



Presentation to the European Institute Sovereign Funds Roundtable London, England

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Good morning. Thank you for inviting me here today to talk about the liability structures of pension funds in Canada.

Presentation (Slide 2) The purpose of this presentation is to provide a brief overview of how our liabilities materialize, how they are quantified and how they are financed. I will briefly discuss the liability structures of our national pension plans: the Canada Pension Plan and the Old Age Security Program. I will then focus on the financing of the public sector pension plans' liabilities and will conclude with which factors to consider for an optimal asset allocation.

Canadian Retirement Income Security System – Funding (Slide 3) At retirement, most Canadians will receive an income from one or both of the following pension schemes. The Old Age Security (OAS) Program is financed on a pay-as-you-go basis, meaning that there is no fund. The Canada Pension Plan, which is similar to the Québec Pension Plan, is a mandatory defined benefit pension plan financed through contributions paid in equal parts by employers and employees. The objective of these plans is to replace 25% of the individual's pre-retirement earnings up to the limit to which employment earnings are subject to CPP contributions. Private pension plans and RRSPs are fully funded, meaning each generation pays for its own benefits. Given these three main sources of income for citizens over age 65, the Canadian system is funded at approximately 40% to 45% of future liabilities. Canada's diversified funding approach makes its retirement income system less vulnerable to changes in economic and demographic conditions than other systems that use a single funding approach. In addition, Canada's mix of public and private pensions has been recognized by international organizations as an effective way to provide for retirement income needs.

Canada Pension Plan Funding (Slide 5) The CPP was introduced in 1966 as a pay-as-you-go plan with a small reserve. Continuing to finance the Plan on a pay-as-you-go basis would have meant imposing a heavy financial burden on Canadian workers after 2020, which was deemed unacceptable by governments. Therefore, following extensive consultations in 1997, the provincial and federal governments agreed to change the funding approach to "steady-state" or partial funding. Contributions were increased, future benefit growth was reduced and the CPP Investment Board was created to invest the funds not required to pay current benefits.



CPP Steady-State Funding (Slide 6) The goal of steady-state funding is to stabilize and minimize the contribution rate. Steady-state funding requires that the contribution rate be set no lower than the lowest rate expected to ensure the long-term financial stability of the Plan without recourse to further rate increases. The contribution rate of 9.9% in 2005 and thereafter will provide Plan's assets equal to approximately 25% of the Plan's liability within about 15 years. The current steady-state funding is expected to generate contributions that exceed the benefits paid out until 2021. As a result, Plan assets are expected to cover an increasing number of years of expenditures over this period to more than five years after 2020. In 2050, it is expected that only 30% of investment earnings will be used to pay annual benefits. The cash flow projections support a long term asset mix composed of more variable income securities than fixed income securities.

CPP Steady-State Funding (Slide 7) Steady-state funding has a built-in hedge that is used when the calculated steady-state contribution rate is higher than the current 9.9%. The default provisions in the Canada Pension Plan Act may result in adjustments being made to the contribution rate and benefits in payment if the federal and provincial governments cannot reach an agreement in response to the actuarial determination of the steady-state contribution rate. If the new steady-state rate is 10.1%, one half of the excess of the new steady-state rate over the 9.9%, that is 0.1%, will be applied to an increase in the contribution rate and the other half will be applied to non-indexation of benefits in pay in order to keep the steady-state rate at 10.0%. In other words, the contributors and the beneficiaries would both support the additional cost shown in the actuarial report.

Actuarial Reporting of Liabilities of Public Sector Pension Plans (slide 8) The federal public sector pension plans discussed in this section cover members of the Public Service, the Royal Canadian Mounted Police and the Canadian Forces.

Funding the Federal Public Sector Pension Plans (Slide 9) Funding a defined benefit plan involves estimating the cost of benefits to be paid in the future and developing a financial program to ensure that contributions plus investment earnings will provide sufficient funds to pay future benefits. For the public sector pension plans, the financial programs differ for financing the years of service before 2000 and the years of service thereafter. Benefits earned up until 2000 are financed through Superannuation Accounts in which employee and employer contributions were credited. These pension plans were unfunded because no assets were set aside. Since April 1, 2000 employer and employee contributions have been deposited into Pension Funds, which are invested in the financial markets by the Public Sector Pension Investment Board with a view to maximize returns without undue risk of loss.

Normal Cost – Public sector (slide 10) In plan year 2007-08, the normal cost of the Public Service Pension Plan is 18% of pensionable payroll. For every \$1 plan members contribute

to the Plan, the government contributes \$2.10. The normal cost of the other two plans is also shown in this table. Annual total contributions of \$4.2 billion are deposited to the Pension Funds and invested in a diversified portfolio of assets.

