



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



Inspiring Innovation and Discovery

# The Future Sustainability of the Canada Pension Plan and Old Age Security Program

## Private Pensions and Income Security in Old Age: An Uncertain Future

**Where are we now? How secure is the future?**

*Presentation to the SEDAP Conference (Social and Economic Dimensions  
of an Aging Population) at McMaster University, Hamilton*



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16 November 2006

Canada

# Presentation



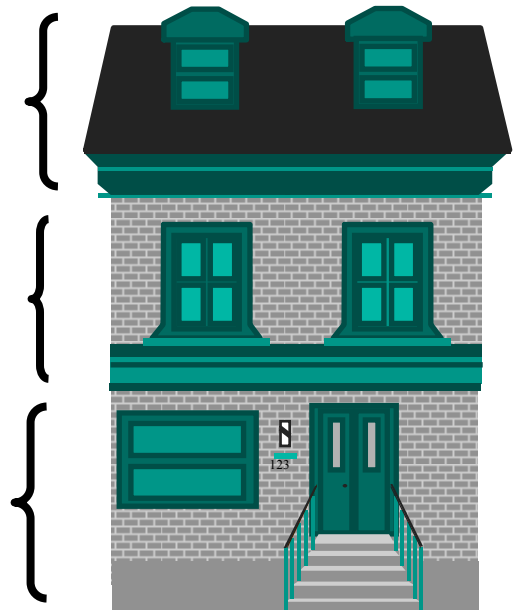
1. Canadian Income Retirement System
2. Canadian and Global Aging
3. CPP Steady-state Funding and OAS Funding
4. Peer Review Process
5. Stochastic Analysis: a tool to measure the volatility and the uncertainty



# Canadian Retirement Security

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

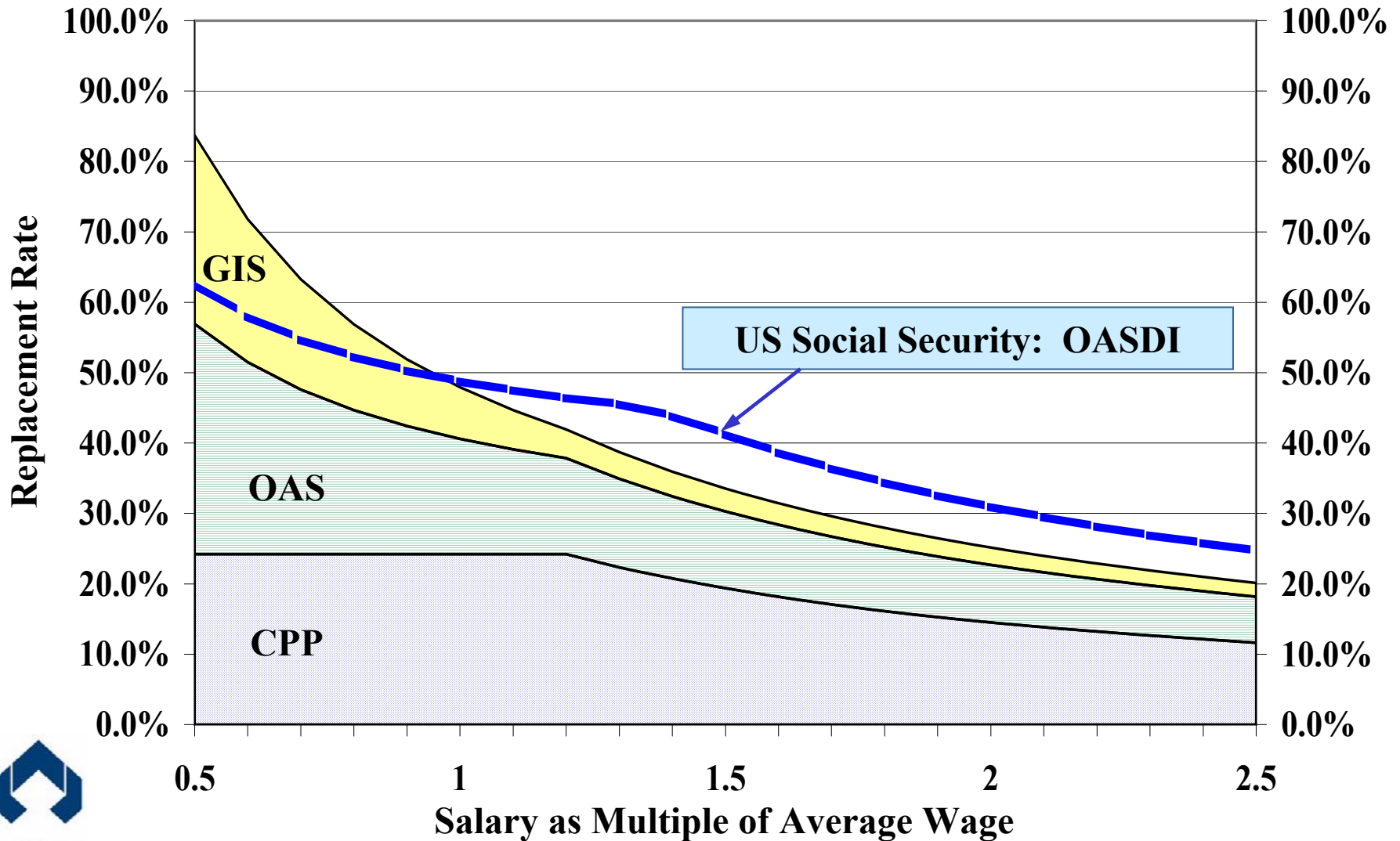
- Full funding (RPP/RRSP)
- Partial funding (CPP/QPP)
- Pay-as-you-go funding (OAS/GIS)



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



# Income Replacement Rate of Public Pension Plans (Canada and United States, 2002)



# Presentation

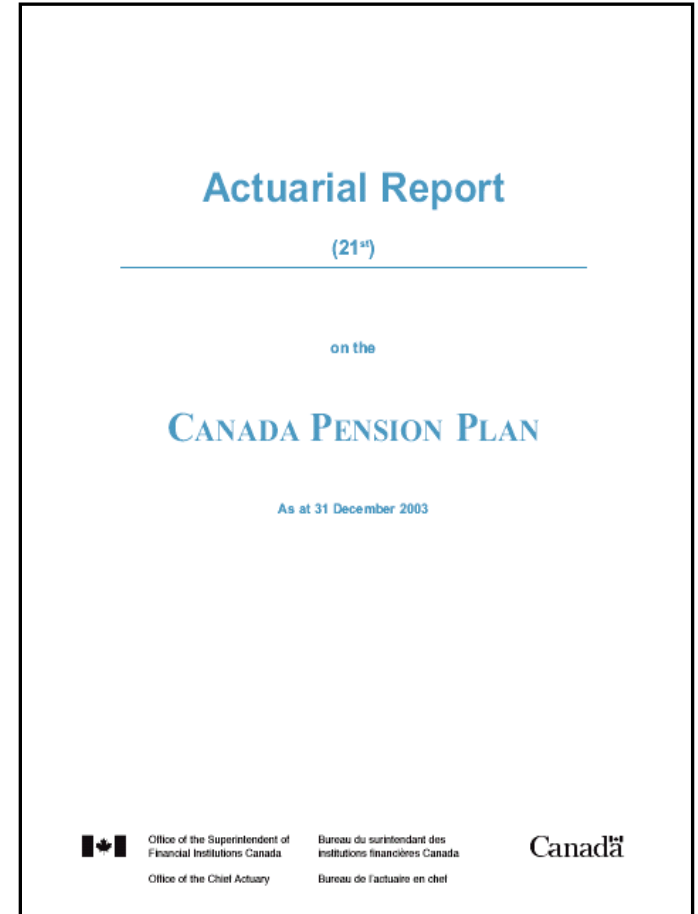


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# Purpose of the CPP Triennial Actuarial Report

