PUBLIC POLICY SOURCES

A New Pension Deal for Alberta

A Provincial Alternative to the Canada Pension Plan

William Robson

Contents

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Executive Summary

Concern about the possible future evolution of the Canada Pension Plan (CPP) and a desire to obtain a better balance of benefits and costs for Albertans than is offered by the CPP have inspired suggestions that Alberta opt out of the CPP and establish a separate Alberta Pension Plan (APP). For both legal and political reasons, an APP would likely offer benefits very similar to those of the CPP. An APP's attractiveness would depend in large part on the contribution rate to cover those benefits. The calculation of that rate is the principal focus of this study.

The key focus of the reform package that took effect in 1998 was to put the CPP on a course that would stabilize its contribution rate indefinitely. Regulations adopted as part of that package define the CPP's "steady-state" contribution rate as the rate that would make the ratio of the CPP's assets at year-end to its expected payouts in the following year the same 13 and 63 years after the evaluation date.

The *Nineteenth Actuarial Report on the Canada Pension Plan as at 31 December 2000* projected the CPP's performance on the basis of a number of demographic and economic assumptions and concluded that a contribution rate of 9.76 percent would hit this target. Simulating the outlook for an APP on a similar basis—using the same reference dates and assuming a gradual convergence of key demographic and economic indicators in Alberta with their counterparts in the rest of Canada, excluding Quebec—yields a steady-state contribution rate for an APP of 8.40 percent. In that baseline simulation, Albertans would pay 1.36 percentage points less to finance the same benefits the CPP promises them now. Expressed relative to Alberta's projected contribution base in 2003, this lower rate would reduce the aggregate premiums paid by Albertans by some $530 million annually, or about $320 per contributor.

The margin between the steady-state contribution rates of an APP and the CPP is sensitive to a variety of contingencies. Adverse developments, such as rapid reversals of Alberta's recent demographic and economic advantages plus very high administrative costs, might reduce it to around 0.45 percentage points. Positive demographic and economic developments, with disability rates comparable to those of the Quebec Pension Plan, could widen the margin to 1.80 percentage points. The passage of time also matters. Simulations of the situation as projected at the end of 2005 suggest that the margin between the CPP's steady-state rate calculated then and an APP rate at the same time might be 1.21 percentage points. For a number of reasons, the cost advantage of an APP would likely be larger the earlier it came into effect.

From an economic perspective, the absolute size of these margins understates the advantage of a lower APP rate. The *Seventeenth Actuarial Report on the Canada Pension Plan* estimated that 5.79 percent would be an actuarially fair contribution rate for the benefits CPP participants were then accruing. This figure suggests that about 4 percentage points of the CPP's steady-state rate feels like a tax to the average participant. If the 5.79-percent figure applies to CPP participants in Alberta, an APP charging 1.36 percentage points less than the CPP would effectively relieve them of about one third of the tax component of CPP premiums.

These calculations do not, by themselves, determine whether Alberta should establish its own plan. The confidence Albertans would have in an APP's promises, as opposed to those of a CPP, matters. So does the response of Ottawa and other provinces to the prospect of an APP and their likely degree of cooperation should Alberta choose to proceed. The cost advantage of an APP, however, would mean that plans to proceed with a separate scheme would strengthen Alberta's hand in negotiations over future changes to the CPP. Should such negotiations move the CPP in directions Albertans consider unhelpful, moreover, plans to implement an APP would prepare Alberta to further the interests of its citizens outside the CPP.

CPP Problems—APP Opportunities

Since 1966, nearly all working Canadians outside Quebec have contributed to and accrued benefits from the Canada Pension Plan (CPP). The CPP is a mandatory, employment-related pension system governed jointly by the federal and provincial governments and administered by the federal government. It pays retirement and other benefits calculated in relation to earnings up to a maximum approximating the average wage and charges contributions on earnings between a yearly minimum of $3,500 and the same maximum. Originally set up to run on a "pay-as-you-go" basis with no significant prefunding of benefits, the CPP underwent reforms in 1998 that trimmed benefits and ramped up contribution rates. These reforms reflected a number of economic and political tensions in the plan.

The CPP's Development from the 1960s to the 1990s

The economic environment of the 1950s, 1960s and early 1970s was congenial for pay-as-you-go social security systems. The growth rate of labour earnings was greater than the return on financial-market investments over that period. In those circumstances, the contribution rate required to fund a given level of benefits over the long run was lower without prefunding than it would have been with it. Since the early 1980s, however, the growth rate of earnings has usually been less than the return on financial-market investments. In these circumstances, prefunding permits a lower contribution rate for a given level of benefits in the long run.[1]

Pay-as-you-go pension plans transfer wealth among generations—especially when the growth rate of earnings is less than returns on financial-market investments. Early participants typically reap richer benefits than their contributions would have permitted had they been invested in a normal pension plan or registered retirement savings plan. Later participants get poorer benefits than their contributions would have permitted in a funded plan. In other words, on average, these plans subsidize the workforce participation of early participants and tax the workforce participation of later participants. The difference between what later participants pay in CPP contributions and what they would pay to earn a benefit package of equivalent value in a funded plan lowers the reward from work in the above-ground economy, making it more attractive not to work, to work in the black market or to emigrate.

For a time, the deteriorating bargain the CPP's pay-as-you-go structure afforded later participants prompted enrichments of benefits. By the mid-1990s, however, a period of exceptionally slow growth in contributions and burgeoning benefits led the Chief Actuary to project that the plan would need to start borrowing to cover its benefits after 2015 and contribution rates would soar above 15 percent of covered earnings by the time most baby boomers were retired in the early 2030s (OCA 1995). These projections prompted consultations among the federal and provincial governments and the public. The resulting reform package trimmed benefits, expanded the CPP's contribution base and ramped the contribution rate up rapidly with the objective of stabilizing it at 9.9 percent of covered earnings.

The Attractions of an Alberta Pension Plan

The 1998 reforms appear to have achieved two closely related goals: putting the CPP on a course where it will have sufficient funds on hand to meet benefits at the "steady-state" contribution rate of 9.9 percent, and reducing the tilt against younger workers now and in the future. Whether the CPP will actually evolve along the lines laid out in the reform package and in subsequent actuarial reports, however, is a matter of some doubt.

Most notable among the reasons for doubt is that a pooled scheme that is still largely unfunded inevitably gives rise to political tensions. In funded individual systems, the richness of each participant's benefits depends on his or her contributions and the performance of his or her investments. However, in unfunded pooled systems, the most potentially lucrative way for individuals to improve their situation is by taking from other participants, both current and future.

