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Bigger CPP, Bigger Risks: What "Fully Funded" Expansion Means and Doesn't Mean

by
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- Advocates of the expanded CPP call the new plan "fully funded," and emphasize the security and reliability of its promised benefits. Yet those promises rely on assumed returns on investment much higher than actual yields on assets suitable for backing an inflation-indexed, sovereign-grade obligation.
- A portfolio designed to achieve more aggressive returns will expose the expanded plan's participants to investment risk. Simulations allowing for fluctuations around the assumed returns show assets sufficient to cover 90 percent of benefits in scarcely more than half the scenarios.
- The federal and provincial governments have yet to say how the expanded CPP will deal with potential funding shortfalls. New regulations should protect younger Canadians by limiting potential contribution-rate increases, and clarify that CPP benefits above a basic level are contingent, not guaranteed.

A key selling point of the CPP expansion announced by federal and provincial finance ministers in June of 2016 and reiterated by the federal department of finance in September (Canada 2016) is that the additional CPP benefits will be "fully funded." Alongside statements that the "CPP provides a secure, predictable benefit" that is "fully indexed to prices," this looks like a pretty sweet deal. Participants will pay comparatively modest additional contributions – 2 percent more than the current 9.9 percent on earnings already covered by the CPP, and an additional 8 percent on newly

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covered earnings above that level. After contributing for 40 years to qualify for full benefits, participants will receive benefits equal to 33.33 percent of the higher covered earnings from the expanded CPP (CPP2), up from 25 percent of the lower amount covered by the current CPP (base CPP). All that, and guaranteed – what's not to like?

The catch here is in the term "fully funded." To most people, that term implies ability to pay obligations at a point in time. In the context of a pension plan, this would mean that a plan has assets sufficient to cover the present value of benefits accrued to date – in other words, no unfunded liability.[1] The base CPP is not, and was not designed to be, fully funded in that sense. Prior to the reforms of the late 1990s, it was almost purely pay-as-you-go, with contributions coming in funding benefits going out, and negligible assets. Since the reforms, it has targeted a sufficient stock of assets to ensure its investment returns offset the need for contribution increases as the population ages – which is better than the prospect of decades of contribution rate hikes, but is not "fully funded."[2]

In discussions of CPP2, "fully funded" also refers, not to any measure of solvency, but to the plan's ability to pay its promises from planned contribution rates over a long period of time. As with the base CPP, those projections involve a number of assumptions. Among the relevant factors are demographic developments, the path of wages and inflation – and, critically, the returns on the CPP's investments. The rates of return assumed in projections for both the base CPP and CPP2 are well above the yields currently available on the kind of sovereign-quality Canadian debt that people might think appropriate to back a "secure, predictable benefit" that is "fully indexed to prices." CPP2 will not make a secure promise: the expanded plan will expose participants to more risk than they know.

The risk that returns will be too low to cover the promised benefits is tough to assess. The Chief Actuary has prepared a report on the potential evolution of CPP2 (OCA 2016b). Its main projection assumes CPP2 assets will earn 3.55 percent in real (inflation-adjusted) terms over 75 years. The federal government's real return bond (RRB), a sovereign-grade asset that promises inflation protection, currently yields much less than this: 0.7 percent. The Chief Actuary's report shows some alternative projections, but they are also point forecasts, not probabilities, and none involves returns as low as current yields on good quality sovereign assets.

Also unknown at this point is what will happen if returns are too low. The bill to expand the CPP left to as yet unwritten regulations how and when benefits or contribution rates would change if the plan does not evolve as predicted. It is reasonable to worry that disappointments will lead to contribution hikes on future workers to pay for benefits that today's workers did not, in retrospect, fully fund themselves. That possibility makes the current gap – a commitment to expand the CPP, but no explanation to Canadians of the risks, or how the expanded plan will adjust if things do not work out as planned – troubling.