- 21<sup>st</sup> 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



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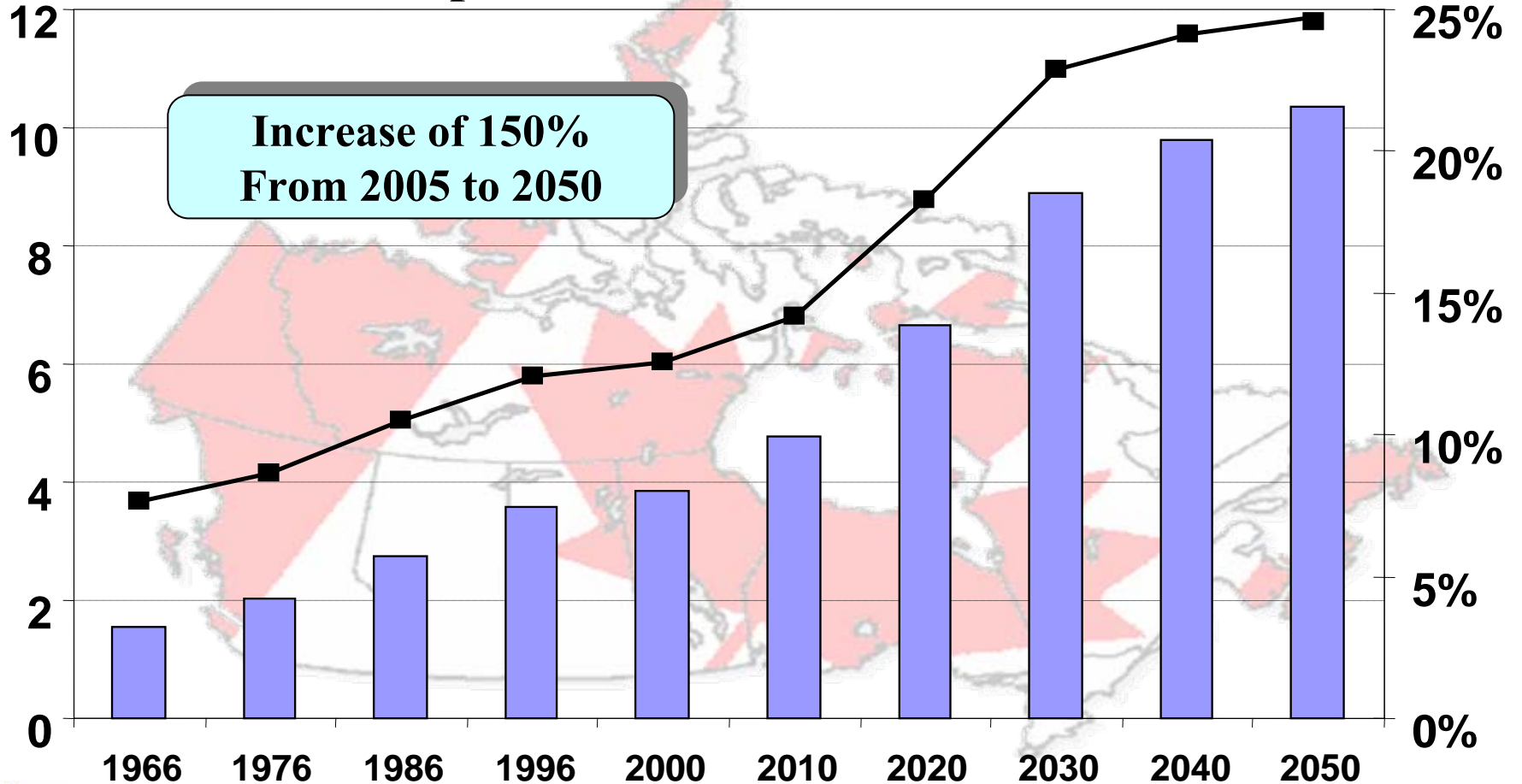
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# Canadian Aging

(in millions)

## Population 65 and over

(% of population)



