



Office of the Superintendent of
Financial Institutions Canada

Bureau du surintendant des
institutions financières Canada

Office of the Chief Actuary

Bureau de l'actuaire en chef

Is There an Optimal Level of Pre-Funding? Optimal Funding of the Canada Pension Plan

28th International Congress of Actuaries
Paris, 28 May- 2 June 2006



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Presentation

- Retirement income security in Canada
- Canada Pension Plan (CPP)
 - 1997 reforms
 - Steady-state funding
 - 21st actuarial report as of Dec. 2003
 - Independent actuarial peer review
- Optimal funding of social insurance schemes
- Optimal funding study of the CPP
- Conclusions



Canadian Retirement Income Security



INSURANCE ASSISTANCE

Programs

Objective

3. Employer pension plans and private savings (RPP / RRSP)

Increase retirement savings through tax incentive

2. CPP / QPP

Replace 25% of pre-retirement earnings up to avg. of last 5 yrs of YMPE (avg 2002-2006: \$40,540)

1. Old Age Security/ Guaranteed Income Supplement

Provide minimum income at retirement for seniors

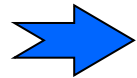


Retirement Income Security

Canadian retirement system with mixed funding approaches is well recognized in the world for its capacity to adapt rapidly to changing conditions.

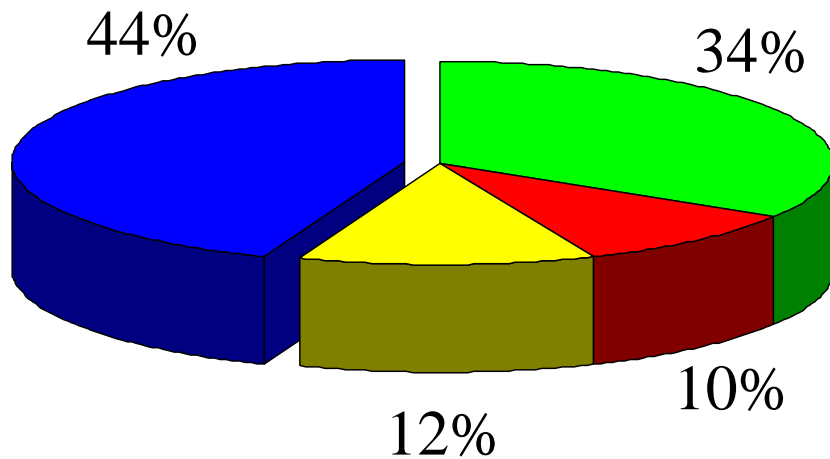
- Full funding (RPP/RRSP)
- Partial funding (CPP/QPP)
- Pay-as-you-go funding (OAS/GIS)

The Canadian retirement system could be viewed as about 40% to 45% funded.



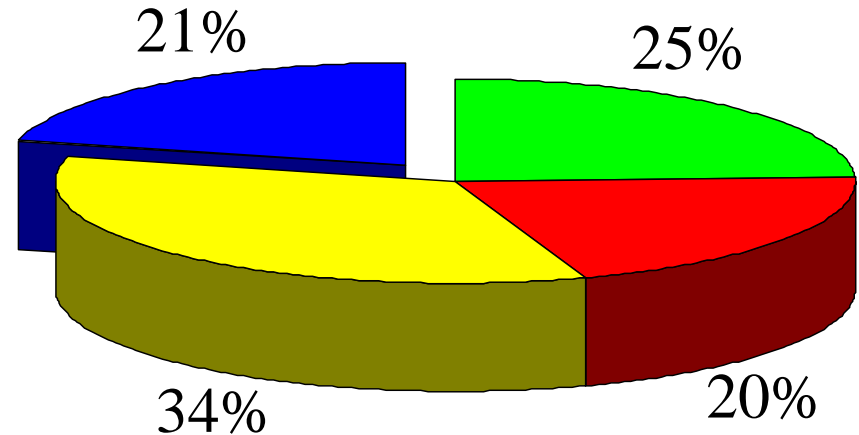
Seniors' Income by Source, Canada

1981



\$40B or 6% of GDP

2003



\$100B or 8% of GDP



OAS/GIS



Retirement Income



CPP/QPP Benefits



Other Income



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CPP 1997 Reforms

Why were changes needed?

- Aging of the population
 - increasing longevity & retirement of baby boomers
 - Under-financing of the Plan
 - Falling fertility rates, more early retirements, higher disability rates
 - Insufficient assets
 - From 1983 to 2000, contribution rates were lower than Pay-As-You-Go (PayGo) rates.
 - Intergenerational equity
- Canadians want the CPP preserved



CPP 1997 Reforms

- Steady-State funding
- Increase contributions by 70% over 6 Years (1997-2003)
- Moderate the future growth of benefits by 10% on a long-term basis (by 2050)
- Creation of the Canada Pension Plan Investment Board
- Increase frequency of actuarial and financial reviews of the Plan (every 5 → every 3 years)



CPP Steady-State Funding

Steady-state contribution rate

- Lowest rate that can be maintained over the foreseeable future and that will result in an asset/expenditure ratio generally constant over a long period of time.
- Regulation requires that the A/E ratio should be equal in the 13th and 63rd year after the valuation date.
- The steady-state rate is the lowest rate that can be charged that is sufficient to sustain the Plan without further increase. A funding level of 20%-25% is sufficient to meet that condition.

