

## **Accounting for and Thinking about Social Security Liabilities in Canada**

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### **Introduction and Overview**

Canada's experience with social security and related programs may interest students of such programs in other countries for several reasons.

First, history has given Canada's pension system a relatively clean and well developed "three-pillars" structure, in which different programs serve distinct purposes. This structure has served Canada well. In particular, the distinction between the redistributive "safety-net" features of the first-pillar programs and the income-replacement features of the second-pillar programs made reforms to the second pillar in the late 1990s much easier to achieve.

Second, the second-pillar income-replacement system is subject to periodic formal evaluations by government actuaries using well established and reasonably transparent techniques. While these evaluations do not make much use of balance-sheet concepts, they were instrumental in spurring the reforms in the late 1990s that moved the second-pillar system from almost pure pay-as-you-go to partial prefunding.

Finally, while Canada's demographic transition is by no means unique, a relatively large baby-boom is producing a shift from a young to an old population that is faster than is occurring in most other countries. This shift makes summary measures of demographically driven implicit assets and liabilities of governments particularly pertinent in Canada.

In the pages that follow, I introduce Canada's social security programs, with particular attention to the second-pillar system. I then discuss the outlook for the second-pillar system. Finally, I provide some broader context with some summary balance-sheet measures that provide a more comprehensive view of the long-term outlook for Canada's public-sector finances.

### **Context**

Because Canada's situation is unfamiliar to many observers from abroad, I begin with some background in three main areas: the structure of Canada's social security system, the allocation of roles between the national and provincial governments that has shaped the system, and the

particularly large baby-boom and subsequent bust in Canada.

### *Major Social-Security Programs in Canada*

The principal social-security programs affecting the elderly in Canada correspond neatly with the three-pillars metaphor promoted by the World Bank (World Bank 1994). All three pillars exist in Canada, and have characteristics that clearly identify their respective functions. In particular, the distinction between the safety-net first pillar and the mandatory income-replacement second pillar is clear. This separation is not only helpful for tidy-minded public-finance economists. The two pillars' distinct objectives made reforms easier in the past, and will likely do so in the future.

#### The First Pillar: Old Age Security and the Guaranteed Income Supplement

Canada's income-support system for the elderly has two main parts: Old Age Security (OAS), and the Guaranteed Income Supplement (GIS).

The OAS was Canada's first national income-support payment for the elderly. It started as a modest transfer to all Canadians fulfilling a residency requirement who were age 70 and over in the early 1950s. It grew in real value through enrichment and lowering of the eligibility age to 65, and has been indexed to consumer price inflation since the early 1970s. It now pays slightly less than C\$6,000 annually. It is taxable at ordinary personal income-tax rates, and since 1990 has been subject to an additional clawback of 15 percent for taxpayers with incomes above about C\$60,000, which reduces it to zero when incomes surpass about C\$100,000.

The GIS started in the mid-1960s as a non-taxable income supplement for Canadians who would receive little or no benefit from the second-pillar plans established at that time. It was enriched at intervals during the 1980s, and is indexed to the consumer price index, which in Canada likely overstates inflation by about 0.6 percent annually (Rossiter 2005). It currently stands slightly less than C\$7,000 annually for a single senior. It is clawed back at a rate of 50 cents per dollar of other income, excluding OAS payments.

The OAS and GIS provide a floor below which no senior's income will go. Together, they provide a single senior having no other sources of income with about C\$12,600 annually – a little more than 30 percent of \$41,100 figure that the second-pillar programs use as their reference point for the average wage. They are largely responsible for the very low rate of severe relative poverty among Canadian seniors (Osberg 2001). (Most provinces provide additional benefits to seniors at this income level.) Their combined structure represents a compromise between the goal of a lightly distorting, but less generous, universal safety net, and more a heavily distorting and more generous alternative.

The OAS originally had trappings of a contributory plan, with a notional allocation from personal and corporate income taxes into a dedicated account, but these earmarked funds disappeared in the early 1970s. The OAS and GIS are now financed from the national government's general revenue. This pure pay-as-you-go approach rules out any advantage pre-funding might offer in reducing their steady-state cost, but give these programs a high-priority claim on government resources and effectively gears them to general prosperity.

## The Second Pillar: The Canada Plan and Quebec Pension Plans

The Canada Pension Plan (CPP) and the Quebec Pension Plan (QPP) are second-pillar programs: social-insurance income-replacement plans. They are defined-benefit plans. Almost all employed Canadians) working outside the province of Quebec must participate in the CPP; those working in Quebec must participate in the QPP. They cover earnings between a fixed dollar minimum of C\$3,500 and a maximum that is indexed to the average industrial wage, and currently stands at C\$41,100.

