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Communiqué

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Reformed CPP stronger but still unstable, says C.D. Howe Institute study

Last year's reforms have put the Canada Pension Plan (CPP) in better shape to cope with the baby boomers' retirement, says a C.D. Howe Institute Commentary released today. But, the study warns, the 9.9 percent "steady-state" contribution rate that was a lynchpin of the reform package may prove to be insufficient.

The study, entitled *Building a Stronger Pillar: The Changing Shape of the Canada Pension Plan*, is the first independent look at the latest report on the CPP issued at the end of 1998 by Ottawa's acting chief actuary. The authors are David W. Slater, a former chair of the Economic Council of Canada who has considerable experience in the pensions field, and William B.P. Robson, a Senior Policy Analyst at the C.D. Howe Institute.

Slater and Robson point out that the latest actuarial report on the CPP is the first that evaluates the reform package in the light of updated projections of the future. The report's fresh look at the CPP's sustainability in the wake of the reforms — in particular, the durability of the 9.9 percent contribution rate that is scheduled in 2003 and beyond — will be key in determining the improvement of public confidence in the CPP in the years ahead.

The actuarial report's bottom line is that the 9.9 percent contribution rate for the CPP will be more than enough to sustain the plan indefinitely. On that basis, there will be no pressure on federal or provincial ministers to revise the plan in the 1998–2000 review. However, Slater and Robson have some reservations about this conclusion for future triennial reviews. They argue that the report's assumptions regarding disability claims, immigration, growth of workers' earnings, and inflation may turn out to be too optimistic, and that the chances of disappointment in these areas, which would force a higher contribution rate in the future, could outweigh the chances of more favorable outcomes. They also note that the method the actuarial report used to calculate the steady-state rate is problematic and that, even if the report's projections are born out in every respect, future calculations using the same method will conclude that the steady-state rate calculated in the report was not adequate.

Slater and Robson give the chief actuary's report high marks for its comprehensiveness and transparency. They especially praise its sensitivity tests, which, for the first time in an actuarial report on the CPP, provide a look at how future events different from those in its main projection would affect the CPP's finances and the contribution rate needed to sustain it.

Their final assessment is that the reform package has made the CPP stronger than it was and that the comprehensiveness of the latest actuarial report should boost confidence in the

plan. Given the risk that future evaluations will find that the 9.9 percent contribution rate is insufficient to sustain the plan indefinitely, however, they conclude that confidence in the CPP's promised benefits is likely to remain incomplete.

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Communiqué

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Le RPC remanié est plus solide mais manque encore de stabilité, affirme une étude de l'Institut C.D. Howe

Les réformes apportées l'an dernier au Régime de pensions du Canada (RPC) lui ont permis d'être mieux en mesure d'assumer la prise de retraite de la génération du « baby-boom », affirme un *Commentaire* de l'Institut C.D. Howe publié aujourd'hui. Mais selon l'étude, le taux de cotisation « d'état stable » de 9,9 % qui était le pivot du plan de réforme, pourrait s'avérer insuffisant.

Intitulé *Building a Stronger Pillar: The Changing Shape of the Canada Pension Plan (Bâtir un pilier plus solide : l'évolution du Régime de pensions du Canada)*, ce document représente la première opinion indépendante émise à l'égard du dernier rapport sur le RPC publié à la fin de 1998 par l'actuaire en chef intérimaire du gouvernement fédéral. Il a été rédigé par l'ancien président du Conseil économique du Canada, David W. Slater, qui possède une vaste expérience dans le domaine des régimes de pension, et William B.P. Robson, analyste de politique principal de l'Institut C.D. Howe.

MM. Slater et Robson soulignent que le dernier rapport actuariel sur le RPC est le premier du genre à évaluer le plan de réforme à la lumière des nouvelles projections pour l'avenir. Le regard neuf que porte le rapport sur la durabilité du RPC dans le sillage des réformes — et plus particulièrement sur la permanence du taux de cotisation de 9,9 % qui est prévu pour 2003 et par la suite — sera déterminant pour renouveler la confiance du public envers le RPC dans les années à venir.

La principale constatation du rapport actuariel, c'est que le taux de cotisation de 9,9 % du RPC sera plus que suffisant pour soutenir indéfiniment le régime. Dans ces conditions, les ministres des paliers provincial et fédéral ne seront pas contraints de remanier le régime dans le cadre de l'examen des années 1998 à 2000. Cependant, les auteurs émettent quelques réserves à l'égard de cette conclusion concernant les examens triennaux futurs. Ils soutiennent que les hypothèses avancées dans le rapport à l'égard de l'incidence d'invalidité, de la migration, de l'augmentation des salaires et du taux d'inflation pourraient être trop optimistes et que les possibilités de résultats défavorables dans ces domaines pourraient l'emporter sur les possibilités de résultats favorables, forçant ainsi une hausse du taux de cotisation dans l'avenir. Ils indiquent également que la méthode utilisée dans le rapport actuariel pour calculer le taux

d'état stable est problématique et que même si toutes les prévisions du rapport devaient se réaliser, tout calcul futur à l'aide de la même méthode parviendra à la conclusion que le taux d'état stable calculé dans le rapport n'était pas approprié.

MM. Slater et Robson donnent une bonne note au rapport de l'actuaire en chef pour son détail et sa transparence. Ils sont particulièrement élogieux à l'égard de ses analyses de sensibilité qui, pour la première fois dans un rapport actuariel sur le RPC, donnent un aperçu des manières dont des événements différents de ceux des prévisions principales, influeraient sur les finances du RPC et le taux de cotisation nécessaire pour le soutenir.

En définitive, les auteurs estiment que le plan de réforme a donné de la solidité au RPC et que le détail de ce dernier rapport actuariel devrait contribuer à rétablir une certaine confiance envers le régime. Cependant, compte tenu du risque que les évaluations futures pourraient établir que le taux de cotisation de 9,9 % est insuffisant pour soutenir le plan indéfiniment, ils parviennent à la conclusion que la confiance envers les prestations promises par le RPC pourrait ne pas être totale.