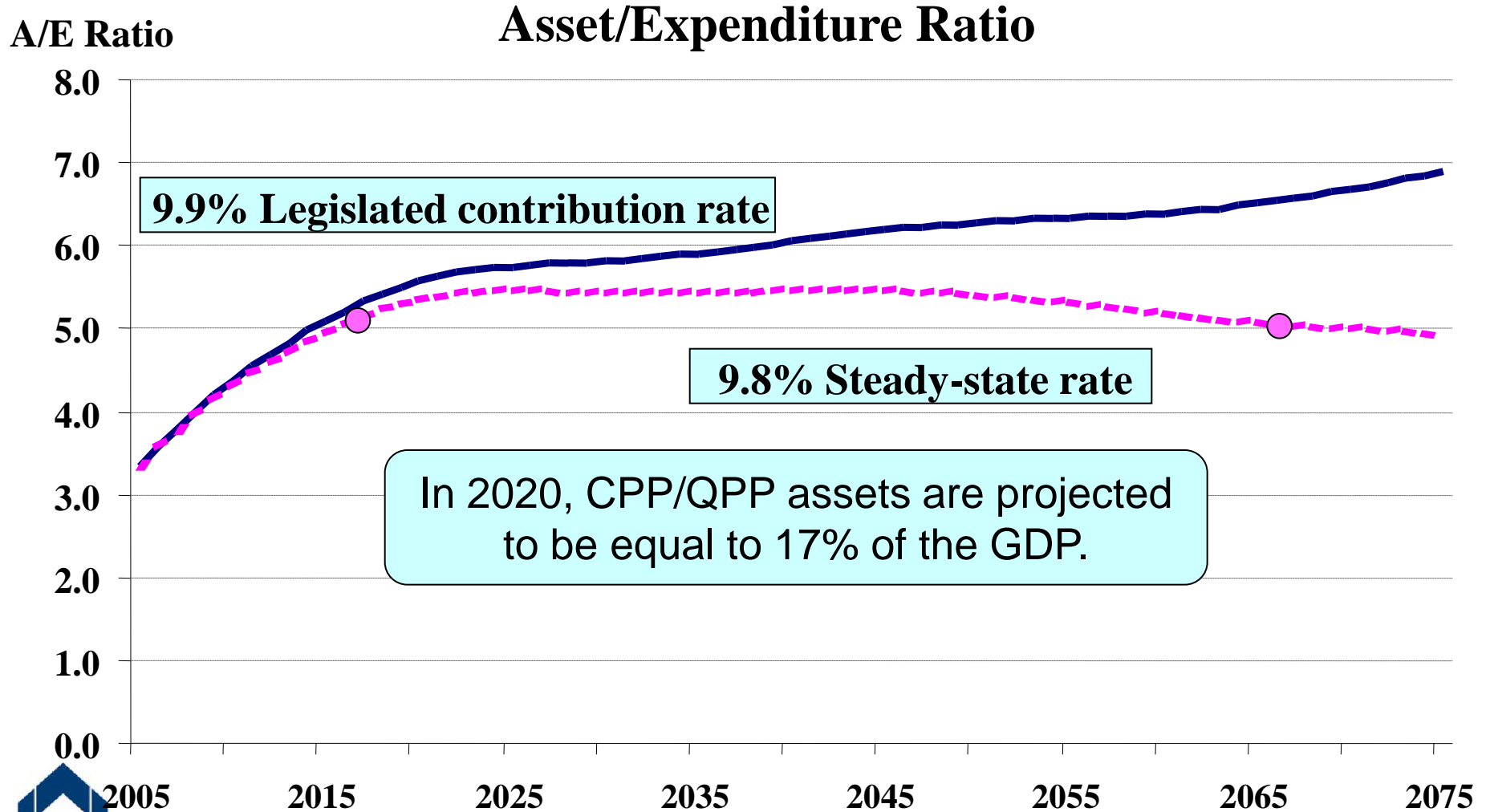


CPP Steady-State Funding

- The current legislated contribution rate is 9.9%.
- The steady-state contribution rate is 9.8%.
- If the legislated contribution rate is higher than the steady-state rate, the funding status of the plan will increase over time.
- The higher this rate is set above the steady-state rate, the faster the Plan will become more funded.



CPP Steady-State Funding



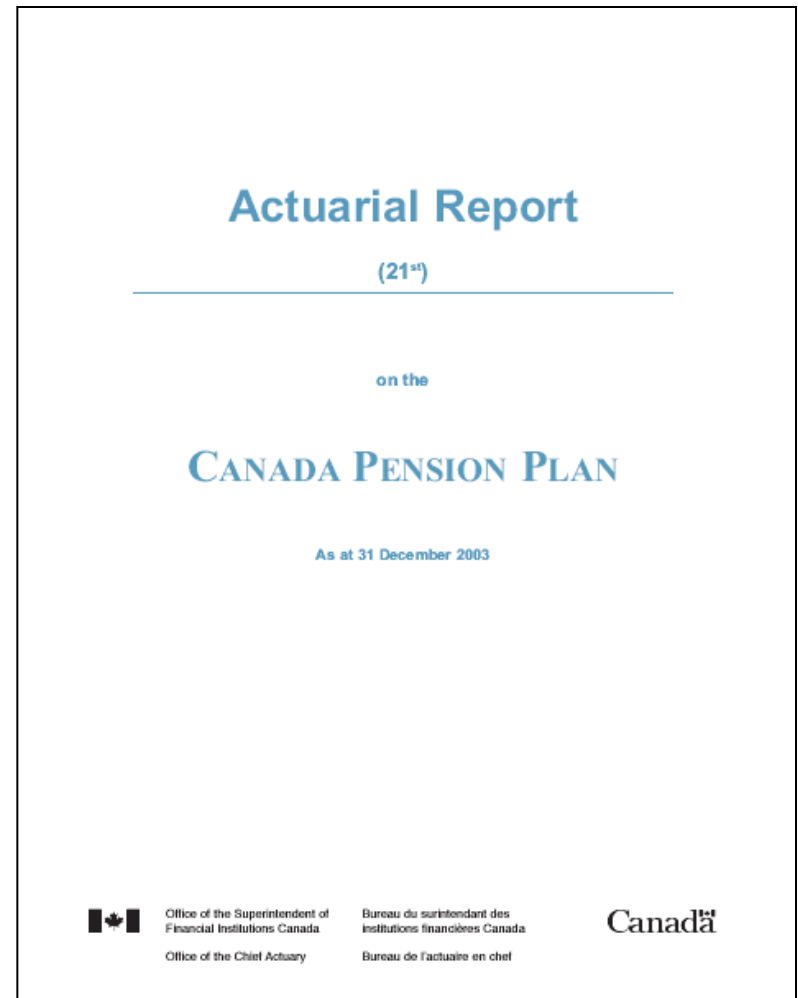
CPP Steady-State Funding

- If the legislated contribution rate is lower than the steady-state rate AND if finance ministers cannot reach agreement on a solution, then default provisions apply:
 - Contribution rate increased by $\frac{1}{2}$ of excess over three years, subject to maximum increase of 0.2% per year
 - Benefits frozen until next review (3 years)
 - At end of three years, next review performed to determine financial status of Plan.



Canada Pension Plan

- 21st Actuarial Report Tabled by the Minister of Finance on 8 December 2004
- Inform on the current and projected future financial status of the Canada Pension Plan
- Calculate the steady-state contribution rate



Main Findings – 21st CPP Actuarial Report

- Despite the projected substantial increase in expenditures as a result of the aging of the population, the actuarial report confirms that the Plan will meet its obligations and remain financially sustainable over the projection period.
- From 2004 to 2021, contributions are more than sufficient to cover expenditures.
- Asset/Expenditure ratio increases from 3.1 to 5.6 over that period and reaches 6.3 in 2050.
- **Contribution rate of 9.9% is sufficient and takes into account the aging of the population.**



Independent Peer Review Process

- Auditor General and Selection Process
- Overseeing of the Peer Review by the UK Government Actuary's Department
- The Independent Review Panel confirmed:
 - That actuarial standards of practice were met;
 - That assumptions were reasonable;
 - That the report fairly communicates the results;
 - The conclusions reached by the Chief Actuary about the actuarial soundness of the CPP.
- and made a series of recommendations.

March 2005



Peer Review of CPP#21

- The Independent Review Panel proposed:
 - **Recommendation 11:** “...that the Chief Actuary conduct an examination of the continued appropriateness of the steady-state methodology...and publish his findings.”
 - **Recommendation 12:** “...that the Chief Actuary keep the Ministers of Finance of Canada and the provinces apprised of research on optimal funding of social security programs.”