The core arguments of this E-Brief are that Ottawa and the provinces should explain these risks more clearly to Canadians, and that, in drafting the regulations, take their inspiration from target-benefit pension plan

1 A key element in this calculation is the discount rate used in calculating the present value of future payments. Assume a high enough discount rate, and even trivial amounts of assets could look adequate to fund a plan. For a proper evaluation, the relevant rate would reflect the yield on other debt obligations of the plan sponsor – for government plans, this implies a rate related to yields on government bonds.

2 The 27th Actuarial Report on the CPP (revised) calculated an actuarial liability of $1,171.1 billion, as against assets of $285.4 billion, for an unfunded liability (or "assets shortfall" in the language of the report) of $885.7 billion (OCA 2017, 48).

models, and adopt rules that limit intergenerational transfers as much as possible. Since the typical route for intergenerational transfers in pension plans is contribution hikes for the young to cover unfunded liabilities for the old, limiting intergenerational transfers is, as a practical matter, a challenge of keeping contributions as stable as possible.

To limit potential increases in contributions, an attractive approach is to give a basic level of benefits a high degree of protection, but build flexibility into benefits above this basic level. As a matter of transparency, moreover, all participants should understand these provisions – most importantly, that benefits above the basic level may drop if the plan's cash flows are inadequate to cover them.

Proposed Expanded CPP Legislation and the Funding Policy

Bill C-26 amended the Canada Pension Plan legislation to establish CPP2.The main features of CPP2, once fully phased in, include:

- a new, higher, maximum level of pensionable earnings (the Year's Additional Maximum Pensionable Earnings, or YAMPE) that is 14 percent above the current Year's Maximum Pensionable Earnings (YMPE);
- an increase in the normal retirement pension from 25 percent of adjusted career-average earnings to 33.33 percent;
- higher survivor and disability pensions, and additional benefits for those aged 65-69 who made additional voluntary contributions while in receipt of CPP benefits; and
- increased combined employee/employer contributions: 2 percent of earnings up to the YMPE, phased in between 2019 and 2023; and 8 percent of earnings between the YMPE and the YAMPE starting in 2024.

An individual's CPP2 benefits will depend on the amount of additional contributions s/he makes, and the number of years over which s/he makes them.

As for financing the benefits, Bill C-26 itself does not use the term "fully funded." It requires that "projected contributions and investment income are sufficient to fully pay the projected expenditures of the additional Canada Pension Plan over the foreseeable future." But it does not define this condition. The Chief Actuary, in producing financial projections for CPP2 and determining the contribution rate that would cover the payments, filled this gap by specifying two criteria: that an actuarial calculation of the CPP2's "open group" assets exceed its "open group" actuarial liability;[3] and that the ratio of CPP2's assets to its following year's expenditures from 2025 to 2100 exceed 25 (OCA 2016b, 31).

This second requirement resembles the sustainability condition adopted for the base CPP, which, since the late 1990s reforms that partially funded it, has used the ratio of projected assets over projected following-year expenditures as a measure of sustainability. A fully funded plan in the sense most people would understand

3 Unlike the "closed group" approach, which evaluates benefits earned to date against assets actually on hand, and yields the unfunded liability mentioned in footnote 2, the "open group" actuarial liability is the present value of projected future CPP2 expenditures with respect to current and future CPP2 participants, discounted using the assumed nominal rate of return on CPP2 assets, compared to the sum of projected CPP2 contributions of current and future contributors, discounted using the assumed nominal rate of return on CPP2 assets, and actual assets if any (OCA 2016b, 32).

the term would always be able to pay its obligations with assets on hand. For the CPP, which was transitioning from a totally unfunded state, this was never a serious objective. Investment returns on accumulated assets will become more important over time, necessary to hold the base CPP's contribution rate at 9.9 percent, even as the inflow of contributions from (relatively less numerous) workers shrinks relative to the payments to (relatively more numerous) retirees – see Box 1. But the reforms still left most of each year's benefits to be financed by contributions received from that year's workers.