The joint federal-provincial governance of the CPP may increase the scope for such advantage seeking. In the mid-1990s, the fiscal pressure afflicting all levels of government in Canada created a congenial political climate for the reform package of 1998. Since then, however, divergent fiscal fortunes and, in particular, Ottawa's reaping of surpluses and subsequent spending spree, suggest that consensus would be harder to achieve today. A sense that the CPP has been "fixed," the growing weight of the already- and soon-to-be-retired population among Canadian voters, and the fact that provinces with relatively youthful populations are in a minority, could produce a coalition that would effectively undo the reforms. The possibility that a future federal government or coalition of federal and provincial governments might see the growing pool of assets under the CPP's control as a tool for industrial or social policy and deploy it in ways that would reduce its capacity to support pensions for participants is another threat to the plan's integrity for which international experience provides ample support.[2]

Such concerns, as well as a desire for further reforms that increase prefunding and lower the "tax" the CPP imposes on younger workers, have inspired suggestions that Alberta—a province with a relatively young population and a relatively robust economy—should look at alternatives. Following the 1998 reforms, the government of Alberta argued that future changes to the CPP should further reduce its intergenerational tilt, more closely link participants' contributions and benefits, keep contribution rates low enough to facilitate other retirement saving, and make its governance more accountable (Day 1998). Some have gone further. To assuage provincial concerns that the CPP infringed their constitutional authority in pension matters and accommodate Quebec's wish to run its own separate Quebec

Pension Plan (QPP), the CPP Act provided for provinces to opt out and establish separate plans of pensions and supplementary benefits for their residents similar to those of the CPP. A widely noted open letter to Premier Klein in early 2001 advocating that the provinces generally, and especially Alberta, exercise their constitutional responsibilities as fully as possible—the so-called "firewall" letter—included an Alberta Pension Plan (APP) as a way to protect the interests of working Albertans (Boessenkool et al. 2001).

There is obvious merit in Albertans and their government seriously considering a separate pension plan as part of a program to protect younger workers from retrograde developments in the CPP. Plans for an APP would strengthen Alberta's hand in any federal-provincial meeting where further changes to the CPP were under discussion and improve the province's chances of achieving its objectives within the CPP. And in the event that Alberta's view did not prevail at the negotiating table, an APP could achieve those objectives for Albertans whatever Ottawa and the other provinces might decide to do.

For the APP to work at the negotiating table or as a going concern, however, it would need to provide Albertans with benefits similar to those they can expect under the CPP at an attractive cost.[3] The most straightforward way to determine an APP's ability to do so is to ask what steady-state contribution rate, calculated the same way the Chief Actuary calculates the CPP steady-state rate, would allow it to cover the same entitlements Albertans have earned in the CPP.

Comparing an APP to the CPP: Outline of the Rest of the Study

The rest of this paper examines this question in some detail. The next section outlines a set of generally conservative but realistic assumptions that allow for the calculation of a steady-state contribution rate for an APP on a basis comparable to that underlying the 9.76-percent steady-state rate for the CPP in the Chief Actuary's *Actuarial Report (19th) Supplementing the Actuarial Report on the Canada Pension Plan as at 31 December 2000* (OCA

2002)—henceforth referred to as the *Nineteenth Actuarial Report*. The section after that calculates the steady-state rate looking forward from 2000 under a variety of alternative scenarios that include erosions and reversals of Alberta's current demographic and economic advantages, different evolutions of disability benefits and administrative costs and differing degrees of cooperation from Ottawa and the other provinces when it comes to sharing the CPP's assets. The penultimate section asks how the passage of time since the 2000 evaluation of the CPP might affect the APP's steady-state rate. The closing section discusses some near-term challenges Albertans must face if the APP is to be either a card at the negotiating table or an established fact.

Calculating an APP's Steady-State Contribution Rate

Some might see an APP similar to the CPP as only a first step toward something quite different, such as individual retirement accounts. An APP that closely resembles the CPP is nevertheless a suitable subject for this examination.

The *CPP Act* requires a province opting out of the CPP to assume all obligations accrued at the opting-out date and provide its residents with comparable benefits to those of the CPP.[4] Exploring the extent to which APP benefits differing from their CPP counterparts might meet this requirement would take us into very uncertain legal territory. An APP would be much more attractive to Albertans, moreover, if it maintained any benefits to which they are currently entitled. A parallel structure would also mitigate potential concerns about the portability of benefits across provincial borders.[5] Finally, such a straight-up comparison makes the contrast between the steady-state rates in the two plans transparent and easy to interpret.

The *Nineteenth Actuarial Report* on the CPP

For producing a straight-up comparison of contribution rates under the CPP and an APP, the *Nineteenth Actuarial Report* is an apt starting point. In all respects but one, that report replicates the projections in its predecessor *Eighteenth Actuarial Report* (OCA 2001), which integrates projections of the population of Canada excluding Quebec (which, for brevity's sake, I refer to as CXQ) with assumptions about employment and earnings and the intensity with which various population groups will take up CPP benefits over the years 2001 to 2075. The *Nineteenth Report* adjusted its predecessor report's projections to take account of the establishment of the CPP Investment Board (CPPIB), which is charged with investing the funds the CPP is amassing as it becomes better funded and is expected to earn a better return on investment than the CPP would have achieved otherwise.

A key output of these reports is the CPP's steady-state contribution rate. Amendments to the *CPP Act* at the

time of the 1998 reforms describe that rate as the lowest rate that will result in the ratio of the CPP's assets to its expenditures in the following year being generally constant over the foreseeable future. Regulations passed subsequent to the reforms specify that the relevant asset/expenditure ratios are those projected 10 and 60 years after the end of the triennial review of which the actuarial report is a part. In the case of the *Nineteenth Report*, this provision means that the steady-state rate is the lowest that will ensure that the asset/expenditure ratios are the same in 2013 and 2063. The actual calculation of the steady-state rate involves a contribution rate calculated in thousandths of a percent (three decimal places), although the final reported number is rounded to the nearest hundredth of a percent (two decimal places), and the actual CPP contribution rate is rounded up to the nearest tenth of a percent (one decimal place).

The *Nineteenth Report* calculated that a contribution rate of 9.76 percent of covered earnings, charged in 2003 and every year thereafter, would produce similar asset/expenditure ratios in 2013 and 2063. After rounding, it identified 9.8 percent as the CPP's steady-state contribution rate and concluded that the currently scheduled 9.9-percent rate will sustain the CPP indefinitely. In what follows, I use the *Nineteenth Report*'s unrounded steady-state rate as the benchmark against which to judge equivalent rates for an APP.

This approach has the advantage of setting up a clean comparison between the CPP and the APP. The projections in the *Nineteenth Report* and the *Eighteenth Report* on which it draws are, of course, no likelier to be borne out in every detail than those of any long-term forecast. New data on population to 2002, CPP contributions up to 2001 and CPP benefits up to 2002 are already available, and these and other new figures will undoubtedly influence the next calculation of the CPP's steady-state rate as at the end of 2003. Variations in the outlook with equivalent effects on both Alberta and the rest of CXQ, however, are less interesting than contrasts between

Alberta and CXQ that produce different contribution rates under a baseline simulation. For this reason, while I make use of information from these new data that shed light on differences between Alberta and CXQ, I scale my APP projections to preserve their comparability with those in the Nineteenth Report for the CPP.