Evolution of Public Service Liabilities (slide 11) This slide shows the evolution of the public service liabilities and the split between the Pension Fund (Financial Markets) and the Superannuation Account (Government Debt). The Pension Funds are among the youngest in the world since they began receiving contributions only six years ago. Thus, the current ratio of actives to total members is quite high at 90% since most contributors to the Fund have not yet retired. Over time, this ratio will decrease (projected to be 52% in 2035) as members age and begin to retire. Currently, the Funds represent only a small proportion of total liabilities at 15%; however, over time this proportion is expected to increase as new members will contribute entirely to the Funds. Finally, the ratio of active to total members in the Superannuation Accounts is projected to decrease to 0% by 2035 and the corresponding liabilities will also decrease over time. The Accounts no longer receive contributions – they only pay benefits. Once all members who contributed to the Account (pre-April 2000) have retired, the ratio of active to total members will be 0; that is, the only members with benefits in the Accounts will be retirees who are receiving their pensions.

Evolution of Liabilities financed through a diversified portfolio of assets (slide 12) This table summarizes the evolution of public sector liabilities financed through a diversified asset portfolio managed by the PSPIB. Since these pension funds are the youngest in Canada and among the youngest in the world, they exhibit distinct features that do not apply to more mature plans. The duration of the Funds' liabilities is approximately 20 years, compared to 12-15 years, on average, for typical DB plan liabilities in Canada, the United States and Europe. Net cash flows to the Pension Funds are projected to remain positive until 2030. Since investment income will not be needed to pay benefits in the next 24 years, the PSPIB is able to utilize more long-term investments than other pension plans.

Evolution of cash flows (slide 13) This chart shows the evolution of the net cash flows of the Funds over a 25-year period. In 2005, the net cash flow was \$3.6B and consisted of contributions of \$3.9B and benefits paid from the Fund of \$300M. Net cash flows are projected to remain positive until 2030, at which time it may be necessary to use a portion of investment income earned on the Funds to pay the excess of benefits over contributions.

Evolution of cash flows (slide 14) How robust are these projections? What factors could change the evolution of the pension liabilities? We have worked closely with the investment manager, the PSPIB, and provided them stress-test scenarios to show how the trajectory of pension liabilities could change in the future. We looked at interest rates, inflation rates, wages increases, life expectancies and new entrants. We found the assumption on new entrants the most sensitive to the evolution of cash flows. If retiring workers are not

replaced by new workers for the next five years, this would reduce the period of positive cash flows by about nine years and likely alter the current asset mix of the PSPIB.

Asset Mix (slide 15) The cash flow projections support an asset mix composed of more variable income securities than fixed income securities. As at March 31, 2006 the assets managed by the PSPIB were invested in 70% variable income securities, 23% fixed income securities and 7% real return assets. The new long-term asset mix target of the PSPIB is composed of 62% variable income securities, 15% fixed income securities and 23% real return assets.

Horizon matching (Slide 16) Over the long life of a pension plan, a number of large positive and negative shocks to equity returns will be experienced. Of most concern will be large negative shocks, as well as the timing of such shocks. A large negative shock early in the pension plan life will have a negligible impact on the fund value as there will be sufficient time for the fund to recover. However, if such a shock were to occur when a plan is more mature, the impact would be much greater and it would be more of a challenge for the fund to recover. Horizon matching, with its systematic switch into bonds as the horizon shortens, is designed to reduce the impact of such events.

One feature of horizon matching is that as the pension plan matures, it is anticipated that a greater proportion of the liabilities will be cash flow matched, thus requiring an asset allocation with more fixed income securities. That is, as the plan matures, the liabilities payable in the horizon period will increase as a proportion of the total liabilities. As an example, the cash flows of the Public Sector Pension Plans were considered as at March 31, 2005 and March 31, 2037 for three horizon lengths. The results are shown on the next slide.

Horizon matching (Slide 17) As you can see, the proportion of plan liabilities that must be matched to bonds increases as the plan matures. A lower proportion of the liabilities requires matching if it is assumed that wages do not increase above the rate of inflation. Liabilities associated with real wage growth may not require matching, as equity investments should provide compensation for this growth in real wages. Thus, a higher proportion of equity investments will be required to achieve this.

Conclusion (slide 18) In closing, I would like to share with you the results of a study titled “Pension Plans: It’s All About Assumptions”, released in August 2006 by the Dominion Bond Rating Service. 90% of the pension plans examined in 2005 reduced their liability discount rates generally to the 5.50% to 6.25% range, which is supposed to represent the yield on AA-rates debt. 90% of Canadian plans have assumed rates of return on assets below 8%, while only 30% on the United States do. On average, our actuarial reports use a rate of return of 6.3% for both assets and liabilities for the next five years. In my view, our actuarial reports present reasonable estimates of pension liabilities compared to North American

Corporations and somewhat conservative estimates compared to the US public sector pension plans.