In the case of CPP2, no transition from an unfunded plan is occurring. So CPP2 will be proportionally much more dependent on investment income to pay its benefits than the base CPP – which means that CPP2 will be more sensitive to the returns it earns on its investments.

How Sensitive Is CPP2 Funded Status to Assumed Investment Returns?

Canada's Chief Actuary calculates that CPP2 can pay its benefits according to the criteria he used with the proposed contribution rates, as long as assets invested with the Canada Pension Plan Investment Board (CPPIB) – contributions and accumulating investment income – earn a 75-year average real rate of return of at least 3.41 percent, net of investment management expenses. Because the future is unknowable, it is hard to say anything definite about the reasonableness of this assumption. We can, however, talk in general terms about some of the risks around it.

Because no investment policy for CPP2 assets exists, the Chief Actuary had to make some assumptions in this area also. The actuarial report on the expanded CPP assumes an asset mix for CPP2 investments consisting of 37.5 percent equities, 37.5 percent fixed-income securities, and 25 percent real assets.[4] It then assumes rates of return on each asset class – an approach that, contrary to the warning in every investment prospectus, rests largely on assumptions that past performance predicts future performance. From that, it calculates that this portfolio, managed using a passive investment strategy, would yield 3.75 percent in real terms on average over a 75-year projection period. The projections add a 0.8 percent premium to reflect value-added from active investment management, for a total gross-of-fees 4.55 percent average real long-term rate of return. They then deduct 1.0 percent to reflect expected CPPIB investment expenses. The result is a projected 75-year average net real rate of return of 3.55 percent.[5]

Because 3.55 percent is greater than the 3.41 percent return viewed as adequate, the Chief Actuary concludes that the proposed CPP2 contribution rates of 2 percent and 8 percent "result in projected contributions and investment income that are sufficient to fully pay the projected expenditures of the additional Plan over the long term" (OCA 2016b, 9).

4 This is a more conservative asset mix than that assumed for base CPP assets, reflecting the fact that in the base CPP, contributions will cover a higher percentage of payouts, allowing the plan to take more investment risks. CPP2, being more dependent on investment income to pay benefits, should by this logic match its liabilities more closely with fixed-income assets, and take less investment and illiquidity risk.

5 The projections for CPP2 also include additional administrative expenses, which – after an expensive start-up year – run around $50 million annually in the first few years. As in the base CPP, with projected administrative expenses in the $600-to-700 million range over that time (OCA 2016a), these are paid out of contributions.

Box 1: Base CPP Funding and Sustainability

The Chief Actuary's reviews of the CPP in the early 1990s show that population aging – fewer workers supporting more retirees – would require a sharp increase in the plan's contribution rate. The reform of 1997 brought part of that increase forward in time in order to forestall the rest of it. Since 2001, the CPP has charged a contribution rate of 9.9 percent – above what it would cost to cover current benefits – and has invested the difference in assets held by the CPPIB. Investment income on those assets is designed to prevent the CPP contribution rate from climbing further even as the flow of payments to retirees outpaces contributions from workers. Starting in 2021, contributions are projected to be insufficient to fully cover current expenditures, and the Plan will start relying on the investment income earned on the assets held by the CPPIB to finance the annual shortfall of plan expenditures over benefits. The condition necessary for the CPP to be judged sustainable, with no reductions in benefits or increases in contributions necessary, is for the ratio of projected assets to projected expenditures in the following year to be the same 13 and 63 years after the projection date.

We must note, however, that achieving a long-term average expected rate of return anywhere near the minimum 3.41 percent requires an assumed asset mix embodying a fair amount of investment risk and uncertainty. With risk and uncertainty comes the likelihood of higher or lower returns.[6]

What kind of long-term returns could we reasonably expect on a relatively secure, low-risk portfolio? Here, too, the future is unknowable in all its contingencies – but we have a major advantage in that yields on high-quality securities are observable.