This approach also has a disadvantage: it describes the APP as though it had actually been up and running at the beginning of 2001. I will discuss the impacts of a later start date on an APP's steady-state rate following the baseline simulation.

Age Structure of Population: APP versus CPP

Social security systems are highly sensitive to the changing proportions of the population that are younger than, in, and above normal working age. The weights of these age groups differ in Alberta and CXQ. Alberta's population is generally younger than that of CXQ. Alberta has a considerably larger proportion of people under 20, a population that currently contributes little to the CPP. It has a slightly larger proportion of people aged 20 to 64, the group that provides essentially all the CPP's revenues. And it has a considerably smaller proportion of people aged 65 and up, a group that contributes little to the CPP but draws heavily on its benefits.

Changes in demographic structure are relatively slow. To obtain population projections for Alberta that are comparable to those for CXQ as a whole in the *Eighteenth* and *Nineteenth Reports*, I use changes in Alberta's share of the total population of CXQ from Statistics Canada's population projections to 2026 to get Alberta's population to that date and assume that the total population of Alberta will grow in line with that of CXQ over the rest of the projection period (2027–2075).[6] I then assume that the shares of the 0–19, 20–64 and 65+ age groups in Alberta's population converge linearly from their 2002 values to join their CXQ counterparts in the *Eighteenth Report* by the end of the projection period. The shares of these major age groups in the Albertan and CXQ populations as they stood in 2000, and as projected with these assumptions in 2005 and 2075, appear in Table 1.

Contributions: APP versus CPP

A convenient summary measure for converting the population projections for the 20–64 age group into projections for APP contributions is what I call "contribution-base intensity"—per-capita earnings subject to CPP or APP levies in the prime working-age category. Because of its robust earnings and relatively high workforce participation rates, Alberta's contribution-base intensity was more than 12 percent higher than that of CXQ in 2001—that

Table 1: Shares of Age-Groups in Total Population

	2000	2005	2075
Age 0–19			
Alberta	28.3	26.7	20.3
CXQ	26.3	24.9	20.3
Difference (Alberta less CXQ)	2.0	1.8	0.0
Age 20–64			
Alberta	61.6	62.7	55.0
CXQ	61.2	62.3	55.0
Difference (Alberta less CXQ)	0.4	0.4	0.0
Age 65+			
Alberta	10.1	10.6	24.7
CXQ	12.4	12.8	24.7
Difference (Alberta less CXQ)	−2.4	−2.2	0.0

Sources: Statistics Canada; OCA; author's calculations.

is, incomes subject to CPP contributions per Albertan aged 20–64 were more than 12 percent higher than incomes subject to CPP contributions in CXQ as a whole.

Over the 31 years from 1971 to 2001, Alberta's contribution-base intensity relative to that of CXQ varied but averaged well above it. For the baseline simulation, I assume Alberta's relative contribution-base intensity moves to its average over the 1997–2001 period (the last five years for which we have data) by 2005—9.1 percent above the level for CXQ as a whole—and converges linearly with that of CXQ over the rest of the projection period.[7] The contribution base per person aged 20–64 for Alberta and CXQ in key years is shown in Table 2.[8]

Benefits: APP versus CPP

Turning to the expenditures of the CPP and a potential APP, the breakdown of the population into three major age groups matches a convenient three-way decomposition of benefits. Retirement and death benefits, by far the largest category of expenditures, can reasonably be thought of as depending primarily on developments in the population aged 65 and up. Disability benefits, much smaller but historically volatile, are primarily dependent on developments in the population aged 20–64. And benefits for survivors, orphans, and children of disabled participants, also smaller but more stable in their trend over time than disability benefits, are dependent on developments in the entire population.

Alberta's benefit intensity—expenditure per person in the pertinent age group—has recently been much the same as that of CXQ in the case of retirement and death benefits. The take-up of retirement and death benefits per Albertan aged 65 and over was 0.4 percent higher than that of CXQ in 2002, roughly the same margin that

prevailed over the 1998–2002 period (the last five years for which data are available). Alberta's disability-benefit intensity—that is, disability payments per person aged 20–64—was about 21 percent less than that of CXQ in 2002, a significant margin; the average margin between Alberta's disability and that of CXQ as a whole from 1998–2002 was 31 percent. And the intensity of survivor, orphan and children's benefits in Alberta—payments of these benefits per person—was 19 percent below that of CXQ in 2000, almost the same as the 18-percent margin that prevailed between the Albertan and CXQ benefit intensities in this category over the period 1998–2002.

Looking forward, I assume for the baseline simulation that the intensity of each category of benefits in Alberta will move from its 2002 level to its 1998-2002 average by 2005 and then converge linearly with the intensities projected for CXQ in the *Eighteenth Actuarial Report* between 2005 and 2075.[9] This projection takes implicit, if rough, account of two offsetting forces. On the one hand, Alberta's recent and current higher contribution intensity should exert upward pressure on its benefit intensity over time as more Albertans pay into and earn CPP entitlements at or close to the maximum covered earnings.[10] On the other hand, the baseline projection for Alberta's contribution intensity assumes that it will move from its current position above the CXQ average to converge with the CXQ average, which would mitigate that upward pressure.[11] Table 3 shows the resulting figures for benefit intensity in each category in key years.

Administrative Costs: APP versus CPP

Consideration of the likely administrative costs of an APP compared to those of the CPP also involves balancing competing forces. Although Alberta has some

Table 2: Contribution-Base Intensity, Alberta and CXQ

	2000	2001	2002	2005	2075
Alberta ($)	19,355	19,580	19,737	21,016	346,949
CXQ ($)	17,874	17,457	17,719	19,270	346,949
Alberta relative to CXQ (ratio)	1.083	1.122	1.114	1.091	1.000

Note: Intensity is the contribution base per person aged 20–64.
Sources: HRDC; Statistics Canada; OCA; author's calculations; see also endnote 8.

Table 3: Benefit Intensity, Alberta and CXQ

	2000	2001	2002	2005	2075
Retirement and Death					
Alberta ($)	4,688	4,847	5,048	5,521	73,697
CXQ ($)	4,723	4,839	5,029	5,504	73,697
Alberta relative to CXQ (ratio)	0.993	1.002	1.004	1.003	1.000
Disability					
Alberta ($)	130	137	145	137	2,657
CXQ ($)	193	181	184	199	2,657
Alberta relative to CXQ (ratio)	0.677	0.761	0.788	0.688	1.000
Survivor, Orphan and Children's					
Alberta ($)	109	113	118	128	1,931
CXQ ($)	137	143	148	161	1,931
Alberta relative to CXQ (ratio)	0.795	0.792	0.799	0.797	1.000

Note: Intensity is expenditures per person aged 65+ for retirement and death benefits, per person aged 20–64 for disability, and per person in the entire population for survivor and children's benefits.
Sources: Statistics Canada; OCA; author's calculations; see also endnote 8.

infrastructure in place to collect work-related premiums for workers' compensation and distribute benefits to seniors, an APP would require substantial up-front investments and ongoing expenditures to collect premiums and distribute benefits. Helping to reduce those costs, however, would be the advantages of newer information technology and, one can anticipate, a smaller bureaucracy than those currently employed by the CPP.[12]

For a baseline simulation, I assume that up-front investments impose administrative costs on an APP that, per participant (contributors and beneficiaries taken together), are initially five times higher than the CPP figure, drop to three and a half times the CPP figure in the second year and to twice the CPP figure in the third year, staying at twice the CPP figure thereafter.[13]

**Assets and Rates of Return:
APP versus CPP**

A key influence on the steady-state contribution rate that will sustain an APP is the net assets in the plan at start-up. Three separate determinants of this amount deserve consideration.