Optimal Funding of Social Insurance Schemes

- Different types:
 - PayGo, partial funding, full funding
- Objectives of funding:
 - 1) Stabilize/Minimize contribution rate
 - 2) Stabilize funding level
- Objectives of partial funding:
 - 1) Partially funded only to adapt to changing demographics
 - 2) Partially fund to stabilize and minimize contribution rate over long term; rate eventually falls below PayGo rate



Criteria for Choosing a Funding Method – Contribution Rate

- **Stability of the contribution rate**

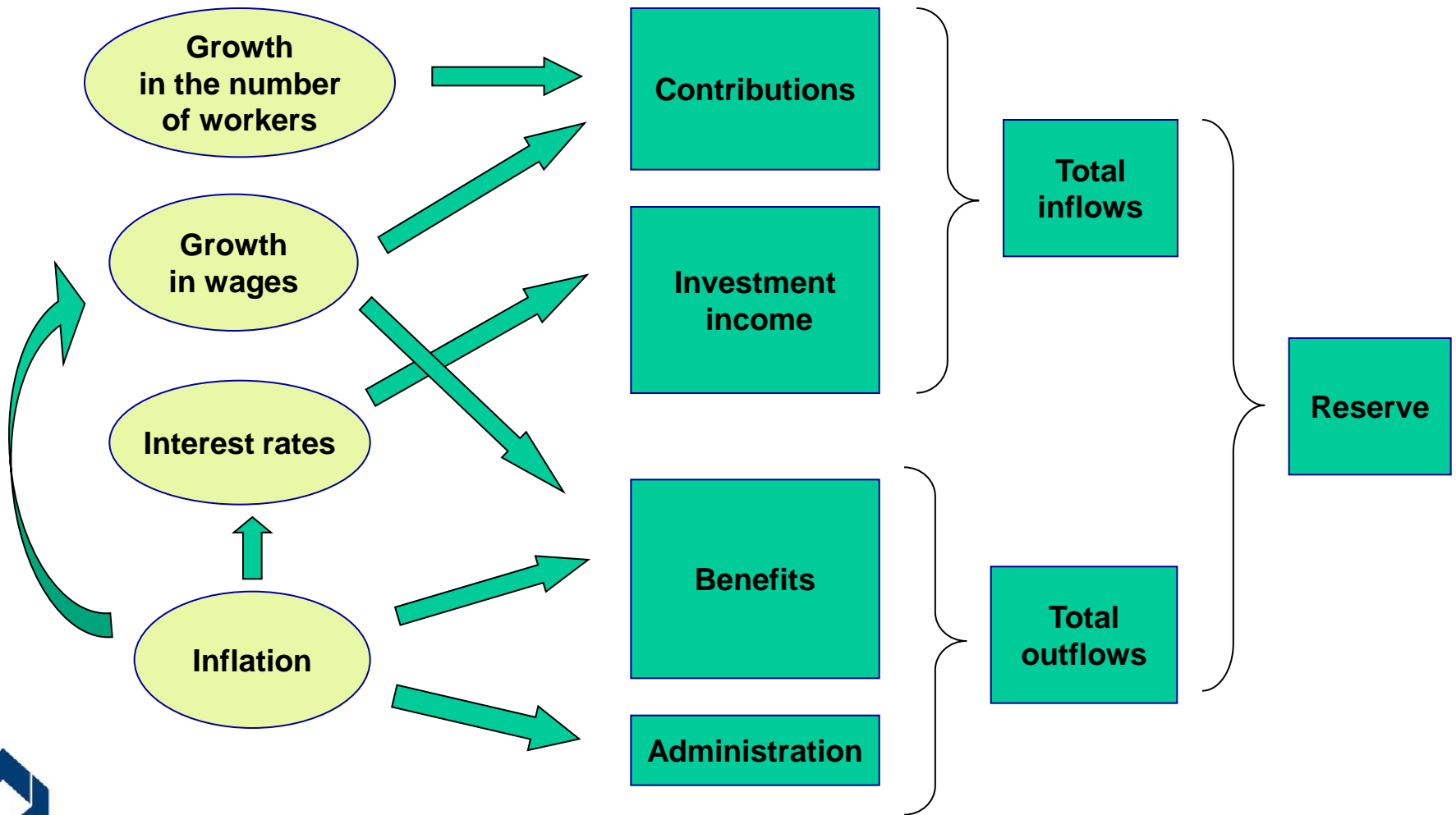
- Strengthen the contribution-benefit connection
- Ensure intergenerational fairness
- Strengthen fiscal discipline
- Maintain public confidence

- **Minimizing the contribution rate**

- Smart funding: increased funding during periods of high rates of return and weak salary increases



Economic variables that influence the inflows and outflows of a pension plan



Impact of the demographic and economic environment on the contribution rate (Canada)

	1960s environment	1990s environment
Long-term Assumptions		
Senior dependency ratio	0.33	0.40
Real increase in wages	2.0%	1.0%
Real interest rate	2.0%	4.0%
Estimated Long-term Cost of Public Retirement Benefits (OAS + CPP/QPP) as % of Covered Payroll		
Pay-as-you-go basis	11.0%	14.5%
Total funding basis	16.5%	7.2%



Source: Canadian Institute of Actuaries, 1996

The financial point of view

- Primary objective : stabilizing the contribution rate
- Secondary objective: minimizing the contribution rate
 - Optimize the funding of a retirement scheme by considering the relation between the rate of return on investments and the rate of increase in wages (implicit rate of return on PayGo schemes).



Factors that Determine the Contribution Rate

- Pure pay-as-you-go basis
 - Ratio of pensioners to contributors
 - Salary levels and growth
 - Maturity of the scheme



Gradual variations in the contribution rate

- Full funding basis
 - Discount rate and other actuarial assumptions
 - Amortization of experience deficiencies (differences between experience and assumptions)
 - Amortization of past service



More short-term variations in the contribution rate



Demographic and Economic Trends of the OECD Countries

Observations:

- Aging of the population
 - Increase in the dependency rate
- Slowing of workforce growth
- Volatility in the increase of wages and interest rates and negative correlation between these variables (for OECD countries: Germany, Japan, United Kingdom, United States, Canada)



