the public components of the retirement income system. Finally, income received through the ‘third pillar’ of employment-based pensions and private savings play a fundamentally important role in the retirement incomes of Canadians.

## **5.0 Adequacy of incomes**

Having gathered evidence on the level and composition of the incomes of elderly and retired Canadians in the previous section, we now progress to a discussion of the adequacy of these incomes. We begin this discussion by reviewing theory and evidence on the time path of consumption between work and retirement. We then examine the concept of replacement rates, as normally constituted. Finally, we review recent findings on income replacement rates.

## **5.1 Consumption near retirement**

The standard economic model of the life-cycle suggests that people should prefer a smooth path for consumption—even if income does not follow a smooth path.<sup>45</sup> The gaps between income and consumption result in saving and dissaving. This smooth path for consumption applies equally to the transition between work and retirement. But, over this threshold from work to retirement one typically switches from saving to dissaving. If the saving plan has been inadequate, the result would be a consumption drop forced by the lack of sufficient resources to maintain a smooth consumption path.

For the last decade, a series of papers have found evidence of consumption drops at retirement. The drops were beyond what might be expected from no longer having to make work-related expenses (for example, commuting or work clothes). This was taken by some as evidence that many households arrive at retirement unprepared to maintain their consumption levels. This has been referred to as the ‘retirement consumption puzzle.’<sup>46</sup> Of note, the available evidence in Canada does not uncover a similar drop in consumption at retirement, except for a slight drop among the bottom quartile of families.<sup>47</sup>

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<sup>45</sup> See Browning and Crossley (2001) for an exposition of the theory and evidence on the life-cycle model of savings and consumption.

<sup>46</sup> The initial finding for the United Kingdom was in Banks, Blundell, and Tanner (1998). In the United States, Bernheim, Skinner, and Weinberg (2001) find similar evidence that households see consumption drops at retirement.

<sup>47</sup> See Lise (2003) for the analysis of Canadian consumption. Brzozowski and Lu (forthcoming) also study Canada but do not find evidence of food expenditure drops at retirement. In contrast, Denton, Mountain and Spencer (2002) do find evidence of an increasing share of expenditure on food-at-home among older Canadians.

As this line of research progressed, however, alternative explanations developed. Specifically, the evidence pointed to a concentration of the consumption drop in the area of food expenditures. Moreover, evidence suggested that the consumption drop was expected by many households, not a surprise. These newer findings led a recent reviewer of the literature to suggest that the consumption puzzle has been retired.<sup>48</sup>

An important focus of this recent research is to distinguish between consumption and expenditure. By expenditures, we mean things that are purchased. But there are two important differences between these expenditures and what is actually consumed by people. First, consumption should include the flow of consumption that comes from durables (such as housing, furniture, or appliances) purchased previously. While careful studies of consumption focus on non-durables, the continued flow of consumption coming from previously purchased durables has implications for income needs in retirement.<sup>49</sup> Second, consumption results from the combination of expenditures with time. For example, the drop in food expenditures at retirement documented over the past decade is matched by a large increase in the time spent shopping and preparing food. On net, actual food intake does not drop at all for most households, even with lower expenditures.<sup>50</sup> Again, this emphasizes the differences in income needs for those working and those who are retired.

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<sup>48</sup> Hurst (2008) reviews the literature. Haider and Stephens (2007) show that some of the retirement consumption drop is caused by unexpected retirements. Hurd and Rohwedder (2005) and Ameriks, Caplin, and Leahy (2007) show that much of the drop is anticipated and not the result of poor planning.

<sup>49</sup> Milligan (2007) shows the strong sensitivity of consumption measures for the elderly to using different measures of housing expenditures. Milligan (2005) shows very large life-cycle patterns in durables accumulation in Canada.

<sup>50</sup> Aguiar and Hurst (2005) emphasize the importance of household time inputs. Aguiar and Hurst (2007) document the increased time spent by the retired on shopping and on food preparation. This is echoed in Canadian evidence by Brzozowski and Lu (forthcoming).

Another important recent finding is the heterogeneity of consumption changes at retirement. For many, consumption changes at retirement are quite small. Two groups, however, experience systematically large drops of consumption at retirement. First, those with low accumulated wealth at retirement have large drops. It is possible that these households suffer from poor planning. Second, those who retire involuntarily—due to health changes, for example—also suffer consumption drops beyond what can be explained. While these cases are potentially troubling, it is important to recall that these problems affect targeted populations; there is no evidence from the consumption literature of systematic poor planning across the population.

