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# Compiling the actuarial balance sheet for the Canada Pension Plan – methodological overview

*Presentation to the  
Eurostat/ILO/IMF/OECD Workshop on  
Pensions*

*by Assia Billig, Actuary, Canada*



OSFI  
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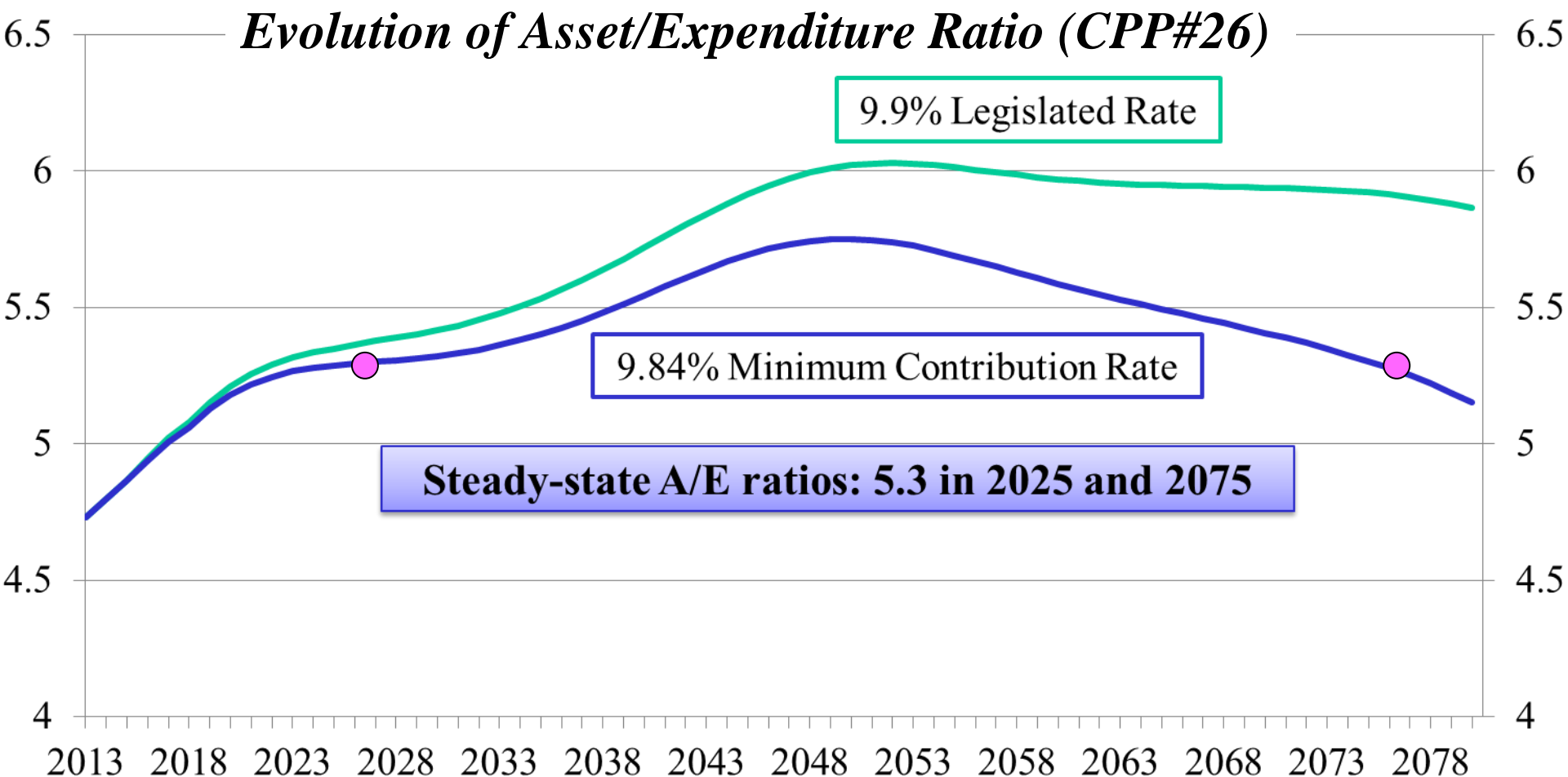
# *Canada Pension Plan is the 2<sup>nd</sup> public pillar of the Canadian Retirement Income System*

