



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

# Canada Pension Plan Financing, Actuarial Valuation and Independent Peer Review Process

Korean National Pension Research Institute  
International Seminar, Seoul, 30 September 2008



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Canada 

# Presentation

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- **Financing of Public Pensions**
- Financing the Canada Pension Plan
- Actuarial Valuation of the Canada Pension Plan
- Independent Peer Review of Actuarial Valuations
- Conclusions



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# Financing Public Pensions

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- Primary objective : stabilizing the contribution rate
  - Strengthen the contribution-benefit connection
  - Ensure intergenerational fairness
  - Strengthen fiscal discipline
  - Maintain public confidence
- 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).



# Financing Public Pensions

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- Pure pay-as-you-go basis
  - Contributions equal benefit each year.
  - Cost heavily dependent on the ratio of pensioners to contributors.
  - Aging population will increase cost for future generations.
  - Favourable in high wage growth and low interest environment.
  - Gradual variations in the contribution rate.



# Financing Public Pensions

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- Full funding basis
  - Contributions pay for future benefits.
  - Favourable in low wage growth and high interest environment.
  - Fully funded schemes are less affected by the age structure of the population since each generation pays for its own benefits.
  - Rates of return volatility result in more short-term variations in the contribution rate.



# Financing Public Pensions

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- Partial funding basis
  - Workers pre-fund a portion of their benefits.
  - Favourable in declining wage growth and rising interest rate environment.
  - Aim is to stabilize contribution rate in light of aging population volatile wage growth and investment returns.
  - Contribution rate falls below PayGo rate.



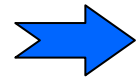
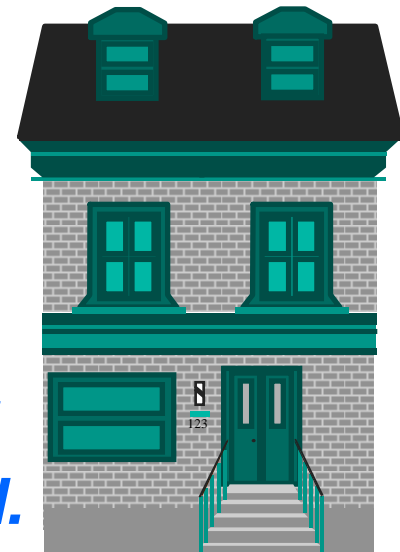
# Financing Public Pensions (Canada)

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**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.***



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# Financing the Canada Pension Plan

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## 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 wanted the CPP preserved



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# Financing the Canada Pension Plan

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## 1997 Reforms

- Steady-State funding of existing Plan and Full funding of future benefit improvements.
- 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)



# Financing the Canada Pension Plan

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Minimum contribution rate is sum of:

- The steady-state contribution rate. 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.
  - Regulation requires that the A/E ratio should be equal in the 13th and 63rd year after the valuation date.
- Full funding rate of future benefit improvements.



# Financing the Canada Pension Plan

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## Default Provisions

- If the legislated contribution rate is lower than the minimum 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.



# Financing the Canada Pension Plan

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- The current legislated contribution rate is 9.9%.
- The minimum contribution rate is 9.82%.
- If the legislated contribution rate is higher than the minimum rate, the funding status of the plan will increase over time.
- The higher this rate is set above the minimum rate, the faster the Plan will become more funded.



# Financing the Canada Pension Plan

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## **Sources of Income**

- CPP follows the 70:30 Rule (Contributions : Investment Earnings).
- When the A/E ratio reaches approximately 5.5, 30% of revenues will come from investment earnings.
- Sources of income of fully-funded pension plans are the opposite (the 30:70 Rule).