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Building a Stronger Pillar:

The Changing Shape of the Canada Pension Plan

by

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and

William B.P. Robson

Reforms to the Canada Pension Plan (CPP) implemented in 1998 reinforced the program's sustainability by improving its intergenerational equity and calming public fears that the CPP might not pay its promised pensions. The 9.9 percent "steady-state" contribution rate, scheduled to prevail in 2003 and beyond, was promoted as the best way to keep the plan afloat through the end of the next century.

At the end of 1998, Canada's chief actuary issued the *Canada Pension Plan: Seventeenth Actuarial Report as at 31 December 1997*, the first such report that combines evaluation of the CPP's new provisions with updated projections based on the latest experience and on some revised assumptions about the future. This report, which is a model of openness and accountability, finds that the reforms have

put the CPP on a firmer financial footing, improving the likelihood that participants will actually receive the full benefits promised them.

Critically, the report indicates that the 9.9 percent contribution rate is enough (indeed more than enough) to maintain the plan. The details of the projections used to reach this conclusion do, however, give rise to some concerns.

Several key assumptions — about disability claims, immigration, earnings growth, and inflation — are problematic. So is a new method of calculating the steady-state contribution rate. On balance, it seems probable that future evaluations will find the 9.9 percent rate insufficient for sustainability. Thus, confidence in the CPP as a pillar of Canada's retirement income system is likely to remain less than perfect.

Main Findings of the Commentary

- Government-run pension plans are political undertakings, Public acceptance of the transfers they involve depends on citizens' sense of the security of the plan. Although fears of the Canada Pension Plan's (CPP's) defaulting outright on its obligations are exaggerated, participants' skepticism about receiving the full value of promised benefits is well founded.
- During this decade, doubts about the longer-term viability of the CPP led to a package of reforms that was implemented for 1998. Aimed at putting the plan on a surer financial footing, the package included sizable increases in the contribution rate to a "steady-state" level of 9.9 percent in 2003. The sustainability of that rate will be crucial in determining whether public confidence in the CPP improves.
- The reforms intend a rapid build-up of CPP investment income to help the plan meet larger expenditures for an aging Canadian population.
- The Seventeenth Actuarial Report, released at the end of 1998, is the first report on the CPP that combines examination of the provisions of the 1998 reforms (which had been evaluated in the previous sixteenth Report) with projections based on updated experience and revised assumptions about the future.
- This report, the first in a triennial review process set up by the reform package, demands scrutiny because it is a bridge between the CPP's old and new financial provisions.
- The report's conclusion is that the 9.9 percent steady-state contribution rate will sustain the plan indefinitely.
- In reaching its optimistic conclusion, the report relies on projections based on a number of demographic and economic assumptions. Although those underlying the "best-estimate" projections in the report are plausible, several raise concerns. A worse (that is, higher-cost) outcome seems more likely than a better (lower-cost) outcome because the assumptions about disability, immigration, productivity, and inflation all look somewhat risky.
- The method of calculating the steady-state contribution rate also raises problems. At the heart of the reform package is a long-run target of about 5 for the CPP's funding ratio (the amount of its assets divided by its annual expenditures). Many of the projections in the report, however, show funding ratios that are less than 5 and trend downward after about 2020 — not good signs of sustainability.
- Moreover, the mathematics of a proposed benchmark for judging the CPP's stability (one that the report has adopted) make it likely that the next three CPP reviews will find insufficient the steady-state rate of the previous review, even if the Seventeenth Report's projections prove accurate in every respect.
- The Seventeenth Report does a fine job of showing the internal workings of the model it uses. But its optimism about the 9.9 percent steady-state contribution rate may prove misplaced. If it does, Canadians' confidence in the CPP's stability may not rise in line with the plan's improved financial condition.

The package of Canada Pension Plan (CPP) reforms implemented in 1998 promised to put the scheme on a firmer footing. Its main elements were sizable increases in contributions over the next five years to pre-fund more of the plan's obligations, some minor trimming of future benefits, and a new investment board, at arm's length from government, to invest some of the new funds in regular financial market instruments.

The *Canada Pension Plan: Seventeenth Actuarial Report as at 31 December 1997* (Canada 1998; henceforth the "Seventeenth Actuarial Report" or the "Seventeenth Report"), released at the end of 1998, gives Canadians their first comprehensive look at the possible evolution of the reformed plan. The Seventeenth Report is the first evaluation that combines the plan's new provisions — which had been evaluated in the Sixteenth Report (Canada 1997) — with projections based on updated experience and revised assumptions about the future.

The Seventeenth Report is particularly important because it is the first in a new triennial review process of evaluation and decision-making set up by the reform package. This process promises more regular review of the plan by the public and the responsible governments, which should help counter the procrastination that has bedeviled public pension plans throughout the world. As a bridge between the old and new financial provisions of the CPP and between the old and new governance of the plan, the Seventeenth Report demands close evaluation.

The report's bottom line is that, even though experience since the previous report was worse than expected, the reform package has put the CPP on a sustainable footing. The 9.9 percent "steady-state" contribution rate now scheduled to prevail in 2003 and beyond is projected to keep the plan afloat through the end of the next century.

The chief actuary reached this conclusion on the basis of a number of demographic and

economic assumptions. With the aid of the extensive sensitivity tests provided in the report, Canadians can make some guesses about the likelihood that the CPP will, in fact, prove sustainable without further modifications. The assumptions underlying the "best-estimate" projection in the report are plausible, but several raise concerns. Our judgment is that a worse (that is, higher-cost) outcome than the best estimate is more likely than a better (lower-cost) outcome because the report's assumptions on disability, immigration, productivity, and inflation all risk disappointment.

In addition, we are concerned about the calculation of the steady-state contribution rate. At the heart of the reform package is a long-run target of about 5 for the CPP's funding ratio — the amount of its assets divided by its annual expenditures. Although well short of the 20-plus figure that would be consistent with full funding, a funding ratio of 5 is sufficient to provide investment earnings that would lower the cost of the CPP's promises to future taxpayers. Many of the projections in the Seventeenth Report, however, show funding ratios that are less than 5 and that trend downward in further-out years — not good signs of sustainability.

One reason for the downward trend is that the report uses a proposed new benchmark for judging stability: that the funding ratio 13 and 63 years after the evaluation date (2010 and 2060 in this first review) be essentially the same. Because the funding ratio (now about 2) will be rising sharply until after 2020, the next three reviews are likely to find that, even if the projections have been borne out in every respect, the steady-state rate calculated in the previous review was inadequate — a process unlikely to raise public confidence in the plan.

