

## SIMULATED REPLACEMENT RATES FOR CPP REFORM OPTIONS<sup>†</sup>

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### SUMMARY

A certain segment of the Canadian population is at risk of being ill-prepared for retirement. These people will likely not have enough pension income when they retire to maintain their current lifestyle. It sounds like a problem that calls for urgent government action. Only, these people are not underprivileged or low-income earners. They are middle- and higher-income earners who lack an employer-provided pension, but presumably have the capacity to save for retirement on their own. Whether we see the fact that many of them do not as a problem for government to solve depends entirely on our view of the role of government.

This, ultimately, is what the current discussions about reforming the Canada Pension Plan, boil down to. The trend in the incomes of the elderly is generally positive: compared to the 1970s, retirees are living far more comfortably, with incomes overall showing no obvious signs of distress. And data show that Canadians earning low incomes will be able to largely maintain their current earnings upon retirement, relying on the Canada Pension Plan and other public supports.

Those Canadians earning mid-range and higher incomes who also enjoy an employer-provided pension, such as public-service workers, are also well-positioned to be able to largely maintain their working-age lifestyles after retirement. Meanwhile, there is no obvious evidence that the number of workers with employment-related pensions will decline in the future; pension coverage among young workers has been increasing, as has the proportion of workers in the public sector.

Expanding the CPP — whether it is using the plan recently proposed by P.E.I., the “wedge” proposal offered by economist Michael Wolfson, or simply doubling the maximum pensionable-earnings room allowed for CPP contributions — would have the largest impact on relatively comfortable workers who are not saving adequately for retirement. In effect, it would force them to save more.

But that is not without risks. On a practical level, simply increasing CPP contributions makes the investment decisions of the Canada Pension Plan Investment Board that much more liable for the retirement fate of Canadians. But it also promulgates a philosophy in which the federal government plays an ever-larger role, moving further into parts of our lives that have traditionally been considered areas of personal responsibility. That said, decisions about retirement savings are complicated and irreversible, yet critically important. There will inevitably be at least some people who make poor choices. Whether leaving relatively advantaged workers to suffer the consequences of their own investment decisions, or whether we require government intervention to protect them with an expanded CPP, hinges very much on just how paternalistic we expect our policy-makers to be.

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## INTRODUCTION

The round of reforms to the Canada Pension Plan (CPP) during the 1990s resulted in several critical changes to the financing of the plan, but only minor changes to the benefit formula. In recent years, concerns over the soundness of Canadians' retirement savings and pension adequacy have led to a renewed discussion, this time focused on expanding Canada Pension Plan benefits. The 1990s' agreement on CPP reform was the product of a lengthy and complicated process.<sup>1</sup> The current discussions of reform have followed a similar winding path, with the latest meeting of Canada's finance ministers in December 2013 failing to produce agreement on a way forward for changes to the Canada Pension Plan.

While the series of discussions have not arrived at a consensus, they have proven very fertile for generating a multitude of new options for reform. With the current pause in the CPP discussions, we now have the opportunity to assess in more detail the reforms that have been proposed in order to observe which reform options best achieve the goals set out for reform. The new options range substantially in their targeted population, with some focusing attention on those with below-median earnings and others exempting those with low earnings. These differences across reform options may come from differing ideas about what problem it is that a reform to the Canada Pension Plan is trying to solve. However, the differences across reform proposals may also be a result of an incomplete appreciation of the overall net impact of a reform on retirement incomes.

In particular, the way that a Canada Pension Plan expansion interacts with the existing Guaranteed Income Supplement is critical. The Guaranteed Income Supplement is a vital part of our retirement income system and provides important benefits to many lower-income seniors. However, its presence makes Canada Pension Plan reform challenging. The Guaranteed Income Supplement is income tested, meaning that it is reduced by 50 cents for each dollar of Canada Pension Plan income received. This income testing results in dramatic changes to the impact of proposed Canada Pension Plan reforms that target those with lower earnings when it is taken into consideration.

We have two goals for this paper. First, we set out the current state of retirement-income adequacy in order to make clear which Canadians are doing well under the current system and where there are opportunities for improvement. We draw on new and existing evidence on retirement incomes in Canada, finding that a particular group of Canadians — middle- and higher-income earners without employment-based pensions — is at higher risk for inadequate pension income. Second, we simulate several proposals for reform in order to assess how they might change the pattern of retirement income across the earnings distribution. Our findings emphasize the importance of considering the interaction between the Canada Pension Plan and the Guaranteed Income Supplement, and of targeting a reform to the Canadians who would benefit most. We find that some of the proposals perform better than others in these regards. We also propose and simulate a simpler reform — an upward expansion of the pensionable earnings cap — that would yield well-targeted results, but with less complexity than some of the other options. We conclude by noting that the case for reform depends critically on how one views the role of government in alleviating under-saving by middle- and high-income earners.

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<sup>1</sup> The definitive account of the 1990s' reforms appears in Bruce Little, *Fixing the Future: How Canada's Usually Fractious Governments Worked Together to Rescue the Canada Pension Plan* (Toronto: University of Toronto Press, 2008).

## WHAT IS THE PROBLEM WE ARE TRYING TO FIX?

The calls for Canada Pension Plan (CPP) reform centre on the future retirement incomes of working Canadians without a workplace pension plan. In this section, we review and assess the evidence that underlies these calls for reform. We look first at overall trends in the income of seniors over the past four decades, then turn our attention to evidence on the adequacy of income in retirement compared to earnings when working. Finally, we examine pension coverage rates in Canada.

### Trends in Elderly Income

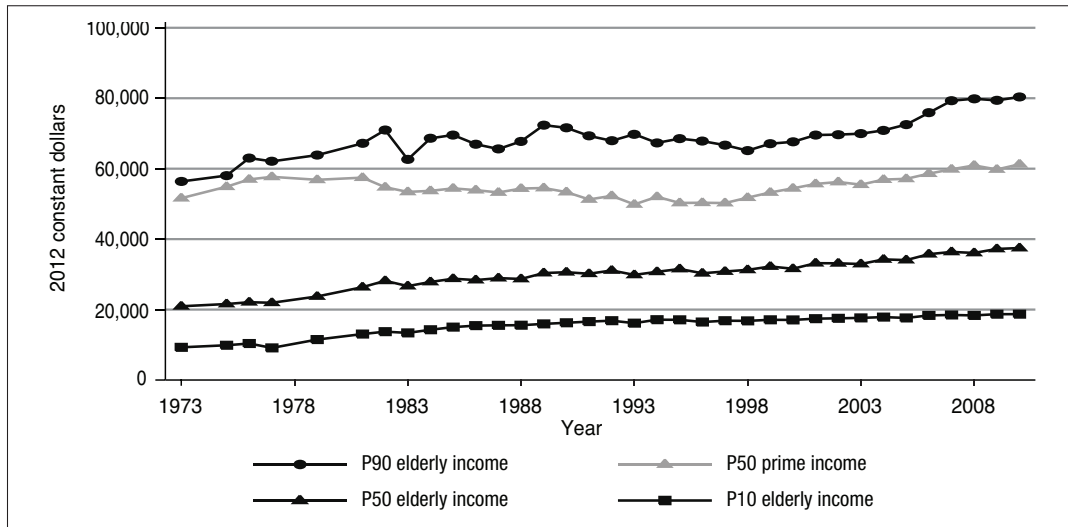
Elderly incomes in Canada have been growing steadily over the last 40 years.<sup>2</sup> The growth has occurred across the income distribution. This can be seen readily in Figure 1, which graphs percentiles of after-tax family incomes for those aged 65 and older from 1973 to 2010 using data drawn from household surveys. All data is adjusted to 2012 dollars using the consumer price index. The percentiles we show are the 10th, 50th, and 90th. For comparison, we also show the median income for families headed by a person aged 25 to 54, which we refer to as “prime” age.

While there has been growth at all parts of the distribution, there are some different trends at the bottom and top ends. Incomes at the 90th percentile for the elderly, and for the 50th-percentile for those of prime age, did not make much progress through the 1980s and 1990s, but have since seen steady growth. The 90th percentile touched over \$70,000 in 1982, and then stayed close to that number until 2005 when it broke strongly upwards. Incomes at the 90th percentile in the most recent few years have not grown, perhaps affected by the unstable financial markets and low interest rates on incomes derived from saving during this time period. For the 50th percentile prime earners, incomes declined until the mid-1990s, when growth resumed. In contrast, those at the 10th and 50th percentile of the elderly income distribution saw steady growth over the whole period. At the 10th percentile, income in 1977 was \$9,127. Thirty years later in 2007, this had more than doubled to \$18,473. The growth of incomes at the 50th percentile for the elderly was modest, but continued over the entire period.

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<sup>2</sup> Further information on the trends in Canadian elderly income can be found in Michael Baker and Kevin Milligan, “Government and Retirement Incomes in Canada,” prepared for the Council of Federal, Provincial, and Territorial Finance Ministers (2009). For analysis of low income in particular, see: Kevin Milligan, “The evolution of elderly poverty in Canada,” *Canadian Public Policy* 34, 4 (2008): S79-S94; and Tammy Schirle, “Senior Poverty in Canada: A Decomposition Analysis,” *Canadian Public Policy* 39, 4 (2013): 517-540.