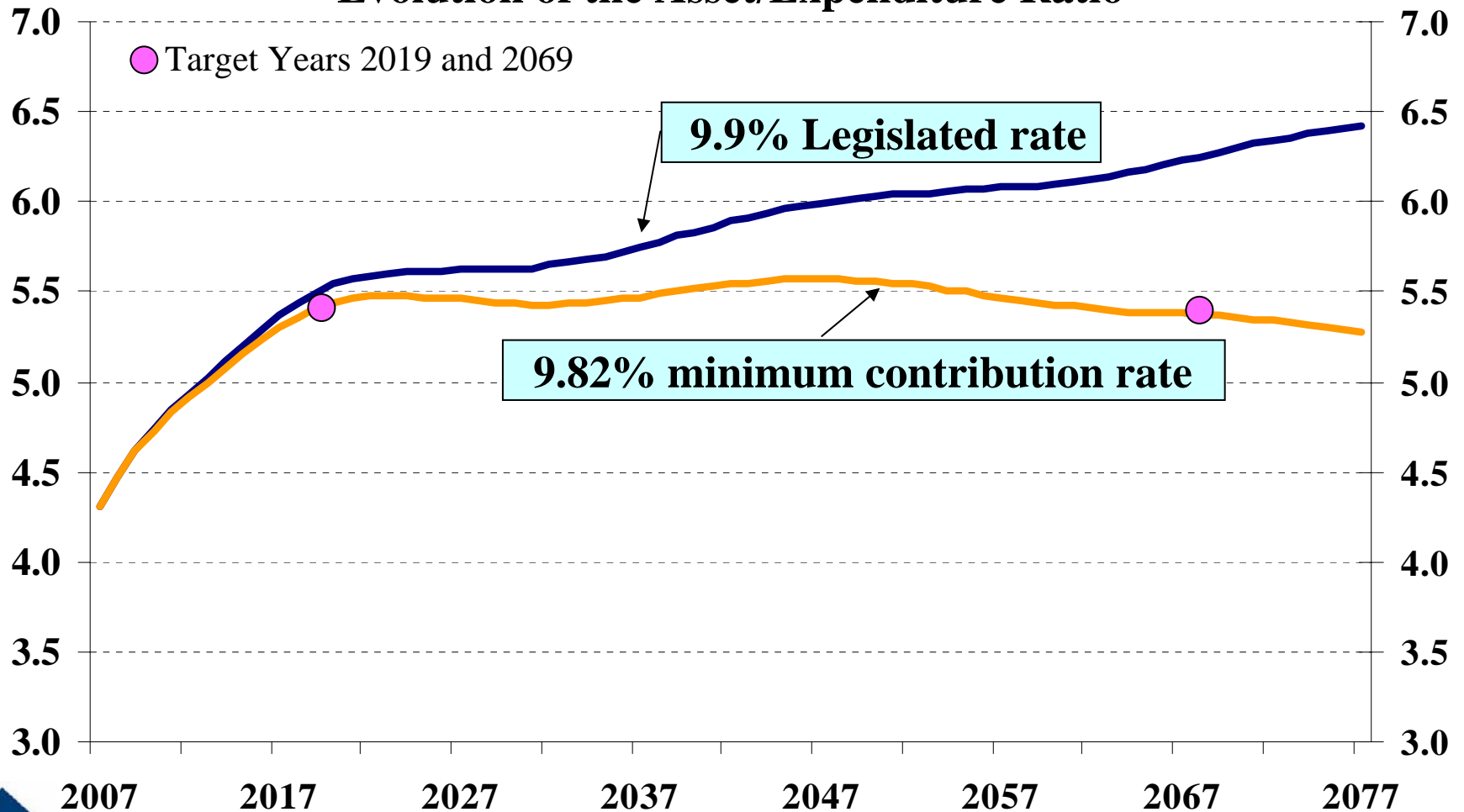
## **How annual benefits are paid**

- From 2007 to 2019, contributions exceed benefits.
- Once the A/E ratio reaches about 5.5, annual contributions will equal approximately 90% of annual benefits paid.
- In 2030, 27% of investment earnings is required to pay benefits.