**Increase of 150%  
From 2005 to 2050**

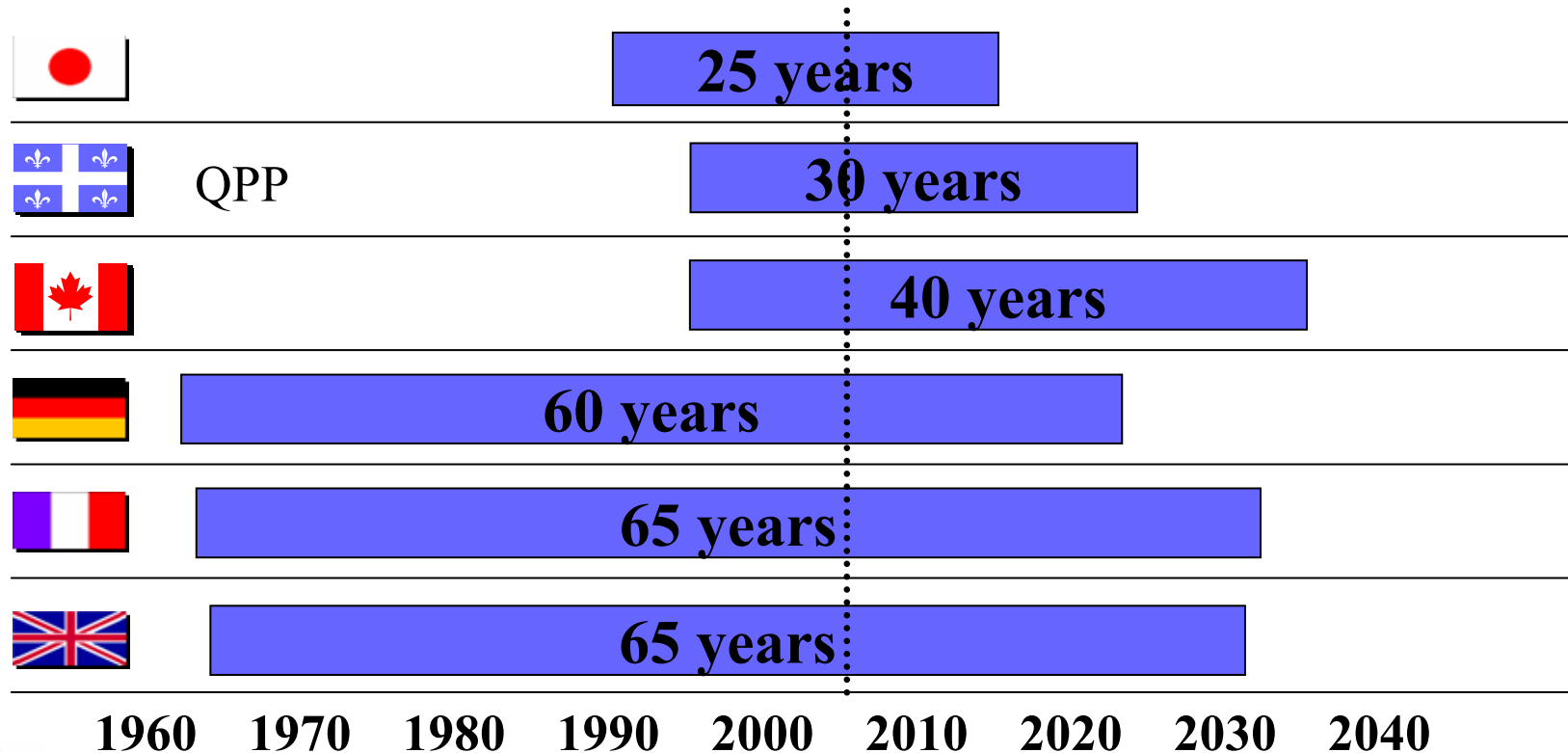
**Increase of 250% for 80+**

■ Number    ■ % of population



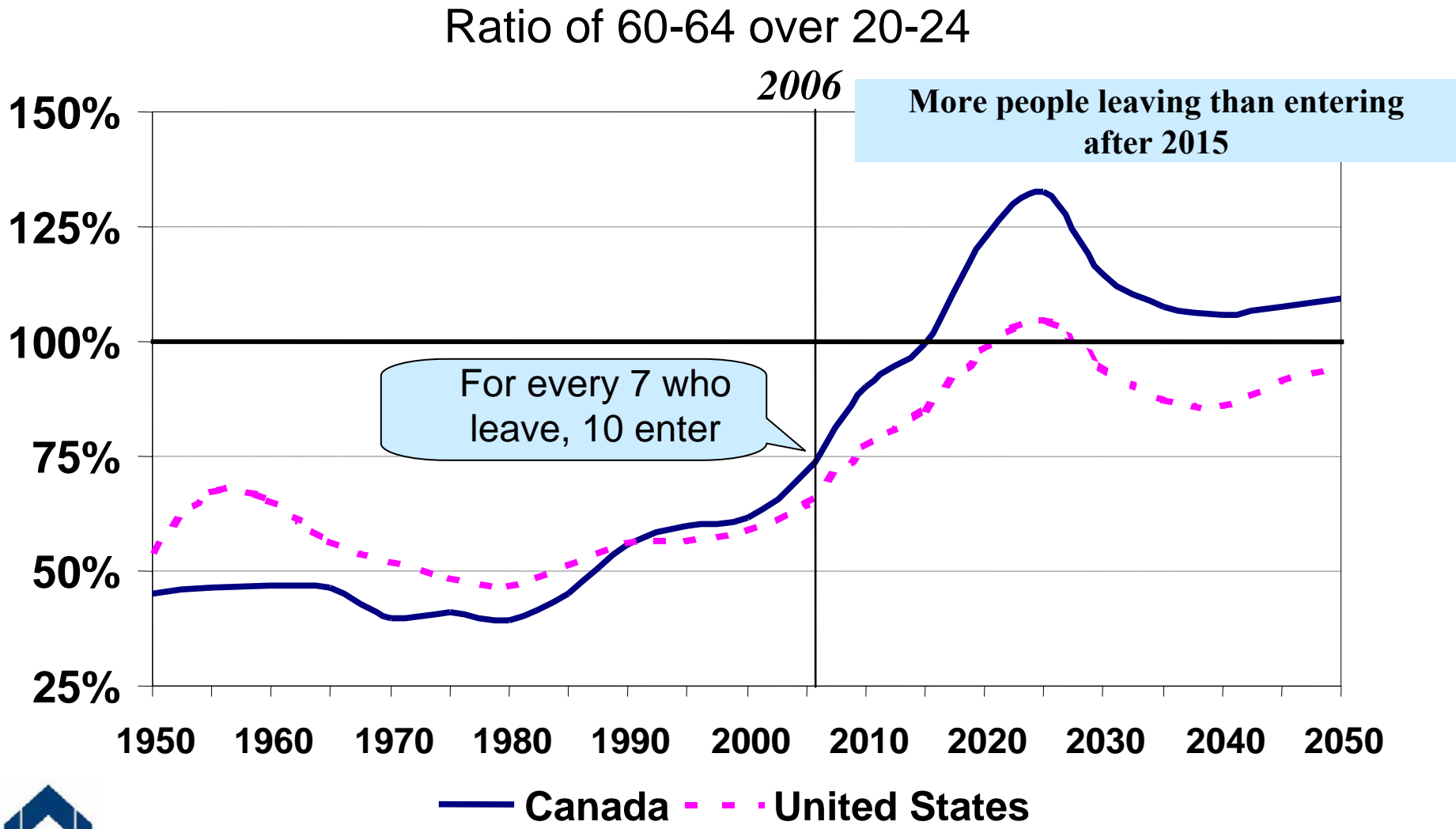
# Global Aging

Projected number of years needed to go from 12% to 24% of 65 and over as a % the total population





# Future Labour Shortage, likely or not?



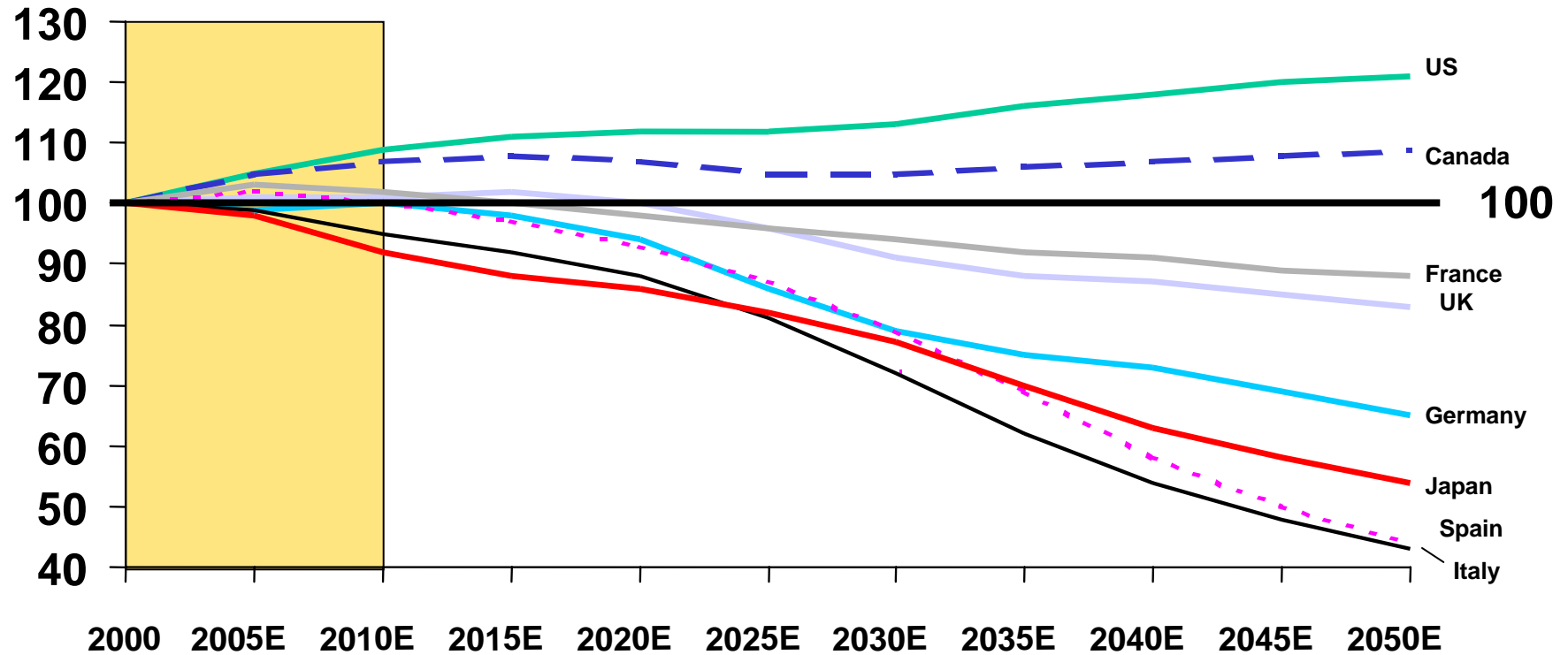
Source for US : United Nations Projections, 2003