Pre-reform, the CPP invested in special 20-year maturity non-marketable bonds of each province (at a concessionary interest rate tied to the federal government's 20-year borrowing costs) in proportion to the contributions received from each province's residents. At the end of its 2000/01 financial year, the CPP reported holding some $3.8 billion in such bonds from Alberta. The reform package gave each province the right to roll its bonds over once. Rather than estimating the precise amount in Alberta bonds that the CPP will hold in the future on the basis of the current maturity schedule and guesses about the Alberta government's roll-over decisions, I simply assume that the amount of these bonds, which would be straightforwardly transferable to an APP, will decline linearly to zero by 2038, after which no bonds issued before the reforms and rolled over once would be outstanding.

More important as time goes by are the other investments the CPP makes as the reform package improves its funding. A small amount of these investments will effectively be substitutes for the old bonds just mentioned that Alberta and the other provinces do not roll over. The rest is net new securities and other income-yielding assets. For the baseline simulation, I assume that an APP

takes ownership of Alberta's share of those assets at start-up. I define Alberta's share as the amount that effectively replaces old Alberta bonds plus an amount equal to the net increase in assets since the 1998 reforms, multiplied by the share of CPP contributions made by Albertans over that period.

A final potential source of assets for an APP at start-up would be the Government of Alberta itself. Swings in natural-resource revenues and political preferences have put Alberta's provincial budget through major cycles of surplus and deficit. Using temporary surpluses or accumulated assets to top an APP up at its inception would be an attractive way for the Government of Alberta to provide an ongoing benefit to its citizens and insulate itself from the temptation to ramp spending up unsustainably during boom times. My baseline simulation makes no allowance for such an infusion, but I return to this possibility later when examining sensitivity to various contingencies.

In calculating the returns an APP would realize on its assets, I turn to the *Nineteenth Actuarial Report* for guidance. My simulations of the CPP's financial status based on the 9.76-percent steady-state contribution rate in that report suggest that the CPP's annual nominal return on investment in that projection, expressed relative to the average of its net assets at the beginning and end of each year, would be 6.96 percent from 2001 to 2075. I assume the APP's annual investment returns would be the same relative to the average of its net assets outstanding at the beginning and end of every year as those of the CPP.

## An APP's Steady-State Contribution Rate: Baseline Simulation

These assumptions permit a baseline simulation of the steady-state contribution rate for an APP similar to the CPP calculation in the *Nineteenth Actuarial Report*. As explained above, that report used the *Eighteenth Report*'s projections for the CPP's contribution base and expenditures through to 2075 and its own slightly higher return on investment assumption. The calculation of the steady-state contribution rate involved "searching down" in increments of one thousandth of a percent until arriv-

ing at the rate that, if charged from 2003 onward, would be just high enough to ensure that the CPP's asset/expenditure ratio, allowing for returns on invested funds, would be the same in 2013 and 2063. As noted earlier, the steady-state rate resulting from that calculation was 9.76; although the level of the asset/expenditure ratio in the reference years in the unrounded calculation is not given in the *Report*, my simulations indicate that it was 4.3.

The same searching-down technique applied to the APP under the assumptions just outlined yields a steady-state rate of 8.40 percent. In other words, under those assumptions, if an APP had been up and running at the beginning of 2001, charged the same contribution rates as the CPP that year and in 2002 and charged 8.40 percent in 2003 and thereafter, its asset/expenditure ratio would have been the same in 2013 and in 2063 (6.4 as opposed to my 4.3 estimate for the CPP). Figure 1 shows the evolution of the asset/expenditure ratios in the two plans with those steady-state rates.

Using asset/expenditure ratios in two reference years 50 years apart to determine a steady-state contribution rate produces odd results in some scenarios. In general, however, the lower contribution rate calculated for the APP and its higher asset/expenditure ratios in the reference years both reflect Alberta's current demographic and economic advantages. These advantages permit greater prefunding for an APP than for the CPP in early years. Even though that greater prefunding requires the APP to hit a higher target for the asset-expenditure ratio in the second reference year, the overall impact of the APP's more substantial investment income is to allow lower contribution rates later on as its current advantages fade.

The difference between the unrounded steady-state rates for the CPP and a potential APP as calculated on the basis of the *Nineteenth Actuarial Report* is thus 1.36 percentage points, or about one seventh of the CPP rate. Whether this is a large amount or not is a matter of perspective. Multiplied by Alberta's projected contribution base in 2003, it amounts to a reduction in Albertan payroll levies of some $530 million—about $320 per contributor. After allowing for the growth in the contribution base over time and returns on investment at the rate in the CPP projections, a young Albertan contributing at

Figure 1: Asset/Expenditure Ratios with Unrounded Steady-State Rates, CPP and APP
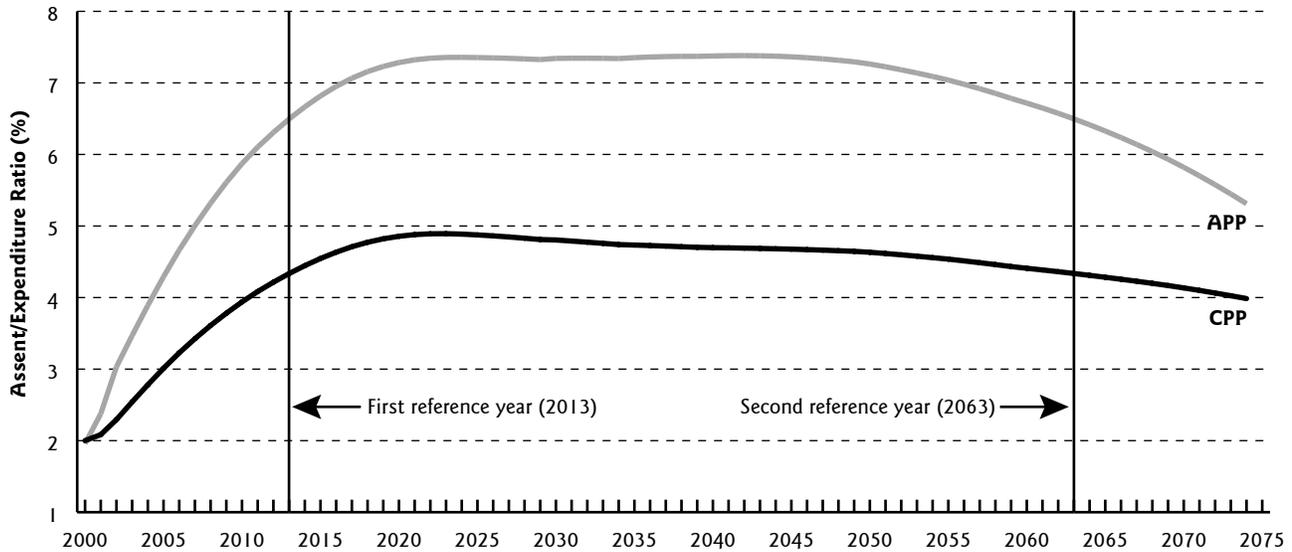
Sources: Statistics Canada; OCA; author's calculations.

the average rate and setting that much aside in tax-sheltered retirement saving would have an additional nest egg of more than $110,000 after 40 years. The economic impact of such a reduction, moreover, is likely larger than the roughly one-seventh margin between the CPP and APP rates suggests.

