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Compiling the Actuarial Balance Sheet for the Canada Pension Plan – Methodological Overview

**Presentation by Assia Billig
Actuary
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**to the
Eurostat/ILO/IMF/OECD Workshop on Pensions**

**Paris, France
March 9, 2016**

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Good afternoon, thank you for inviting me to speak here. Today, I will discuss the Canadian practice for reporting assets and liabilities for the Canada Pension Plan - a contributory retirement social security program.

Canada Pension Plan is the 2nd public pillar of the Canadian Retirement Income System (slide 2)

The Canada and Quebec Pension Plans (C/QPP) are earnings-related social security plans. The financing sources for these plans are contributions from employment earnings and investment income.

The Canada Pension Plan is financed on a steady-state basis which is a partial funding approach. It is a mix of pay-as-you-go and full funding.

Steady-state funding was introduced in the mid-1990s to build a greater reserve of assets over time. Investment earnings on this pool of assets in turn help to stabilize the contribution rate and the asset/expenditure ratio. At the same time, as you will see later, contributions are projected to remain the main source of financing for the CPP.

A very important point is that the financing of the Canada Pension Plan doesn't presume any financial subsidies from the Government.

The key legislatively prescribed measure for evaluating the CPP is the steady-state contribution rate (slide 3)

The key financial measure of the Plan's sustainability is the steady-state contribution rate: its adequacy and stability over time. This rate is determined as the minimum rate that stabilizes the Asset/Expenditure ratio (the ratio of assets at the end of one year to the expenditures of the next year). For the CPP to be sustainable in its current form, the steady-state rate should be lower than the legislated contribution rate of 9.9%. The

¹ Remarks to be accompanied by slide presentation, which can be found at the following link:
<http://www.osfi-bsif.gc.ca/Eng/Docs/OCA-Assia-Billig-03092016-Slides.pdf>

graph of the A/E ratio calculated using the minimum rate of 9.84% (blue line) is below the one calculated using the legislated rate (green line).

The 26th CPP Actuarial Report as at 31 December 2012 (slide 4)

The most recent CPP Actuarial Report found that with a legislated contribution rate of 9.9%, it is expected that contributions will exceed benefits until 2023. Funds not required to pay benefits are invested by the CPP Investment Board (the arm's length investment entity). Over time, this will create a large enough reserve to help pay the costs that are expected to grow as more and more baby boomers begin to collect a retirement pension.

The conclusion is that the CPP is sustainable over the long-term under the current legislated contribution rate. So, how this situation could be properly reflected by means of an actuarial balance sheet? Let's first draw down the basic principles.

Pension schemes assets and liabilities - methodologies considered (slide 5)

Several factors need to be considered when calculating assets and liabilities of social security pension plans. The first choice is whether a closed or an open group approach should be used. For a closed group, only current participants are included, with no new entrants allowed. For an open group, both current and future participants are considered. Second, it needs to be decided whether future benefit accruals are permitted. If yes, then, for a closed group, current members continue to contribute and accrue benefits and, for an open group, both current and new members do so. This means that future benefit accruals can apply to both closed and open groups. In contrast, not allowing future accruals can only apply to a closed group. The difference between the assets and liabilities is called the asset excess, if positive, or the asset shortfall, if negative. Another term used to describe an asset shortfall is the unfunded liability.

Asset shortfalls shown using closed group methodology contradicts the conclusion that the CPP is sustainable (slide 6)

Let's illustrate these concepts using the Canada Pension Plan as an example. This slide shows the CPP balance sheets under a closed group without and with future accruals.

If future accruals are not considered, the asset shortfall for the closed group is larger (830 billion). This is because there are no future contributions to the Plan as well as no future accruals. The asset shortfall decreases for the group with future accruals compared to group without future accruals.

The existing substantial shortfalls under the closed groups (with or without accruals) are the result of the inconsistency of these methodologies with the CPP financing

approach: future contributions of current and future generations are not recognized as a major source of financing of the Plan.

So, even if the CPP is financially sustainable, the balance sheets under the closed group methodologies give the false impression that the Plan either creates future financial obligations for the government or actions to restore its sustainability are needed.

Open group should be used to account for intergenerational risk sharing and social contract (slide 7)

The choice of methodology used to produce a pension system's balance sheet is mainly determined by the system's financing approach.

Pay-as-you-go and partially funded systems, including the CPP, represent social contracts where, in any given year, current contributors allow the use of their contributions to pay current beneficiaries' benefits. As a result, such social contracts create a claim for current and past contributors on the contributions of future contributors. The proper assessment of the financial sustainability of a pay-as-you-go or partially funded social security system by means of its balance sheet should take these claims into account. It should be emphasized that these claims are not government debt.

The traditional closed group methodologies do not reflect these claims since only current participants are considered. In comparison, the open group approach accounts explicitly for these claims by considering the benefits and contributions of both current and future plan participants.

The open group approach accounts explicitly for sources of financing by considering the benefits and contributions of both current and future plan participants (slide 8)

Valuing the Plan on an open group basis includes future generations of contributors and beneficiaries who participate in the cost and risk sharing of the Plan. It also recognizes the social contract embedded in the CPP.