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# Working Age Population (ages 20-60) (indexed 2000=100)



Source: UN World Population Prospects



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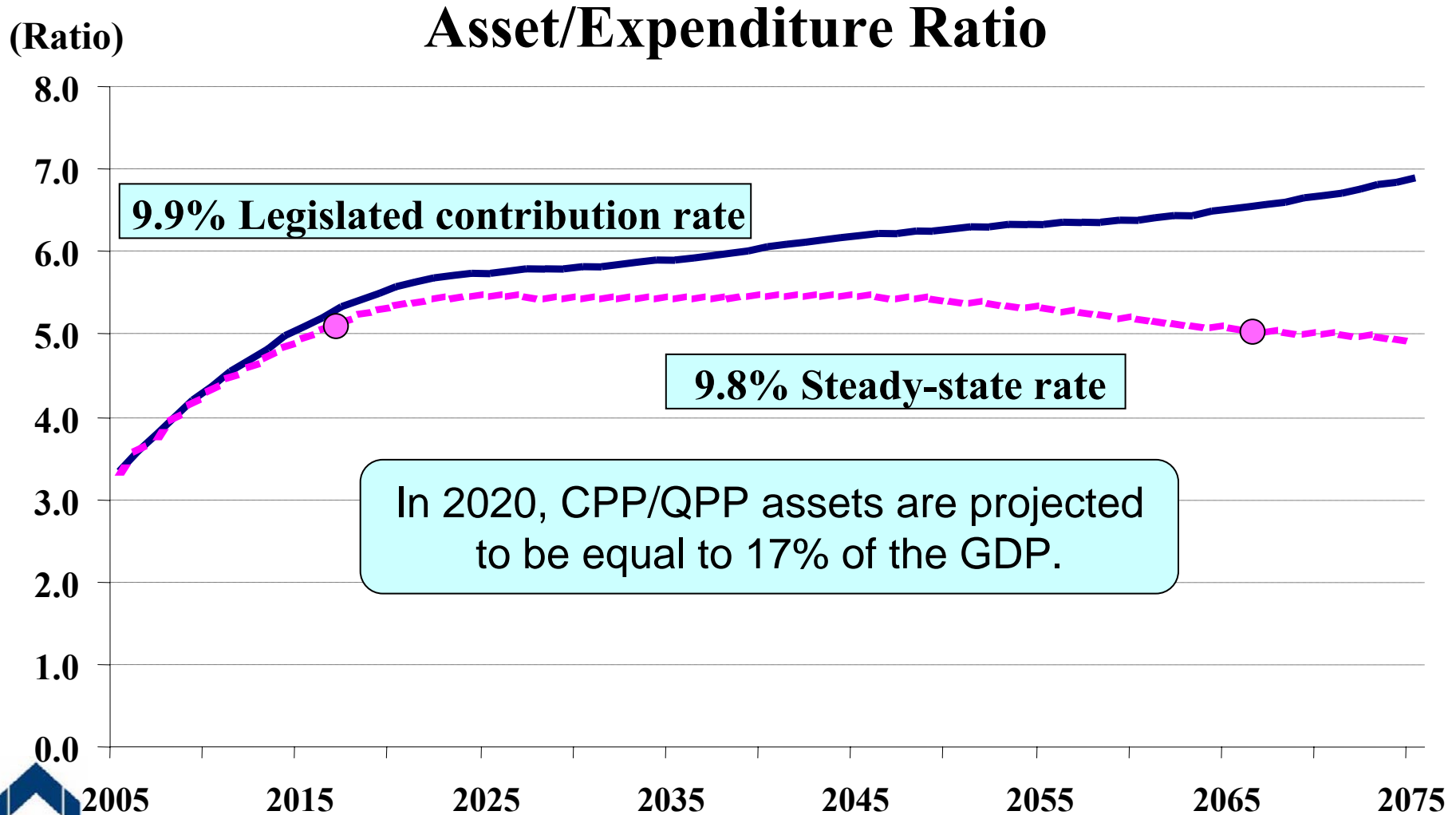
# *How do we position for the aging of the Canadian population? : CPP Steady-state Funding*

## **Effect of the 1998 Amendments**

- Increase the contribution rate by 65% over 6 years (1997-2003) and keep the same rate thereafter
- Moderate the future growth of benefits by 10% on a long-term basis (in 2050).
- Creation of the CPP Investment Board to diversify the CPP reserve fund and increase investment returns ([www.cppib.ca](http://www.cppib.ca))