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- Canada/ Québec Pension Plans (C/QPP): DB Earnings-Related
- Partial funding approach: hybrid of pay-as-you-go financing and full funding
  - All new and/or improved benefits should be fully-funded
- Main source of financing are employer/employee contributions (combined rate of 9.9% of covered earnings)
- ***Financing does not presume any subsidies from the Government.***



# *The key legislatively prescribed measure for evaluating the CPP is the steady-state contribution rate*



# *The 26<sup>th</sup> CPP Actuarial Report as at 31 December 2012*

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*The results contained in this report confirm that the legislated contribution rate of 9.9% is sufficient to financially sustain the Plan over the long term.*



# *Pension schemes assets and liabilities - methodologies considered*

<b>Closed Group without Future Benefits Accruals</b>	<b>Closed Group with Future Benefits Accruals</b>	<b>Open Group</b>
Current participants	Current participants	Current and future participants
<b>ASSETS*</b>		
Market Value	Market Value + PV of <u>Future</u> Contributions for <u>Current</u> Participants	Market Value + PV of <u>Future</u> Contributions for <u>Current</u> and <u>Future</u> Participants
<b>LIABILITIES*</b>		
PV of <u>Accrued</u> Benefits for <u>Current</u> Participants	PV of <u>Accrued</u> and <u>Future</u> Benefits for <u>Current</u> Participants	PV of <u>Accrued</u> and <u>Future</u> Benefits <u>Current</u> and <u>Future</u> Participants

$$\mathbf{Asset\ Excess\ (Shortfall)\ =\ Unfunded\ liability\ =\ Assets\ -\ Liabilities}$$



# *Asset shortfalls shown using closed group methodology contradict the conclusion that the CPP is sustainable*

## *CPP– Balance Sheet at 31 December 2012 (9.9% contribution rate, best-estimate scenario)*

	<b>Excluding Future Benefit Accruals</b>	<b>Including Future Benefit Accruals</b>
Present Value as at 31 Dec. 2012 (in \$ billion)	<b>Closed Group</b>	<b>Closed Group</b>
<b>Assets</b>		
Current Assets	175	175
Future Contributions	-	804
<b>Total Assets (a)</b>	<b>175</b>	<b>979</b>
<b>Liabilities*</b>		
Current Benefits	370	370
Future Benefits	635	1,175
<b>Total Liabilities (b)</b>	<b>1,005</b>	<b>1,545</b>
<b>Asset Excess (Shortfall) (a) – (b)</b>	<b>(830)</b>	<b>(566)</b>
Total Assets as a Percentage of Total Liabilities (%) (a)/(b)	17.4%	63.4%

\* Liabilities include administrative expenses. The projected cash flows over an extended time period of 150 years are used

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# *Open group should be used to account for intergenerational risk sharing and social contract*

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- CPP represents a social contract
  - Each year current contributors allow the use of part or all of their contributions to pay current beneficiaries' benefits
  - Claims for current and past contributors to contributions of future contributors is created
  - A balance sheet should take these claims into account

## **These claims are not government debt**

- At any valuation date, these claims
  - could be expressed as present value of future contributions of current and future contributors
  - represent a part of system's assets
- The corresponding future benefits should also be taken into account.



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

*CPP– Balance Sheet at 31 December 2012  
(9.9% contribution rate, best-estimate scenario)*

	Excluding Future Benefit Accruals	Including Future Benefit Accruals	
Present Value as at 31 Dec. 2012 (in \$ billion)	Closed Group	Closed Group	Open Group
<b>Assets</b>			
Current Assets	175	175	175
Future Contributions	-	804	2,071
<b>Total Assets (a)</b>	<b>175</b>	<b>979</b>	<b>2,246</b>
<b>Liabilities*</b>			
Current Benefits	370	370	370
Future Benefits	635	1,175	1,885
<b>Total Liabilities (b)</b>	<b>1,005</b>	<b>1,545</b>	<b>2,255</b>
<i>Asset Excess (Shortfall) (a) – (b)</i>	<i>(830)</i>	<i>(566)</i>	<i>(9)</i>
Total Assets as a Percentage of Total Liabilities (%) (a)/(b)	17.4%	63.4%	99.6%