The CPP balance sheet under the open group approach shows a small unfunded liability of \$9 billion as at December 31, 2012. The ratio of assets to liabilities is 99.6%. Given the length of the projection period and uncertainty embedded in such projections, these unfunded liabilities are quite insignificant and it can be concluded that the Plan is sustainable over the long term.

***Will open group methodology show if there are sustainability problems?
(slide 9)***

The open group methodology recognizes that a social security program covers multiple generations of participants. Thus, it properly reflects the financial position of the plan and is able to identify potential sustainability issues.

For example, let's consider a fictional country that is a hybrid of Canada and South Korea, and call it South Canada. At the valuation date, the demographic and economic profiles of Canada and South Canada are the same, but it is expected that in the future, South Canada will look like South Korea: the fertility rate will be 1.2 children per woman, and there will be no immigration. Assuming that all other economic conditions are the same as in Canada, will the contribution rate of 9.9% be sufficient for South Canada? According to the open group balance sheet – no. Even if the open group assets and liabilities would be lower for South Canada, the asset shortfall would be much higher. If the benefits were not changed, a significant increase in the contribution rate would be required.

But what would happen if the closed group balance sheet is prepared for South Canada? It would show the same financial position as for Canada! Not only would the closed group miss South Canada's sustainability issues, it would also create the impression that both Canada and South Canada are in the same boat.

Length of projection period for the open group (slide 10)

For the rest of my presentation I will focus on some technical aspects related to the open group balance sheet.

To prepare the CPP open group balance sheet, the cash flows are projected over an extended time period of 150 years.

Choosing the appropriate projection period for the open group balance sheet should take into account two considerations. First, would a projection period that is too short underestimate the asset shortfall? This could occur since, on one hand, part of the future expenditures for cohorts that will enter the labour force during that time are excluded from the liabilities, but on the other hand, most of the contributions for these cohorts are included in the assets.

Second, would the length of the projection period materially impact the accuracy of the results? As shown on this slide, using projection periods beyond 150 years yields a decreasing ratio of total assets to total liabilities. However, due to the discounting of cash flows occurring more than 150 years in the future, these declines are marginal.

Finally, it should be noted that although increasing the length of the projection period enhances the assessment of the financial sustainability, it also increases the uncertainty of results.

Open Group Modified Balance Sheet – Description and Purpose (slide 11)

The balance sheet for the open group may be presented in a modified way so that the assets and liabilities of the pay-as-you-go and funded components are shown separately. Under the pay-as-you-go component, contributions always exactly equal expenditures in any given year. Contributions for the funded component exist as long as the current year's contributions exceed the same year's expenditures. These excess contributions are added to the Plan's invested assets, while expenditures in excess of contributions create the funded component's liabilities.

By modifying the balance sheet in this way, the hybrid nature of the steady-state partial funding of the Plan is highlighted. This modification also allows for a clearer understanding of how the Plan's future expenditures are financed.

Open Group Modified Balance Sheet – Formation: Step 1 (slide 12)

The open group modified balance sheet could be built in two steps.

First, the present values of the contributions and expenditures on the assets and liabilities sides of the balance sheet are separated out as shown in the chart. On the left, we see that the assets are split in three parts: the present value of future contributions that cover future expenditures (yellow bar), the present value of future contributions in excess of future expenditures (golden bar), and the current assets as at the end of 2012 (purple bar). On the right, the liabilities are split into two parts: the present value of future expenditures covered by future contributions (yellow bar), and the present value of future expenditures not covered by future contributions (golden bar).

Open Group Modified Balance Sheet – Formation: Step 2 (slide 13)

For the second step, the present values of the future contributions and expenditures are regrouped into the pay-as-you-go and funded components.

Note that for the pay-as-you-go component, the assets and liabilities exactly offset each other and so no unfunded obligation exists.

The chart also shows that, for the funded component, adding the present value of future contributions to the invested assets results in assets shortfall of \$9 billion.

Change in the discount rate for PayGo component does not affect asset excess (shortfall) (slide 14)

Finally, let's briefly discuss the ever-present question of the discount rate. It is desirable that a discount rate used to determine the present values of future cash flows of a pension system reflects the growth in the system's financing base. The

financing base of the CPP has two components: future contributions (contributory base) and the invested assets. So, what would happen if the cash flows of the pay-as-you-go component were discounted using the growth in the contributory base, and the cash flows of the funded component were discounted using the expected rate of return on the CPP assets?

In a nutshell, the total liabilities and assets would significantly increase (from \$2.2 trillion to \$6.5 trillion), but the assets shortfall would remain the same since the funded component would remain unchanged.

To summarize... (slide 15)

To summarize, it is important to keep in mind that the CPP, from its inception, was never intended to be fully funded. The key measure of the CPP's financial status is the steady-state contribution rate, and in particular, its adequacy and stability over time. If the CPP financial status is assessed by the means of the balance sheet, it should be done on an open group basis since this basis emphasizes the long-term nature of the Plan and takes into account its largely pay-as-you-go nature. Finally, by its design, the CPP doesn't create government debt.

Thank you for your attention. If you would like to learn more about this topic, please read our actuarial study (the link is provided on the next slide).

I will be happy to answer any questions that you have.