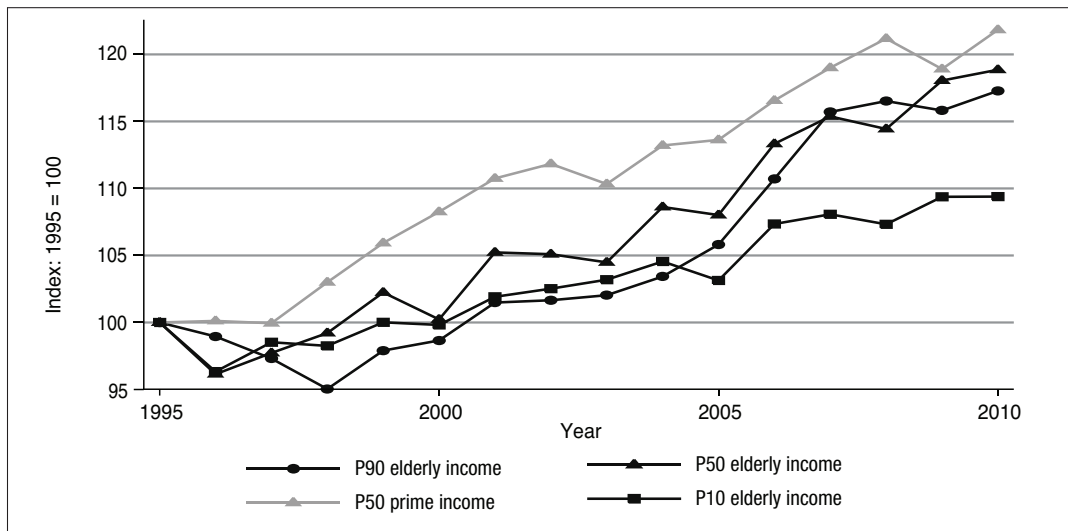
**FIGURE 1: INCOME TRENDS, 1973-2010**



Notes: The data are drawn from the Survey of Consumer Finances for 1973 to 1997, and the Survey of Labour and Income Dynamics for 1998 to 2010. We graph the 10th, 50th, and 90th percentile of economic family income for families with the reference person age 65 and older (elderly) and the 50th percentile for those between 25 and 54 (prime). All dollar values adjusted to 2012.

The next graph sets an index equal to 100 for each of the four income percentiles in 1995, which allows the percentage growth to be seen more clearly. Figure 2 displays the same four percentiles as in Figure 1, but in index form. The year 1995 was chosen because it was the mid-1990s that saw a return to income growth for the 50th percentile of prime earners after 15 years of stagnation. Since 1995, there has been growth at all parts of the elderly income distribution, but the growth was stronger at the 90th and 50th percentiles than at the 10th. Moreover, growth in 50th-percentile prime income was stronger still, rising about 20 per cent over this period.

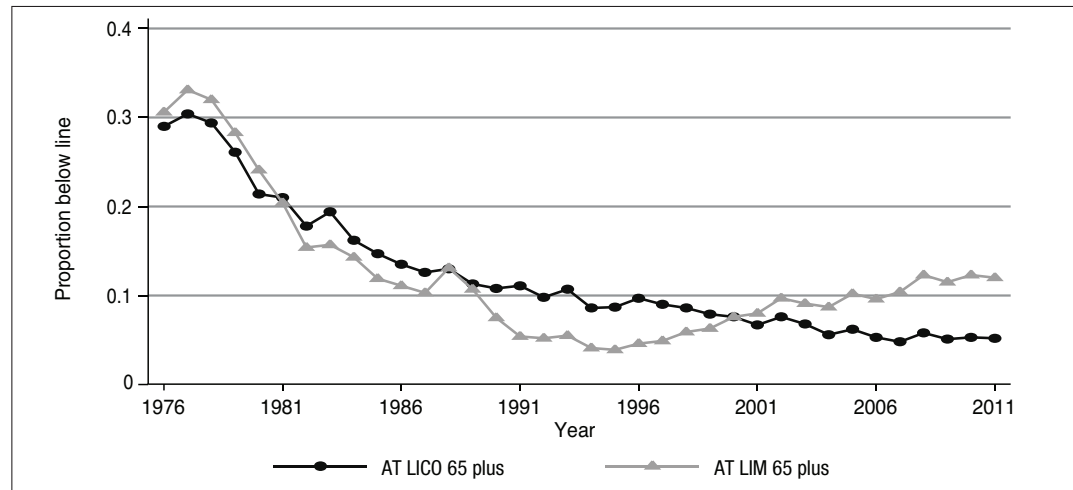
**FIGURE 2: INDEX OF INCOME TRENDS, 1995-2010**



Notes: The data are drawn from the Survey of Consumer Finances for 1985 to 1997, and the Survey of Labour and Income Dynamics for 1998 to 2010. For all data, we set an index equal to 100 in 1995. We graph the 10th, 50th, and 90th percentile of economic family income for families with the reference person age 65 and older (elderly) and the 50th percentile for those between 25 and 54 (prime).

The final graph looking at incomes examines those below two different low-income lines. We use the after-tax low income cut-off (LICO) line that was set in 1992, and has since been updated only for changes in the consumer price index. We also show the data for the after-tax low income measure (LIM), which forms an income cut-off at half the 50th percentile of income adjusted for family size; this line moves around through time as the 50th percentile of income shifts.<sup>3</sup> Figure 3 shows the proportion of elderly Canadians living in families/households that have incomes under each of the two lines.

**FIGURE 3: LOW INCOME AMONG ELDERLY 1976-2011**



Notes: The data are drawn from CANSIM Table 202-0802. We graph the proportion of Canadians over the age of 65 living in a family with income below the after-tax low income cut-off (AT-LICO) and the after-tax low income measure (AT-LIM).

Both the LICO and the LIM show great improvements from the 1970s to the 1990s. From the mid-1990s however, the paths taken by the LICO and the LIM for the elderly have diverged. The LIM showed less low income in the 1990s and more in the 2000s, with the LICO showing opposite trends. The reason for these seemingly confusing trends can be seen quite clearly by looking back at Figure 1 and Figure 2. The LIM is based on the 50th percentile of household income in Canada. In the mid 1990s, the 50th percentile of income was dropping, meaning that the cutoff for the LIM was dropping. Even if elderly income were stagnant, the proportion under the LIM would shrink as more elderly households make it over the slumping LIM line. In contrast, as the 50th percentile of income has grown since 1995, the LIM cutoff has grown along with it. Even though elderly incomes are growing, they have not been growing as quickly as the LIM cutoff.

The clear conclusion to take away from Figure 3 is that elderly incomes at the bottom have been growing, but not as quickly as the incomes of the rest of Canadians since 1995. Whether this represents a problem depends on the degree to which it is important for the elderly to keep up with the incomes of younger Canadians, or whether the elderly care more about maintaining the lifestyle they themselves had when they were younger.

<sup>3</sup> For a recent review of low-income measurement in Canada, see: Brian Murphy, Xuelin Zhang and Claude Dionne, “Low Income in Canada: A Multi-Line and Multi-Index Perspective,” Income Research Paper Series, Statistics Canada (2012), Catalogue No. 75F0002M-001. Note that we use the updated LIM numbers that account for the new “household,” rather than the “economic family” basis. OECD *Pensions at a Glance 2013: OECD and G20 Indicators* (Paris: OECD Publishing, 2013) reports an elderly low-income rate of 7.2 per cent, based on a relative-income concept similar to that of the LIM.

Overall, the incomes of elderly Canadians do not show obvious signs of distress. Compared to the 1970s, elderly incomes are much higher, and have gained relative to prime-age Canadians. However, in recent years the income growth of elderly Canadians has lagged those of other Canadians by a bit. Later in this paper when we describe policy tools, we will assess how well an expansion to the Canada Pension Plan might address this potential weakness.

## Retirement Income Replacement Rates

Beyond looking at the level of incomes of the elderly, a common way to characterize the adequacy of elderly incomes is to compare the income when retired to the income of the same family when working, and ask what proportion of the working income is “replaced” by retirement income. The resulting so-called “replacement rates” are often calculated and compared to benchmarks to assess the adequacy of retirement income.

How high replacement rates need to be is an open question.<sup>4</sup> It is commonly assumed that the elderly need not have 100 per cent of the income they had when they were younger for a number of reasons. For example, work expenses (commuting, work clothing) are no longer incurred. Also, retirement affords more time for shopping and doing work around the home, reducing household expenses. Mortgages and children no longer take the centre of family budgets at these ages, and the consumption flow from a lifetime of durable purchases can be enjoyed. While every family might have a different view on the adequate replacement rate, the range of 50 per cent to 70 per cent of pre-retirement income comprises what most would consider to be adequate replacement.

We do not conduct our own analysis of overall replacement rates here. Instead, we draw on recent work that produces replacement rates for a cohort in which the men reached age 55 to 57 in 1991 using a large longitudinal administrative data set.<sup>5</sup> The analysis compares the replacement rates of couples characterized by whether or not either spouse had coverage from an employment-based pension when working. It uses a replacement-rate measure that compares the total employment earnings of couples when the male is age 55 to 57 in 1989–1991 to the total income from all sources of these same couples in 2006. This is an income-based measure, and so excludes wealth, draw-down of assets such as housing or non-registered savings, and flows of consumption from durables. The distinction between those with and without employment-based pensions is quite important for understanding the role of any expansion to the Canada Pension Plan, since it is those who lack an employment-based pension that would see the largest potential gain from any such expansion.

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<sup>4</sup> For an extensive discussion and references on replacement rates, see: Baker and Milligan, “Government and Retirement.”

<sup>5</sup> See: Yuri Ostrovsky and Grant Schellenberg, “Pension Coverage and Earnings Replacement Rates Among Canadian Couples,” Analytic Studies Branch Research Paper Series, Statistics Canada, (2010), Catalogue No. 11F0019M-No. 327. They use the Longitudinal Administrative Database, which is based on the tax forms of a 10 per cent sample of Canadians. See also Sébastien LaRochelle-Côté, John Myles and Garnett Picot, “Income security and stability during retirement in Canada,” Analytical Studies Branch Research Paper No. 306 (2008), for similar analysis and findings.

In Table 1, we create replacement rates based on the Ostrovsky and Schellenberg analysis.<sup>6</sup> The table splits the sample of elderly Canadian couples into five quintiles, based on their earnings when working. These quintiles range from the lowest-earnings quintile at the top of the table to the highest-earnings quintile at the bottom. For each quintile, the shaded row reports the proportion of couples in which neither spouse has a workplace pension and the proportion in which at least one of the spouses does have a workplace pension. Below that, we report the average earnings of the couples in each quintile (measured in 1989–1991; reported here in 2012 dollars adjusted by the consumer price index). Finally, we show the distribution of couples across three replacement-rate categories: those under 50 per cent; between 50 and 69 per cent; and 70 per cent or more.