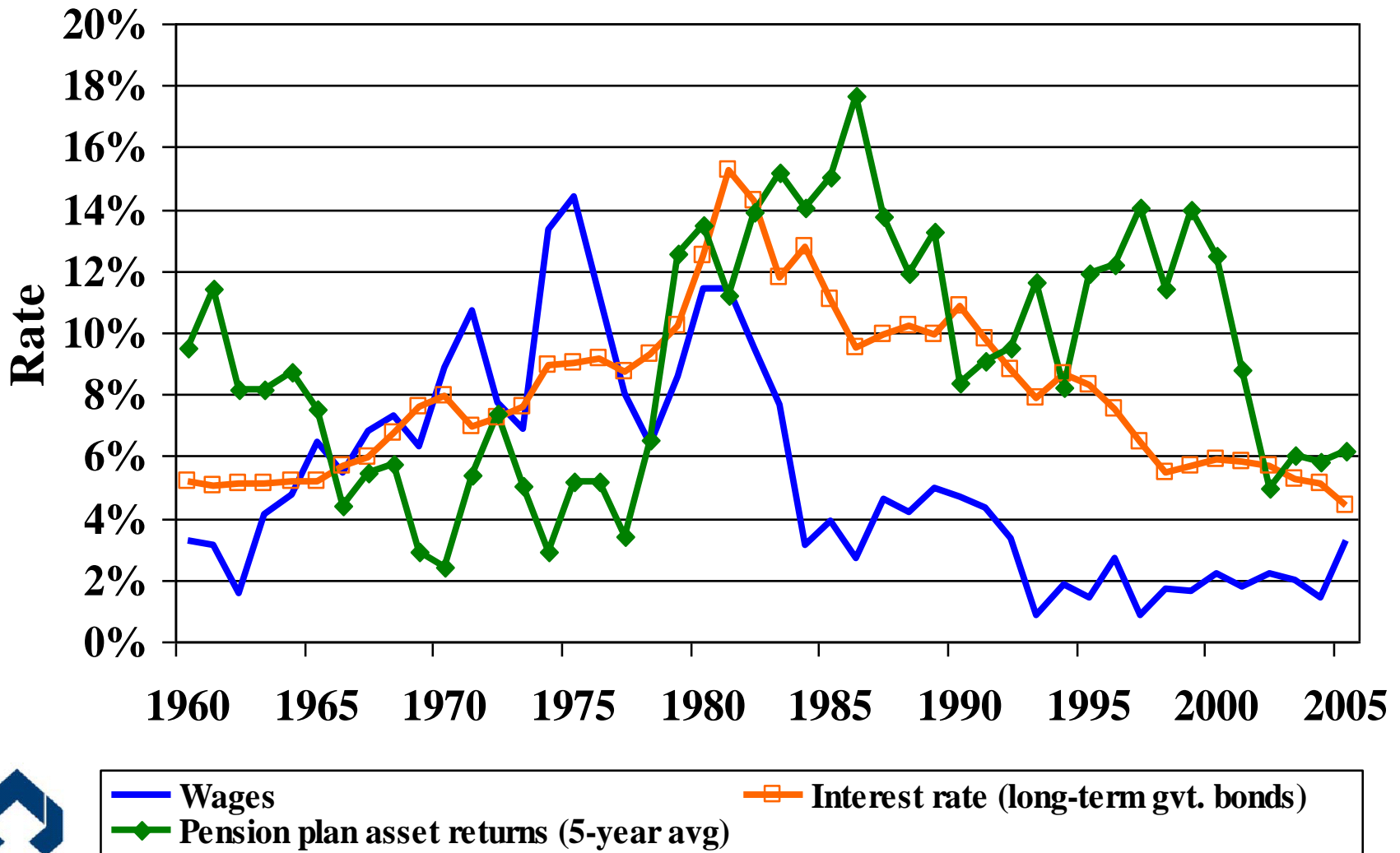
Demographic and economic trends of the OECD countries

Conclusions:

- Vulnerability of pay-as-you-go plans
- Increased importance of funding
- Need for protection against the volatility of contribution rates resulting from uncertainty over future increases in wages and rates of return on investments



Wage increases and rates of return in Canada (1960-2005)



Optimal Funding of the CPP

- OCA Actuarial Study
- Examine different ways and objectives of funding a social insurance scheme
- Discuss history and funding of the CPP
- Examine appropriateness and robustness of CPP steady-state funding methodology using sensitivity analysis



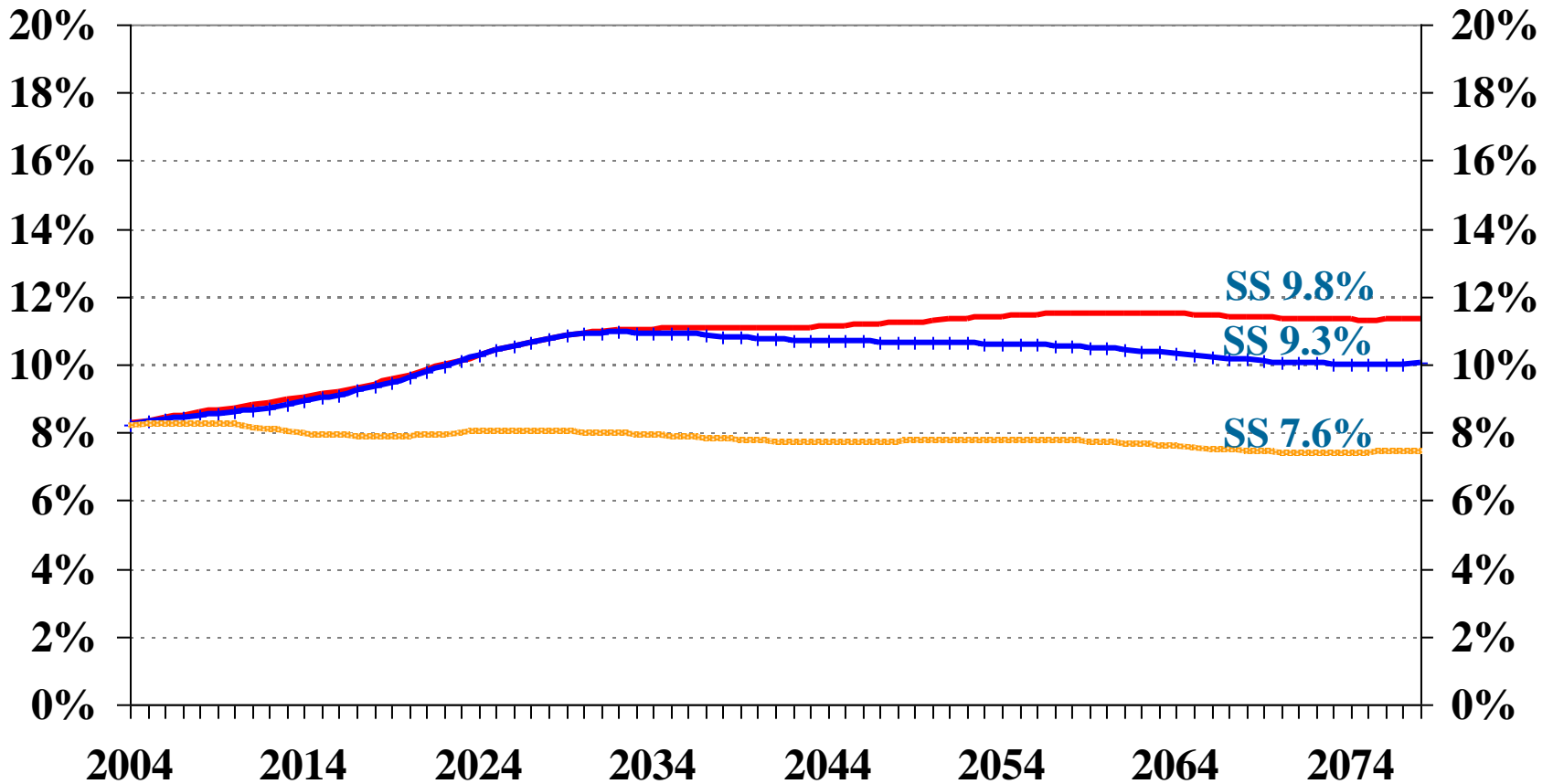
Optimal Funding of the CPP

- Sensitivity analysis:
 - ‘Young’ scenarios
 - Younger populations
 - Much younger with better economic growth
 - ‘Old’ scenarios
 - Older populations
 - Much older with economic stagnation
 - Variations of ‘old’ scenario
 - Low real return and real wage growth
 - Low real return and real wage growth, retirement at age 70
- ⇒ Time evolution of steady-state rate