CPP contribution rates can usefully be considered in two parts. One part is a levy similar in principle to actuarially fair contributions to an ordinary pension and benefit plan. The other is effectively a tax reflecting the intergenerational transfers in the plan. The former part would be equal to the annual contribution an average CPP participant would make to a funded plan for the benefits he or she earns each year. The latter part is the difference between that price and the overall levy.

Although neither the *Nineteenth* nor the *Eighteenth Actuarial Report* gave an actuarially fair "normal cost" rate for CPP participants, the *Seventeenth Actuarial Report* estimated that the discounted value of benefits earned by CPP participants in 1998 was equal to 5.79 percent of that year's covered earnings (OCA 1998, p. 192). Applying that figure to the 9.76-percent rate calculated for the CPP in the *Eighteenth Report* suggests that an average CPP participant who is confident of receiving the benefits he or she has earned would perceive some 4 percent of the CPP's steady-state levy as akin to a tax. If the normal cost rate for Albertans were the same as that of other CPP participants, an APP charging 8.40 percent would reduce this tax, and the associated incentive to work in the underground economy or not at all, by around one third.

Sensitivity Analysis

All forecasts, especially those covering as many years as these projections, are subject to huge uncertainties. The actuarial reports on the CPP provide a number of alternative scenarios that, among other results, show the sensitivity of the steady-state contribution rate to demographic and economic developments different from those in its "best-estimate" projections.

Developments that influence Alberta and the rest of CXQ similarly will not generally have much affect on the gap between the steady-state contribution rates for the CPP and an APP, and I do not pursue the alternatives outlined in the *Eighteenth Report* here. I do, however, look in this section at variations on the assumptions used in the baseline simulation about Alberta's demographic and economic evolution relative to that of CXQ.

Different Scenarios for Alberta's Demographic Advantage

In the short run, Alberta's demographic advantage is unlikely to change much, since demographic cycles are far longer than economic ones. Nevertheless, after a generation or more, the movement of people among age groups can make a considerable difference to the shares of the population working and in retirement.

Statistics Canada's population projections by province to 2026 contain such a dynamic.[14] They show Alberta's edge over CXQ in its proportion of those aged 20 to 64 persisting for two decades and then turning around. By 2026, the difference between the share of this population in Alberta and CXQ turns negative by some 0.2 percentage points as opposed to a continuing advantage of slightly under 0.3 percenta in my baseline projection, where the shares of the various age groups converge from their 2002 levels by 2075. The Statistics Canada projections show Alberta continuing to have a relatively small proportion of 65-and-ups throughout the projection period, but the gap between Alberta and

CXQ is less pronounced by 2026 than in the baseline projection: 1.2 percentage points instead of 1.5.

To test the sensitivity of the APP's steady-state rate to this sort of dynamic, I ran a simulation in which the size of the adverse shifts in the shares of the major age groups in Alberta's population is twice as large as in the Statistics Canada projections between 2002 and 2026, after which the shares of the age groups converge with the CXQ totals by 2075. In those circumstances, the APP's steady-state contribution rate comes to 8.75 percent, 0.35 percentage points above the baseline rate. The fact that such a large shift in the population profile does not more seriously affect the contribution rate testifies to the importance of shorter-run dynamics in an APP's long-run evolution, with substantial early prefunding to cushion the impact of later reversals.[15]

It is also interesting to run a simulation in which Alberta's recent demographic advantages fade more slowly. Suppose that the size of the adverse shifts in the shares of the major age groups by 2026 is half as large as in the Statistics Canada projections, with convergence again occurring thereafter. In those circumstances, the APP's steady-state rate comes in at 8.34, some 0.06 percentage points below the rate in the baseline simulation.

Different Scenarios for Alberta's Economic Advantage

There is a greater likelihood of significant near-term swings in Alberta's economic position relative to CXQ than of significant near-term demographic swings. The margin of Alberta's contribution-base intensity above that of CXQ is a major reason for the lower steady-state rates calculated for an APP, so investigation of economic changes can usefully focus on this variable.

In the baseline simulation, Alberta's relative contribution-base intensity moved from its 2001 figure of 1.122 times CXQ to its 1997-2001 average of 1.091 times CXQ

by 2005 and then converged to match the CXQ figure by 2075. Looking at the longer term, Alberta's contribution-base intensity averaged 6.1 percent above that of CXQ as a whole. What if, by 2005, Alberta's relative contribution-base intensity were to fall as far below its 1971-2001 average as it was above it in the baseline—that is, to 1.031? In that case, the steady-state rate for the APP comes to 8.72, some 0.32 percentage points above the rate in the baseline simulation.[16]

More benign scenarios are also possible. What if Alberta's relative contribution-base intensity remained at its 2001 level until 2005 and then converged with CXQ over the remaining years of the projection? A simulation on that basis yields a steady-state rate of 8.24, 0.16 percentage points below the baseline result.

Different Scenarios for Disability Intensity

A third eventuality meriting detailed attention is the possibility that disability benefits in an APP would evolve differently from their CPP equivalents.

The diverging experience of the CPP and QPP in this regard in the 1980s and 1990s highlighted the extent to which administrative practices and interaction with programs such as workers' compensation and social assistance can influence disability payments offered by social security programs. The intensity of disability benefits in the QPP—QPP disability payments per Quebecker aged 20 to 64—rose rapidly relative to that of the CPP during the 1970s, peaking at 14 percent above disability-benefit intensity in the CPP in 1984. This rising relative trend then rapidly reversed as the QPP tightened its program while CPP disability benefits exploded. By 1994, disability intensity in the QPP was only 44 percent of the CPP figure. Even in the wake of the CPP reform package, which put downward pressure on CPP disability payments, the QPP's disability-benefit intensity was not much more than half that of the CPP over the 1998–2000 period.

The baseline simulation assumed that Alberta's disability-benefit intensity would move to its 1998-2002 level by 2005 and converge with that of CXQ by 2075. What if, instead, an APP coordinated with other provincial work-related income supports and social programs reduced Alberta's relative disability-benefit intensity to

match the level prevailing in Quebec in 2000 (0.540 of the CPP figure) by 2005 and maintained it at that level thereafter? In that case, the APP's steady-state rate would work out to 8.18, some 0.22 percentage points below the baseline result.