The most important benefit paid by the CPP and QPP is, naturally, the retirement benefit. For the purposes of calculating the retirement benefit, the plans look at a participant's contribution history from age 18 to retirement or age 70, whichever is earlier, and subtract periods of disability, rearing of children under seven, and the 15-percent of months of lowest earnings. The retirement benefit is equal to one quarter of the resulting index of pensionable earnings, multiplied by the average of maximum pensionable earnings in the five years up to and including the year of retirement. Pensions may be drawn as early as 60 or as late as 70. Early commencement reduces the pension by 0.5 percentage points for every month before the recipient's 65<sup>th</sup> birthday; late commencement increases the pension by a like amount.

The plans also provide disability benefits: these have a flat-rate portion and an earnings-related portion, and at their maximum slightly exceed the retirement benefit. There are also combined flat-rate and earnings-related survivor benefits, and flat-rate benefits to the children of deceased or disabled participants. Finally, the plans provide a modest death benefit.

The pensionable earnings calculations mean that entitlements are effectively indexed to earnings while they accrue. All benefits are indexed to consumer price inflation once they are in pay.

To anticipate later discussion, the CPP and QPP have the appearance of funded plans to their participants, but they were originally intended to be largely pay-as-you-go. The CPP began paying full benefits after only a decade in operation, and was obliged to invest any unneeded funds in unmarketable provincial-government debt. The QPP's phase-in was two decades, but the reason for this longer phase-in was that the government of the province of Quebec wanted the larger pool of assets it permitted for industrial policy and as "captive" financing, not to secure any benefits of prefunding (Vaillancourt 2000, 24). Both plans' assets were dramatically short of their actuarial liabilities by the mid-1990s. In the case of the CPP, one can argue that the requirement to hold only provincial government debt in its portfolio meant that it had no economically meaningful pre-funding at all.

A reform package in the late 1990s more fully funded both plans. Each is subject to regular reviews by government actuaries, which in the CPP's case includes one summary balance-sheet measure. As I discuss more fully below, the actuarial projections for the two plans can trigger reviews of their provisions if they discover that the currently legislated contribution rate will not ensure a benchmark level of assets at future reference dates.

The financing of Canada's second-pillar systems reflects their insurance aspects. Contributions

are a proportion of earnings between a bottom threshold of C\$3,500 and the lower of actual earnings or covered earnings. Participants receive periodic statements of their status, and benefits are linked, albeit somewhat loosely, to contribution history.

In principle, such plans could present participants with contributions that are actuarially fair — no different, say, from deductions from pay to finance fringe benefits. If they did, participants would see them as imposing no tax and providing no subsidy, promoting an efficient labour market. Not surprisingly, Canada's plans are not actuarially fair. For most younger contributors, a substantial fraction of their contributions feels like a tax.

Although the adequacy of senior citizens' incomes in absolute and relative terms is a delicate subject in Canada as in other countries, there has not been enormous pressure to enrich the first and second tier plans in recent years. The maximum annual income from the first and second pillars together – allowing for the clawing back of most of the GIS in recognition of CPP income – would be about \$17,600 annually, or 43 percent of the average wage. As noted already, Canada's consumer price index – to which first- and second-pillar benefits are linked once they are in pay – has an upward bias of about 0.6 percent annually, which helps contain any erosion that productivity growth might impose on the living standards of seniors relative to the working population.

#### The Third Pillar: Private Tax-Deferred Pension Saving

Canada has relatively well developed and well funded private pension plans. To encourage private sponsors to fund their plans, Canada's income taxes allow deductions of employer contributions up to specified limits from taxable income and exempt income earned inside the plans from tax. To provide a level playing field for employees who have such plans and those who do not, contributions to individual retirement saving plans receive the same treatment. Distributions are taxed at regular personal income tax rates.

Of special interest in a discussion of cross-country contrasts in social-security arrangements are the pension plans for public employees. As elsewhere, Canada used to have unfunded government-employee pensions the liabilities of which were incompletely reported on government balance sheets. With a handful of economically insignificant exceptions, Canada has now made a transition to systems that fund accruing benefits about as well (or as badly) as privately sponsored defined-benefit plans fund theirs, and liabilities on government balance sheets are reasonably close to actuarial valuations.

In general, the third pillar of Canada's pension system appears, like the other two, to be well suited to its purpose. The bulk of the population has claims on defined-benefit plans, personal defined-contribution plans, or both. By international standards, the assets in Canada's third-pillar plans are large – equal to more than 80 percent of Canada's gross domestic product (GDP). The fact that distributions from these plans are taxable means that, from a balance-sheet perspective, deferred taxes on the funds they contain constitute an important kind of asset for governments, something conventional measures of net worth tend to ignore.

This is not to say that all is well with Canada's third pillar. Defined-benefit plans in particular are

under pressure. Canadian income taxes prohibit contributions to plans that have actuarial surpluses of more than 10 percent of liabilities, but provide no offsetting support to plans that are in deficit, which tends to produce underfunding on average over time. Policy and judicial decisions have also undermined the symmetry of defined-benefit arrangements, confirming that sponsors are responsible for covering deficits, but restricting their access to surpluses. As elsewhere, sponsors of defined-benefit plans have discovered that the projections of ample returns on which many such plans were founded were overly optimistic. All these developments are reflected in declining rates of coverage of these plans, especially in the private sector, and the almost complete absence of new plan start-ups.