Consider a portfolio of long-term government bonds. OECD long-term (10-year) bond yield estimates for 2016 for the United States, the United Kingdom, and the Euro area are 1.8 percent, 1.3 percent, and 0.9 percent (OECD 2017). The federal government's benchmark 10-year bond yielded an average of 1.3 percent over the 12 months of 2016. Assuming 2 percent inflation, three of four of these yields would be negative in real terms. Looking at longer maturities, the federal long-term, real return bond currently yields a meagre 0.7 percent. If the CPPIB were to invest in such an asset – sovereign-grade, paying in inflation-adjusted Canadian dollars – and its yield stayed at that level, the contribution rates on CPP2 would need to more than double from 2 percent of earnings up to the YMPE and 8 percent of earnings between the YMPE and the YAMPE, to about 4.1 and 16.6 percent. Alternatively, promised benefits would need to fall by more than half.[7]

6 The CPP2 actuarial report (OCA 2016b) does not contain a probabilistic analysis indicating the likelihood of success or failure.

7 Because the Chief Actuary's CPP2 valuations (OCA 2016b) provide sensitivities of required contribution rates to different assumptions about rates of return, we can – extrapolating using a crude exponential trend – estimate what the required contribution rates would be under various rate of return assumptions.

Projected economic growth provides another useful guide to potential returns. Many theories of economic growth link the real rate of return on "risk-free" capital investments and real per capita output growth.[8] In the long run, on average, real returns on capital should be no lower than growth of real output per person. In Canada, long-run annual growth in real gross domestic product (GDP) per person is likely to be between 0.75 and 1.35 percent (Ambler and Alexander 2015). Globally, the Economist Intelligence Unit (2015) forecasts world real GDP per capita growing at an average annual rate of about 1.6 percent up to 2050. Thus, in theory, a perfectly diversified global portfolio of secure investments could be expected to yield at least 1.6 percent in real terms.[9] If CPP2 achieved these returns, its contribution rates would need to be 3.2 and 12.8 percent or alternatively, promised benefits would need to be reduced by more than a third – before even considering investment costs.

Greater Transparency and a Risk Management Strategy Needed

To summarize to this point, participants in CPP2 will be betting on a 3.41 percent average long-term real rate of return. In the event that this return assumption turns out to be too low – as current yields would suggest is unlikely – they may end up with richer-than-expected benefits and/or lower-than-expected contributions. In the likelier event that it turns out to be too high, they may end up with lower-than-expected benefits and/or higher-than-expected contributions. But that is not what Canadians are hearing: they are hearing that CPP2 will be "fully funded," that its benefits will be "secure," and that they will be payable with the contribution rates specified in Bill C-26.

CPP2 needs more transparency regarding its risk exposure, which of its participants bear how much of it, and how the plan will respond if things do not work out as expected. The legislation specifies that following a triennial financial review of the CPP, contribution rates may be increased in the future subject to provincial consent. Future rate increases, however, are limited to no more than two-tenths of a percentage point per year, which may not entirely cover potential funding shortfalls. In the event that provinces and the federal government do not agree to raise contribution rates, moreover, the legislation leaves to as-yet-unwritten regulations the parameters that will dictate how and when benefit levels or contribution rates may automatically change. Such regulations will be subject to provincial consent as well.