This exploration into recent research on the consumption path among the near and newly retired has three important implications for the discussion of adequacy for retirement incomes. First, it is normal to expect some drop-off in expenditures at retirement due to work-related expenses. Second, the availability of more time means that less expenditure is needed to maintain consistent consumption. Third, some fraction of the population will still experience unexpected consumption drops due to health limitations or poor planning.

## ***5.2 Measurement of income replacement rates***

In policy discussions of the adequacy of retirement incomes, the replacement rate is the focus of measurement. The replacement rate is defined as some measure of retirement income divided by some measure of working-life income. Financial planners often use

‘rules of thumb’ such as 70% or 80% as desired replacement rates. Before embarking on a review of recent evidence on replacement rates in Canada, however, the concept of replacement rates needs further reflection.

We begin with the link between incomes, which are used in replacement rate calculations, and consumption, which is what contributes to well-being. There are two steps: income is linked to expenditure, and expenditure is linked to consumption. Each of these links carries important distinctions.<sup>51</sup>

First, moving from income to expenditure is different for a retired and a working family. That is, the level of income necessary to maintain a given level of expenditure is different. The difference comes from taxation. Taxes on the elderly are lower: for example, income splitting, the age credit, and pension income credit. Moreover, earned income attracts CPP and Employment Insurance premiums; retirement income does not. Combined, this suggests that it is important to use after-tax income measures to compare incomes before and after retirement.

Second, the link between expenditures and consumption is also different. As discussed earlier, the prediction coming from the life-cycle model is that we expect relatively smooth consumption streams throughout life. But, a smooth stream of consumption is quite distinct from a smooth stream of expenditure. Many reasons underlie this, some of which were discussed above:

- Work-related expenses go down at retirement.

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<sup>51</sup> This section draws in part on Hamilton (2001).



- Time available for household production rises, leading for example to lower food expenditure.
- Elderly households can consume durables purchased years and decades previously.
- Many elderly households have lower housing expenditures if mortgages are paid off or are based on mortgages taken out long ago.
- Children have moved on: For most of the elderly, the financial burden of children (food, clothing, education, vacations / entertainment) has been relieved.

Taking these together, it is clear that a constant stream of consumption does not require equivalent expenditure, before and after retirement. A recent study that accounts for some of these differences between income and consumption found replacement rates of 60% were adequate to maintain expenditure.<sup>52</sup>

Perhaps more importantly, this discussion also emphasizes the heterogeneity of circumstances. In comparing incomes at ages 50 and 70, a childless couple might need a very different income level to maintain constant consumption than would a couple with four children.<sup>53</sup> For example, families with children have higher expenditures for food, clothing, shelter, and education. Similar distinctions between those who might benefit from more time for household tasks afforded by retirement, those who finish paying off a mortgage before retirement, and those who don't intend to update their furniture and other durables purchased earlier. Given the diversity of circumstances, using one

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<sup>52</sup> See Brady (2008). This analysis accounted for savings, taxes, and housing expenses, but not for children.

<sup>53</sup> Scholz and Seshadri (2009) specifically examine the differences in wealth accumulation attributable to children.

replacement rate for all—unconditional on their circumstances—is likely to be a misleading indicator of the well-being of the retired.

A different concern arises from thinking about the definition of income and savings used in conventional analysis. Certain types of income are unlikely to be included in measures available in survey or tax data, or appear in somewhat arbitrary ways. For example, capital gains in a taxable account will appear as income, but gains in a tax-exempt account or from the sale of a primary residence will not. On the savings side, there are similar arbitrary distinctions. For example, dissaving from a taxable account or from an account such as the new TFSA will not appear as income on tax records. On the other hand, dissaving from a RRSP is added to income for tax purposes. These distinctions primarily affect capital income, so are less important for measuring income at working ages for most Canadians. However, in retirement, these somewhat arbitrary distinctions can have a large impact on the measured income of Canadians with non-trivial amounts of financial wealth.

### ***5.3 Recent evidence on income replacement rates***

With the caveats raised in the previous section in mind, we now turn to recent evidence on replacement rates in Canada. A recent, comprehensive comparison of public pension programs around the world estimated replacement rates at different levels of pre-retirement earnings.<sup>54</sup> For those earning half-average earnings, replacement rates for Canada were near the average among high-income OECD countries. However, for those

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<sup>54</sup> See chapters 5 and 6 of Whitehouse (2007).

earning 2 or 2.5 times the average earnings level, Canadian replacement rates were less than half of the OECD average, only bettering those in Ireland and New Zealand. Most importantly, this analysis accounted only for mandatory public pensions, and as was seen earlier, employment-based pensions and private savings contribute much to retirement incomes in Canada. In fact, recent simulations by the OECD that do account for employer-provided pensions show replacement rates for higher-earning Canadians to be in line with the average for the top ten OECD countries.<sup>55</sup> This demonstrates that an analysis of Canadian replacement rates must include all sources of income, not just the public sources.