**TABLE 1: REPLACEMENT RATES FROM OSTROVSKY AND SCHELLENBERG**

Quintile		Whether couple has employment based pension	
		Neither spouse	One or both
<b>Lowest</b>	<b>Per cent of sample</b>	<b>77.3</b>	<b>22.7</b>
	Average earnings	28,166	35,401
	Replacement rates:		
	<50	0.8	0.4
	50-69	3.7	3.0
<b>2nd</b>	<b>Per cent of sample</b>	<b>46.7</b>	<b>53.3</b>
	Average earnings	54,659	56,061
	Replacement rates:		
	<50	5.5	1.9
	50-69	38.9	28.2
<b>3rd</b>	<b>Per cent of sample</b>	<b>31.0</b>	<b>69.0</b>
	Average earnings	73,734	74,453
	Replacement rates:		
	<50	23.9	9.4
	50-69	33.0	39.9
<b>4th</b>	<b>Per cent of sample</b>	<b>22.1</b>	<b>77.9</b>
	Average earnings	95,709	96,137
	Replacement rates:		
	<50	27.9	15.8
	50-69	26.8	41.2
<b>Highest</b>	<b>Per cent of sample</b>	<b>23.0</b>	<b>77.0</b>
	Average earnings	183,777	153,387
	Replacement rates:		
	<50	38.9	17.8
	50-69	23.0	38.3
	70+	37.9	43.9

Notes: For each quintile, the shaded row reports the proportion of couples for which neither has a pension and for which one or both has a pension. The average earnings for each quintile are taken between 1989 and 1991, and updated to 2012 constant dollars. Below that, we show the distribution of couples in each quintile across three ranges of replacement rates. The source for all the data appearing here is the analysis of the Longitudinal Administrative Database in Ostrovsky and Schellenberg, "Pension Coverage."

<sup>6</sup> We take the distribution of couples across the different replacement-rate cells for each quintile in Ostrovsky and Schellenberg's Appendix, Table 1. We then combine this with the proportion of families of each type as appearing in Appendix, Table 2 to form the data we present here.

The data show that 77.3 per cent of couples in the lowest quintile have no workplace pension income from either spouse. The average earnings in this bottom quintile is \$28,186 for those without an employment-based pension, but \$35,401 for those with at least one spouse having an employment-based pension. This simply reflects that, within this lowest-quintile earnings range, the earnings of those without employment-based pensions tend to be lower than those who do have employment-base pensions. In this lowest quintile, 95.6 per cent of the couples maintain a replacement rate of 70 per cent or more. For the 22.7 per cent of couples in the lowest income quintile with a workplace based pension, the proportion with a replacement rate of 70 per cent or more is 96.6 per cent. These high replacement rates reach the standard benchmark of adequacy, likely because most of these families receive substantial income from the public pension system.

Looking further down Table 1, those in the second quintile also appear to have fairly adequate income replacement, with very few falling under the 50 per cent replacement-rate benchmark. Upon reaching the third quintile, however, things begin to change, with 23.9 per cent of those without workplace pensions falling under the 50 per cent replacement-rate level. In the fourth and fifth quintiles, the proportion of couples under a 50 per cent replacement rate is 27.9 per cent and 38.9 per cent. In some contrast, those couples with one or both members having a workplace pension look much better. Average income in the top quintile for those without an employment-based pension is \$183,177, which is higher than the average for those with an employment-based pension at \$153,387. This comes about because the proportion of top earners within the quintile is higher for those without pensions. Given these high incomes for the fifth quintile, the observed lower replacement rates will still result in retirement incomes well above the low-income cutoffs for most. Moreover, given the higher average earnings for those with pensions in this quintile, a lower replacement rate may be consistent with similar retirement income. The lower replacement rates seen in this highest quintile may also reflect consumption choices made by those with quite adequate resources. These considerations are at the heart of the question of what role government should take in retirement income provision.

This analysis provides a summary of some of the pension inadequacy issues that have raised the demands for expansion of the Canada Pension Plan. It is important to point out that the adequacy problem revealed by the analysis is not widespread, but targeted. It affects a portion of those in the top three quintiles of lifetime earnings and is much more of a problem for those without an employment-based pension.

### **Proportion of Canadians Covered by Registered Pension Plans**

An important motivation for expanding the Canada Pension Plan is the concern that future generations of Canadians will not enjoy the same income security and replacement rates as current retirees, and this is in part due to an expected decline in registered pension plan coverage over time.<sup>7</sup> With respect to income security, an important concern is the relative increase in the portion of registered pension plans that are defined contribution pension plans instead of defined benefit pension plans. More generally, as demonstrated in Table 1, income replacement rates tend to be lower among those who do not have registered pension plan income.

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<sup>7</sup> See, for example: Bob Baldwin, "Pension Reform in Canada: A Guide to Fixing our Futures Again," IRPP Study 13 (2010).



Unfortunately Canadians have very little publicly available data for judging the extent to which future generations will be covered by registered pension plans and what their replacement rates might be.<sup>8</sup> We know that the portion of the elderly receiving income from a registered pension plan is higher now than ever before in Canadian history. According to recent tabulations, in 1977–79 only 33 per cent of men and 17 per cent of women age 65 and over received employer pension income.<sup>9</sup> In 2006–08, 71 per cent of men and 61 per cent of women age 65 and over received employer pension income. This dramatic increase in pension coverage has played an important role in raising the incomes of seniors across the income distribution, including the incomes of seniors in the lower half of the senior income distribution.

Researchers have made projections for replacement rates using the Statistics Canada LifePaths model and available information regarding income, pensions, savings, and other economic behaviour and circumstances.<sup>10</sup> The results indicate that, while few current retirees face a substantial reduction in consumption post-retirement, future retirees may face greater difficulties. In particular, while only about 16 per cent of recent retirees face inadequate replacement rates upon retirement, about 44 per cent of current 25 to 30 year olds are expected to have inadequate replacement rates. There are several factors driving these projections, but the authors point to two key factors: (1) an expectation that productivity-driven increases in earnings will be higher than expected increases in Old Age Security benefits and (2) a declining share of private-sector workers participating in registered pension plans (RPPs) affecting primarily new membership in RPPs.

In Figure 4 we present information on registered pension plan coverage in Canada from 1992 to 2011. The historical series most often referred to is based on the Pension Plans in Canada Survey (PPCS) and shows a decline in the total number of registered pension plan members as a portion of all employed individuals aged 15 and over from 1992 to 1999. The overall trend is not declining after the late 1990s. However, it is informative to account for important demographic changes in the labour market over this period that can influence aggregate statistics.

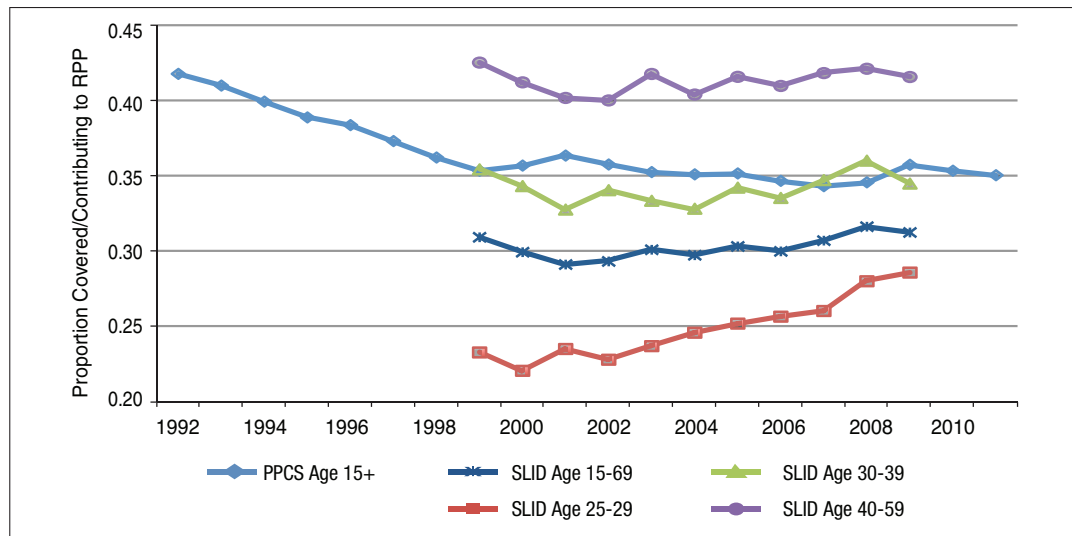
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<sup>8</sup> It is possible to estimate pension coverage by age and birth cohort from the Longitudinal Administrative Database. However, the data are not yet readily available to researchers outside Statistics Canada.

<sup>9</sup> These tabulations come from Tammy Schirle, “The Incidence of Low Income Among Seniors in Canada,” Report prepared for Human Resources and Skills Development Canada (2012).

<sup>10</sup> See Kevin D. Moore, William Robson and Alexandre Laurin, “Canada’s Looming Retirement Challenge: Will future retirees be able to maintain their living standards upon retirement?” C.D. Howe Commentary 317 (2010).

**FIGURE 4: REGISTERED PENSION PLAN COVERAGE**



Source: 1992–2011 coverage rates based on Statistics Canada, CANSIM Table 280-0008 (“Total members of registered pension plans from the Pension Plans in Canada Survey”) and Table 282-0002 (“Employment or Labour force participants, age 15 and over”). The 1999–2009 rates are based on the Survey of Labour and Income Dynamics PUMF files, representing the portion of employed individuals in each age group that made contributions to a registered pension plan.