Overall, we conclude that, although the Seventeenth Actuarial Report deserves commendation for its comprehensiveness and open discussion of the CPP's situation, its optimistic assessment of the plan's longer-term

stability and the public trust this assessment might create are by no means assured.

Background

Before considering the Seventeenth Report or our concerns about its projections, readers need to understand the old CPP and concerns that motivated the reforms of 1998.

The Structure of the CPP

The Canada and Quebec Pension Plans (CPP/QPP) were established in 1966 to provide a mandatory employment-related pension alongside the existing income-support system of the universal old age security (OAS) program.¹ The CPP, like the parallel QPP, covers employment income up to a maximum — the year's maximum pensionable earnings (YMPE), roughly equal to the average annual wage — and pays a maximum retirement pension equal to just less than 25 percent of the YMPE, as well as a variety of disability, survivor, and children's benefits.

Like other social security systems set up about the same time, the CPP had a pay-as-you-go design. Each period's benefits were funded by contributions collected in the same period, with no pre-funding of the kind that is usual in private sector pension plans. After its initial buildup, the plan was never intended to maintain more than a small buffer of funds: an amount equal to two years' worth of expenditures, invested in nonmarketable provincial government debt at concessional interest rates (see Box 1). Such a setup looked sustainable in the economic environment of the 1960s, when economic growth rates that exceeded returns on many investments made pay-as-you-go look more cost effective than pre-funding.

The environment changed markedly, however, during the following 30 years. Birth rates fell and life expectancy rose, yielding demographic projections of a population aging more

Box 1: *The Provinces and the CPP*

Although the CPP is administered by the federal government, the provinces have considerable interest in it.

First and most obviously, the program was — and still is — established under a federal-provincial agreement. Even Quebec, which chose to opt out when the scheme was put in place and simultaneously set up its own plan, is still an “included province” for amendments of substance to the CPP legislation. Principal decisions must be agreed between Ottawa and two-thirds of the provinces containing two-thirds of the population.

One reason for this level of agreement is the need to keep the mandatory plans portable across the country. If an individual has worked in Quebec, making contributions to the QPP, equity requires that he or she be able to move to another province and have CPP credit for that work. Similar portability is needed for workers who move to Quebec from elsewhere in the country.

A second important feature for the provinces is that they have historically had the right to borrow from CPP funds at preferential rates. The new CPP investment policy, which was part of the 1998 reforms, reduces this special treatment, but the provinces will still have access to the pool under the legislation's generous transitional measures.

rapidly than had been expected. On the economic side, income growth slowed, while rates of return on investments rose.

A decision in the mid-1980s to increase future contribution rates without changes in the plan's benefits or investment practices proved an inadequate stopgap. By the early 1990s, estimates of the CPP's long-term costs had almost tripled from what had been calculated at the plan's inception. The scheme was carrying heavy burdens of early entrants whose pensions and other benefits would cost much more than their contributions. New young entrants were paying more than the cost of their

prospective benefits, the difference helping to meet the unfunded and underfunded liabilities due their elders.

By this time, the CPP was offering a typical young entrant a package that, even if he or she had full faith that the promised benefits would be paid in full, was worth only about half of what the same money would have purchased outside it (Robson 1996).² Worse, the chief actuary's Fifteenth Report (Canada 1995) projected that deteriorating cash flow would exhaust the plan's buffer of funds in about 20 years. A growing sense of the CPP's future instability prompted negotiations among the federal and provincial governments in 1997 that produced the 1998 reform package.

The 1998 Reforms

Although the 1998 reforms trimmed some CPP benefits slightly, retirement, disability, and other entitlements remain essentially the same as those that were in place. The key thrust of the changes is to pre-fund those benefits more fully.

During these first few years of the new regime, contributions are rising sharply, thanks to accelerated increases in the contribution rate and to an expansion of the contribution base brought about by the freezing of the year's basic exemption (YBE) — the threshold earnings below which no contribution is charged — at \$3,500 without inflation adjustment. The expectation is that contributions will soon exceed payouts by a substantial margin, building an investment fund that, at its peak, will amount to a little more than 20 percent of the plan's actuarial liabilities, much superior to today's 8 percent.

Moreover, the plan's assets are being diversified beyond the pre-reform portfolio of tax-supported debt. The reforms establish an independent, trustee Canada Pension Plan Investment Board to invest in a market portfolio of assets, which is intended to obtain rates

of investment return comparable to well-performing private and public pension funds.

Overall, after the initial ramping up of contributions, the reforms are designed to allow CPP benefits to be covered by a contribution rate of 9.9 percent in perpetuity — the steady-state contribution rate — with the difference between contributions and benefits being covered by earnings from the investment fund.

From a fiscal point of view, the reforms improve the CPP's structure. When investment returns exceed economic growth rates, pre-funding is more cost effective than pay-as-you-go, so the total cost of the CPP's benefits to its participants should be lower than it was. For the sake of isolating the impact of the reform package, the Sixteenth Actuarial Report (Canada 1997) evaluated the new plan on the basis of the same economic, demographic, and other assumptions that had underlain the previous report. Its projections showed that the CPP's assets after reform — rather than running out between 2010 and 2020 — would rise by the end of that decade to almost five times the plan's annual payouts and that in the early 2020s the earnings from these assets would cover more than a third of expenditures, allowing the contribution rate to stay at 9.9 percent.

Whether the CPP — the pillar of Canada's retirement income system as it is sometimes called — is now more sustainable than before is, however, a more complicated question. Government-run public pension plans are political undertakings, not legally enforceable contracts. They involve sharing of current national income between their beneficiaries and all taxpayers, with transfers generally running from younger to older people and, less reliably, from better-off to worse-off people. (Redistribution from the better to the less well-off within employment-related programs such as the CPP is complicated by such considerations as the exclusion, by definition, of those who have neither worked nor married someone who worked and by the correlation between

income and life expectancy, which means that the less well-off are less likely to live to enjoy their benefits.)

The acceptability of these transfers depends on the public's sense of fairness and the apparent security of the scheme's promises. Such plans have a history of instability,³ both because of procrastination in keeping contributions in line with commitments and because of the dissipation of funds in unsustainable benefits or industrial and regional policies. Although fears of an outright default on CPP obligations are exaggerated, skepticism about receiving the full value of its promised benefits is well founded.