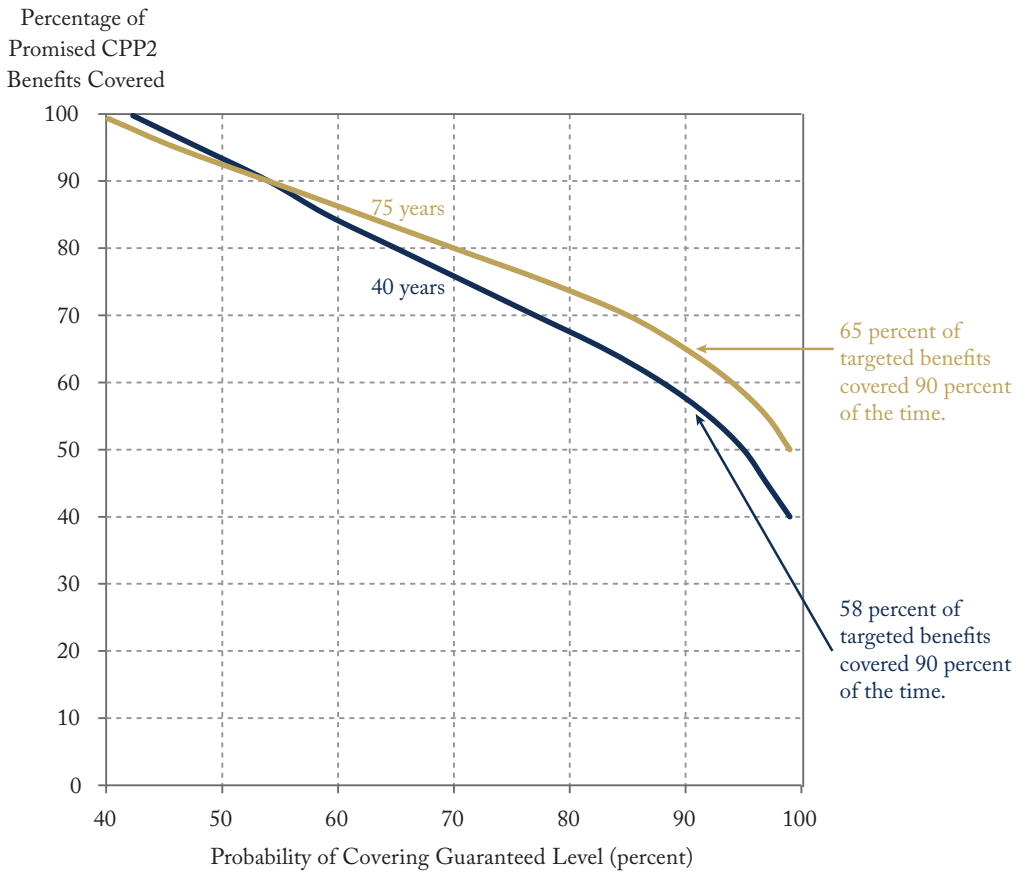
These negotiations should be on the agenda for the next December meeting of finance ministers. In drafting the regulations, the provinces and Ottawa should adopt a model designed to guard against the intergenerational transfers so common in pension plans that end up hiking contributions to pay insufficiently funded benefits. They could take their inspiration from probabilistic thresholds adopted in New Brunswick's shared-risk pension model. The New Brunswick approach uses stochastic modeling – multiple projections with distributions of values for key variables – to establish thresholds of confidence for base benefits and inflation protection (Steele et al. 2014).

For example, the objective could be to protect 80 percent of the targeted benefit (the basic level) in 90 percent of scenarios with benefits above this basic level allowed to adjust. In the current CPP2 context, achieving this would mean adopting a more conservative asset mix than that assumed by the Chief Actuary, and launching CPP2 with higher contribution rates (see Box 2).

8 Ambler and Alexander (2015) derive and explain this relationship.

9 Without taking into consideration the exchange rate risks.

Box 2: The Trade-off between Investment Risks and Certainty of Benefits



Note: Probabilities calculated from 20,000 simulated scenarios of approximately normally distributed annual returns over a 40-year and 75-year period, based on an average annual real rate of return of 3.55 percent with a standard deviation of 9.2 percent, as provided in OCA (2016b). Percentage of CPP2 benefits payable derived from the sensitivity analysis of minimum contribution rate to investment returns in OCA (2016b).

Source: Authors' calculations.

How confident can we be that investment income will be sufficient to cover promised benefits, over, say, the next 40 years (the minimum length of contributions for full CPP2 benefits), or the next 75 years (the projection period adopted by the Chief Actuary)?

In preparing the actuarial report on the CPP2, the Chief Actuary assumes an asset mix for CPP2 investments consisting of 37.5 percent equities, 37.5 percent fixed-income securities, and 25 percent real assets (OCA 2016b). This portfolio yields a 3.55 percent real return on average over a 75-year period, with a one-year standard deviation of 9.2 percent.