The erosion of defined-benefit plans has highlighted the absence in Canada of large plans that allow individuals and/or employees of small firms to pool risks and reap economies of scale in investing. Individual retirement accounts are common and popular, but individual investors tend to pay fees of various kinds that bite deeply into the low single-digit returns that have been typical of recent experience.

Another problem that has attracted recent attention is the adverse effects of interactions among the first pillar and both the second and third pillars for retirement incomes of elderly people with modest incomes. For people with low earnings, for example, the 50-percent clawback of the GIS takes away half of the modest upward adjustment the CPP and the QPP provide to retirement pensions of people who commence them after age 60 (Milligan 2005). Similarly, means-tested programs for the elderly run by provincial governments, such as subsidies for drugs, for eye-wear, for long-term care, and so on, make saving in third-pillar plans unattractive for many modest-income individuals (Shillington 2003). Although very high effective tax rates on distributions from third-pillar plans currently affect few older Canadians, the pressures of aging on government budgets I outline in the final section of this paper raise a major risk that savings in these plans will eventually incur much higher effective tax rates than the plan holders anticipate today.

#### Other Social-Security-Like Programs

To round out the picture of Canada's social-insurance system, I note the existence of other programs: national unemployment insurance, provincial workers' compensation, provincial drug programs, and provincially funded doctor and hospital services.

The first two of these run on recognizable social-insurance principles, albeit with predictable politically motivated distortions. Although projections of the unemployment-insurance system's payments are important in setting premium rates, no attempt is made to measure accruing obligations in a way that would yield a recognizable balance sheet. The workers' compensation programs get more sophisticated attention, and periodic efforts to rein in their unfunded liabilities occur. Demographic changes, however, do not threaten them.

Drug programs are funded from general revenues in most, though not all provinces. Some, but not all provinces, charge co-payments. Subsidized or free drugs are usually provided to the elderly but not to the able-bodied working population. Doctor and hospital services historically resembled social-insurance programs, but nowadays are direct claims on general revenue. (Some

provinces charge “premiums”, but these are simply hybrid per-capita/income taxes that flow into the general budget.) Neither drug nor doctor/hospital programs is the focus of formal attempts to measure obligations at a point in time. If the current pattern of age-specific utilization continues into the future, demographic changes will swell the use of these programs, creating an important implicit liability for the governments involved, as I illustrate in the final section of this paper.

### *Federalism and Responsibilities for Major Programs*

As the previous discussion hinted in several places, Canada’s federal structure has affected the evolution of its social security system in important ways. Canada’s constitutional arrangements from the 19<sup>th</sup> century gave provincial governments primacy in social insurance programs.

The federal government’s establishment of OAS required a constitutional amendment in the 1950s. With regard to the CPP/QPP, the existence of a parallel plan in the province of Quebec signals clearly the joint occupancy of the pension field. The legislation governing the CPP allows other provinces to withdraw from it if they offer a comparable plan. Changes to the CPP require agreement of a majority of the provinces with a majority of Canada’s population.

Outside the pension field, the establishment of national unemployment insurance also required a constitutional amendment. The national government’s involvement in health care has arisen less formally. As in many other federations, national government revenues have tended to outrun national government spending responsibilities. Provincial governments have felt more constrained in taxing, while facing major pressure to spend. These forces have fostered substantial transfers from the national government to provincial governments, with various formal and informal conditions.

### *Demographic Background*

One final stage-setting comment is that Canada’s demographic and economic experience in the second half of the twentieth century, while similar to that of many developed democracies, was in some respects more extreme.

For Canada more than for the developed democracies as a whole, the first quarter century after World War II featured rapid productivity growth and higher baby-boom fertility. Economic growth rates exceeded rates of return on financial assets by a large margin, encouraging pay-as-you-go financing and government deficits.

The second quarter century featured a reversion to more historically normal rates of economic growth and a resumption of a longer-term trend toward fewer children. Expansion of government obligations and the end of the productivity boom then created large fiscal deficits. More dramatically in Canada than elsewhere, rates of return reverted to the historically more common situation above economic growth rates.

The closing years of the twentieth century featured fiscal consolidation in Canada. Ordinary budget deficits largely disappeared. The combined budget balances of the national and provincial governments recorded deficits averaging almost 8 percent of GDP over the decade from 1984 to

1993; over the past seven years, they have shown combined surpluses averaging almost 1 percent of GDP. The combined net public debt of these governments reached nearly 100 percent of GDP in the mid-1990s; now it is below 60 percent. The improved funding of government-employee pensions mentioned earlier was part of that improvement. The national saving picture also improved with the move of the CPP and QPP to more advance funding.

Not surprisingly, the key fact behind much current concern about Canada's social security systems is the looming change in the ratio of working-age to older Canadians. Over the 25 years from 1980 to 2005, the ratio of people age 18-64 to people age 65 and up went from 6.6 to 5.0 – a decline of about one-quarter. Over the next 25 years, from 2005 to 2030, C.D. Howe Institute projections show the ratio going from 5.0 to 2.5 – a decline of one-half – before levelling out around 2.0.