With CPP premiums now rising sharply, these doubts matter. To the extent that participants see the higher premiums as conferring a benefit, they will regard them much like the cost of any employment-related fringe benefit, and the economic and political repercussions will be small. To the extent that participants doubt the higher premiums confer a benefit, however, they will see them as a tax, causing fears about job losses and prompting workers to move into the underground economy or even abroad. Economic damage and discontent about higher premiums thus has the potential to create a vicious circle; political support for scaling back the CPP can only exacerbate skepticism about its promised benefits (Robson 1999). This is the delicate post-reform environment in which the Seventeenth Report appeared.

The Legislative Setting

Along with changes to the CPP's contributions, benefits, and investment practices, the reform package also established a regular three-year cycle for review and possible further revisions to the entire plan. The amended *Canada Pension Plan Act* requires the chief actuary to evaluate the plan's long-term prospects in the first year of every cycle and to calculate a

steady-state rate that makes the plan's funding ratio "generally constant." The release of the Seventeenth Report at the end of 1998 marked the end of this phase of the first post-reform three-year review.

During the second year of each cycle of evaluation and review, the federal and provincial governments look at the plan's contributions and benefits in the light of the actuarial report and other CPP reports. They have until the end of that year — December 31, 1999, in the current cycle — to decide on any changes to the plan. The final year of each three-year review period — 2000 in the current cycle — gives time for the governments to pass the legislation required to implement any agreed-on changes.

Ministers' recommendations to maintain or to change benefits and contributions will draw heavily on projections of the CPP's likely future performance in the light of experience and of reasonable forecast assumptions in the successive actuarial reports. The chief actuary is required to determine on the basis of objective standards of performance and explicit, realistic assumptions about the future, a best estimate of the contribution rate that will yield a constant funding ratio in the future.

Current plans call for a constant contribution rate of 9.9 percent of the contribution base from 2003 on. If the chief actuary determines a steady-state rate that is less than the scheduled 9.9 percent rate, the ministers may leave the plan unchanged or decide to enrich its benefits. If, however, the best estimate rate is more than 9.9 percent, the amended act contains provisions for increasing the scheduled rate by an amount equal to half the difference between the best-estimate rate and 9.9 percent and for freezing the indexation of benefits for the following three-year period (2001–03 in the current cycle). Although ministers can overrule these fail-safe provisions, a best-estimate rate higher than 9.9 percent would put strong pres-

sure on them to reopen the CPP for further changes to contributions or benefits.

Each triennial report on the CPP thus stands out as critical in determining the confidence that CPP participants will have in their benefits and, therefore, on the overall economic and political impact of the plan.

The Seventeenth Actuarial Report

The Seventeenth Actuarial Report (Canada 1998) sets out the experience of the CPP up to the evaluation date (December 31, 1997) and then gives the projections required for the chief actuary's best estimate of the steady-state contribution rate.

The Conclusions

Following normal practice in actuarial valuations of pension programs, both public and private, the Seventeenth Report presents the position of the CPP as at the end of 1997 and sets out how that position differed from what was previously projected. (These reconciliations are important to establish the initial base for the projections and to provide credibility to the evaluation and projection process.)

The previous reports had shown CPP expenditures exceeding contributions plus investment earnings from 1994 to 1997 and consequent depletion of the program's investment fund, but the Seventeenth Report shows performance to have been considerably worse than expected. Contributions were \$4.5 billion less than had been projected, owing to lower-than-expected levels of employment, inflation, and real wage gains. Expenditures were also less than projected, thanks to lower-than-expected disability payments, but by only \$2.3 billion.

The effect of this worse-than-expected net cash flow was to lower the CPP's assets from what had earlier been projected, with the result that investment earnings (never very

significant in a fundamentally pay-as-you-go plan) were also less than the previous reports had anticipated.

For the future steady-state rate, the net impact of the differences in 1994–97 experience from what the previous reports had projected was an increase of 0.223 of a percentage point (Table 1, section A). Along with a small increase arising from changes in methodology (section B in the table), the experience update would have been sufficient to raise the unrounded steady-state rate calculated in the Sixteenth Report to 10.183 percent.⁴

That rise does not, however, show up in the bottom line of the Seventeenth Report because its projections of future experience more than offset the increases from the experience update and the methodological changes. Those projections incorporate key variables, several of which are based on assumptions different from those of the Fifteenth and Sixteenth Reports (see Table 1, section C). The variables used are:

- Lower fertility rates. This change reduces the future contribution base relative to pay-outs, increasing the steady-state rate.
- Higher net immigration. This change increases the future contribution base relative to payouts, lowering the steady-state rate.
- Lower mortality rates. Longer life expectancy increases the number of beneficiaries relative to contributors, increasing the steady-state rate.
- Lower disability incidence. This change reduces payouts significantly (a point discussed further below), lowering the steady-state rate.
- A lower share of earners in the population. This change reduces the relative size of the contribution base through most of the projection period, raising the steady-state rate.
- More gradual growth of real wages. The Sixteenth Report assumed that wages would increase one percentage point faster

Table 1: *Changes in Steady-State Rate between the Sixteenth and Seventeenth Actuarial Reports*

	Rounded Steady-State Rate	Effect on Rate	Unrounded Totals
	(%)	(% points)	(%)
<i>Sixteenth Report</i>			
After rounding	9.900		
Before rounding			9.923
<i>Seventeenth Report</i>			
A. Experience update			
Demographic		0.062	
Economic		0.229	
Benefits		-0.068	
Subtotal			0.223
B. Improvements in methodology			0.037
C. Changes in assumptions			
Fertility		0.279	
Migration		-0.492	
Mortality		0.318	
Disability		-0.613	
Employment ratio of the population		0.239	
Real wage increases		0.040	
Inflation		0.209	
Return on investments		0.000	
Other (mainly timing of retirement)		-0.300	
Subtotal			-0.320
D. Proposed new calculation method			-0.099
Total (A-D)			-0.159
Before rounding			9.764
After rounding	9.800		

Source: Canada 1998, 32.

than inflation in every projection year, whereas the Seventeenth Report assumes a five-year transition to the ultimate 1 per cent annual growth rate. This change shrinks the relative size of the contribution base in the initial years, slightly increasing the steady-state rate.