Sensitivity Analysis: Young Scenarios

PayGo Rate



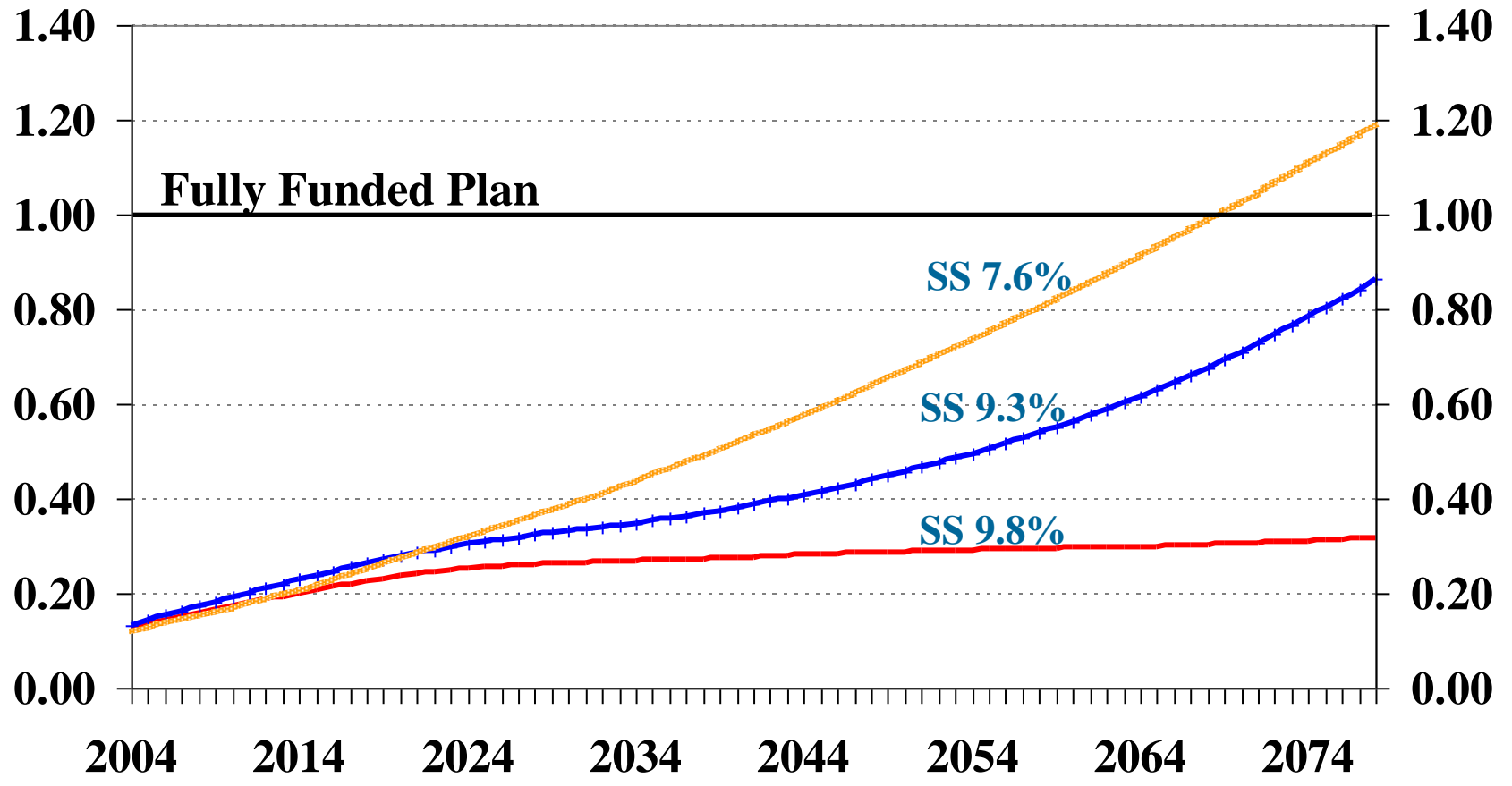
— Best-Estimate —+— Younger Much Younger with Better Economic Growth



Sensitivity Analysis: Young Scenarios

(9.9% Legislated Rate)