# CPP Steady-State Funding



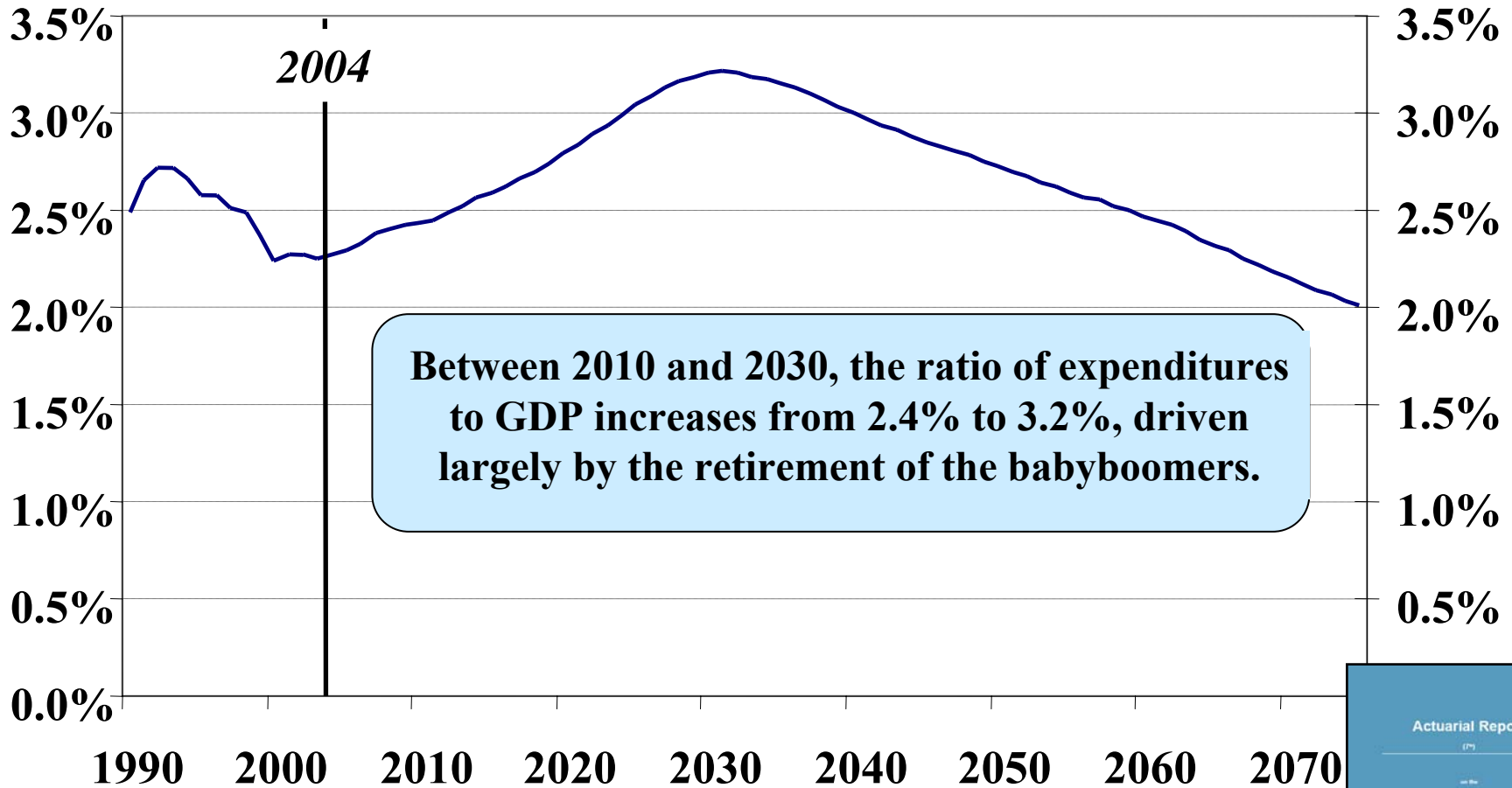
# CPP Steady-State Funding

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



# How do we position for the aging of the Canadian population?

## Evolution of Old Age Security Expenditures in % of GDP



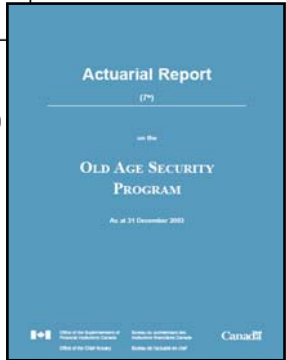
**Between 2010 and 2030, the ratio of expenditures to GDP increases from 2.4% to 3.2%, driven largely by the retirement of the baby boomers.**

**\$28 billion in 2004; \$37 billion in 2010; \$110 billion in 2030**



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# 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 actuarial conclusions reached by the Chief Actuary about the soundness of the CPP.
- and made a series of recommendations.

*March 2005*



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# CPP Actuarial Report as at 31 December 2003

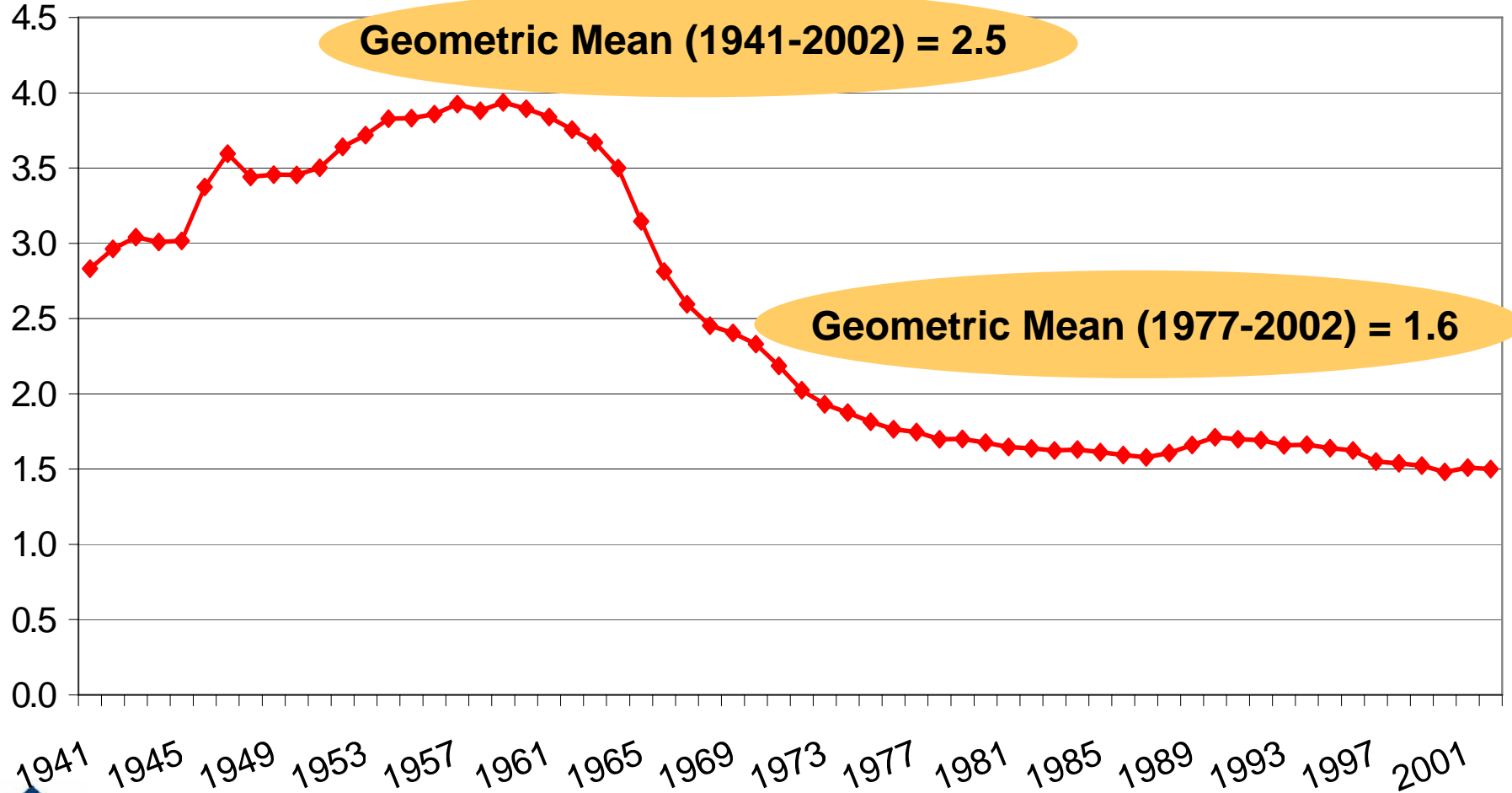
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- Sensitivity Analysis
  - Vary values of 9 key assumptions individually
  - Two tests performed with respect to each assumption
    - High cost: alternative assumption increases steady-state contribution rate
    - Low cost: alternative assumption decreases steady-state contribution rate
- Stochastic Analysis
  - Using historical data, stochastically determine the probability that the actual value for selected assumptions will fall outside the range of potential outcomes determined by the high- and low-cost scenarios