.... Continued

Box 2: Continued

Assuming an approximately normal distribution, we can simulate thousands of scenarios and estimate the probabilities of different compounded average rates of return.[a] We can use those to work out probabilities of contribution rate increases or benefit reductions if returns turn out lower than projected.

The figure in this Box presents confidence levels, using asset mix and variabilities assumed by the Chief Actuary, that a given portion of the promised benefits will be payable over a 40-year period, and over a 75-year period. For example, at least 40 percent of promised CPP2 benefits are covered over 40 years, and at least 50 percent covered over 75 years, in 99 percent of simulated scenarios. At least 58 percent of promised benefits are covered over 40 years, and at least 65 percent covered over 75 years, in 90 percent of scenarios. A more demanding standard – that 90 percent of benefits be covered over 40 or 75 years – is achieved in only about 54 percent of scenarios.

a Many students of investment returns judge that the distribution of returns is fatter tailed than normal. To the extent that this is true, these calculations overstate the confidence we can have in various levels of guarantees of benefit.

Conclusion

The Chief Actuary's calculations show that paying promised CPP2 benefits from anticipated contributions and investment income – as legislated in Bill C-26 – is possible if the assets in the plan earn a real rate of return of 3.41 percent or better over the long run. Given how much lower yields on high-quality assets currently are, and the likelihood of more modest returns in a future of lower-than-historical growth of real output, a 3.41 real rate of return is far from certain – and therefore the planned benefits at planned contribution rates are also far from certain.

CPP2 is, in an important sense, not yet a done deal. We do not yet have mechanisms to deal with situations in which CPP2 has surplus – or, more probably, insufficient – assets. In negotiating the regulations to cover these contingencies, the provinces and Ottawa should guard against intergenerational transfers. A conservative investment policy and higher contribution rates could provide a high probability of basic benefit protection, and more transparency about potential variability of benefits above that level. Achieving a greater level of benefit protection, say 80 percent of promised benefits nine times out of 10, would require a less volatile and thus less risky portfolio. Since under this model lower volatility of returns is available only on lower return investments, this greater level of benefit security would require higher contribution rates.

The starting place for this discussion needs to be understanding among the officials and among interested Canadians that, in an uncertain world, even the Canada Pension Plan makes no guarantees. Neither the base CPP nor CPP2 are, or will be "fully funded." They are risky, and wise policymakers – and farsighted Canadians – must deal with this fact.

References

Ambler, Steve, and Craig Alexander. 2015. "One Percent? For Real? Insights from Modern Growth Theory about Future Investment Returns." E-Brief. Toronto: C.D. Howe Institute. October.

Economist Intelligence Unit. 2015. "Long-Term Macroeconomic Forecasts: Key Trends to 2050." Special Report.

Canada. 2016. "Backgrounder: Canada Pension Plan (CPP) Enhancement." http://www.fin.gc.ca/n16/data/16-113_3-eng.asp. September.

OECD. 2017. Long-term interest rates forecast (indicator). doi: 10.1787/662d712c-en (Accessed on 27 March 2017).

Office of the Chief Actuary. 2016a. *Actuarial Report (27th) on the Canada Pension Plan as at 31 December 2015*. Office of the Superintendent of Financial Institutions. September.

Office of the Chief Actuary. 2016b. *Actuarial Report (28th) supplementing the Actuarial Report on the Canada Pension Plan as at 31 December 2015*. Office of the Superintendent of Financial Institutions. October.

Office of the Chief Actuary. 2017. *Actuarial Report (27th) on the Canada Pension Plan as at 31 December 2015 (Revised)*. Office of the Superintendent of Financial Institutions. February.

Steele, Jana, Angela Mazerolle, and Mel Bartlett. 2014. *Target Benefit Plans: An Innovation Worth Expanding*. Commentary 411. Toronto: C.D. Howe Institute. July.

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