Asset/Liability (Funded) Ratio

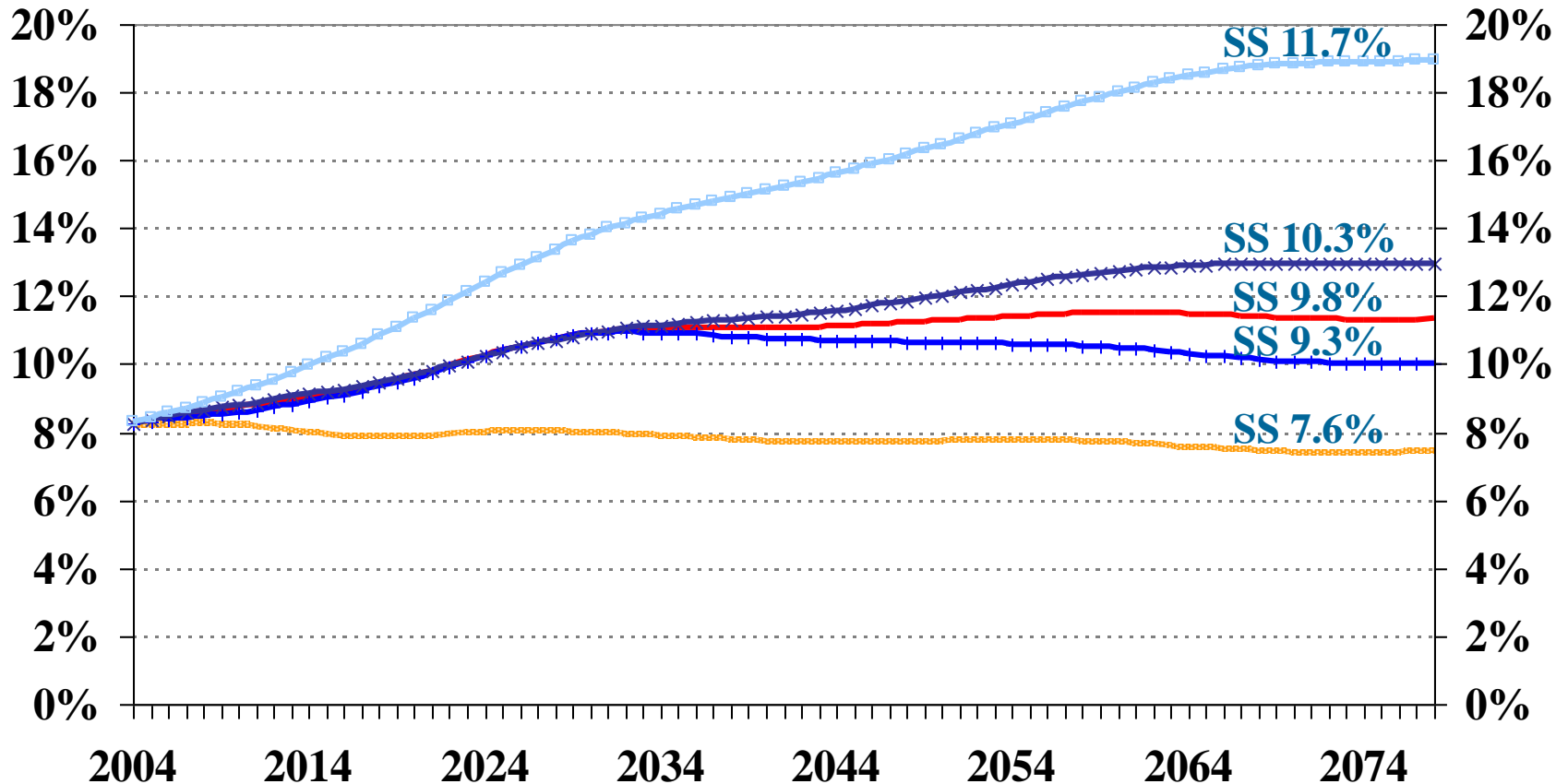


— Best-Estimate
 — Younger
 - - - - - Much Younger with Better Economic Growth



Sensitivity Analysis: Young and Old Scenarios

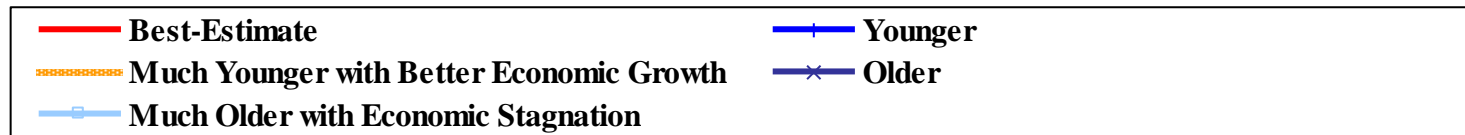
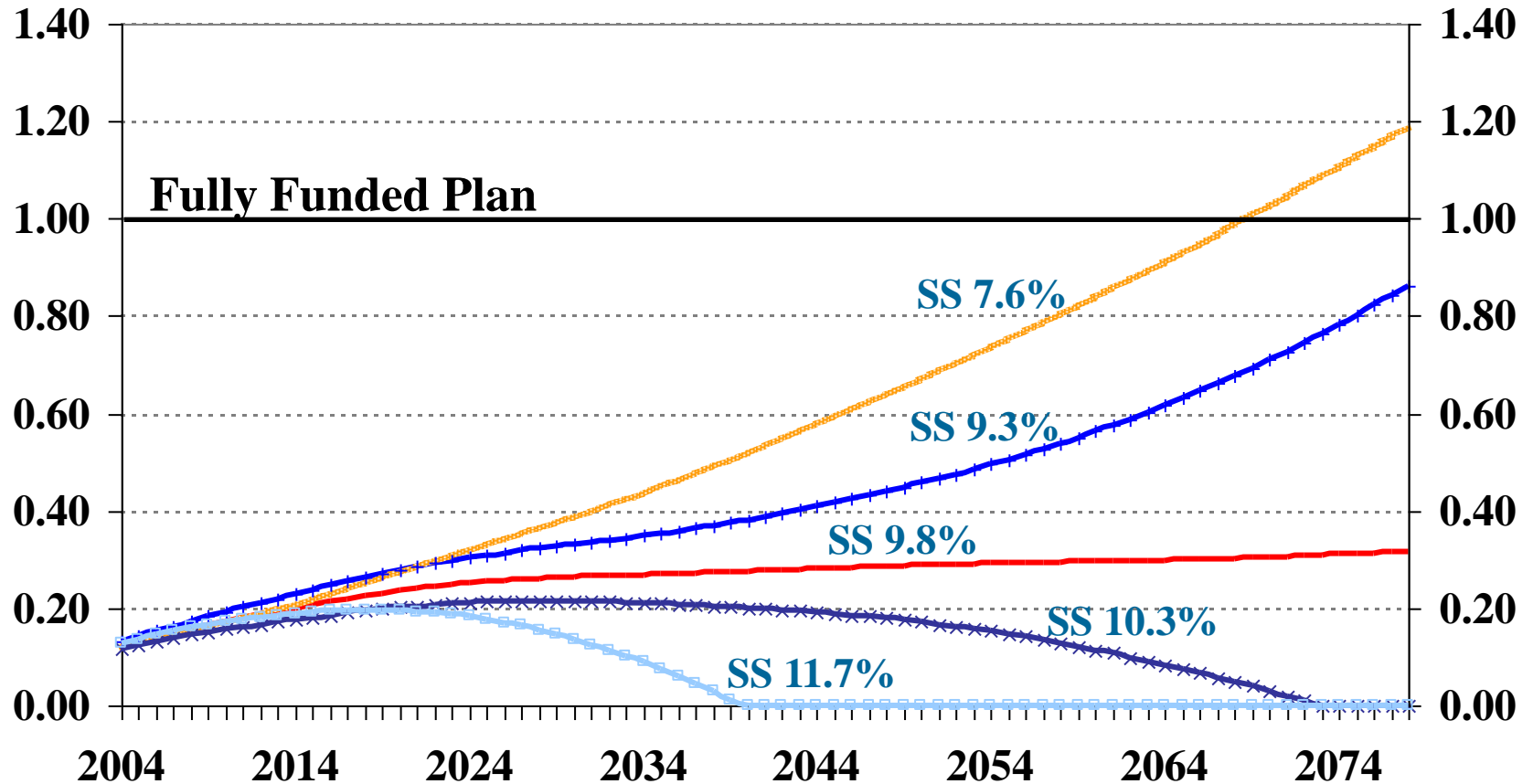
PayGo Rate