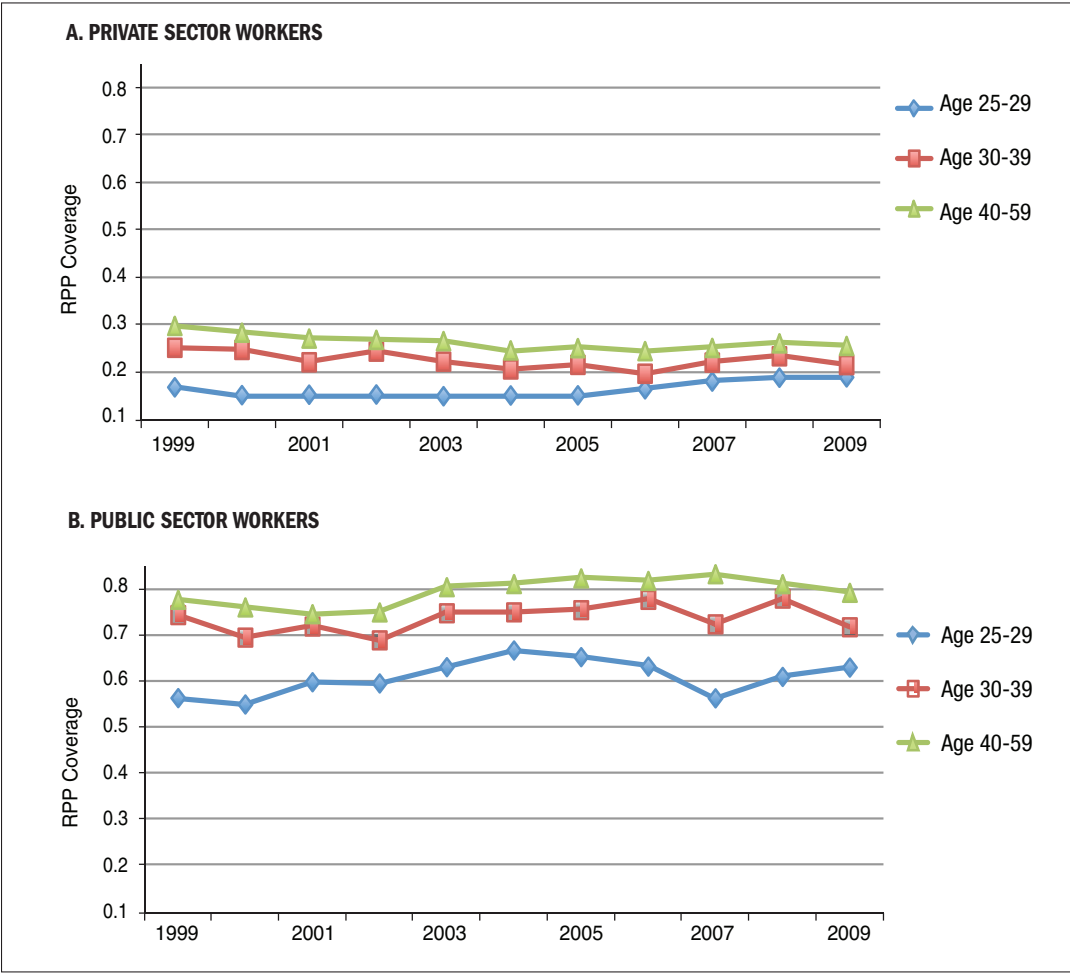
Unfortunately, comparable statistics for plan membership are not readily available for smaller age groups. So, we create our own series using information from individual-level data in the Survey of Labour and Income Dynamics (SLID) that allows us to break down pension coverage by age group. These data can also be seen in Figure 4, where we graph the portion of individuals employed in each year, by age group, who made contributions to a registered pension plan.

To note, despite following a similar trend, the SLID coverage rate of individuals aged 15 to 69 is slightly lower than the coverage rates based on the PPCS data due to differences in measurement and sampling. Interestingly, pension coverage appears to increase for the youngest members of the workforce over this period while remaining relatively stable for more experienced workers.

In Figure 5, we separate the 1999–2009 trends for private- and public-sector workers. The first two panels (A and B) demonstrate that coverage for the youngest workers (aged 25–29) has increased slightly for both private- and public-sector workers. The trends diverge for older groups of private- and public-sector workers. In the private sector, the largest declines in coverage are observed for those aged 40–59 and this likely reflects a persistence of the large declines in RPP coverage of the 1990s. This is also the group that would dominate the aggregate trends in pension coverage presented in Figure 4, given the relative size of the baby boom cohort currently at these older ages in the private sector. A slight increase in pension coverage for public-sector employees, particularly younger employees, is important for future trends in pension coverage given a general increase in the portion of paid workers that are working in public-sector jobs.<sup>11</sup>

<sup>11</sup> For example, the authors’ tabulations from SLID show that the portion of employees age 25–29 in the public sector rose from 12.4 per cent in 1996 to 21.6 per cent in 2009.

**FIGURE 5: REGISTERED PENSION PLAN COVERAGE BY SECTOR AND THE PROPORTION OF WORKERS IN THE PUBLIC SECTOR, 1999-2009.**



Source: Authors' tabulations; Survey of Labour and Income Dynamics, based on the portion of employees that made contributions to a registered pension plan.

Overall, it is not obvious that we should expect lower registered pension plan coverage in the future. Pension coverage among employees aged 25–29 has risen in both the private and public sectors while coverage for 30–39 year olds appears fairly stable in the private sector. An increasing portion of workers is appearing in the public sector, and public-sector pension coverage rates are generally increasing. Following the retirement of the baby boom cohort, it remains to be seen whether future cohorts of retirees will face declining pension coverage.

**POLICY OPTIONS**

The previous section provided evidence indicating the source of the pension problem in Canada. The current system appears to do an adequate job replacing income for the majority of Canadians. However, those in the upper three quintiles without a workplace pension do seem to be at elevated risk of arriving in retirement with inadequate resources.

The Canada Pension Plan is arguably a fitting policy tool for this task. The Old Age Security pension and the Guaranteed Income Supplement would be appropriate tools if the goal were to increase redistribution, as they are most important income sources for lower earners. However, for targeting those in the middle- and upper-earnings quintiles, the Canada Pension Plan is in the best position among the existing public pension programs to provide extra earnings replacement. Of course, there are also other policy tools that might address the identified pension coverage problem. For example, the federal government’s Pooled Registered Pension Plan initiative, which provides a voluntary option for those who need to save more, might fill some of the gap. In addition, a myriad of mandatory public or private options outside the Canada Pension Plan have been envisaged by other policy commentators. Comparing these options against an expanded CPP is outside our chosen scope for this paper, but the other potential non-CPP options should be kept in mind.

Below, we examine four specific proposals for reform to the Canada Pension Plan. We describe each of them in turn. For all of the reform options, we ignore any concern about how they would be phased in, and focus on the steady-state, fully phased-in plan. First, however, we describe the core functioning of the existing status quo Canada Pension Plan, as well as the other main public pension plans.

### Current Canada Pension Plan

The current Canada Pension Plan is a contributory plan that pays a defined benefit pension at older ages when the pension is taken up. While working, individuals and their employers make contributions to the Canada Pension Plan on all earnings between the Year’s Basic Exemption (YBE) and the Year’s Maximum Pensionable Earnings (YMPE). In 2013, the YMPE was \$51,100 and the YBE is \$3,500.

The annual benefit received from the Canada Pension Plan upon benefit take-up depends on individuals’ average earnings based on the relevant years of their earnings history and only covers earnings up to the YMPE in any year.<sup>12</sup> To calculate benefits, an individual’s earnings in each month of work is compared to the YMPE. This set of ratios of earnings to YMPE for each month in the work history is then averaged; we refer to this average ratio as  $AVGEARN_i$ . If, for example a person always earned one-half of YMPE, the average ratio would be 0.5. If a person always earned more than the YMPE, their average ratio would be one. The CPP replacement rate is set at 25 per cent. In the calculation of benefits, an average of the previous five years’ YMPE is used to calibrate the ratios and the replacement rate to currently prevailing earnings levels. The following formula is used:

$$CPP\ Pension_i = 25\% \times AVGEARN_i \times YMPE^5 \quad (1)$$

The resulting CPP retirement pension is the product of the replacement rate (25 per cent for everyone), the average career earnings (different for everyone, depending on how much was earned in each year), and  $YMPE^5$  (same for everyone).

<sup>12</sup> For more details on years that are included in a person’s earnings history for the purposes of determining average earnings, see: Kevin Milligan and Tammy Schirle, “Improving the labour market incentives in Canada’s Public Pension System,” *Canadian Public Policy* 34, 3 (2008): 281-304. Individuals have the opportunity to omit years spent at home with young children, years of disability, and some years of low earnings from that history.

Along with the CPP, most Canadian seniors are also eligible for the Old Age Security pension (OAS), and its component, the Guaranteed Income Supplement (GIS).<sup>13</sup> The OAS pension is a flat, taxable benefit paid to all Canadians age 65 and older who satisfy a lifetime residency test.<sup>14</sup> The amount as of September 2013 is \$550.99 per month. There is an income test, which reduces OAS payments by 15 cents per dollar of income above \$70,954. The GIS is a non-taxable supplement paid to OAS recipients who have lower incomes. The maximum benefit for GIS is \$747.11 per month for single recipients. The income test is performed by reducing GIS benefits by 50 cents for each dollar of non-OAS income.<sup>15</sup> Those singles with non-OAS income above \$16,704 will not receive any GIS.

The OAS and GIS are important for understanding the CPP for two reasons. First, OAS income is taxable, so getting the tax liability correct for the CPP benefit requires assessing the OAS income amount. Secondly, there is an important interaction between GIS and CPP benefits.<sup>16</sup> Any extra CPP benefits an individual receives will result in the loss of GIS benefits for those who are in receipt of the GIS. This means that lower-income elderly Canadians who receive the GIS would, on net, receive only half of any expansion to the CPP because of the reduction in GIS benefits. When combined with income taxes, the result is that less than half of the expanded CPP benefits are realized into consumable income for many Canadians.