\* Liabilities include administrative expenses. The projected cash flows over an extended time period of 150 years are used



# *Will open group methodology show if there are sustainability problems?*

***YES, IT WILL***

- Consider a hybrid of Canada and South Korea— no future immigration and fertility rate of 1.2 (vs. 1.65), and call it “South Canada”

	Canada – contribution rate 9.9%	South Canada – contribution rate 9.9%	South Canada – contribution rate 12%
Assets	2,246	1,464	1,713
Liability	<u>2,255</u>	<u>1,747</u>	<u>1,747</u>
Asset Shortfall	(9)	(283)	(34)
Ratio of assets to liability	99.6%	83.8%	98.0%

**Will closed group identify the issue? Not necessarily!**

***For both Canada and South Canada, the closed group would show the same financial position!***



# *Length of projection period for the open group*

- Insufficiently long period overestimate funded status since
  - Some of future expenditures are excluded
  - But corresponding contributions are included
- The extending of projection period beyond 150 years result in marginal changes due to the time value of money.

## **Open Group Balance Sheet as at 31 December 2012 for the CPP: Various Projection Periods (9.9% contribution rate, \$ billion)**

	<b>Length of the Projection Period in Years</b>					
	<b>75</b>	<b>100</b>	<b>125</b>	<b>150</b>	<b>175</b>	<b>200</b>
<b>Total Assets</b>	1,897	2,078	2,183	2,246	2,279	2,300
<b>Total Liability</b>	1,833	2,048	2,176	2,255	2,298	2,324
<b>Asset excess (shortfall)</b>	64	30	7	(9)	(19)	(24)
<b>Total Assets as a Percentage of Total Liabilities (%)</b>	103.5%	101.5%	100.3%	99.6%	99.2%	99.0%

# *Open Group Modified Balance Sheet – Description and Purpose*

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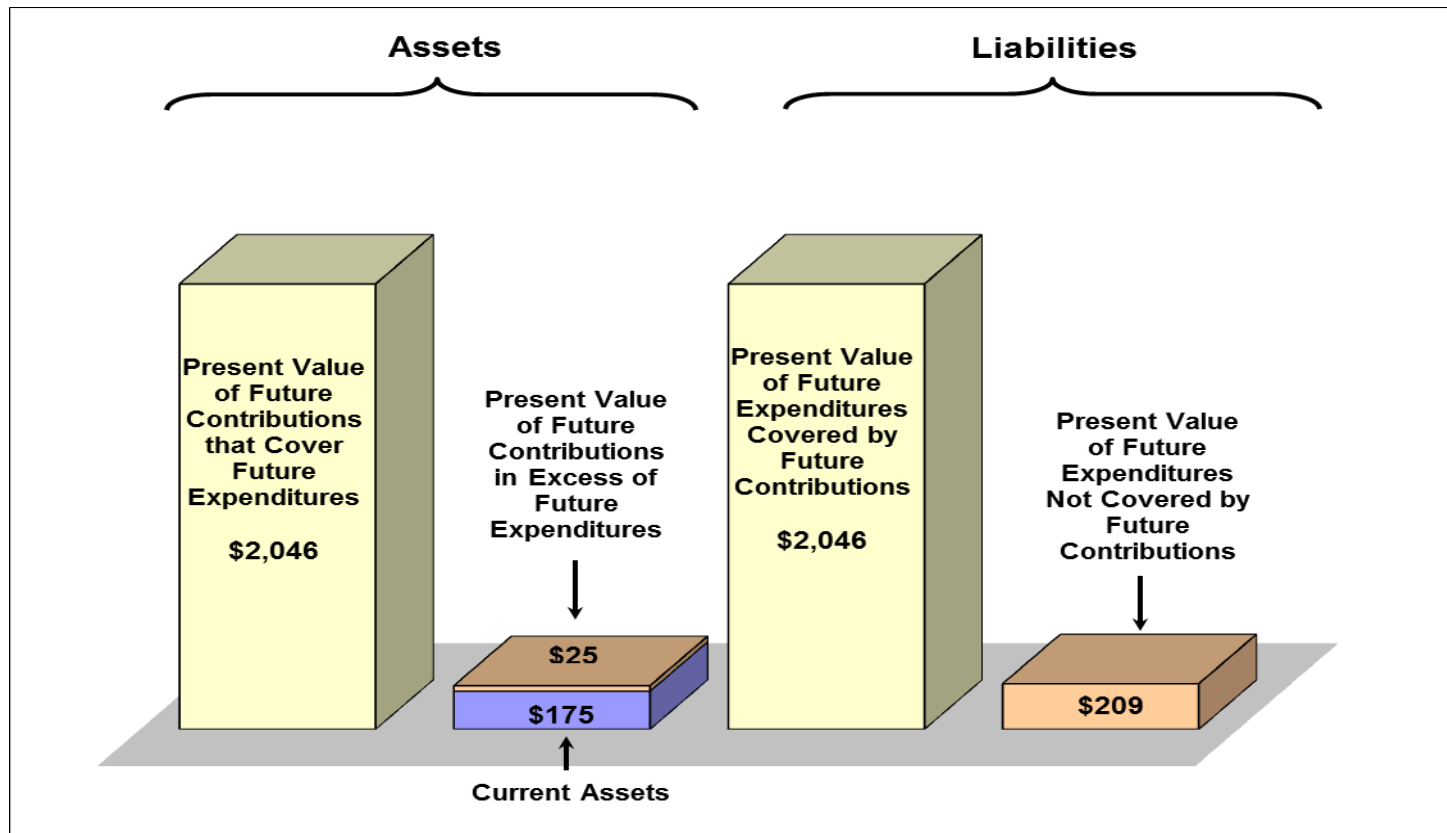
- Open group balance sheet may be presented in alternative format: split out into pay-as-you-go and funded components of the Plan
- Modified balance sheet emphasizes hybrid nature of partial (steady-state) funding of the Plan and thus allows for better understanding of how future expenditures are financed.