A recent Statistics Canada study tackles the challenge of estimating replacement rates in Canada.<sup>56</sup> The data source for their analysis is longitudinal, meaning that the same individual is observed at different ages. The data are derived from tax filings, so all income reported to the tax authority is visible to the researchers. This kind of data is typically thought superior to survey data relying on respondent recall. Moreover, the dataset follows people for very long periods, allowing for meaningful comparisons. Incomes are measured on an after-tax basis, with adjustments for family size. This accounts for two of the criticisms—taxes and children—addressed above about replacement rate calculations. The ‘working’ income is determined by taking an average of incomes over the ages 54-56. This income serves as the denominator for the replacement rate calculations. In the numerator goes the income for the age under consideration. This includes both pension and labour market income. This is appropriate

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<sup>55</sup> See OECD (2009b). For those earning 1.5 times the average income, the estimated replacement rate including ‘voluntary’ sources was 59.4%, compared to 63.6% for the average OECD country.

<sup>56</sup> See LaRochelle-Côté, Myles, and Picot (2008).

for assessing the well-being of the seniors at these ages, but should not be interpreted as a strict pension replacement rate. For the earliest cohort they are able to study, they can observe from age 55 up to age 77.

There are three important findings about median replacement rates across ages. First, over the whole population, the age range where replacement rates drop is the early 60s, consistent with when most Canadians retire. The drop is around 20 percentage points, implying a replacement rate of about 80%. Second, the lowest income quintile (selected based on age 55 income) shows a markedly different pattern. For these families, there is almost no drop in replacement rates through the retirement years—meaning an effective retirement replacement rate of 1 at the median. Third, the drop for the highest income quintile is sharper, with replacement rates coming in between 0.70 and 0.80 at the median through age 70. Compared to median replacement rates in the United States, the rates in Canada appear slightly higher at all points in the income distribution.<sup>57</sup>

Another interesting finding relates to the distribution of replacement rates among families. Similar to the age-path for median replacement rates, there are strong differences across quintiles. For the lowest income quintile, only 1.9% had a replacement rate less than 0.60 at age 74 to 76, and 50.9% had a rate exceeding 1.0. In contrast, for the highest income quintile, 33.9% were below 0.60 and only 17% were above 1.0. For the middle quintile, however, 24% had a net replacement rate below 60%.

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<sup>57</sup> See Smith (2003) for replacement rate calculations for the United States.

Taken together, this research suggests that the Canadian retirement income system is providing substantial income replacement to almost all lower-income Canadians, and more modest income replacement to most higher-income Canadians.

## **5.4 Summary**

This section has discussed the adequacy of incomes of Canadian retirees. Evidence from examining the consumption of those crossing the retirement threshold points to some possible drops in expenditure, but it is not obvious these expenditure decreases lead to a drop in well-being. The concept of income replacement rates presents a rather dull tool for examining the well-being of families in various circumstances across the retirement threshold. Nevertheless, recent evidence based on excellent data suggest that income replacement rates are quite high for almost all Canadians.

Looking forward, the observed decline in coverage by employer-provided pensions may have a negative impact on future replacement rates. However, countering that trend are factors such as the increased labour force attachment of younger cohorts, easier extraction of housing equity through relaxed borrowing rules, and the less physically intense nature of work. Predicting the future is beyond the scope of our analysis, but we see no clear indication that the replacement rates of future generations will be substantially different.

## 6.0 Conclusions

This paper began with a motivation and justification for the role of government in retirement savings and retirement income. Both market and decision-making failures can support more active government involvement in the provision of retirement income. The Canadian retirement income system, built from many components, has the potential to match instruments and goals better than a monolithic system. In the empirical reality, we find that retirement incomes of Canadians have shown strong improvements—especially for lower-income Canadians. There is little evidence from the retirement consumption literature or from income replacement rates that there are substantial holes in the system. In spite of the difficulties of learning about the tax and pension system and implementing a savings plan, Canadians have appeared to do well, in general.

This mostly positive conclusion should be tempered by at least two important caveats. First, while the current system may be achieving the goals of poverty alleviation and encouraging adequate retirement standards of living, we present no evidence here that it is doing so efficiently. It is quite possible that there may be better ways of designing the system to achieve these same goals at lower cost. Second, we can only observe the incomes of current and past retirees—not those of the future. With the downward trend of employment-based pension coverage for men, in combination with the troubles of uncertain benefits for those with employment-based pensions, future retirement incomes could look different from those we observe today.

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