Sensitivity Analysis: Young and Old Scenarios

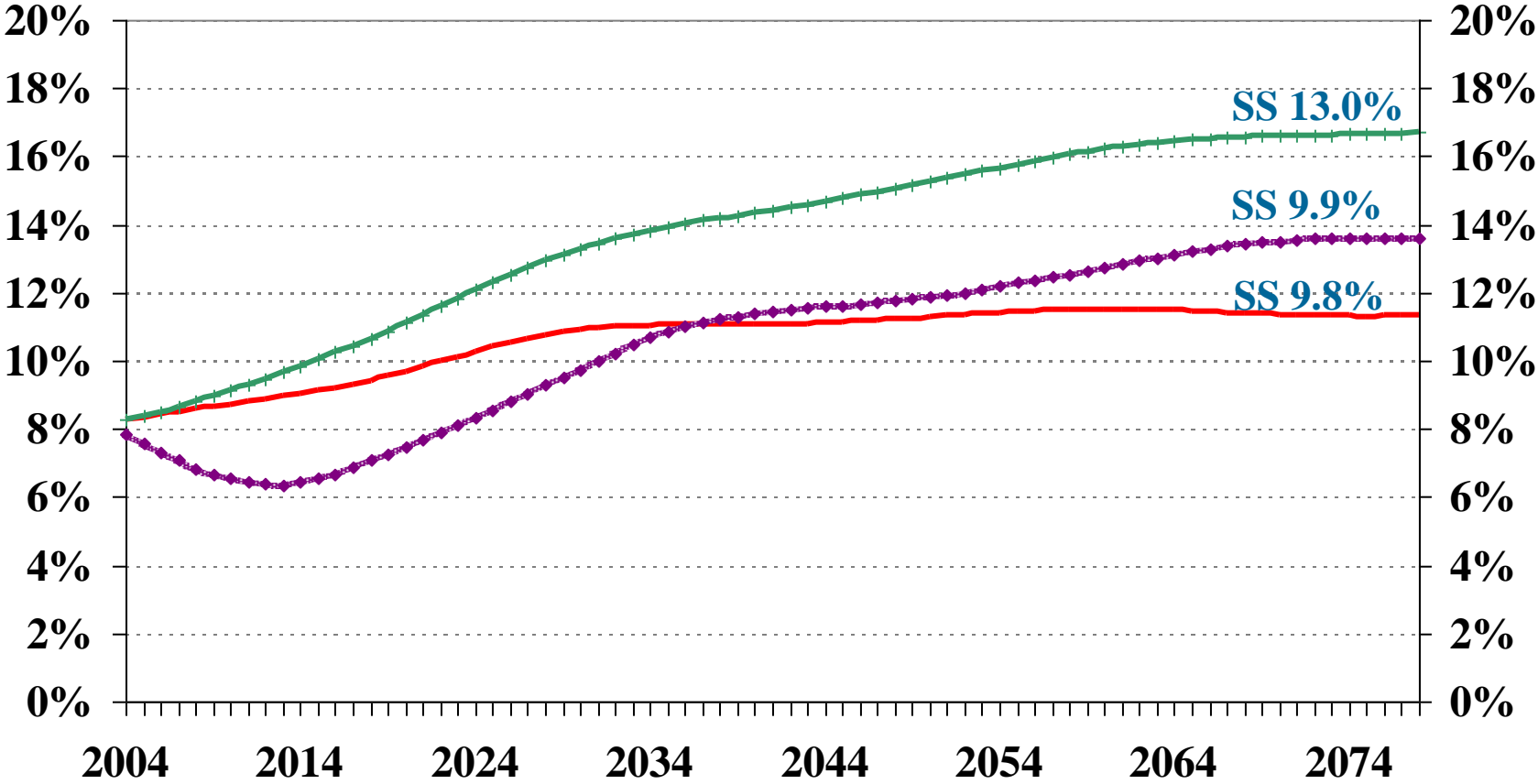
(9.9% Legislated Rate)

Asset/Liability (Funded) Ratio



Sensitivity Analysis: Older Scenario Variations

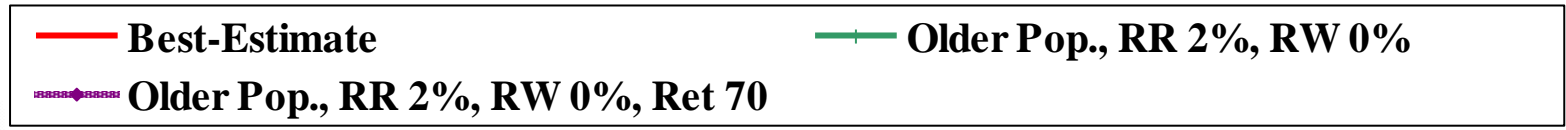
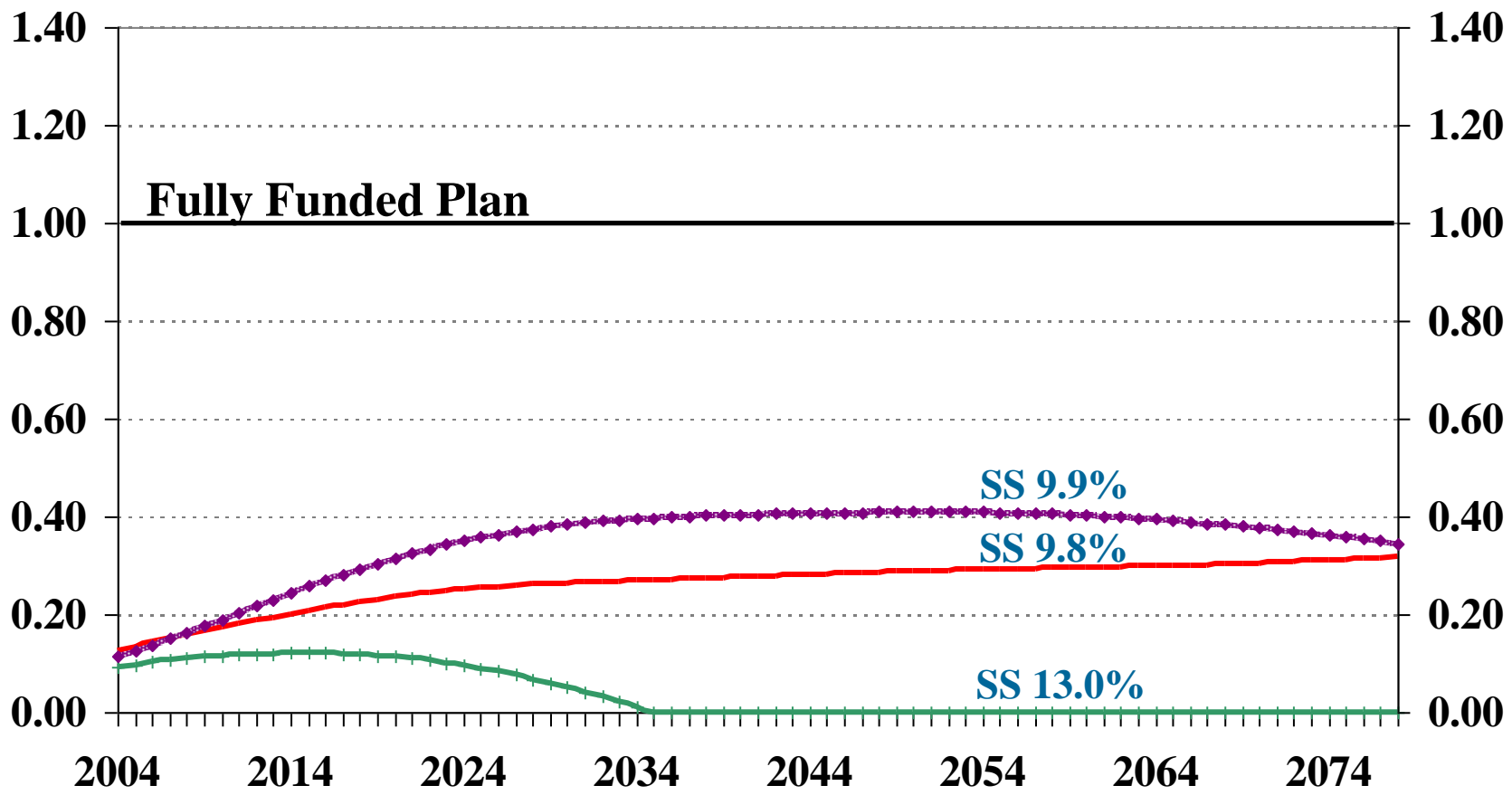
PayGo Rate