- Lower inflation. This change (which is expanded on below) reduces both benefits and contributions. Mainly because of the slower erosion of the real value of the YBE,

the effect on contributions is stronger, raising the steady-state rate.

- An unchanged real rate of return on CPP investments. The Seventeenth Report uses the same assumptions here as the Sixteenth Report, so there is no change to the steady-state rate from this source.
- Other advantageous changes. The bulk of the change in this category reflects assumptions about later retirement, which lowers benefits relative to contributions and lowers the steady-state rate (more than offsetting the higher than previously projected administrative costs that are also included in this category).

The net effect of the changes in assumptions is -0.320 of a percentage point, more than enough to offset the adverse impacts of the experience update. They would have reduced the unrounded steady-state rate to 9.863 percent, which rounds to the 9.9 percent rate already scheduled. And taking into account a change in the method for calculating the steady-state rate (Table 1, section D, a point discussed below) brings the rounded rate to 9.8 percent.

The Best-Estimate Projections

Not surprisingly, then, the Seventeenth Report's best-estimate projection shows that the 9.9 percent steady-state rate will be sufficient to keep the reformed CPP on a stable footing.

The logic here is as follows. Over the next half-century, the ratio of people ages 65 and over to those between ages 20 and 64 is expected to double, from about 20 percent in 1997 to more than 40 percent in 2050, with the most rapid increase taking place between 2010 and 2030. Largely as a result of this bulge of baby-boomer retirements, the ratio of expendi-

Table 2: *Projected Financial Developments, Selected Years*

	Pay-as- You-Go Rate ^a (1)	Contribution Base ^b (2)	Contributions (3)	Investment Earnings (4)	Expenditures (5)	Net Cash Flow ^c (6)	Accumulated Investment Funds ^d (7)	Funding Ratio ^e (8)
	(percent)			(billions of dollars)				(ratio)
1997	8.67	202.8	12.2	4.0	17.6	-1.4	36.5	2.00
1998	8.21	222.4	14.2	3.9	18.3	-0.2	36.3	1.91
2003	8.06	284.7	28.2	4.3	23.0	9.5	62.3	2.56
2010	8.27	431.3	42.7	9.7	35.7	16.7	156.8	4.12
2020	9.75	695.0	68.8	23.7	67.8	24.8	371.3	5.15
2030	11.09	1,085.1	107.4	42.1	120.3	29.2	641.7	5.07
2040	11.12	1,723.3	170.6	66.1	191.7	45.0	1,006.2	5.02
2060	11.00	4,243.7	420.1	172.0	466.9	125.3	2,623.6	5.38
2080	11.02	10,389.3	1,028.5	471.9	1,145.0	355.4	7,197.2	6.01
2100	11.23	25,206.0	2,495.4	1,285.8	2,831.3	949.8	19,566.1	6.61

Note: Beginning in 2003, the assumed contribution rate is 9.9 percent.

^a The ratio of expenditures to the contribution base (column 2).

^b As projected by the chief actuary using assumptions in the Seventeenth Report and derived from projections and assumptions about the YMPE and the YBE. It is the base to which the contribution rate is applied to determine the CPP's annual contribution income (column 3).

^c Contributions (column 3) plus investment earnings (column 4) minus expenditures (column 5).

^d The amount in the fund at the end of the previous year plus the net cash flow from the current year.

^e The ratio of assets at year-end to the following year's projected expenditures.

Source: Canada 1998, 12-13.

tures to the contribution base (termed the "pay-as-you-go" rate in Table 2) is expected to increase steadily from slightly more than 8 percent in 2003 to exceed 11 percent by 2030 and thereafter.

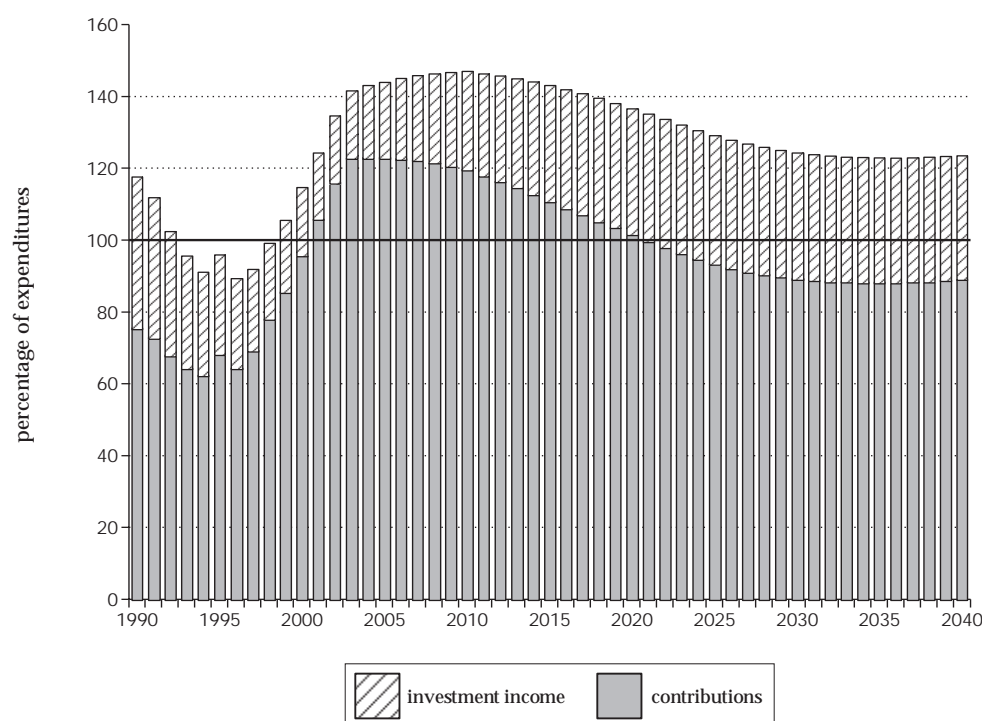
With the actual contribution rate rising to 9.9 percent by 2003 and staying there indefinitely, however, contributions will exceed expenditures by the end of 2000, and the net cash flow plus the fund's reinvested earnings will begin to increase the CPP's assets as early as 1999. By the end of 2010, the annual growth of the fund is projected at more than \$16 billion, with the accumulated amount reaching more than \$156 billion (compared with about \$36.5 billion at the end of 1997). Cash flow from the excess of contributions over expenditures is expected to be positive between 2001 and 2021; the accumulated fund is projected to be about \$371 billion by the later year. The CPP's

funding ratio (the ratio of assets at the end of a year to the following year's expenditures) is projected to rise from less than 2 to more than 5 in 2017 and thereafter.