While the shift looming in Canada's old-age dependency ratio is not as extreme as that of Japan, it is more pronounced than the OECD average. And because the age-structure of Canada's population of traditional working age is also shifting sharply, Canada is one of the OECD countries most exposed to demographically-driven erosion of the workforce (Burniaux et al. 2003, pp, 50, 52). C.D. Howe Institute projections show that, over the next 25 years, the population of traditional working age – people age 18 to 64 – will grow by some 1.3 million. At the same time, however, the population in the top decade of that group – those age 55 to 64 – will grow by 1.2 million. So for every 13 net new person in the Canadian population of traditional working age, 12 will be of an age that, by today's standards, are close to retirement, or already past it.

This abrupt change in Canada's demographic structure has prompted some important changes in the second-pillar system, and inspired fresh interest in the measurement of implicit assets and liabilities arising from demographic change in other areas.

### **The Canada and Quebec Pension Plans**

For students of the measurement of solvency in social-security systems, the recent history and outlook of the CPP and QPP are likely to be of greatest interest. Because these are income-replacement plans that gear the benefits they pay to participants' work histories, balance-sheet measures are particularly appropriate for them. It is easier to estimate accruing benefits for plans of this type. And since they are effectively substitutes for private pension saving up to the amount they cover, it is natural to think of their premiums and benefits as substitutes for private plans, for which such calculations are normal.

#### *History*

As I mentioned in introducing them, the CPP and QPP started in the 1960s as largely pay-as-you-go plans. Because the province of Quebec wished its separate plan to build a stock of investable funds, and there were clear advantages if both plans charged the same contribution rate, contributions levied at the outset more than covered benefits. Once the plans were maturing, however – in the sense that most participants had participated long enough to qualify for full benefits – experience had revealed the over-optimism of initial assumptions about 1960s-style

economic growth rates and demographic developments, and the assets in the plans were much smaller than their accrued liabilities.

At the end of 1997, the Chief Actuary estimated the total accrued entitlement of the CPP's participants at C\$465 billion. Assets in the plan stood at C\$37 billion, roughly 8 percent of liabilities, leaving an unfunded liability of C\$428 billion (OCA 1998, 191). The Quebec government does not produce comparable actuarial valuations of the QPP. Using the arithmetical short-cut of assuming that the ratio of QPP to CPP liabilities is proportional to the respective covered populations, the unfunded liability of both plans at the end of 1997 would have been C\$566 billion (64 percent of that year's GDP).

More startling to the public were the findings of the actuarial report on the CPP as at the end of 1993, which had been published only shortly before. That report showed that the then-effective schedule of contribution rates would bring in revenues so far short of expenditures that the CPP's assets would be exhausted by around 2015 (OSFI 1997, 6). If the plan had evolved as those projections anticipated, the cost of benefits and servicing accumulated debt would have forced the contribution rate up to more than 15 percent of covered earnings by the end of the 2020s, more than three times the 5-percent rate that was charged in 1993. In a remarkable example of leadership, the national government launched a debate about reforms to put the CPP on a more sustainable footing.

The resulting package was implemented in 1998. Most of its features applied to both the CPP and the QPP. It trimmed benefits slightly – most notably, it changed the average used in calculating retirement benefits from the final three years to the final five years of earnings – and ramped up contribution rates. The actuarial projections that guided the reforms showed that the CPP's assets would rise to about 20 percent of its accrued liabilities over the next 20 years. This greater prefunding would provide sufficient investment income to hold the contribution rate at a politically palatable 9.9 percent of covered earnings through most of this century. The reforms also freed the CPP from its obligation to invest in provincial government debt, and created an arms-length CPP Investment Board (CPPIB) to manage its assets.

#### *Current Status of the CPP*

An investigation of the intergenerational effects of the CPP reforms suggests that they sharply improved the package the plan offers younger participants.

Internal rate-of-return calculations by government actuaries for the CPP at the time the reform package was under consideration showed that the average real return for the age-cohort born in 1948 fell from 5.4 to 4.9 percent as a result of the reforms, while the average real return for the cohort born in 1988 rose from 1.6 percent to 1.9 percent (OCA 1997, 14). (Cohorts born before 1930 earned double-digit returns both pre- and post-reform.) More recent evaluations, reflecting both experience during the interim and changes to the investment arrangements for the CPP's funds, suggest that the internal rate of return under the reformed plan is about 2.1 percent for all cohorts born after 1980 (OCA 2005, 121).

These rates of return tell only a partial story, since the significance of a poor (or a good) return

depends on the amount of money that is at stake. Expressing the CPP's effects in relation to covered earnings – which, to repeat, are roughly equal to the average wage – gives a different impression (Robson 2000). Pre-reform, the CPP offered a typical participant born after the mid-1990s a benefit package that fell short of what the same contributions might have earned in a funded plan by an amount equal to more than five years' covered earnings at retirement. The reform package cut that penalty to about three years' covered earnings.