## Big CPP

Some earlier proposals for CPP expansion called for a doubling of the CPP's replacement rate to 50 per cent.<sup>17</sup> This requires a simple adjustment to the CPP pension formulas as follows:

$$\text{CPP Pension}_i = 50\% \times \text{AVGEARN}_i \times \text{YMPE}^5 \quad (2)$$

The replacement rate under this proposal moves from 25 per cent to 50 per cent, but the other elements remain the same. This proposal focuses attention on those up to the current YMPE, rather than expanding coverage to those at higher earnings ranges. The main challenges confronting this model are its effectiveness in targeting the Canadians who may be under-saving and the potential interaction of the expanded CPP benefits under this reform with the Guaranteed Income Supplement.

<sup>13</sup> Full details can be found at Service Canada website, <http://www.servicecanada.gc.ca/eng/services/pensions/oas/payments/index.shtml>.

<sup>14</sup> One must have lived in Canada for 10 years to receive any OAS. For those who have lived in Canada for fewer than 40 years, a reduced OAS pension is paid.

<sup>15</sup> \$3,500 of employment earnings are exempt from the GIS income test.

<sup>16</sup> See: Milligan and Schirle, "Improving the labour."

<sup>17</sup> For example, the Canadian Labour Congress had proposed this type of "Big CPP" in 2010. See: Canadian Labour Congress website, "Grow the CPP – A better way to save," <http://www.canadianlabour.ca/action-center/retirement-security-everyone/retirement-security-reform-1-double-cpp-benefits>. The federal NDP also took this position in the 2011 federal election.

## Wolfson Wedge

Economist Michael Wolfson proposed a refinement to the “Big CPP” model to shift the focus away from those at lower lifetime earnings (few of whom have inadequate replacement rates) and onto those in the middle and upper quintiles of lifetime earnings.<sup>18</sup> Those with earnings up to \$25,550 (about half the current YMPE) would see no change to the replacement rate. Those with earnings from \$25,550 up to \$102,200 (which is two times the current YMPE) would see an enhanced replacement rate of 40 per cent for earnings in that range. Above the \$102,200 level, there would be no further CPP coverage. This plan inserts a “wedge” with the higher 40 per cent replacement rate for middle- and higher-income earners. In the formula, the Wolfson wedge looks like this:

$$\begin{aligned} \text{CPP Pension}_i = & 25\% \times \text{AVGEARN}_i^1 \times 25,550 \\ & + 40\% \times \text{AVGEARN}_i^2 \times (\$102,200 - \$25,550) \end{aligned} \quad (3)$$

There are now two average earnings terms ( $\text{AVGEARN}_i^1$  and  $\text{AVGEARN}_i^2$ ), which represent average earnings within each of the two specified earnings ranges. The replacement rates over those two ranges (25 per cent and 40 per cent) are then multiplied by the average earnings. The final pieces of each product are the endpoints of the earning ranges.

## P.E.I. Plan

The proposal made by the minister of finance for Prince Edward Island, Wes Sheridan, has some of the features of the Wolfson wedge, but with an additional third earnings range featuring a lower replacement rate for higher earners. This P.E.I. plan maintains the current 25 per cent replacement rates for average earnings up to half the current YMPE (at \$25,550), provides a 40 per cent replacement rate on earnings between half and the current YMPE (between \$25,500 and \$51,100) and then provides additional coverage with a replacement rate of 15 per cent on a third range of earnings between 100 per cent of the current YMPE and 200 per cent of the current YMPE (\$51,100 to \$102,200). The full CPP pension formula then depends on individuals’ average earnings. For an individual with high earnings above twice the existing YMPE, we have the following:

$$\begin{aligned} \text{CPP Pension}_i = & 25\% \times \text{AVGEARN}_i^1 \times 25,550 \quad (4) \\ & + 40\% \times \text{AVGEARN}_i^2 \times (\$51,100 - \$25,550) + 15\% \times \text{AVGEARN}_i^3 \times (\$102,200 - \$51,100) \end{aligned}$$

For those with low earnings over their career, there would be no difference compared to either the current CPP or the Wolfson wedge. The main difference with the Wolfson wedge is for those with earnings over the \$51,100 level, where the replacement rate for earnings in that range would be 15 per cent instead of 40 per cent.

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<sup>18</sup> For complete details, see: Michael C. Wolfson, “Projecting the Adequacy of Canadians’ Retirement Incomes: Current Prospects and Possible Reform Options,” IRPP Study 17 (2011); and Michael C. Wolfson, “Not-so-modest Options for Expanding the CPP/QPP,” IRPP Study 41 (2013).

## Double YMPE

For the last proposal, we present a new idea here for the first time. This proposal keeps the 25 per cent replacement rate for the whole range of earnings, but simply extends the upper limit to a value twice the current YMPE (\$102,200). The resulting CPP benefit formula is simply:

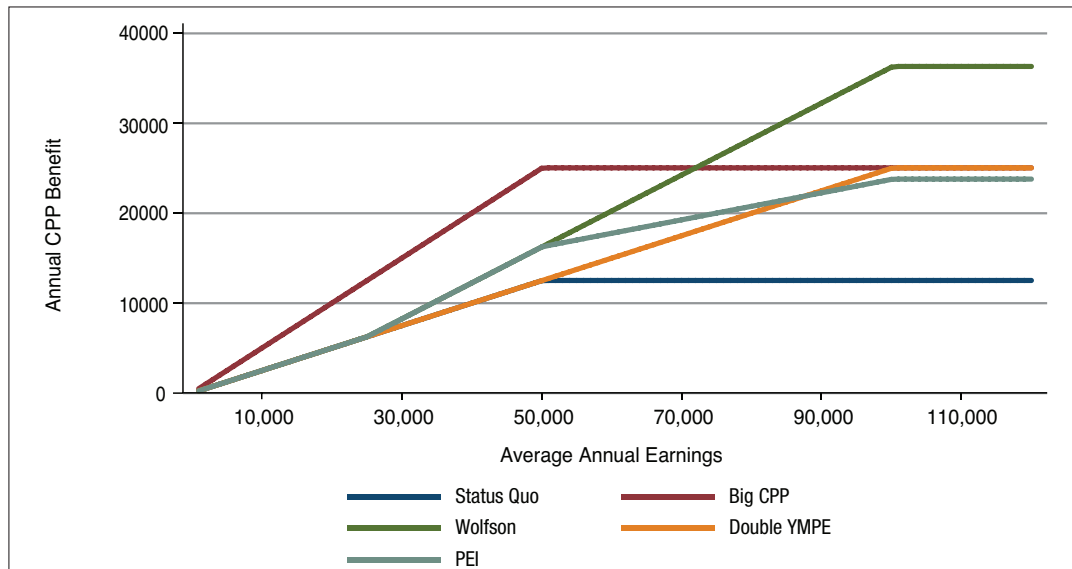
$$\text{CPP Pension}_i = 25\% \times \text{AVGEARN}_i \times \$102,200 \quad (5)$$

Note that AVGEARN is only capped at one when a person's average earnings exceed the \$102,200 upper cap. This benefit formula would not change the benefits received by those with average earnings below the current YMPE. For those earnings above the current YMPE, there would be new coverage of earnings at a replacement rate of 25 per cent.

## Summary of Options

To summarize these four options, we graph out a simple example of the annual CPP benefit that would result from each option for a given level of average annual earnings. We also include the status quo CPP in this graph. Figure 6 displays these five lines, with annual benefits on the Y-axis and average annual earnings on the X-axis. Everything here is on a pre-tax basis, and does not account for the interaction with other programs. Over the range from zero up to \$25,550, all options are the same — except for Big CPP which doubles the replacement rate to 50 per cent over this range. The Wolfson wedge and the P.E.I. plan diverge from the status quo at \$25,550, since the replacement rate increases to 40 per cent at that point under those plans. After \$51,100, the P.E.I. plan shows a much lower slope than the Wolfson wedge, reflecting the 15 per cent replacement rate above \$51,100 for the P.E.I. plan. Finally, the double-YMPE plan delivers higher benefits for high-income earners, but doesn't diverge from the status quo until after \$51,100.

**FIGURE 6: ANNUAL CPP BENEFIT FOR EACH POLICY OPTION**



Source: Authors' calculations.

There are two important interactions that could arise with these reforms to the CPP. First, as mentioned earlier, the reforms vary in the role of the interaction between the CPP and the GIS. Increasing the CPP replacement rate over the range of incomes affected by the GIS means that the GIS will take back 50 cents from each dollar of new CPP benefits. This makes it very difficult to increase replacement rates over lower- and middle-earning ranges. Our simulations below will quantify this point. Second, larger CPP payments may interact with existing private savings, whether through individual accounts such as registered retirement savings plans or through employment-related pensions. The apparent income boost from CPP expansion will be moderated by any offsetting decrease in those private sources.

## **SCOPE, AIM, AND METHODOLOGY FOR SIMULATIONS**

We present simulations that quantify the extent to which Canada's public pension programs (CPP/OAS/GIS) replace individuals' earnings after retirement. We then consider the four reforms to CPP that have been proposed, and account for provincial and federal income taxes in the calculation of replacement rates.

A stylized example is presented, based on a "steady state" centred in 2012. The goal of the simulation is not to find results for a representative case, but to use a simple example to uncover the mechanisms at play in the different CPP reform options. With a more complete understanding of the mechanisms, future work can begin to bring in more representative and complex examples. We do however present some robustness checks and alternative scenarios in the appendix.