Different Scenarios for Administrative Costs

A prominent concern raised by many people who have looked at the APP option is the administrative cost of a separate provincial plan.[17] In their eyes, the above assumption about administrative costs—that an APP's cost per participant would start off at five times the CPP figure and level off at twice the CPP figure—may be too optimistic.

Suppose, alternatively, that the APP's experience is twice as bad as in the baseline. In other words, the APP's administrative costs are ten times higher per participant than those of the CPP in its initial year, seven times those of the CPP in the second year, and level off at four times those of the CPP thereafter. In those circumstances, the APP's steady-state rate would come to 8.67 percent, 0.27 percentage points above the baseline figure.[18]

Varying Amounts of Assets at Inception

A final variable that could affect the steady-state contribution rate for an APP is the amount of assets in the plan in its early years. In the baseline simulation, I assumed the APP would have an amount at inception equal to Alberta's nonmarketable bonds plus the net new assets of the plan since the beginning of 1998, multiplied by Alberta's share of CPP contributions since that time. Here I look at a possible negative development—an obstructive approach by the federal government toward the transfer of those assets from the CPP to the APP—that would raise the steady-state contribution rate. I also look at a possible positive development—an injection of funds into the APP by the government of Alberta at start-up—that would lower the rate.

Thinking about ways the federal government might seek to complicate life for Alberta as it established an APP takes us into territory at least as uncertain as any of

the demographic and economic contingencies discussed earlier in this section. A straightforward way of modelling a grudging response on Ottawa's part is to imagine that the transfer of CPP assets other than the Alberta bonds to an APP is delayed and no compensation for the resulting loss of investment income is forthcoming. Re-running the baseline simulation on that basis raises the steady-state rate by only 0.01 percentage points, to 8.41. A two-year delay would raise the rate to 8.43 percent, 0.03 percentage points above the baseline rate. In the extreme event that the transfer never occurred at all, the steady-state rate for the APP would rise to 8.69 percent, 0.29 percentage points above the baseline.[19]

Turning to the positive side, the government of Alberta might find topping the APP up at its inception an attractive way to buy a long-term benefit with a budgetary surplus that might otherwise quickly be spent. The importance of early prefunding in the longer-term evolution of social security plans means that a top-up provides a lasting benefit. Suppose, for example, that the government of Alberta provided the APP with an additional $1 billion at its inception. Re-running the baseline simulation with such a top-up (which, in that scenario, would have been provided on January 1, 2001) yields a steady-state contribution rate of 8.34 percent, 0.06 percentage points below the rate in the baseline simulation. The impact of larger top-ups on the steady-state rate is roughly proportional to their size: every billion added to the APP's assets at the time of an assumed start-up on January 1, 2001 lowers the steady-state rate by a further 0.06 percentage points.[20]

Summary of Sensitivity Analysis

Many more variations on these assumptions are possible. On balance, the contingencies examined here lean toward the less optimistic side, even though the baseline simulation anticipates a gradual erosion of Alberta's advantages. In view of the natural caution with which Albertans will likely examine an APP, this focus on less advantageous developments seems justified. The different relative demographic and economic possibilities outlined in this section seem to be useful guides to the range of possible steady-state contribution rates a cautious ob-

server would expect for an APP with CPP-like benefits if it had been up and running at the beginning of 2001.

Suppose that the projections for such an APP had incorporated the demographic and economic reversals just canvassed as well as the dismal scenario for administrative costs. In that case, the calculation of a steady-state contribution rate would have yielded a figure of 9.3 percent, some 0.90 percentage points above the rate calculated in the baseline simulation. By contrast, projections for such an APP that incorporated the more benign demographic and economic developments and assumed Quebec-like disability rates would have yielded a steady-state rate of 7.96 percent, 0.44 percentage points below the rate in the baseline simulation.

Table 4 illustrates steady-state contribution rates for an APP that reflect the demographic and economic contingencies just discussed. It compares them to the steady-state rate calculated for the CPP in the *Nineteenth Report*. It also uses the actuarially fair cost of benefits estimated in the *Seventeenth Report* (5.79 percent) as a basis for a rough estimate of the extent to which the lower APP rate would relieve contributors from what feels like a tax. (Of course, relative to the 9.9-percent CPP contribution rate currently scheduled, the APP's lower steady-state rate would constitute a larger cut.)

Readers should note that, in one respect, the figures in the last column of Table 4 overstate the variation in "tax relief" in the different scenarios, as the actuarially fair rate would be higher in the more adverse scenarios and lower in the more benign ones. Alberta's demographic and economic advantages—its higher contribution-base intensity and lower average benefit intensity—suggest, moreover, that the actuarially fair cost of benefits for the average Albertan would be less than for the average CPP participant, making the existing tax wedge for Albertans larger and the relative extent of tax relief somewhat smaller. The calculations nevertheless highlight the key point that the economic significance of a lower APP contribution rate could be greater than a straightforward comparison between it and its CPP counterpart might suggest.

The range of possibilities would expand, and the potential for lower APP contributions with it, if an APP's benefit structure were not exactly the same as the CPP's. Differences between the QPP and CPP benefit structures provide precedents for variations that have been judged

Table 4: An APP's Steady-State Contribution Rate under Various Contingencies

	Level (percent)	Difference from CPP (percentage points)	Difference as share of "tax" (percent)
Baseline Simulation	8.40	−1.36	−34
Rapid Loss of Demographic Advantage	8.75	−1.01	−25
Slow Loss of Demographic Advantage	8.34	−1.42	−36
Rapid Loss of Economic Advantage	8.72	−1.04	−26
Slow Loss of Economic Advantage	8.24	−1.52	−38
Costly Administration	8.67	−1.09	−27
QPP-Style Disability	8.18	−1.58	−40
All Three Bad Things	9.30	−0.46	−12
All Three Good Things	7.96	−1.80	−45
Note: CPP (18th Report)	9.76		

Sources: OCA; author's calculations.

acceptable in light of the obligation of a parallel provincial plan to offer benefits comparable to those offered by the CPP. Full benefits did not become payable under the QPP until after a 20-year phase-in, while the CPP phase-in was 10 years. Today, some QPP benefits are more generous than their CPP equivalents while others are less generous.[21]

An APP could, for example, boost the adjustment that reduces pensions begun prior to and increases pensions begun after age 65. The CPP's 0.5-percent-per-month adjustment effectively subsidizes early retirement and discourages later retirement. A more actuarially neutral figure would likely shift the balance between the average participant's contribution period and pension-receiving period in a direction that would allow further reductions in the contribution rate. The impact of social security programs on retirement is a subject of debate among economists, but for illustration's sake, suppose a change along those lines altered the balance of those working and those retired in Alberta so that, by 2075, Alberta's contribution-base intensity was one percent above the baseline assumption and its retirement and death benefit intensity was one percent below that assumption. Those changes, slow as they are to make much difference in the annual receipts and payments of the plan, would lower the APP's steady-state contribution rate to 8.35 percent.