Looked at another way, pre-reform, more than three fifths of a typical participant's premiums would have felt like tax. Post reform, that share fell closer to two-fifths. These calculations assume that participants fully expected the old program to pay what it promised – an assumption polling data do not support. To the extent that they doubted the CPP's promises and the reforms alleviated that doubt, the reform package reduced the perceived tax-share of CPP premiums by more than that.

We do not have good data on confidence in the CPP's promises before and after the reforms. My guess, however, would be that confidence rose once the reforms were in place, and that if it has changed since then, it has risen higher yet. Events since 1998 have proved mostly congenial for the CPP. Revisions in the demographic assumptions underlying successive actuarial reports have been unhelpful to the plan, but thanks to robust growth in contributions, the reports have found that it will be sustainable with a 9.9 percent contribution rate.

At this point, a digression on the method for calculating this rate is appropriate. The ease with which Canada reformed its main employment-related plan might justifiably strike observers from other countries as enviable. Canada notably failed, however, to learn from other countries' mistakes in setting criteria for a sustainable, or "steady-state" contribution rate.

To justify a contribution rate below 10 percent, the designers of the 1998 reforms chose to compare the CPP's funding ratio – the ratio of assets at a given year-end to expenditures in the following year – at two reference dates. Specifically, they specified that the funding ratio should be the same 13 years and 63 years after the period examined by the actuarial review. The most recent review of the CPP as at year-end 2003 (OCA 2004a) projects that a contribution rate of 9.77 percent will yield a funding ratio in 2016 that is the same (about 5) as in 2066, and concludes that 9.9 percent will sustain the plan indefinitely.

There is, of course, no necessary inconsistency between this finding and the existence of a substantial unfunded liability in the plan. As was mentioned above, the actuarial reports on the CPP contain one summary balance-sheet measure: an accrued benefit liability calculated using standard actuarial assumptions about the entitlements, life expectancies, and other attributes of plan participants and their dependants, and discounted by the rate of return expected on plan assets (between 4.4 and 5.0 percent in real terms during the remainder of this decade, falling to 4.1 percent real after 2020 – see OCA 2004a, pp. 22, 116). One suspects that fixing attention on another finding in the report – that the C\$68 billion of assets in the plan were still less than 12 percent of its accrued liabilities of C\$584 billion, and that its unfunded liability stood at C\$516 billion – would cause the public to take a less positive view.

One possible trigger for another political debate about the CPP is a problem inherent in a formula

using two widely spaced reference dates during a period when the ratio of retirees to workers is rising sharply. Projections using the minimum contribution rate that fulfils the criterion for stability will show a funding ratio that rises through the first reference date, peaks, and then falls through the second reference date. So with each actuarial review, the passage of time alone will push the minimum contribution rate up – not a satisfactory property of a “steady-state” contribution rate.

### *Current Status of the QPP*

I know of no study of the intergenerational effects of the reforms on the QPP, but it resembles the QPP so closely that the broad impacts must have been very much the same. (The transition from high to low birthrates was even more abrupt in Quebec than in the rest of Canada, so a given improvement would still leave the QPP with a worse intergenerational tilt.) It seems reasonable to suppose also that the reform package increased confidence that the QPP would pay its promises.

Interestingly, the QPP established a different criterion for judging the sustainability of its contribution rate. It deems a contribution rate sustainable if the funding ratio is the same in 2040 – the year that the number of retirees becomes “relatively stable” – and 2055, the end of its current projection period. Using this benchmark, the latest actuarial report for the QPP (RRQ 2004) concludes that the QPP needs a 10.3-percent contribution rate to sustain itself.

As noted above, the actuarial valuation of the QPP does not include an accrued-benefit liability. The short-cut of assuming that the QPP’s accrued liability is the same relative to that of the CPP as the respective sizes of their covered populations would put the QPP’s liability at the end of 2003 at C\$186 billion. The plan held C\$19 billion in assets at that point, a little more than 10 percent of that estimated liability, suggesting an unfunded liability of C\$166 billion. (The combined unfunded liabilities of the two plans stood at 63 percent of Canada’s GDP in 2003 – almost exactly the same as the estimated combined liability before the reform package took effect.)

The laws governing the QPP specify an automatic review in the event that two successive actuarial reports calculate a steady-state contribution rate more than 0.3 percentage points above the 9.9 percent legislated rate. Even though the QPP sustainability criterion uses a later first reference date for its funding target than the CPP does, extending its projections further in time will also tend to produce a bleaker outlook. The next actuarial valuation will likely also find that the QPP needs a contribution rate more than 0.3 percentage points about the currently legislated rate, a finding will prompt suggestions for further reforms of the plan.

### *Outlook*

It would be tedious to review the many assumptions in the CPP and QPP projections that are open to debate. In thinking about factors that might shake confidence in the sustainability of the plans in their current form, however, two stand out.