We consider unmarried individuals across the earnings distribution who are 18 years old in 2012 and plan to fully retire at the age of 65. The individuals reside in Ontario. Upon retirement the individuals plan to immediately take up Canada Pension Plan benefits. We assume the individuals' earnings will increase at the same rate as the Year's Maximum Pensionable Earnings (YMPE). We also assume that all parameters of the retirement income system and the provincial and federal income tax systems do not change in real terms after 2012.<sup>19</sup> We have assumed that each individual expects to receive his OAS pension at age 65, despite the policy announcement that will raise his or her first age of eligibility for OAS to age 67 (applicable to all those born after 1963). We make this assumption so that we can relate our results to the basic CPP benefit determined at age 65. If the retirement age of 67 were chosen to align with the first age of eligibility for OAS, CPP's replacement rate will be slightly higher than 25 per cent, as the actuarial adjustment (0.7 per cent per month after age 65) will be applied to benefit amounts.<sup>20</sup> In the tax calculations, we have assumed the individual has no other taxable income. While it is unrealistic to assume individuals have no other income, we have also conducted simulations that allow for other income from pensions (with a 60 per cent replacement rate). The results are provided in the appendix.

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<sup>19</sup> Implicit here is that there is no change through time in the Old Age Security and Guaranteed Income Supplement payments beyond the legislated price indexing. Over a long period, having only price indexing would leave these benefits as a shrinking percentage of incomes if there is real wage growth.

<sup>20</sup> We have performed simulations using the age-67 OAS age and the results of our analysis of CPP reform are little changed.



The replacement rate at age 65 is then calculated as:

$$R_{65} = (CPP_{65} + OAS_{65} + GIS_{65} - Taxes_{65}) / (Earnings_w - Taxes_w) \quad (6)$$

The subscript 65 here refers to the values at age 65, and the subscript w refers to the values when working. Because our example is not representative, direct comparisons to the empirical replacement rates in Table 1 cannot be made without reservation.

The assumptions underlying our stylized example are made for two reasons. First, the assumptions simplify our calculations so that the source of any variation in the resulting replacement rates is clear. Second, for the simulation of proposed reforms to CPP, we want to consider the case of an individual who would have fully contributed to any proposed system, rather than accounting for the time required to phase-in the proposed benefits for mid-career workers. In this way, we are comparing across fully phased-in reforms rather than the transition paths.

In previous research, we presented simulations that examine the incentives for retirement imposed by the public pension system.<sup>21</sup> In that study, it was important to account for gender, marital status, variable earnings, work interruptions, and particularly the timing of retirement, as each of these factors would affect the present value of public pension income received over one's lifetime and thus the incentives to retire at each age. In this present study, however, we are focusing our attention on the replacement rate achieved when a person first retires at age 65. To some extent, the timing of retirement matters for an individual's replacement rate since an adjustment factor applies to CPP benefits if they are taken up before or after age 65. While this would be important for examining an individual's incentives to take up benefits, it does not affect comparisons across income groups or potential policy reforms conditional on benefit take-up at age 65.

## SIMULATION RESULTS

Our simulation results focus on the after-tax public pension replacement rates of individuals across income levels based on the current structure for the Canada Pension Plan. We compare the replacement rates for a range of average annual earnings for each of the policy proposals. These are presented in Figure 7, with the replacement rates at specific earnings levels presented in Figure 8 to highlight the differences. In the appendix, we also present results using before-tax income, for different provinces, for a married individual, and for individuals with pension income.

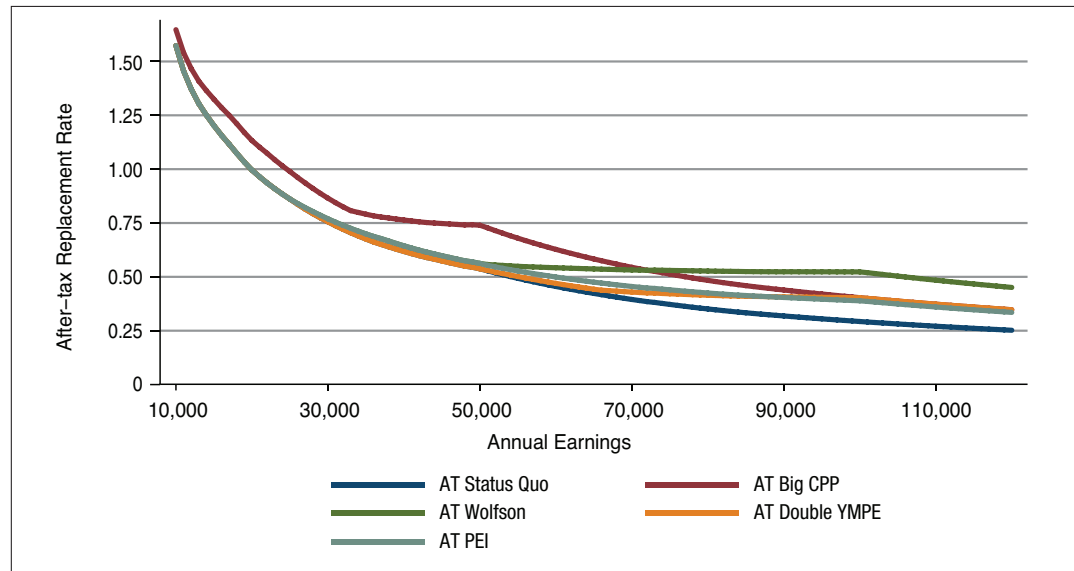
A first option of doubling the replacement rate for all CPP contributors is represented by the red line (Big CPP) in Figure 7. For those in the lowest part of the average earnings distribution, public-pension replacement rates would be higher than before, although higher CPP benefits are partially offset by a reduction in benefits from the GIS. With the 50 per cent replacement

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<sup>21</sup> See: Milligan and Schirle, "Improving the labour."

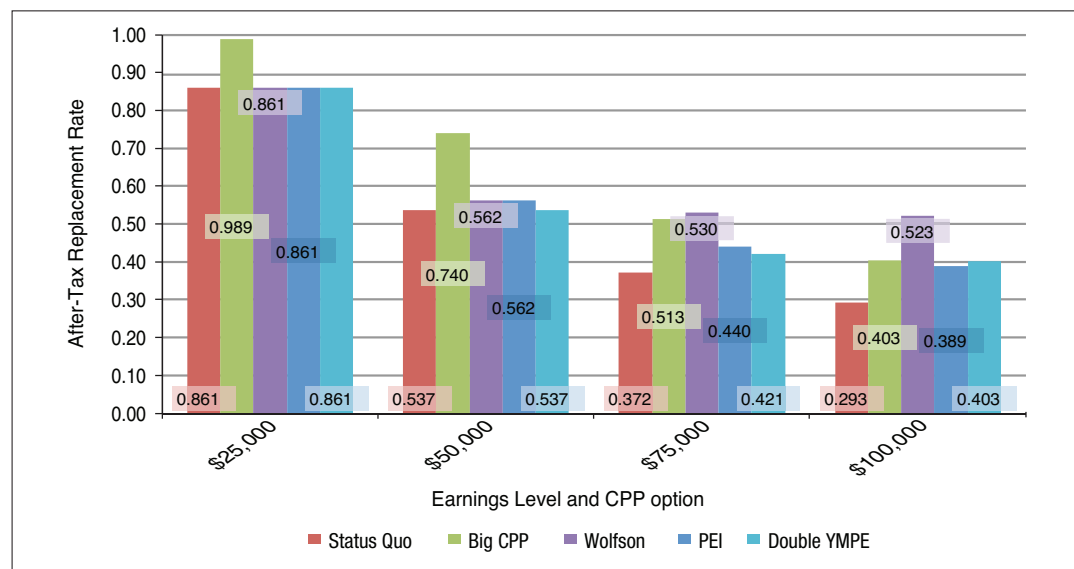
rate, the GIS is pushed to zero at a lifetime earnings level of just over \$32,000 — a kink is visible in the line for Big CPP at that point, as the higher CPP payments are no longer subject to the GIS reduction after that point. The largest increase in replacement rates are for those individuals with average earnings just below the current YMPE but above thresholds whereby their CPP benefits are high enough that they would be ineligible for GIS benefits. For individuals getting the maximum CPP benefit (average earnings around the current YMPE) replacement rates would rise from 54 per cent under the current CPP to 74 per cent under the Big CPP (see Figure 8).

**FIGURE 7: AFTER-TAX PUBLIC-PENSION REPLACEMENT RATES FOR EACH POLICY OPTION**



Source: Authors' calculations using CTaCS simulator.

**FIGURE 8: AFTER-TAX REPLACEMENT RATES AT SPECIFIC EARNINGS LEVELS**



Source: Authors' calculations using CTaCS simulator.

The Wolfson-wedge proposal first diverges from the status quo at a lifetime earnings level of \$25,550. As can be seen in Figure 8, this is a virtue, since replacement rates at lifetime earnings of \$25,000 are at acceptable levels under the status quo. However, between \$25,000 and \$50,000 the Wolfson wedge adds surprisingly little to the after-tax replacement rate compared to the status quo. This is again because of the GIS. With a replacement rate of 25 per cent in the first income range and 40 per cent after \$25,550, the total CPP benefit still leaves the individual eligible for the GIS even at lifetime earnings of \$50,000. For Ontario, the income tax rate in this range is 5.05 per cent, making the combined federal-provincial income tax rate 20.05 per cent. So, for every dollar of new CPP benefits above the \$25,550 threshold until \$50,000, taxes take away 20 cents, and 50 cents is removed from the GIS, leaving a net increase in retirement income of just 30 cents on the dollar. This explains why the overall after-tax replacement rate for the Wolfson wedge at \$50,000 in lifetime earnings in Figure 8 is only slightly higher than the status quo. Appendix Table A3 shows that an individual with employment-based pension income would exhaust the GIS earlier, allowing the public-pension replacement rate to grow more quickly under the Wolfson wedge than in the example shown in Figure 7.

The P.E.I. proposal is depicted in the grey line in Figure 7. Here, the plan is exactly the same as the Wolfson wedge until \$51,100. So, the P.E.I. plan suffers from the same problem that only 30 cents on each dollar of new CPP income actually make it into net income after tax. After \$51,100, the CPP replacement rate is just 15 per cent, making the gains for the P.E.I. plan more modest compared to the Wolfson wedge for these higher-income earners. Individuals with average earnings around \$75,000 would see replacement rates rise from 37 per cent under the status quo to 44 per cent if the P.E.I. proposal replaced the current CPP structure. Individuals with earnings around \$100,000 would see replacement rates rise from 29 per cent to 39 per cent.