Sensitivity Analysis: Old Scenario Variations

(9.9% Legislated Rate)

Asset/Liability (Funded) Ratio



Optimal Funding of the CPP

- Evolution of the steady-state rate
 - As the PayGo rate increases, the steady-state rate calculated at successive intervals also increases
 - Over time, a variable PayGo rate tends to destabilize the steady-state rate
 - Default provisions are in place to deal with this situation (if required)

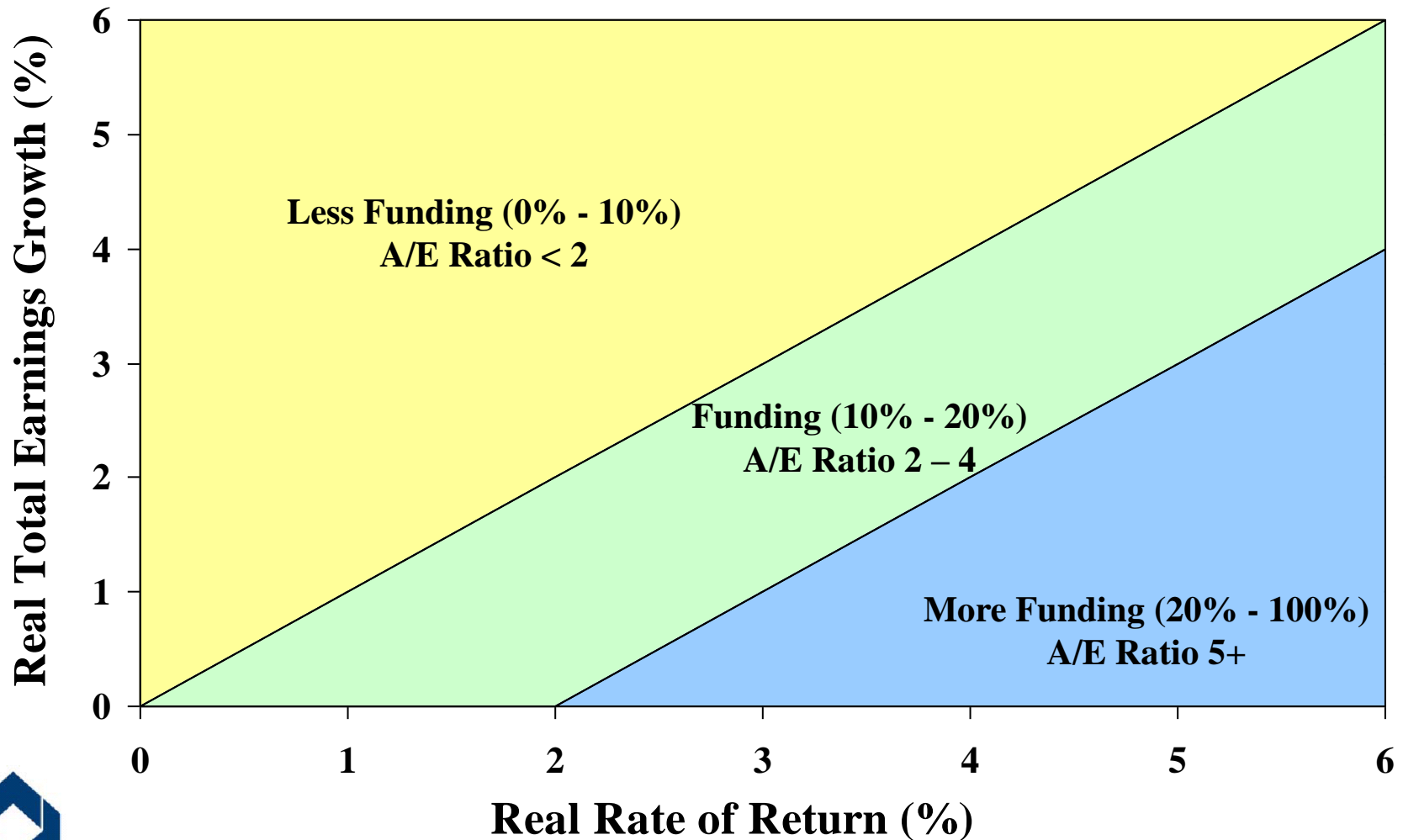


Optimal Funding of the CPP

Population	Target Funding Level at the End of 30 Years as a Percent of CPP Actuarial Liabilities
Much older	100%
Older	75%
Young	50%
Younger	25%
Much Younger	0%



Optimal Funding of the CPP



Conclusions

- ❖ A social insurance scheme's contribution rate is sensitive to changes in the demographic and economic environments.
- ❖ Demographic and economic variables impact the rate differently.
- ❖ Ways of immunizing a pension system against these fluctuations:
 - Partial funding of the public system
 - A mixed (public-private) system
- ❖ Lower funding may be appropriate, especially in a context of high earnings growth and low rates of return, and conversely for higher funding.
- ❖ Funding method should be appropriate to the current and projected environments.



Conclusions

- ❖ CPP Reforms of 1997 led to greater accountability for the Plan (more frequent reviews, default provisions if steady-state exceeds legislated rate, etc.)
- ❖ Partial funding of CPP through stabilization of steady-state rate improves intergenerational equity.
- ❖ Current steady-state methodology is sufficient and appropriate for the purpose of long-term financial sustainability of the Plan
 - as long as fund earns reasonable return, and
 - as long as the PayGo rate is not much greater than the steady state rate.





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Thank you.



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