First, the projections for both plans assume that inflation will eventually rise above the Bank of

Canada's 2-percent target. This assumption is helpful to the financing of the plans because the C\$3,500 earnings threshold at which contributions become payable is fixed in nominal terms. If the inflation target does not change and the central bank continues to hit it, future evaluations using 2-percent inflation will produce higher "steady-state" contribution rates.

Second, the projections for both plans assume real returns on invested funds that, while not overly aggressive by the (inflated) standards of private-sector defined-benefit plans, look ambitious to me. As I noted parenthetically above, the CPP assumes that its long-term sustainable real rate of return will be 4.1 percent. The QPP assumes a real rate of return of 4.7 percent over its projection period. Government of Canada real-return bonds currently yield 1.6 percent, and few economists predict long-term real growth for Canada above 3 percent. Like private-sector defined-benefit pension plans, the CPP and QPP are looking for extra yield in equity markets, in illiquid projects such as real estate and quasi-public infrastructure, and in financial derivatives with properties even their designers may not fully understand. Even astute investment policies may yield results that are less robust than projected, with obvious consequences for contribution rates.

This consideration leads to a third concern that international observers might have expected me to list first: the possibility that politicized investments will undermine the funds' performance. I noted the Quebec government's original intent to use the QPP funds for industrial policy already: that the QPP is no better funded than the CPP, despite its longer running-in period, testifies to the resulting harm to the QPP's returns. The funds held by the CPPIB are projected to surpass C\$100 billion in 2007, and C\$200 billion in 2014. The national government's annual tax revenue is currently about C\$200 billion, and aggregate own-source revenue of provincial governments (that is, excluding transfers from the national government) is about C\$190 billion.

The CPPIB's governance represent a state-of-the-art attempt to control the well-known problems of government-run provident funds (Slater 1997; Robson 1998). The documentation on its mandate, structure and activities ([www.cppib.ca](http://www.cppib.ca)) is clear and comprehensive. In the 2004/05 financial year, a full tally of its expenses – internal costs of C\$32 million, fees to external private equity and infrastructure managers of C\$72 million, plus amounts deducted from net investment income for external public equity and real estate managers of C\$23 million – amounted to less than 0.3 percent of the CPPIB's average net assets of C\$45.7 billion (CPPIB 2005, pp. 27, 33, 36). The national government and provincial governments both make appointments to its board of directors, and the directors, not the national government, appoint the Chief Executive Officer – provisions that should help insulate the plan from political direction of its investments. Nevertheless, as its assets grow in relation to tax revenues, it seems inevitable that governments will see the CPP as a tempting source of funds for projects that, if undertaken at all, should be financed by taxes.

What about future reforms? Tinkering with current structures is likely. For example, the CPP and the QPP reduce/increase pensions by 0.5 percent for every month payment commences before/after age 65: adjusting these amounts could encourage later retirement (Guillemette 2004). Actual political interference in the CPP's investments could inspire other provinces that could run a program on attractive terms to pull out (Robson 2003b). Or, as funds to ease the transition accumulate, one can imagine a move to individual accounts, as some advocated during the mid-

1990s debate (Robson 1996).

Since social-security plans always evolve, the fact that Canada's CPP and QPP will change further in the future should not discourage attention from outside observers wondering how to convert pay-as-you-go plans in their own countries to partially funded status.

### **Other Demographically Driven Implicit Assets and Liabilities in Canada**

To repeat, the CPP is the only program for which Canadian governments prepare formal balance-sheet measures. Programs without explicit accrual of entitlement to benefits do not lend themselves to the same kind of treatment. It is nevertheless interesting to ask – as preparers of intergenerational accounts do – what current government programs imply as the demographic structure of a country changes. In this final section, I provide some illustrations for this approach for Canada and show how they enter an extended balance sheet for the public sector.

#### *Implicit Assets and Liabilities in Demographically Sensitive Programs*

In my calculations, I use tools similar to those of intergenerational accountants, but emphasize a summary measure that can, with appropriate caveats, supplement other balance-sheet measures: the implicit asset or liability represented by demographically driven decreases or increases in spending. I take the current share of GDP allocated to every program as the price taxpayers currently pay. If current patterns of spending imply a fall in the share of GDP allocated to a given program as the age-structure of the population changes, that program creates an implicit asset. If current patterns of spending imply a rise in a program's share of GDP, the program creates an implicit liability.

Implicit assets represent the amount of additional debt a government could carry at the assumed interest rate and still meet its obligations at constant tax rates as demographic changes lower its program costs. Implicit liabilities represent the amount of additional interest-bearing funds a government would need to hold to meet its obligations at constant tax rates as demographic changes increase its program costs.

Amounts of this sort are measures of the gap between the benefits of public programs and their apparent cost, as seen by current recipients and taxpayers. As such they are similar to the bonus or wedge that net assets or net debt place between program benefits and tax costs in regular government budgets, and the unfunded liabilities in programs such as the CPP and QPP that will require future contributors to pay more than an actuarially fair rate for their benefits.