Finally, we simulate the proposal to extend the earnings cap up to double the current YMPE while maintaining the 25 per cent CPP replacement rates over the whole range. The orange line in Figure 7 represents the resulting replacement rates. Here, the after-tax replacement rates are not substantially different from the P.E.I. proposal, which may be surprising given the different CPP replacement rates in the two proposals. The explanation lies in Figure 6 and Figure 7. In Figure 6, it can be seen that the 40 per cent CPP replacement rate does create a pre-tax wedge for the CPP over the 25 per cent replacement rate under the status quo or the double-YMPE proposals. However, accounting for the GIS and income taxes shrinks the modest advantage for the P.E.I. plan seen in Figure 6 down to a very small advantage in Figure 7. After \$51,100, the CPP replacement rate under the double-YMPE plan is 25 per cent, compared to 15 per cent under the P.E.I. scheme, so the double-YMPE plan is able to catch up and surpass the P.E.I. plan by the time lifetime earnings reach \$100,000, as can be seen in Figure 8. These results suggest that the extra complexity of having three separate earnings ranges with three different replacement rates in the P.E.I. proposal results in surprisingly little effective boost for replacement rates compared to the much simpler double-YMPE plan. This raises the question of whether the additional complexity is worth it.

## DISCUSSION

In this section we raise some important points relevant to the interpretation of our simulations and the implementation of the various policy proposals.

### Family Replacement Rates

In our simulations, we present the replacement rates for an individual who is single. We might also want to consider the family unit when defining replacement rates. In this case we would need to make a distinction between dual-earner families and single-earner families with the same average (family) lifetime earnings. For example, a dual-earner family where each spouse had contributed to CPP over his or her lifetime, and each had average lifetime earnings around \$50,000, would have a much higher family replacement rate than a single-earner family with average lifetime earnings of \$100,000. Under the current CPP structure, the dual-earner family would have a family replacement rate of roughly 50 per cent while the single-earner family (having made half the contributions) would have a family replacement rate of 30 per cent. (Refer to Figure 8).<sup>22</sup> One advantage for the single-earner family with \$100,000 average lifetime earnings, of course, is the survivor benefits available to the non-earner in the family. Given existing caps on total retirement and survivor CPP benefits, many dual-earner families are not eligible for survivor benefits. As such, current single-earner families have a higher expected return on their CPP contributions.

### Poverty Reduction

The CPP proposals do not focus explicitly on poverty reduction, nor do they address redistribution. The CPP's function in the retirement-income system is an earnings-replacement tool; other policies such as the OAS and GIS are better placed to handle poverty reduction or increased redistribution. Many Canadians may desire overall greater redistribution to Canadian seniors. If so, tools other than the CPP are appropriate.

For middle- and upper-earners, one advantage to expanding CPP's YMPE is that it forces those able to save for their retirement to do so. Currently, many individuals whose average lifetime incomes are above the YMPE, but who do not have employer pensions, do not adequately save privately (see analysis of Table 1 above). Some of these individuals without savings may end up with incomes below low-income thresholds and ultimately will rely on the GIS for income support. As demonstrated in the simulations, simply doubling the YMPE will force these individuals to save more for their retirement and reduce their reliance on those programs financed from general tax revenues.

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<sup>22</sup> Replacement rates for dual-earner couples are presented in the appendix.

## Contributions and Variable Earnings

The simulations presented in this paper represent an individual with stable earnings over his or her lifetime. With respect to contribution rates, however, we may want to consider the implications of expanding the CPP under the proposed P.E.I. or Wolfson reforms in cases where individuals have fairly volatile earnings. It has been suggested that employer and employee contribution rates on earnings over half of the current YMPE would have to increase by roughly 1.5 percentage points, from 4.95 per cent to 6.45 per cent. As a simple example, consider an individual with average lifetime earnings of \$23,000, but with some volatility in annual earnings. He earns \$10,000 per year for half of the 47 years in his earnings history and \$36,000 per year for the other half. With current contribution rates and the 2013 YMPE, this individual will contribute \$45,367 to CPP over his career. Under the proposed system, his contribution rates in some years will increase, so that he pays \$49,050 to CPP over his career. Unless the proposed system introduces a mechanism that accounts for earnings and contributions volatility, however, this individual will not enjoy higher CPP monthly benefits commensurate with the higher premiums paid. The differential CPP replacement rates will make it difficult to administer contribution rates in a way that ensures individuals' contributions are closely linked to individuals' retirement benefits.

## Consequences of Shifting More Savings to CPP

One should expect that any expansion of the Canada Pension Plan will be met with at least some reduction of savings in alternative savings vehicles. This may involve individuals reducing the amount they save in RRSPs or tax-free savings accounts. As well, a renegotiation of employer pension plans, particularly those pensions held in the public sector, is likely. For example, previous CPP expansions have led to "carving out" contribution and benefit space from existing pension plans. That is, employers and employees agree to decrease contribution rates to their employment-based plan over the range covered by the CPP, and also adjust downward the pension-benefit formula. In this way, the addition of expanded CPP coverage ends up not affecting their after-tax pay or eventual benefit receipts, as their employment-based pension decreases to match the expanded CPP.

There is, however, an impact of this kind of "carving out." The impact comes from the management of the pension funds. An expanded CPP would effectively transfer money from existing pension-fund managers (such as the Ontario Teachers' Pension Plan or the B.C. Municipal Pension Plan) to the Canada Pension Plan Investment Board (CPPIB). The CPPIB is already very large, with assets of \$192.8 billion as of September 2013. Any further transfer of funds from other pension managers into the CPPIB will make it even larger. Alternative arrangements, such as having funds from the new and expanded component of the CPP managed in a separate institution in competition with the CPPIB may be possible.

On a risk-return after-fees basis, it is difficult to say clearly whether moving funds from other large professional pension managers to the CPPIB would be a gain or a loss. A stronger case might be made for any shift of funds from individually managed accounts to the CPPIB. There is evidence of shortcomings in investment returns of individual investors compared to professional management.<sup>23</sup> If the CPPIB achieves higher returns with lower fees, any funds newly managed by the CPPIB would be a gain for CPP members.

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<sup>23</sup> See Vijay Jog, "Investment Performance and Costs of Pension and other Retirement Savings Funds in Canada: Implications on Wealth Accumulation and Retirement," Prepared for the Council of Federal, Provincial, and Territorial Finance Ministers (2009).

Should a larger CPPIB be a concern? Little<sup>24</sup> documents that the initial idea of the CPPIB in the 1990s' CPP reform was very controversial for reasons ranging from political interference to taking undue risks in volatile stock markets. Since that time, we now have 16 years of experience with the CPPIB — a period that has included a very large financial crisis. To date, few of the concerns expressed in the 1990s have come to pass. However, it is possible that a still-larger CPPIB could start to expose some of the institutional weaknesses discussed in the 1990s.

### Timing of CPP Expansions

Concerns have been expressed regarding the ability of employers and employees to manage the burden of additional payroll taxes associated with an expansion of the Canada Pension Plan.<sup>25</sup> In this regard, there are several factors working in the favour of employers and employees. First, any change to the Canada Pension Plan will take several years to implement. This provides both employees and employers time to revise their expectations for wages and benefits and renegotiate employee compensation appropriately. Second, the more modest proposed changes will only affect the payroll taxes levied on middle- and high-income earners. This will limit the impact on small and medium-sized firms. More importantly, evidence on labour supply elasticities suggests that workers in this income range are not likely to alter their labour supply in response to small changes in their net wage. This is expected to facilitate the employer's renegotiation of wage and benefit packages when payroll taxes are increased. Third, as long as any additional contributions made by workers and their employers are directly tied to higher benefits in retirement (and workers value those benefits), workers may be willing to accept the full burden of the additional payroll tax in the negotiation of their compensation.

## CONCLUSION

In this paper, we have laid out the current income and pension position of the elderly in Canada, and the trends that led to today's position. We show that the area of greatest concern is middle and upper earners without a workplace pension plan. We then describe several options for reform to the CPP that might address these shortcomings. We find that options such as the Wolfson wedge and the P.E.I. plan do a good job of targeting the expansion where it might be needed most. We also show that a simpler reform — doubling the YMPE — would perform very similarly to the P.E.I. plan, but would do so without the complexity of three separate CPP replacement-rate ranges.

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<sup>24</sup> Little, *Fixing the Future*.

<sup>25</sup> See: Bill Curry and Adrian Morrow, "Expanded CPP is a good idea — but not right now, Flaherty says," *The Globe and Mail*, November 7, 2013 — which cites concerns expressed by Finance Minister Jim Flaherty and the president of the Canadian Federation of Independent Business, Dan Kelly.

Our simulations are limited in many ways. We do not address concerns about longevity risk, poverty, or redistribution. We also do not account for dual-earning couples and the dynamics of survivor benefits. Another limitation is that we leave out other savings, such as housing wealth, which if considered might limit the degree of under-saving observed for middle- and high-income earners.

While our paper has provided some insight into what shape a reform should take if the CPP is reformed, it remains an open question whether government action is needed to address the replacement-rate concerns identified in this paper. The answer to this question depends in part on the role one sees for government in the provision of retirement income.<sup>26</sup> The substantive difference between the Wolfson-wedge plan and the double-YMPE plan is the extent of income replacement for those earning more than \$50,000 per year, with the Wolfson wedge providing a much larger share of retirement income through the public plans. Should government play a larger role in retirement savings for those who have above-median earnings, or is government attention best focused elsewhere?

A standard “market failure” argument for government involvement in pension income is the provision of an inflation-adjusted lifetime annuity at a fair price. Because of adverse selection (high-risk people with longer expected lifespans are more attracted to buy annuities), annuity markets can fail to provide good pricing for such annuities. In the absence of government, this could make it hard to insure against the risk of outliving one’s saving. An expanded CPP facilitates more annuitization of retirement income by middle- and higher-income earners. The extent to which higher-income earners would benefit from further annuitization is important for understanding whether a large expansion of public retirement income is beneficial.