Figure 1 shows the CPP's projected contributions and investment earnings as a proportion of expenditures through 2040. Total income well in excess of expenditures yields strong positive cash flow for the plan in the first decade of the twenty-first century, well before the baby-boom retirees appear on the scene; thus, investment earnings can make a large contribution in the following decades.

An additional twist in the Seventeenth Report is, however, the method used to calculate the steady-state rate. As already mentioned, this report uses a calculation method that differs from its predecessor's. The amended *Canada Pension Plan Act* specifies that the steady-state rate should be the lowest rate that results

Figure 1: *CPP Revenues as a Percentage of Expenditures, 1990–2040*



Source: Authors' calculations based on data from Canada 1998.

in the funding ratio's being "generally constant," but it does not spell out what that phrase means. The approach taken for the Sixteenth Report was to choose a rate that resulted in the projected ratio's being the same for 2100 as it was for 2030. The Seventeenth Report, however, adopted an approach laid out in a new regulation proposed by Ottawa (but not yet agreed to by the required number of provinces) that makes 2010 and 2060 the reference years. This change (as Table 1 shows) lowers the steady-state rate by just less than 0.1 of a percentage point. So that rate is 9.764 percent, which rounds to 9.8 percent.

Figure 2 presents the CPP's projected funding ratio under the best-estimates projections with three contribution rates: the scheduled 9.9 percent rate, the rounded steady-state rate calculated on the basis of the proposed regulation (9.8 percent), and the unrounded rate calculated on the same new basis (9.764 percent).

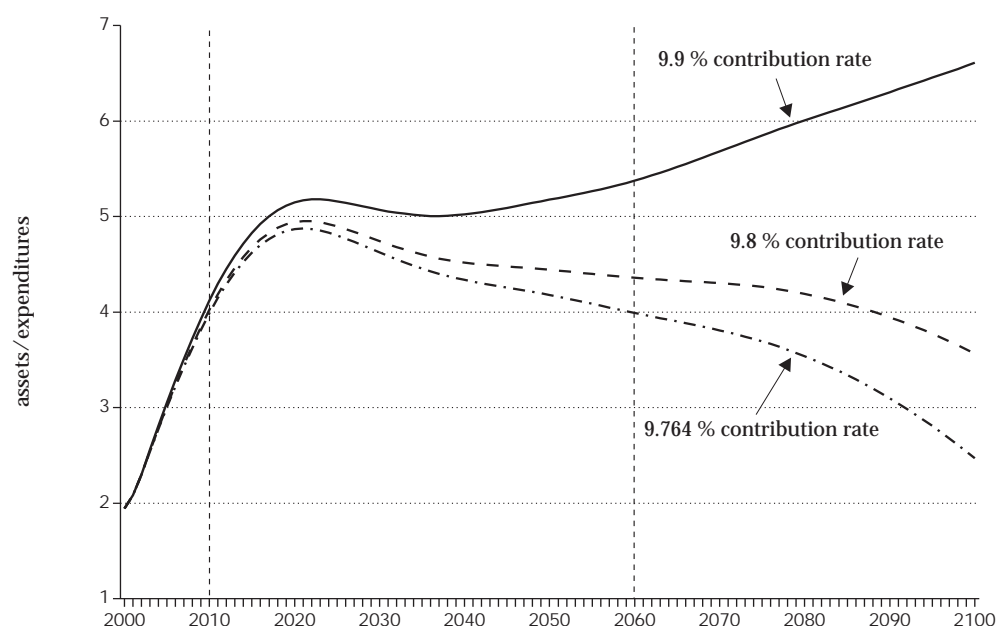
These differences in the steady-state rate may sound small, but they have a considerable effect when applied to the lengthy projection period needed in judging a pension program's funding.

With the 9.9 percent rate, the funding ratio exceeds 5 before 2020, falls back to about 5 in the 2030s, and increases thereafter. With a 9.8 percent rate, the funding ratio almost reaches 5 by 2021 and then falls back below that ratio, registering 4.36 in benchmark year 2060 and gradually dropping to less than 4 by the end of the century. Under the unrounded steady-state rate, the funding ratio is identical at 4 in 2010 and 2060, peaks at just less than 5 in 2021, and drops below 3 by the end of the century.

Sensitivity Analysis

A useful further element in the Seventeenth Report is its analysis of the sensitivity of its

Figure 2: *Projected Funding Ratio with Various Contribution Rates, 2000–2100*



Note: The dashed lines marked 2010 and 2060 are the reference years used in the Seventeenth Report (see text).

Source: Canada 1998, 13–14, 169–170; and authors' calculations.

projections to variations in the assumptions behind them. To shed light on these sensitivities, the report provides simulations involving variations from the best estimate for each key assumption in turn and also for the most advantageous (“low-cost”) and disadvantageous (“high-cost”) combinations of the variations considered. The variables investigated and their impact on the rounded steady-state rate are reported in Table 3.

A comparison of the low- and high-cost total impacts makes clear the significance of the sensitivity tests. Under the low-cost combination, the Seventeenth Report’s steady-state rate of 9.8 percent drops by 1.7 percentage points to 8.1 percent — even less than the contribution rate now scheduled for 2001. At the other extreme, under the high-cost combination, the steady-state rate comes in at 12.7 percent. It is worth noting that, although the impact of most of the changes, considered individually, on the calculated steady-state rate is fairly symmetrical (the rounding makes them appear less sym-

metrical than they are), the combined impact of the low-cost variations is considerably smaller than that of their high-cost counterparts.

Commentary

The Seventeenth Report stands out for the complete documentation of its data sources, for the clear explanations of its assumptions and its methodology, and for the comprehensiveness of its projections. Models of anything as complicated as a public pension plan are inevitably somewhat like a black box to outside observers, and the report does a fine job of showing the internal workings of the model. On that basis, the report may be judged helpful to public confidence in the CPP.