To value the demographically driven implicit assets and liabilities in key government programs, I take existing patterns of spending by age (and, in the case of health-care) by sex also. In the case of first-pillar transfers to the elderly, I can use real per-senior transfers from projections made by the Chief Actuary (OCA 2004b).

I then use the C.D. Howe Institute's population model to project expenditures forward (more information on the sources and methods for these calculations can be found in Robson 2003a). To focus attention on demographic changes alone in the illustrations below, I assume that costs

in each program area rise in line with general inflation, and also that real expenditures per person in the relevant age group grow at the same rate as real GDP per person of working age.

Converting these projections into amounts expressible as assets and liabilities requires a time horizon over which to value the difference between their future shares of GDP and the current benchmark. Since my approach treats these programs as implicit promises to Canadians currently alive, I use a time horizon is 50 years, which is a little more than the remaining life expectancy of the average-age Canadian.

The conversion also requires a discount rate. For that, I use 5 percent — equal to the 3 percent real growth that relatively optimistic projections show for Canada over the long term along with 2 percent inflation, and roughly the current yield on long-term provincial-government bonds.

The results of this exercise appear in Table 1.

Table 1

### **Demographically Driven Fiscal Assets and Liabilities: 2004**

	<i>C\$ billion</i>	<i>% of GDP</i>
Health	(1,194)	(93)
Education	391	30
Elderly Benefits	(107)	(8)
Child/Family Benefits	137	11
<i>Total</i>	<i>(773)</i>	<i>(60)</i>

The most important implicit liability, not surprisingly, arises from the interaction of the current age-profile of health-care spending with an aging population. Estimates of government-funded health spending by age category put the average per-person amount for people age 65 and up at some 5.4 times that for people age 0-64 (CIHI 2004, 149). If this pattern persists in the future — and it seems to have been quite stable for the past two decades — then the aging population will be an important contributor to rising health costs.

A sizeable implicit asset appears beside publicly funded education. Canada's population age 5-17 is in decline, which — on the assumption of unchanged spending per pupil — promises an immediate and substantial saving on elementary and secondary education. The population in the age-group that contributes most postsecondary students, which I take to be the population age 18-24 is falls less rapidly in the short run. Nevertheless, the entire education budget should, by these calculations, decline as a share of GDP in the years ahead, producing the implicit asset shown in Table 1.

The liability associated with the first-pillar programs for the elderly, the OAS/GIS, may appear relatively modest for programs of this type. One factor that helps limit it is the indexation of OAS/GIS benefits to price inflation, which over time tends to depress their value relative to GDP.

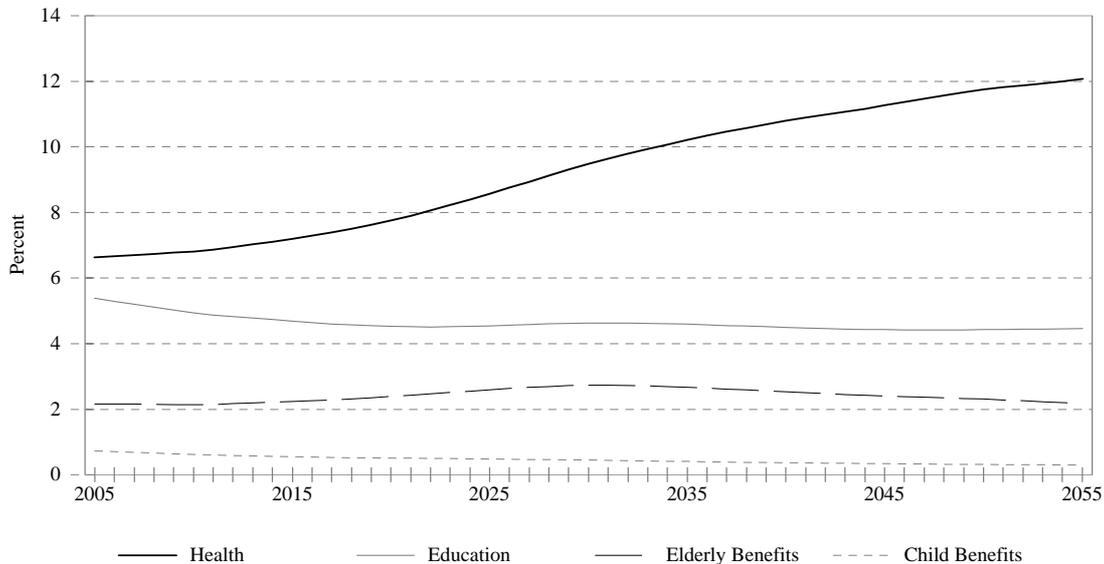
A second factor is the projected growth in private retirement income, which means that the clawbacks in both the OAS and GIS take more back from potential recipients over time.

Finally, Canada has a major income-sensitive transfer to families based on the number of children. Discretionary increases have made this transfer larger in recent years. Nevertheless, projections that allow demographic change alone to drive spending in the future predict declines in this category, creating an implicit asset.