The Steady-State Rate of an APP Starting in 2006

The steady-state APP contribution rates calculated in this report have used projections based on, and generally converging with, the projections underlying the *Nineteenth Actuarial Report on the CPP* as at 31 December 2000. While easing comparison with the steady-state rate calculated for the CPP, this approach has the drawback that an APP was not up and running at the beginning of 2001. A real-world APP, if such a thing ever comes to pass, will not exist for several years.

The *CPP Act* provides that a provincial pension plan replacing the CPP can come into existence no earlier than the third year following the year in which the province concerned has provided the federal Minister of Human Resources Development with written notice of its intent to opt out.[22] The most rapid conceivable move toward an APP, then, would have the government of Alberta giving such notice in 2003 so that an APP could be up and running at January 1, 2006. Several key variables affecting the steady-state contribution rates of both the CPP and the APP will have changed by then, and the margin between the two rates will likely change also.

Impact of Change in Reference Years on Steady-State Rate Calculation

One mechanical source of such changes arises from the use in subsequent valuations of later reference years for judging stability in the CPP's asset/expenditure ratio. Even if the projections in the *Nineteenth Report*, which used 2013 and 2063 as its reference years, turned out to be accurate in every detail, later reports using reference years 13 and 63 years after their evaluation dates will come up with different steady-state rates. As Figure 1 illustrates, the asset/expenditure ratio of a CPP charging the unrounded steady-state contribution rate is projected to rise until the early 2020s. Actuarial valuations

using years up to then as their first reference years will therefore adopt higher targets for the asset/expenditure ratio in their second reference years. Other things being equal, these higher targets will raise the steady-state rates calculated in those reports.

For an APP starting up at the beginning of 2006, an evaluation at the end of 2005 would be the appropriate point from which to calculate a steady-state contribution rate. That evaluation would use 2018 and 2068 as the reference years in which the asset/expenditure ratio should be the same. For a CPP evolving exactly along the lines of the projections in the *Nineteenth Report*, the steady-state contribution rate using those years would be 9.81 percent.[23] Re-running the APP baseline simulation on the same basis yields a steady-state contribution rate of 8.49 percent. Advancing the reference years five years thus narrows the margin between the CPP and APP steady-state rates to 1.32 percentage points.[24]

Impact of the Longer-lasting 9.9-percent Contribution Rate on Steady-State Rates

Projections for the CPP and APP based on evaluations at the end of 2005 will also vary from those in the *Nineteenth Report* because, by then, the 9.9-percent contribution rate currently scheduled for the CPP will have been in place through 2003—the first year in which the steady-state contribution rate is allowed to vary in the baseline simulations—as well as through 2004 and 2005.

As a result, the CPP's assets will be greater by the end of 2005 than in the simulations on which the *Nineteenth Report*'s steady-state rate was calculated. For the CPP, I estimate that calculating a steady-state rate for 2006 and thereafter using the later reference years and allowing for the more substantial funding arising from charging 9.9 percent from 2003 through 2005 would yield a figure of 9.80 percent.

Impact of Delay on an APP's Steady-State Contribution Rate

The higher assets in the CPP at the end of 2005 would, on the assumption of sharing with an APP in proportion to Alberta's contributions since the 1998 reforms, increase the assets an APP holds at start-up in 2006. The assumptions for contribution-base intensity and benefit costs do not depend on the start-up date, so they are the same in this scenario as in the baseline simulation. The higher APP administrative costs occur five years later.

The tendency of the higher assets to lower the steady-state APP contribution rate at that point is not enough to offset two other forces. Albertans would continue pooling with the rest of CXQ for longer, exposing Albertans to the higher benefit intensities of CPP participants in other provinces. And the demographic and economic advantages of Alberta erode in the baseline calculations.

Simulating an APP that starts in 2006 with the higher assets resulting from the CPP's 9.9-percent contribution rate but otherwise evolves according to the assumptions in the baseline calculation yields a steady-state rate of 8.59 percent. The margin between this rate and the steady-state rate for the CPP calculated from the end of 2005 (9.80 percent) is 1.21 percentage points. Relative to the 1.36-percent margin between the steady-state rates of the two plans in the baseline simulation, about one quarter of the narrowing of the margin with the later start arises from the change in reference dates and the rest arises from the net impact of the delayed start on the finances of the two plans (see Table 5).

Table 5: Impact of 2006 Start on Steady-State Rates, CPP and APP

	CPP	APP	Difference
Baseline	9.76	8.40	1.36
Later Reference Years Only	9.81	8.49	1.32
All Changes	9.80	8.59	1.21

Sources: OCA; author's calculations.

Conclusion: Thinking about an APP

The key conclusion of these simulations, then, is that an APP providing benefits paralleling those offered by the CPP could likely finance them at a lower contribution rate than the CPP can. The baseline simulation, which assumes a gradual erosion of Alberta's demographic and economic advantages over time plus significant administrative costs, indicates that an APP up and running at the time of the last actuarial valuation of the CPP at the end of 2000 would have been sustainable with a steady-state contribution rate 1.36 percentage points below the 9.76-percent steady-state rate calculated at that time for the CPP. Expressed in terms of Alberta's projected contribution base in 2003, this difference amounts to an aggregate reduction in premiums of some $530 million or about $320 per contributor. Compared to the current CPP contribution rate of 9.9 percent, the lower APP steady-state rate would reduce aggregate premiums in Alberta by some $590 million or about $360 per contributor.

Examinations of the sensitivity of this margin to various demographic and economic setbacks and the impact of delays in establishing an APP suggest that there would still be a cost advantage to an APP under more difficult circumstances, and several scenarios give the APP a bigger cost advantage.

Alongside the demographic and economic uncertainties discussed in this report, several other unknowns loom large in deciding whether Alberta can gain at the negotiating table by holding an APP in reserve, or—should the province not succeed in moving the CPP in desirable directions—implementing a separate plan.

One unknown is the reaction of Albertans to the prospect of a provincial plan managing the contributions they now make to the CPP and providing the benefits they now expect from that plan. The more Albertans value the promises of an APP over those of the CPP, the larger the economic advantage of an APP would be, since skepticism about receiving benefits increases the proportion of premiums that feels like a tax and confidence reduces it.[25] It will be important to test Albertans' views on the subject, especially once concrete proposals for an APP are available and subject to public debate.

The response of the federal government and other provinces to the prospect of Alberta leaving the CPP also matters. To the extent that plans for an APP help keep CPP reforms on track—limiting benefit increases that increase the CPP's intergenerational tilt, for example, or inhibiting the use of CPP assets for industrial-policy purposes—the incentive to set up an APP would shrink. Attempts to obstruct an APP through slow or incomplete transfers of CPP assets could also be awkward, especially as the CPP's near-term prefunding increases the amounts at stake.