At the same time, however, aspects of the report and its conclusions raise doubts about whether public confidence in the reformed CPP will be as much higher as one might wish. The bottom line for many people will be the

Table 3: *Sensitivity Test Assumptions, Ultimate Years*

	Best-Estimate Assumption	Low-Cost Variation		High-Cost Variation	
		Assumption	Impact on Steady-State Rate	Assumption	Impact on Steady-State Rate
	(%) ^a	(%) ^a	(% points)	(%) ^a	(% points)
Total fertility rate	1.7	1.9	-0.2	1.5	+0.1
Net immigration	0.6 ^b	0.75 ^b	-0.3	0.4 ^b	+0.4
Mortality improvement	100 ^c	50 ^c	-0.3	150 ^c	+0.2
Disability rate: male/female	4.0/3.0 ^d	3.5/2.5 ^d	-0.2	5.5/4.5 ^d	+0.4
Unemployment rate	7.0	6.0	-0.1	8.0	+0.0
Real-wage differential	1.0	1.4	-0.4	0.6	+0.4
Inflation	3.0	4.0	-0.3	2.0	+0.2
Real rate of return on new funds	4.0	5.0	-0.4	3.0	+0.2
Combined impact	—	—	-1.7	—	+2.9

Note: Changes from the present to the assumed rates are assumed to take place over various periods of three to fifteen years, as set out in the Seventeenth Report. The rates for the ultimate years are the long-run steady-state values for the various assumptions.

^a The assumed fertility rates are shown for Canada. The corresponding assumptions for Quebec are 1.6, 1.8, and 1.4 percent.

^b Percentage of population.

^c Percentage of best-estimate projection.

^d Number per 1,000.

Source: Canada 1998, 35, 42.

durability of the 9.9 percent contribution rate on which the reform package was sold. If that rate turns out to be insufficient after all, an increasing number of Canadians will surely feel that the CPP is still too unstable to rely on — a sentiment already prevalent among part of the population.

Accordingly, we consider some of the assumptions that may risk disappointment.

Disability

The projections of eligibility for disability benefits raise some concerns. CPP disability payments grew explosively in the late 1980s and early 1990s, more than quadrupling from 1985 to 1994. Much of the improvements in the base for the projections incorporates the short-run experience of the plan's reduced disability costs after 1994.

An examination of overall Canadian policy regarding disabilities shows considerable instability in the relative roles of private insur-

ance, worker's compensation, health care, and social welfare. In the early 1990s, disability-related payments of all kinds were both increasing and being shifted to CPP disability expenditures by provincial welfare programs and private insurers. Administrative changes have since lowered the CPP's expenditures in this area, but one can reasonably speculate that this reduction will dissipate once the pressure generated by the reform process is off. The enormous impact of the more optimistic assumptions adopted since the previous actuarial reports — a decline in the steady-state rate of more than 0.6 of a percentage point (see Table 1) — indicates how badly even a partial return to the experience of the early 1990s could undermine the steady-state contribution rate of 9.9 percent.

Immigration

Another change in the Seventeenth Report's projections that has a major helpful impact on

its steady-state rate is an assumed net increase in immigration to Canada. One of the principal reasons for this change — taking account of returning emigrants, which previous projections did not do — is reasonable. Nevertheless, the overall ratio of annual net immigration to the resident population of 0.6 percent used in the current projections looks high in the light of the experience of the past few years, which have seen a sizable increase in the number of Canadians working “temporarily” in the United States, many of whom appear not to return. As Tables 1 and 3 show, lower net immigration rates would significantly increase the steady-state contribution rate.

Real Wages

The assumptions about the margin of wage increases over inflation stand out as needing scrutiny. The assumption used in the Seventeenth Report, like its predecessor, was that over the long haul, annual increases in wages will exceed annual increases in prices by one percentage point.

The problem is that this assumption looked too optimistic in the previous report, and experience since then has done nothing to justify maintaining it. Over the past two decades, wages have grown less quickly than the consumer price index (CPI), and we see little sign of the sort of rebound in productivity growth that would support real wage growth of the magnitude assumed in the report. Since the effect of lower real wage growth is to raise the steady-state contribution rate point for point,⁵ real wage growth closer to recent experience would have an enormous impact on that rate.

Inflation

The inflation assumptions are in some ways the most problematic of all. Before the 1998 reforms, the ongoing rate of inflation affected the

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CPP very little, since all of its parameters were fully indexed to either wages or prices. As noted earlier, however, the reforms changed some of these provisions. The calculation of retirement benefits now uses a five-year average of the YMPE, rather than a three-year average, and the death benefit is now set at \$2,500 (in nominal dollars) forever. Most important of all is the freezing of the YBE, at \$3,500, to expand the contribution base. Together, these changes mean that inflation, which the previous actuarial report projected at 3.5 percent annually forever, is important in making the package work with a 9.9 percent contribution rate.

The problem is that the Bank of Canada and the minister of finance have agreed to target a 2 percent inflation rate for the foreseeable future, and average annual CPI inflation has

run half a percentage point below that rate since 1991. The inflation projections in the Seventeenth Report are for a gradual increase to an ultimate rate of 3.0 percent by 2003, in contrast to the Sixteenth Report's projections of a 3.5 percent ultimate rate starting in 2000. As Table 1 shows, this change raises the steady-state rate by 0.2 of a percentage point. If the new report had instead used the inflation target of 2 percent in its projections, the steady-state rate calculation would have come in a further 0.2 of a percentage point higher (see Table 3), breaching the 9.9 percent ceiling.⁶

If the actuarial projections foreshadow the future accurately in other respects and there is no change in either the inflation target or the Bank of Canada's approach to achieving it, the 9.9 percent rate will be inadequate.

The Steady-State Rate Calculation

Our final set of concerns relates to the size and stability of the CPP's funding. As already noted, the *Canada Pension Plan Act* now specifies that the chief actuary calculate a steady-state rate: one no lower than will result in the funding ratio's being "generally constant." This formula leaves open both the target level for the ratio and the years to be used in judging whether or not it is constant.