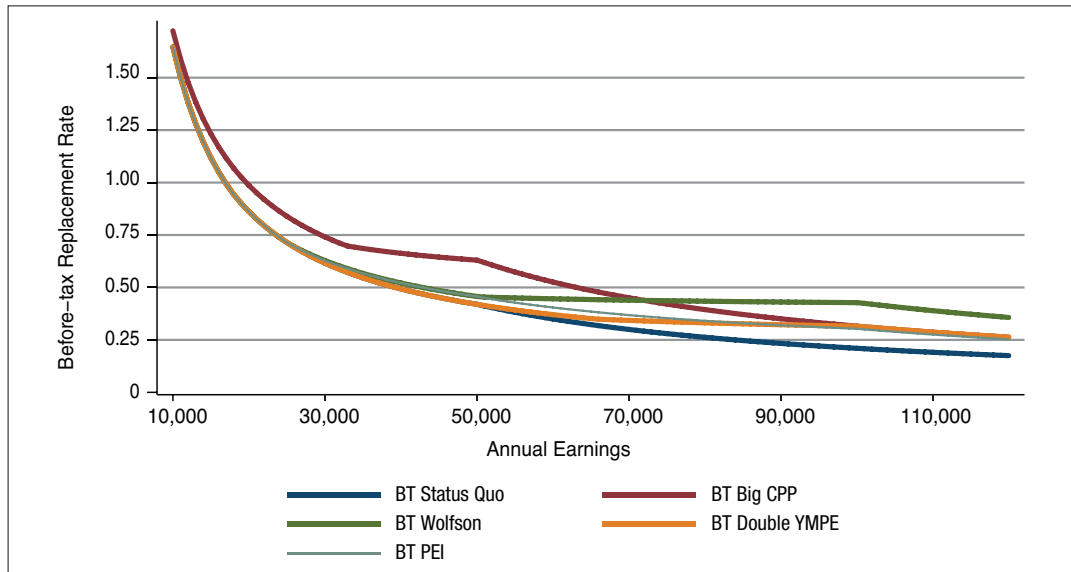
Beyond market failures, there are persistent “decision-making failures” in the realm of savings that can be alleviated by mandatory investing through the CPP. Decisions about saving are complicated, irreversible, and vitally important. Leaving people to make these decisions on their own will result in some proportion of the population choosing poorly and ending up in a dire position in their last years. If government has some responsibility for alleviating personal decision-making failures, a modest expansion to the CPP might be justified on those grounds.

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<sup>26</sup> Baker and Milligan, “Government and Retirement,” provide a more extensive discussion of the role of government in retirement-income provision.

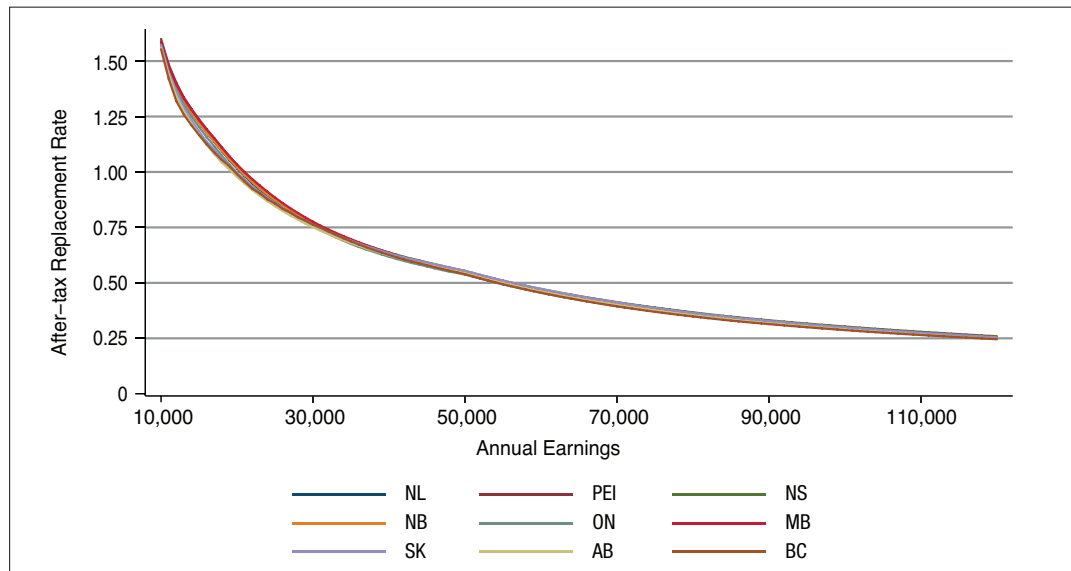
## APPENDIX

**FIGURE A1. BEFORE-TAX PUBLIC-PENSION REPLACEMENT RATES FOR EACH POLICY OPTION**



*Source: Authors' calculations.*

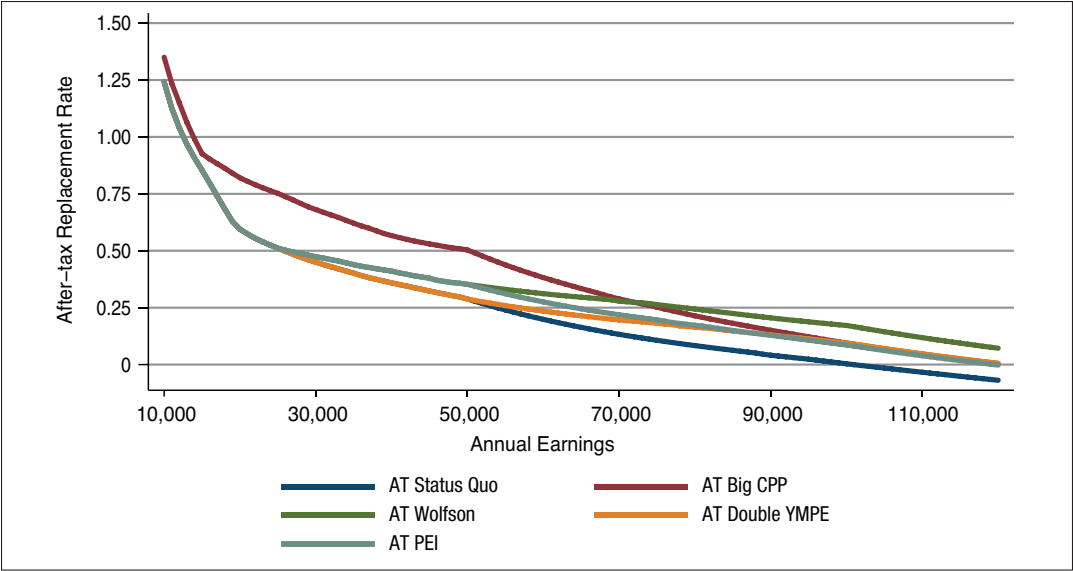
**FIGURE A2. AFTER-TAX PUBLIC-PENSION REPLACEMENT RATES WITH CURRENT CPP ACROSS PROVINCES**



*Source: Authors' calculations based on the CTaCS simulator.*

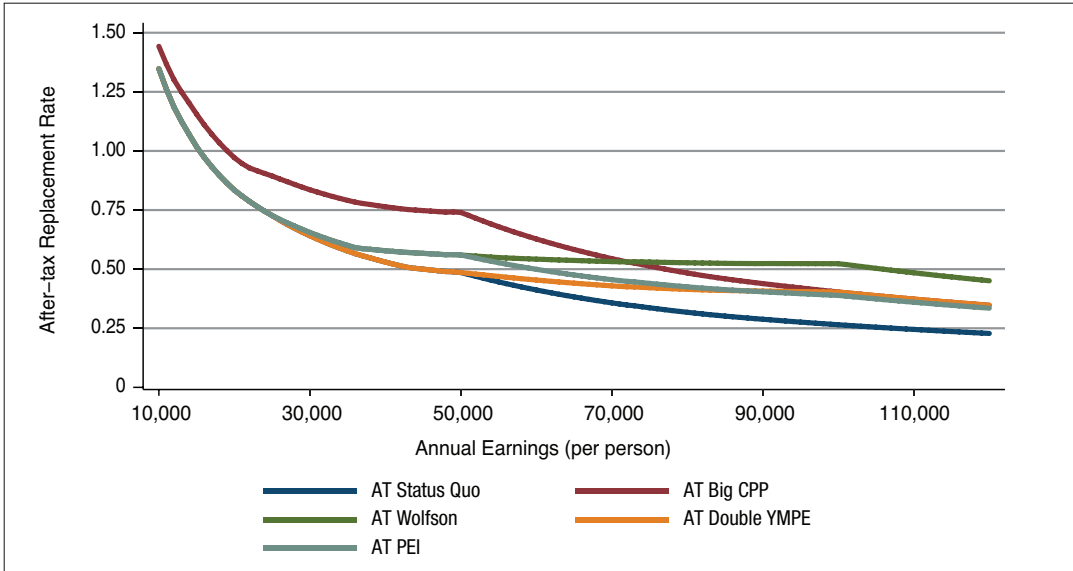


**FIGURE A3. AFTER-TAX PUBLIC-PENSION REPLACEMENT RATES FOR EACH POLICY OPTION, RETIREMENT AT AGE 65, WITH PENSION INCOME**



Source: Authors' calculations. Pension income is assumed to replace 60 per cent of career average earnings.

**FIGURE A4. AFTER-TAX PUBLIC-PENSION REPLACEMENT RATES FOR EACH POLICY OPTION, RETIREMENT AT AGE 65, MARRIED INDIVIDUALS WITH EQUAL-EARNINGS SPOUSE**



Source: Authors' calculations. Spouses are assumed to be the same age with the same career average earnings.

## About the Authors

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