# Historical Fertility Rate

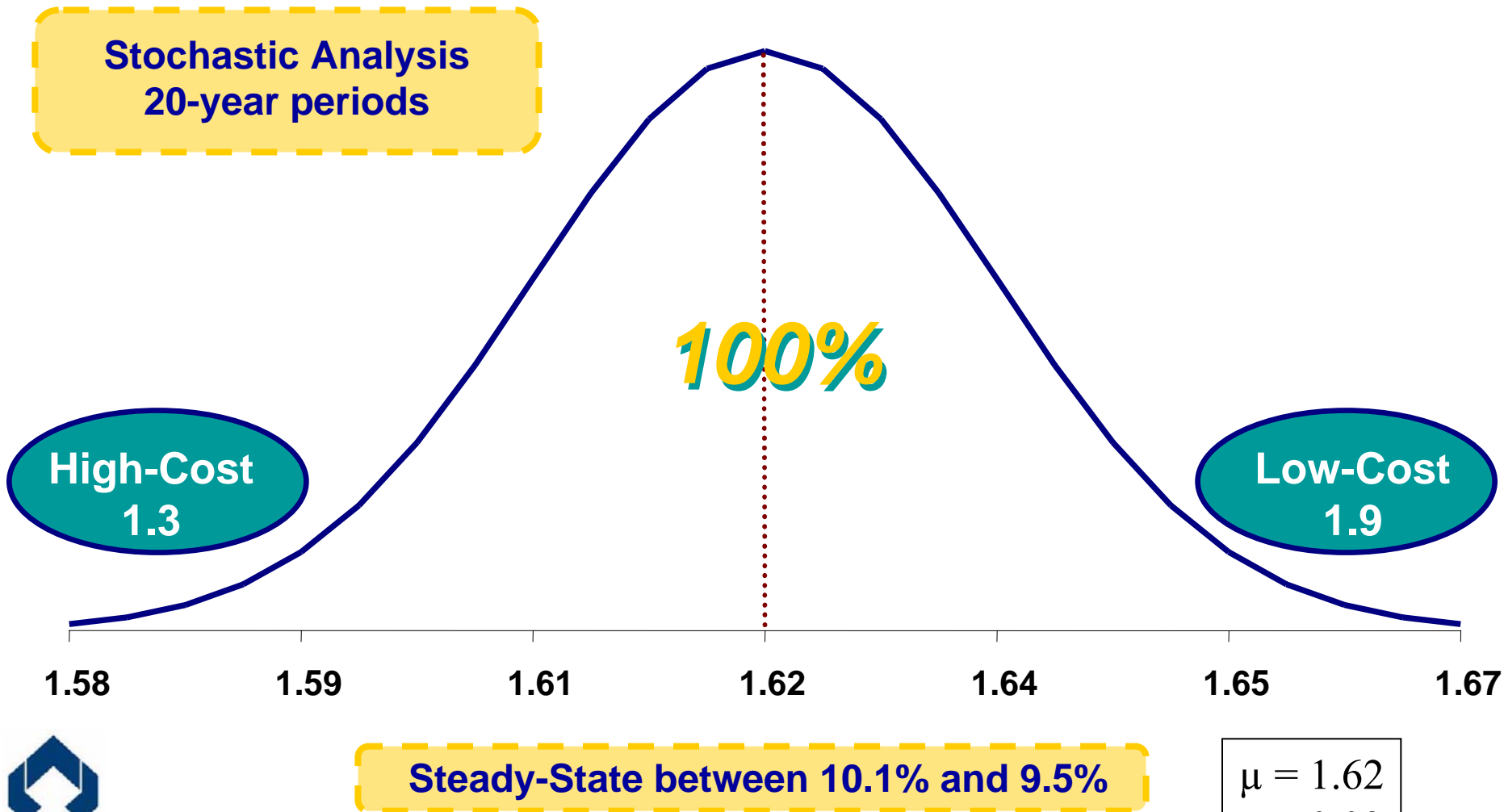
(Children per woman)



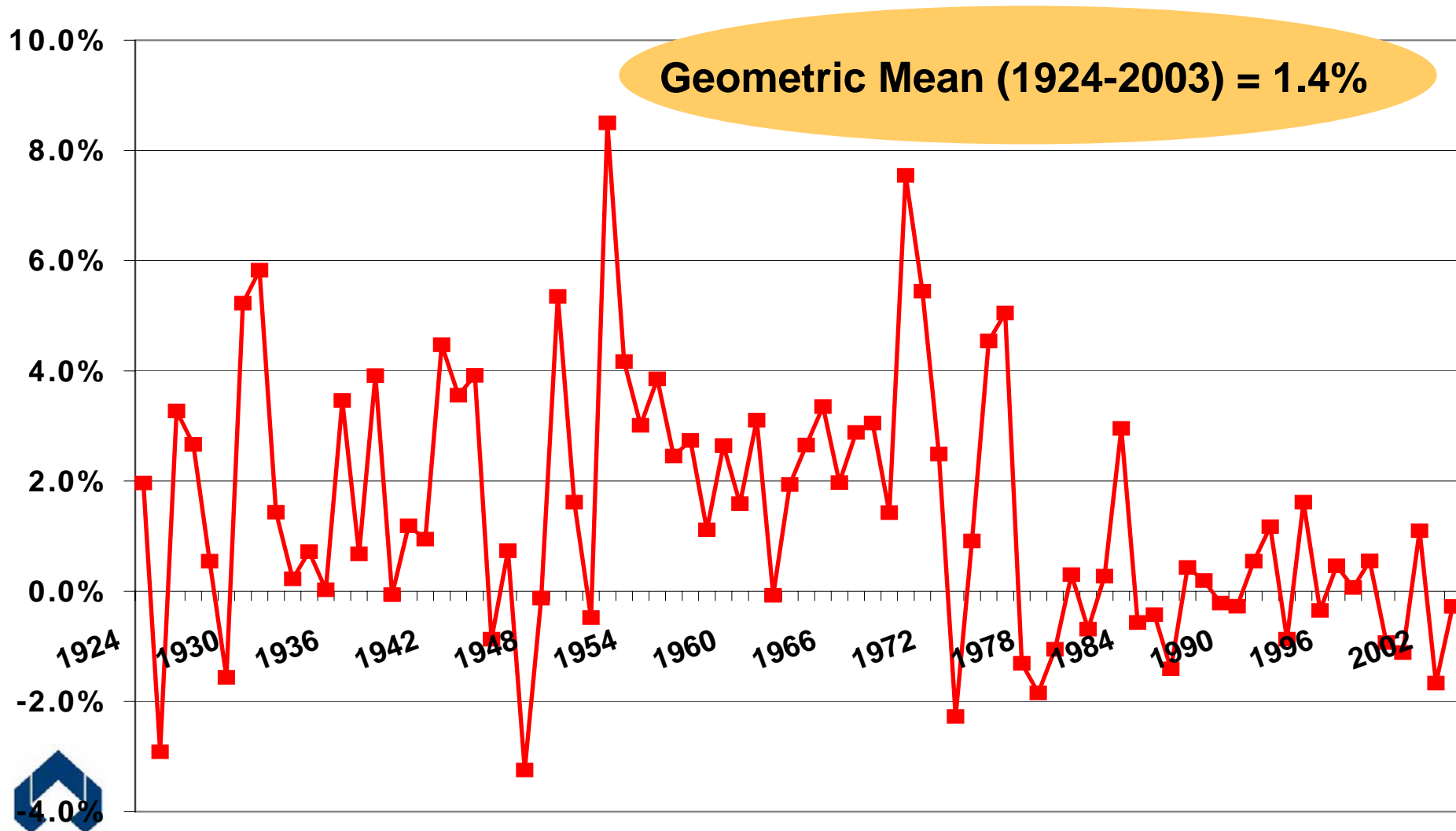
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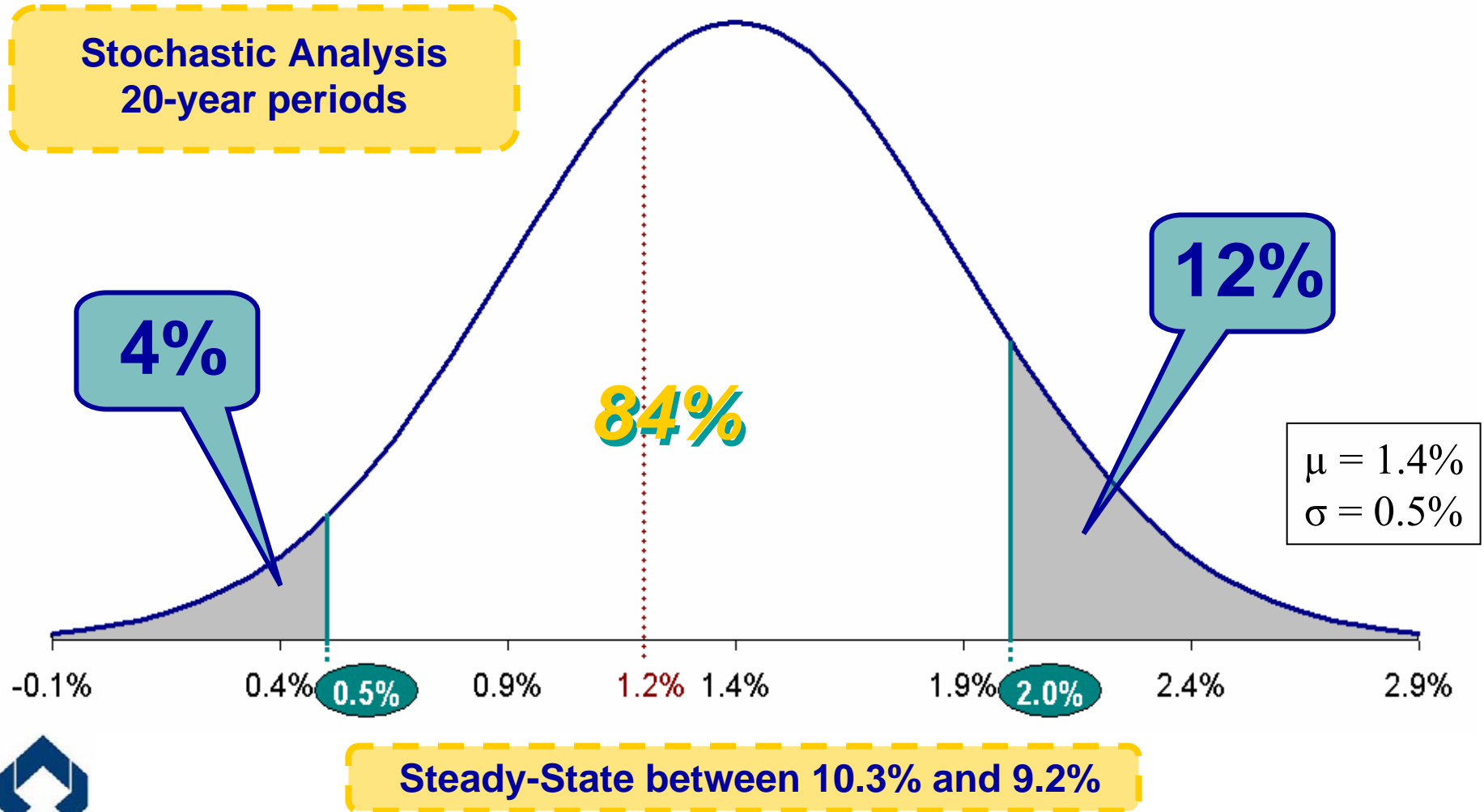
# Fertility Rates (1977-2002)