The reform package aimed at a target funding ratio of 5. The Sixteenth Actuarial Report, which costed the amended CPP, arrives at its steady-state rate by calculating the amount that would result in the same funding ratio in 2030 and in 2100.⁷ This combination of benchmark years has some attractive features. By 2030, the main strain on the CPP from the baby-boom retirees will have already occurred, so setting a steady-state rate that achieves the desired funding ratio at and beyond that time constitutes a strong guarantee of the program's sustainability.

The proposed new regulation, by contrast, specifies that the funding ratio be the same on

a different pair of benchmark years: 13 and 63 years after the evaluation date, or 2010 and 2060 in this round of review. This choice is less attractive because (as Figure 2 shows) the dynamics of the reformed plan mean that the funding ratio is likely to peak in the early 2020s.⁸

Choosing benchmark years on either side of the peak has two awkward consequences. First, setting the target ratio for the second year of a review cycle on the basis of a first-year ratio that is below the peak typically means that the ratio in the second year will be on its way down. In the Seventeenth Report, the best-estimate projection using the 9.8 percent rate, the product of a rounding upward of the raw number, is not overly alarming: the funding ratio hits 4.02 in 2010, peaks at 4.95 in 2021, and then starts down again, passing through 4.36 in 2060 and heading for about 3.5 by the end of the century (as shown in Figure 2).

Many of the projections in the sensitivity analysis, however, show a more disturbing pattern, with the funding ratio peaking well under 5 and then declining, at first gradually and then at an accelerating rate, through and beyond 2060. (In some of the projections, the ratio is below today's level of 2 by the end of the period; in others, the fund is exhausted.) Clearly, the prospect of such extreme outcomes would lead to changes to the program long before these trends were allowed to materialize. Such a potential makes this an unsatisfactory basis for determining a steady-state rate.

Second, because the benchmark years move forward three years with every scheduled round of review, the chief actuary will have to calculate new steady-state rates on the basis of comparisons of the funding ratio at 2013 and 2063, 2016 and 2066, and so on. Since the funding ratio will be higher on each of these first benchmark dates, the target ratio for the later year will also rise. Even if actual experience each time has been exactly as projected in the previous evaluation, the calculated steady-state

Table 4: *Future Calculations of the Steady-State Rate*

(based on best-estimate projection)

Year of Review	First Reference Year	Second Reference Year	Steady-State Rate	Funding Ratio
			(percent)	(ratio)
1997	2010	2060	9.764	3.99
2000	2013	2063	9.813	4.48
2003	2016	2066	9.841	4.83
2006	2019	2069	9.853	5.02
2009	2022	2072	9.854	5.07

Source: Authors' calculations based on data from Canada 1998.

rate and the funding target will rise during the next decade or more (see Table 4).

Conclusion

In summary, then, the Seventeenth Actuarial Report provides a useful bridge between the old and the new provisions of the CPP. It is a model of openness and accountability, providing much of the information required for its own evaluation. The report shows that the 1998 reform package has put the program on a firmer financial footing, with the fuller funding contemplated in the reforms reducing the cost to future workers and improving the likelihood that participants will actually receive the full benefits the CPP promises them.

As for the key question — whether public confidence in the CPP's promises will increase commensurately with its improved financial condition — the sustainability of the 9.9 percent rate will probably be crucial in determining the answer. Although the Seventeenth Report's bottom line indicates that the 9.9 percent rate is more than enough, the details of its projections give rise to some cautions.

The balance of risks appears negative with respect to several key assumptions; those about disability benefits, immigration, earnings growth, and inflation stand out as problematic. The reliability of these assumptions needs review in future reports. Although better-than-projected investment earnings could counterbalance setbacks in these areas, help from this source will be limited in the early years, while the plan's funding is still quite low. Moreover, the proposed new method for calculating the steady-state rate may pose problems because using benchmark years on either side of the projected peak in the funding ratio means that the arithmetic of the next few actuarial reviews will be biased into finding that a higher rate is necessary.

Thus, although the Seventeenth Actuarial Report deserves commendation for its comprehensiveness and open discussion of the CPP's situation, its optimistic assessment of the plan's longer-term stability and the superior confidence in the CPP as a pillar of Canada's retirement income system that this assessment might create are by no means assured.

Notes

- 1 The guaranteed income supplement (GIS) came into existence at the same time as the CPP, to provide a payment to low-income seniors beyond that provided by the OAS.
- 2 The Fifteenth Actuarial Report (Canada 1995) estimated that the internal rate of return to new participants in the CPP would be 2 percent or less, after allowance for inflation.
- 3 A round-the-world survey in the early 1990s (World Bank 1994) uncovered no example of a public pension plan whose provisions had stayed stable during the time it took for one age cohort to move through it.
- 4 Because the distribution of the impacts of each factor on the total change in the steady-state rate depends on the order in which they are considered, we should note that, in the actuarial report, the effect of the changes in methodology was calculated before the experience update.
- 5 The report's sensitivity analysis shows that lowering the annual real wage differential from 1.0 to 0.6 of a percentage point raises the best-estimate steady-state rate from 9.8 to 10.2 percent (Canada 1998, 39, 42).
- 6 It may seem odd that the change from the Sixteenth Report's 3.5 percent ultimate inflation rate to the Seventeenth Report's 3.0 percent rate (Canada 1998, 42) raises the steady-state rate by roughly the same amount (0.2 of a percentage point) as using a 2.0 percent rate in the latter report would have. The explanation lies in the fact that the Sixteenth Report used the same economic projections as its predecessor. Actual inflation has been, and during the next few years is now projected to be, much lower than the Fifteenth Report assumed for the 1998–2002 period, cutting into the helpful boost that higher inflation during those years would have given the reformed CPP's finances.
- 7 The Sixteenth Report presents results for the rounded rate of 9.9 percent, not the unrounded rate of 9.923 percent. As a result, the funding ratio in the Sixteenth Report's projections never quite reaches 5.00, and the figures for 2030 and 2100, which would have been identical at a 9.923 percent rate, are 4.56 and 3.91, respectively.
- 8 In some projections, where the rounded steady-state rate is well above the unrounded level, the decline after the peak in the early 2020s is followed by a further (and unlimited) rise. In most cases, however, the early 2020s peak is unique and is followed by a decline and, ultimately, exhaustion of the fund.

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