Those uncertainties noted, the margin between the steady-state contribution rates of the CPP and the APP in a variety of circumstances appears large enough to warrant continued attention by Albertans to the possibility of a separate provincial plan. Now that the CPP has moved to its 9.9-percent contribution rate, the prospect of an APP that offers the same benefits at a rate 1 to 1.5 percentage points less than the CPP is charging has an obvious attraction. That attraction would make the APP a useful bolster to Alberta's negotiating position when possible changes to the CPP next come up for discussion. And they would put the province in an enviable position should it decide that Albertans' interests would be best served by a separate provincial plan.

Notes

1 Robson (1996) and Canadian Institute of Actuaries (1996) detail the significance of the changed economic environment for the funding of pension plans.

2 World Bank (1994) documents the dismal performance of such "provident funds" in other countries.

3 Since skepticism about the CPP actually paying the benefits it promises is widespread, particularly among the young, the confidence Albertans would have about their benefits actually being paid by an APP, as opposed to the CPP, also matters. Although I suspect Albertans would have greater confidence that an APP would deliver on its promises than the CPP would, I know of no publicly available documentation of their views, and therefore do not pursue the subject further.

4 *CPP Act*, s. 3(1).

5 Portability of benefits between Quebec and the rest of Canada has not posed major problems for the QPP and CPP. Essentially, contributors contribute to the plan in the jurisdiction where they work and beneficiaries collect from the plan in the jurisdiction where they live. I know of no transfers between the two plans to redress any resulting imbalances. Whether Ottawa would accommodate Alberta in similar fashion is open to debate, which makes the assumption of similar, and therefore more easily portable, benefits more attractive for the purposes of this paper.

6 Projection 3: "High-growth and west interprovincial migration" scenario; CANSIM Table 052-0001. The *Eighteenth Report* shows projected population by year from 2001 to 2010, at five-year intervals from 2010 to 2030, and then single-year figures only for 2050 and 2075. To obtain annual figures for population totals and for each of the 0–19, 20–64 and 65+ age groups, I interpolate on the basis of the dynamics in the Statistics Canada projection to 2026 and constant annual growth rates over each interval after that.

7 OCA 2001 shows financial projections for the CPP annually until 2030 and at five-year intervals after that. To obtain annual figures for the contribution base (and contributions), I interpolate on the basis of constant annual growth rates in CXQ's contribution-base intensity.

8 The contribution-base intensities calculated here and the benefit intensities calculated in the next section may not exactly match the intensities that would result from dividing the most recent benefit data by the most recent population data for the pertinent age group. Discrepancies may arise because the totals for population, contributions, and various benefits are scaled to match the total population, contributions, and benefits in the *Eighteenth Actuarial Report*. As explained in the text, this scaling exercise helps produce estimates of a steady-state contribution rate for an APP comparable to the most recent official estimates for the CPP, and any discrepancies that result are not material to that comparison.

9 As just noted, OCA 2001 shows financial projections for the CPP at five-year intervals after 2030. My figures for CXQ's benefit intensity in the intervening years are interpolations assuming constant annual growth rates in each category.

10 Since entitlement to CPP benefits is a function of covered earnings rather than dollars of contributions paid, accrual of benefits would be no different if the contribution rate for an APP differed from that of the CPP.

11 Alternative projections in the *Seventeenth Actuarial Report on the Canada Pension Plan* (OCA 1998) showing sensitivity to various contingencies included one simulating the impact of a persistent change in employment levels on benefits over time. The proportion of such changes reflected in overall benefit costs was initially low, increased rapidly some 35–45 years after the change and converged to a level just short of the change in contributions after some 75–80 years. Further insight might be available from more detailed modelling of the earning of entitle-

ments by various categories of CPP/APP participants, but since the initial response of benefits to changes in earnings is low and the largest changes are evident after the second reference year in the calculation of the steady-state rate, more elaborate "top-down" modelling of the kind used here would yield little additional insight.

12 The CPP's average administrative costs per participant were some 60 percent higher in real (inflation-adjusted) terms over the five years from 1996–2000 than they were over the five years from 1971–1975, despite advances in information technology and the economies of scale that growth in the number of participants should have permitted, which suggests that the disadvantages of legacy technology and bureaucratization have been considerable.

13 Since administrative-cost intensity for the APP is calculated relative to that of the CPP, and the baseline projection assumes stability or convergence in relative contribution-base and benefit intensities, I take a convenient short-cut and assume that the ratios of participants to total population in both Alberta and CXQ remain fixed over the projection period.

14 As before, I use Statistics Canada's projection 3: the "high-growth and west interprovincial migration" scenario (CANSIM Table 052-0001).

15 A simulation in which the age shares of Alberta's population change relative to those of CXQ exactly as in the Statistics Canada projections until 2026 and converge with them from 2027 to 2075 yields a steady-state contribution rate of 8.47 percent for the APP, 0.07 percentage points above the baseline figure.

16 A more extreme scenario would be one in which Alberta's relative contribution-base intensity fell all the way to the CXQ average by 2005—something that has not occurred since 1973—and then stayed there. A simulation under that assumption yields a steady-state rate of 8.90, 0.50 percentage points above the baseline.

17 See, for example, Emery and McKenzie (1999).

18 For symmetry's sake, I note that, if an APP's administrative costs were the same per participant as those of the CPP, the steady-state contribution rate would come to 8.26, 0.14 percentage points below the baseline rate.

19 The impact on the steady-state rate is muted by the fact that an APP without those assets would have a smaller asset/expenditure ratio in 2013, which lowers the target for the asset/expenditure ratio in 2063, easing the task of achieving this particular criterion for stability.

20 In this case also, changes in the funding status of the plan at its inception have muted impacts on the steady-state rate because of the peculiarities of a formula for judging stability that makes use of reference dates 50 years apart.

21 The QPP's maximum benefit for survivors aged 55–64 is 57 percent more generous than that of the CPP; its maximum benefit for children of disabled or deceased contributors is 68 percent less generous (HDRC, Income Security Programs Information Card, July–September 2003).

22 *CPP Act*, s. 3(1).

23 This simulation follows the baseline in sticking with the legislated contribution rates in 2001 and 2002 and implementing the steady-state contribution rate in 2003 and thereafter. There is an obvious element of unreality in allowing the contribution rate to vary in years preceding the evaluation date, but this method isolates the effect of changing the reference years only.

24 The use of two reference dates 50 years apart for calculating steady-state rates again produces a somewhat odd result. The larger impact on the APP rate is a consequence of the APP's richer early funding. Since the APP's asset/expenditure ratio rises more in the early years than that of the CPP, later reference dates raise the APP's target more than that of the CPP.

25 Robson (2000) calculates the implicit taxes the CPP imposes on Canadians of various ages under the alternative assumptions that they have full confidence in receiving their benefits and that their confidence in receiving their benefits diminishes the further in the future their benefits are.

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About the Author

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William Robson is President of Northern Analytics Inc. and Senior Vice President and Director of Research, C.D. Howe Institute. He has written extensively on fiscal impacts of demographic change and on public pensions and the Canada Pension Plan.