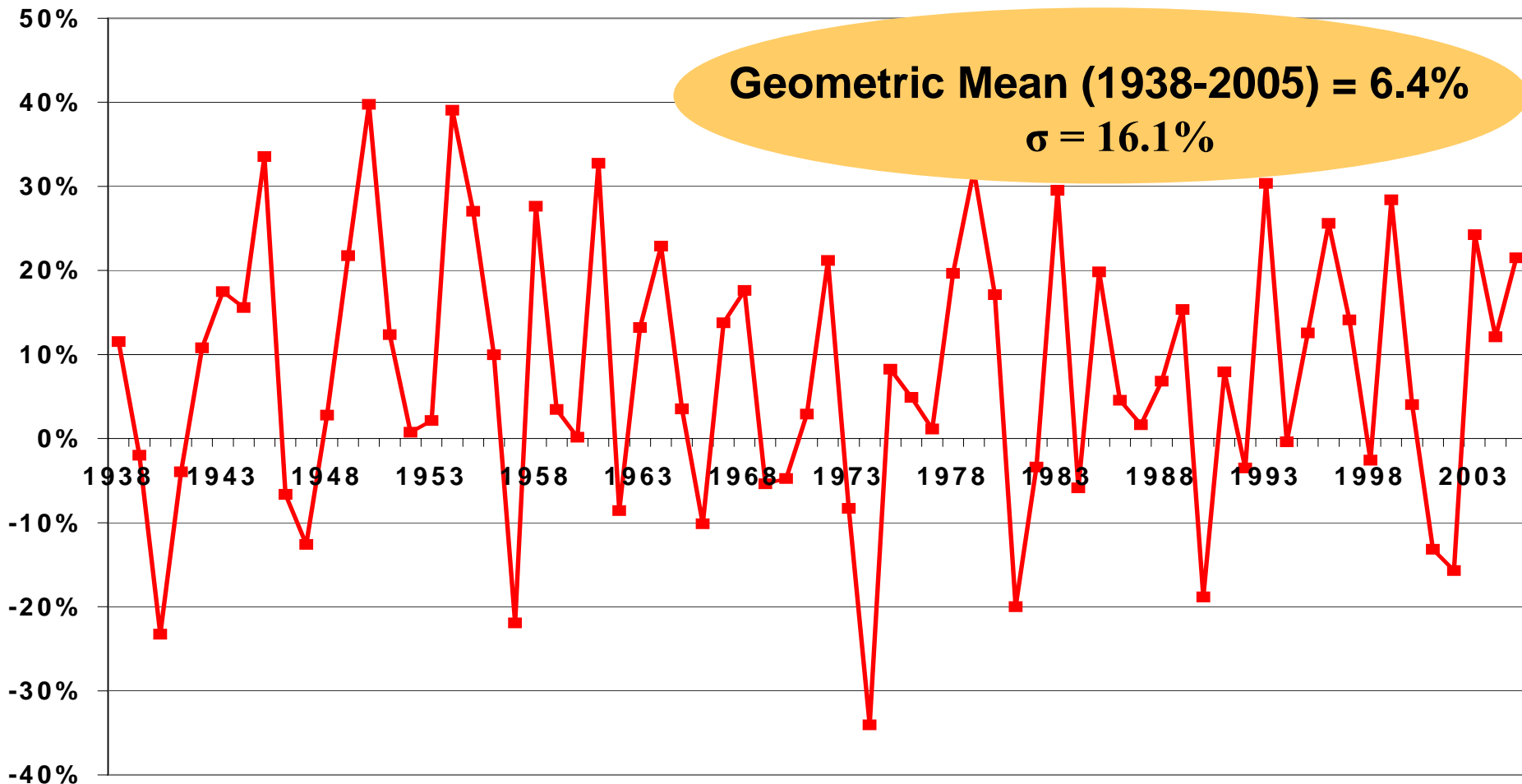
# Historical Real Wages Differential



# Real Wage Differential (1924-2003)

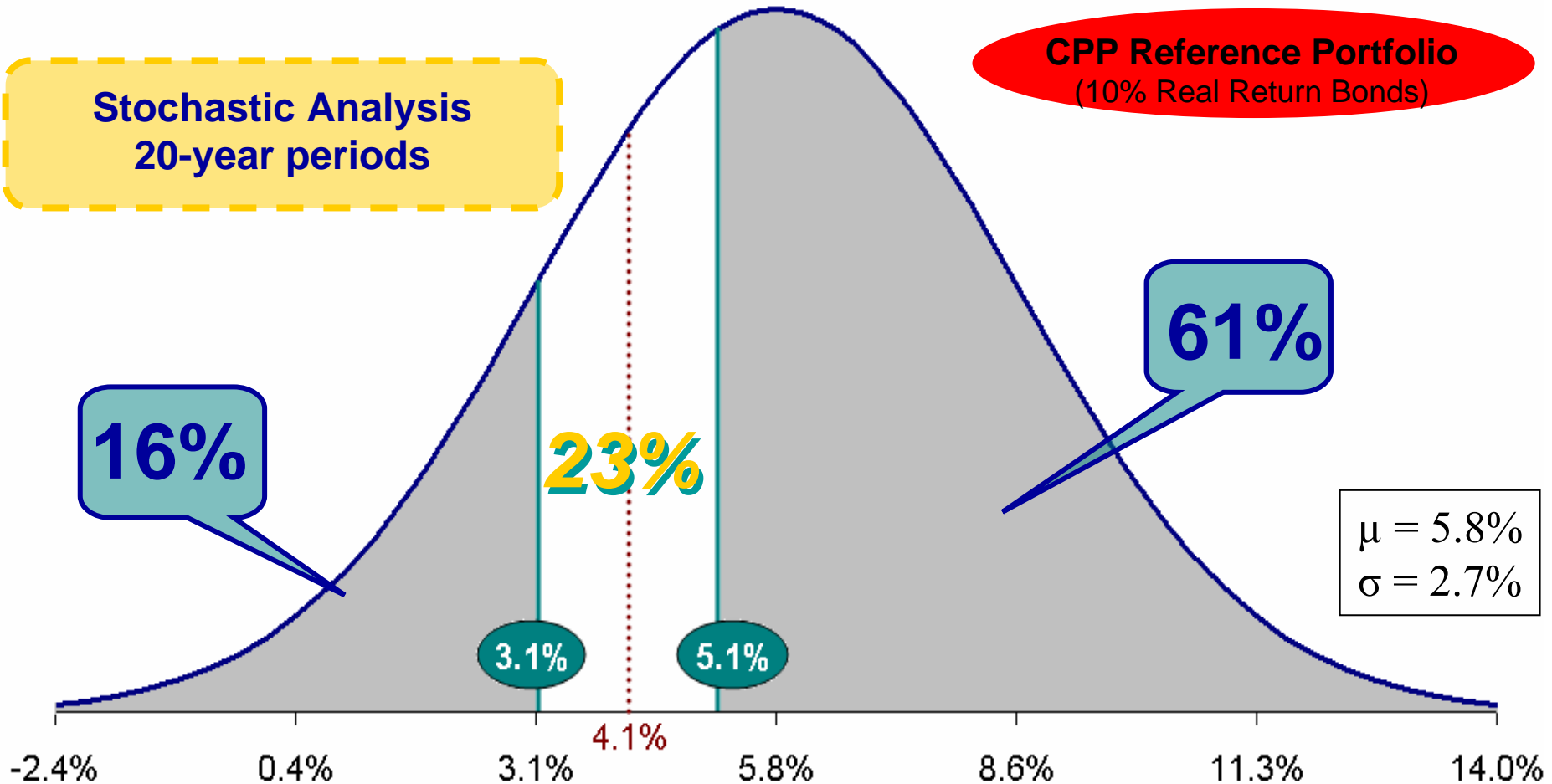


# Historical Canadian Equity Return (1938-2005)

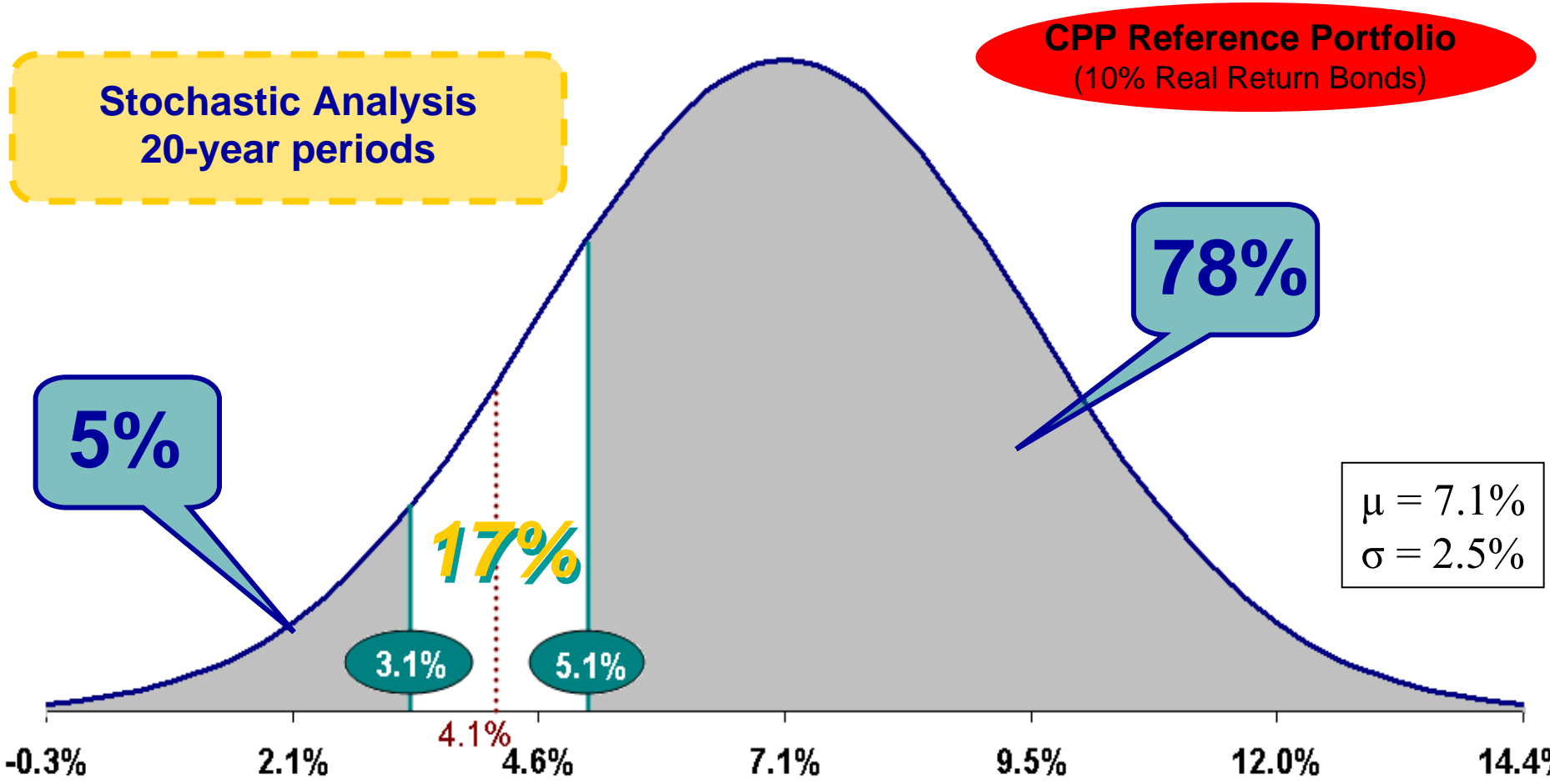




# Real Rates of Return (1938-2005)



# Real Rates of Return (1938-1972, 1983-2005)



# CPP Actuarial Report as at 31 December 2006

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- How uncertain is the certainty? How certain is the uncertainty?
- Stochastic analysis
  - Determine confidence intervals for assumptions such as fertility, migration, wages increases, investment returns
- Uncertainty of results
  - a new section will be added explaining the uncertainty involved in estimating future contribution rates as per the peer reviewers' recommendation.





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*Thank you*



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