Figure 1 shows the time profile of these various categories over the 50-year time horizon used in the calculations.

**Figure 1.**

### Major Demographically Driven Programs as Share of GDP: National Total



The distribution of these assets and liabilities between the two levels of government will not be a major concern for an international audience. For Canadians, however, the complications arising from the different levels of exposure of the national and provincial governments will be a source of stress in the years ahead.

The national government is in relatively good shape. It has no formal responsibility to fund health-care programs. It is the major funder of child-related programs and the first-pillar pension system, and the savings in prospect from population change in the former appear larger than the obligations in prospect from the latter. The provinces, by contrast, face huge liabilities in the health-care area which are only very partially offset by their implicit asset in education. To the extent that these different pressures increase the number of conditional health-related transfers from the national to the provincial governments, my expectation is that the challenge of providing good health care at reasonable cost will be harder to meet.

*An Augmented Balance Sheet for Canadian Governments*

If one accepts the comparability of these implicit assets and liabilities with other balance-sheet measures of the wedge various obligations place between taxes paid and services received, they allow a more comprehensive balance sheet for governments. Table 2 shows the net demographically driven liability calculated in Table 1 alongside other pertinent measures.

One additional set of figures is the familiar public-accounts numbers for net public debt. The most readily comparable figures for on-budget debt in Canada neglect real assets other than those of the national government, but they do contain reasonable estimates of the pension liabilities of direct employees of governments, and are relatively good by international standards. This amount appears in the second line of Table 2.

A second pertinent amount is the unfunded liability of the CPP and QPP discussed earlier. This amount appears in the third line of Table 2.

A final useful item in such a tally is deferred taxes on private pension saving.

No single comprehensive tally of private pension saving exists in Canada. Assets in employer-sponsored pension plans amounted to some C\$729 billion in mid-2005. Assets in individual registered retirement saving plans amounted to C\$292 billion in 2001; if growth of those assets have kept pace with growth in nominal GDP since then (a conservative assumption), they would have amounted to some C\$341 billion by 2005. I therefore estimate the total of private pension savings at about C\$1.1 trillion in 2005 – some 83 percent of that year’s GDP.

Table 2

**An Augmented Balance Sheet for Canada's Public Sector**

	<i>C\$ billion</i>	<i>% of GDP</i>
Demographically Driven Subtotal	(773)	(60)
Public Accounts Net Debt	(768)	(60)
CPP/QPP Unfunded Liability	(769)	(60)
Deferred Tax on Pension Saving	402	31
<i>Total</i>	<i>(1,908)</i>	<i>(148)</i>

To place a value on this implicit asset, I use the estimate of Robbins and Veall (2002) that the average national-government income-tax rate that will apply on distributions from these accounts is 20 percent, and scale this rate up to an all-government rate of about 38 percent by applying a recent ratio of provincial to national-government personal income-tax collections. I also assume that the rate of return on investments in these plans will be the same as my benchmark discount rate of 5 percent, which makes the present value of tax-deferred pension savings to governments equal simply to the amount saved times the tax rate. A figure of C\$402 billion therefore appears

in the fourth line of Table 2.

One can think of the total of all these items – the bottom line in Table 2 – as a demographically-augmented balance sheet for Canada’s public sector. Not having comparable numbers for other countries, I cannot say with confidence how Canada would compare. My casual impression is that Canada’s turn from sizeable on-budget deficits in the mid-1990s to surpluses more recently, its efforts to slow the rise in the unfunded liabilities of its second-pillar pension system, and its relatively well-funded private pension system would help its standing in such a comparison.

Working against its favourable position would be rapid aging in the context of program structures, particularly in health-care, that look affordable to a young country, and demand stressful cost-containment in an older one. From a the perspective of a Canadian, especially one the age of this author’s children, total liabilities of roughly 1½ times GDP look like a serious fiscal challenge.

### **Conclusion**

I hope the discussion in this paper has been clear enough that no lengthy conclusion is necessary. Canada has the advantage of social-security systems that, thanks to history and the country’s federal structure, are in some respects distinct in their objectives. This clear separation of roles was helpful in the late-1990s reforms to the second-pillar CPP and QPP, since the existence and stability of the clearly redistributive first-pillar programs clarified the task of shoring up the income-replacement system.

Less helpful to Canada is the abruptness of its demographic transition. Canada has dealt with on-budget debts better than many observers, including this author, expected a decade ago. It nevertheless still needs to reform a health-care system shaped in an era when demands for care were much lower than they are going to be and when the working-age population was generating tax revenue that was much more robust than it is going to be.

The budgetary savings in prospect as the young population shrinks are nowhere near as large as the obligations as the older population grows. For the holders of C\$1.1 trillion in Canadian pension assets, the prospect that future governments will seek to impose a higher effective tax rate on their pension distributions than I assumed in my calculations above will not be a cheerful prospect. Yet it seems certain that governments will look to the implicit asset of deferred taxes on pension saving as they struggle to pay the health costs of the generation that is spending a substantial part of its retirement visiting the doctor.

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