# Open Group Modified Balance Sheet – Formation: Step 1

- Separate out present values of contributions and expenditures on assets and liabilities sides of balance sheet

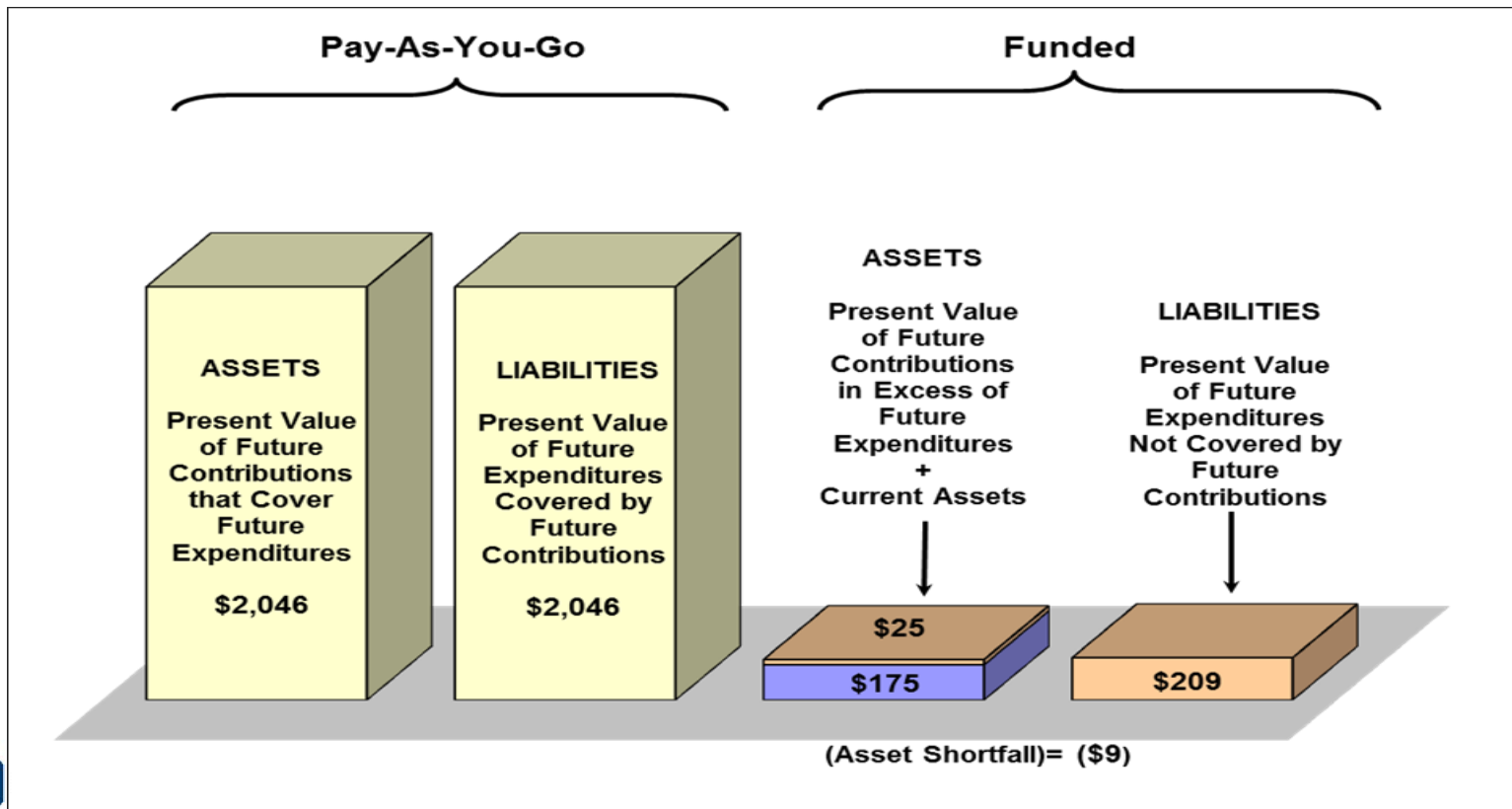
As at 31 December 2012, 9.9% contribution rate, \$ billion:



# Open Group Modified Balance Sheet – Formation: Step 2

- Regroup present values into pay-as-you-go and funded components

As at 31 December 2012, 9.9% contribution rate, \$ billion:



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

<b>Present Value (PV) as at 31 December 2012 (in \$ billion)</b>	<b>Rate of Return on the CPP Assets (6.2%)</b>	<b>Growth in Contributory Base (4.0%)</b>
<i>Pay-As-You-Go Component</i>		
Assets = Liabilities		
PV of Future Contributions that Cover Future Expenditures = PV of Future Expenditures Covered by Future Contributions (a)	2,046	6,284
<i>No asset excess (shortfall) exists for pay-as-you-go component.</i>		
<i>Funded Component – best-estimate nominal rate of return of the CPP Assets of 6.2%</i>		
<u>Assets</u>		
PV of Future Contributions in Excess of Future Expenditures	25	25
<u>Current Assets</u>	175	175
Total Assets for funded component (b)	200	200
<u>Liabilities: PV of Future Expenditures Not Covered by Future Contributions (c)</u>	209	209
<i>Asset Excess (Shortfall) with respect to funded component (d) = (b) – (c)</i>	<b>(9)</b>	<b>(9)</b>
<i>Total Plan</i>		
Total Assets (e) = (a) + (b)	2,246	6,484
Total Liabilities (f) = (a) + (c)	2,255	6,493
<i>Total Asset Excess (Shortfall)</i>	<b>(9)</b>	<b>(9)</b>
<i>Total Assets as a Percentage of Total Liabilities</i>	<b>99.6%</b>	<b>99.9%</b>
<i>Component obligations as a percentage of total obligations:</i>		
Pay-As-You-Go (a)/(f)	<b>91%</b>	<b>97%</b>
Funded (c)/(f)	<b>9%</b>	<b>3%</b>

# *To summarize...*

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- CPP was never intended to be fully funded
- Steady-state funding produces an A/E ratio that is relatively stable over time
- Asset excess/ (shortfall) may be used to evaluate Plan's financial status; however, key measure is the steady-state contribution rate (adequacy and stability over time)
- Open group basis is the most appropriate since it takes into account both sources of Plan's financing: future contributions and investment earnings
- CPP doesn't create government debt.



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This presentation is based on the Actuarial Study No. 13 of the Office of the Chief Actuary, Canada, published in August 2014

*Assessing the Sustainability of the Canada Pension Plan through Actuarial Balance Sheets*

<http://www.osfi-bsif.gc.ca/Eng/oca-bac/asia/Pages/ascpp.aspx>







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## *Thank you*



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