# Financing the Canada Pension Plan

## Evolution of the Asset/Expenditure Ratio



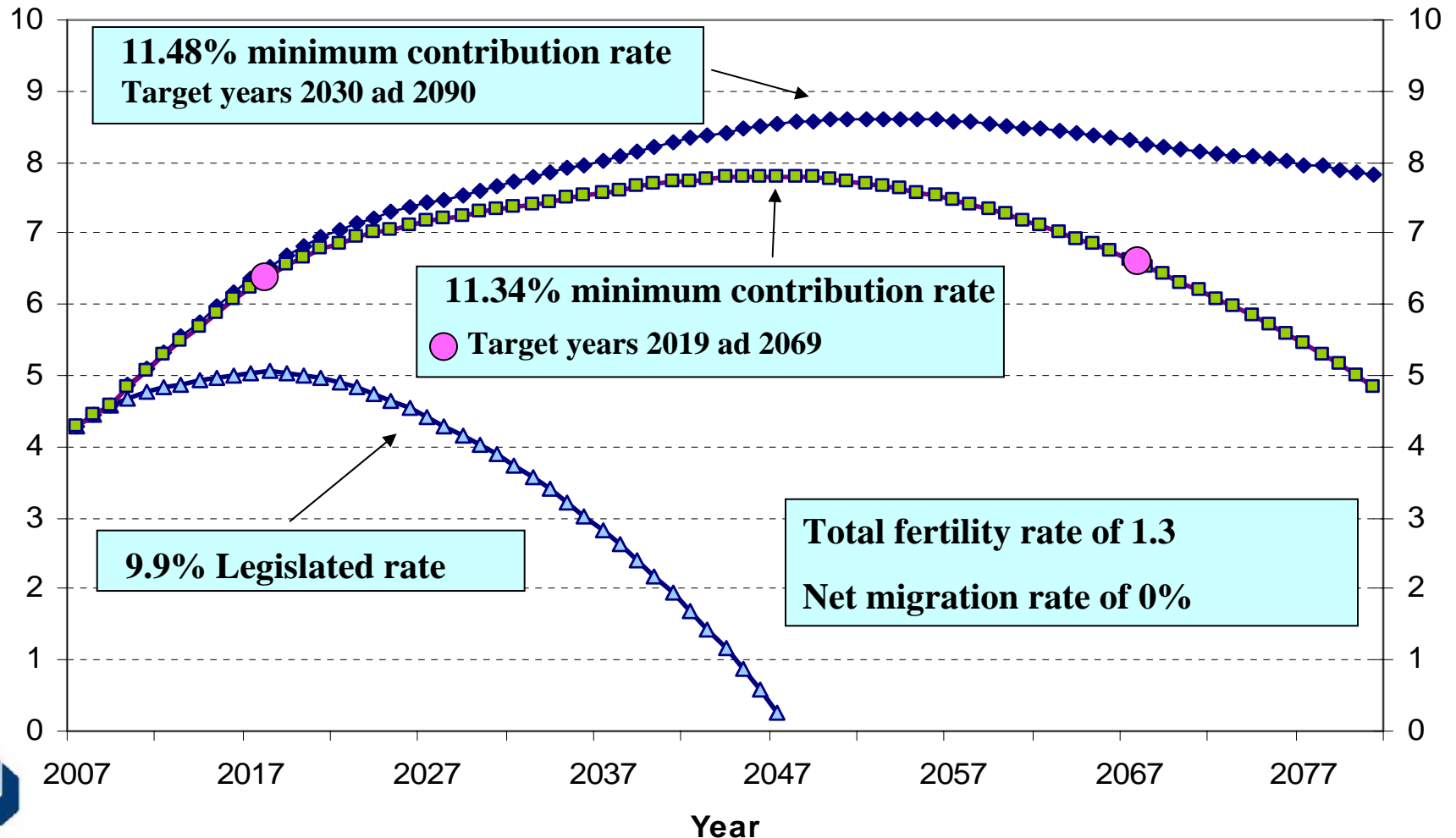
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# Financing the Canada Pension Plan

(assuming South Korea's Current Demography)

## Evolution of the Asset/Expenditure Ratio



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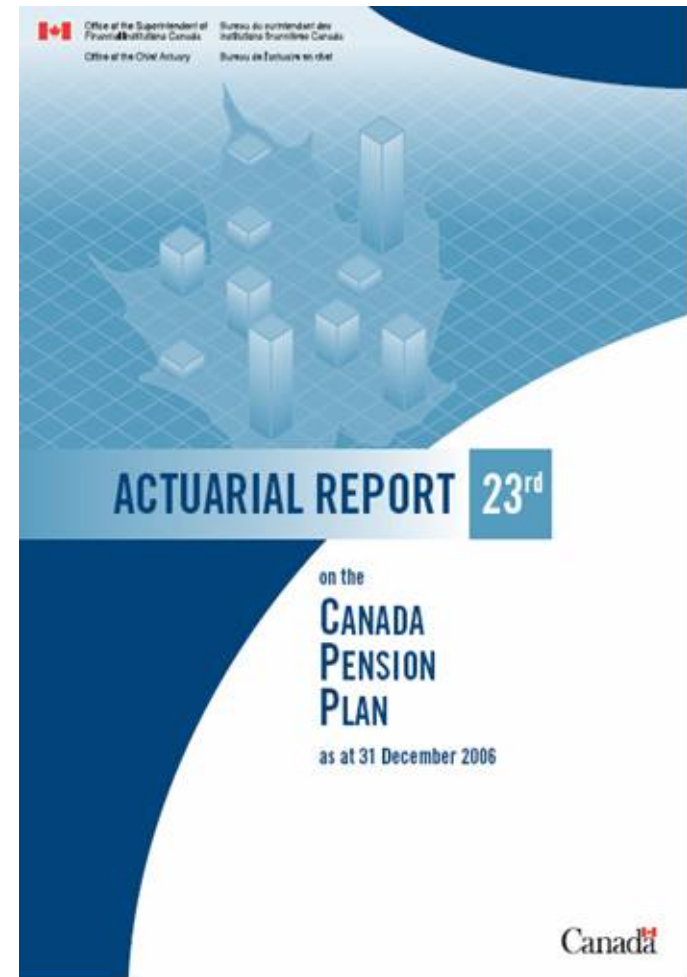


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# Actuarial Valuation of the CPP

- Tabled by the Minister of Finance on 29 October 2007
- Inform on the current and projected future financial status of the Canada Pension Plan
- Calculate the minimum contribution rate



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# Actuarial Valuation of the CPP

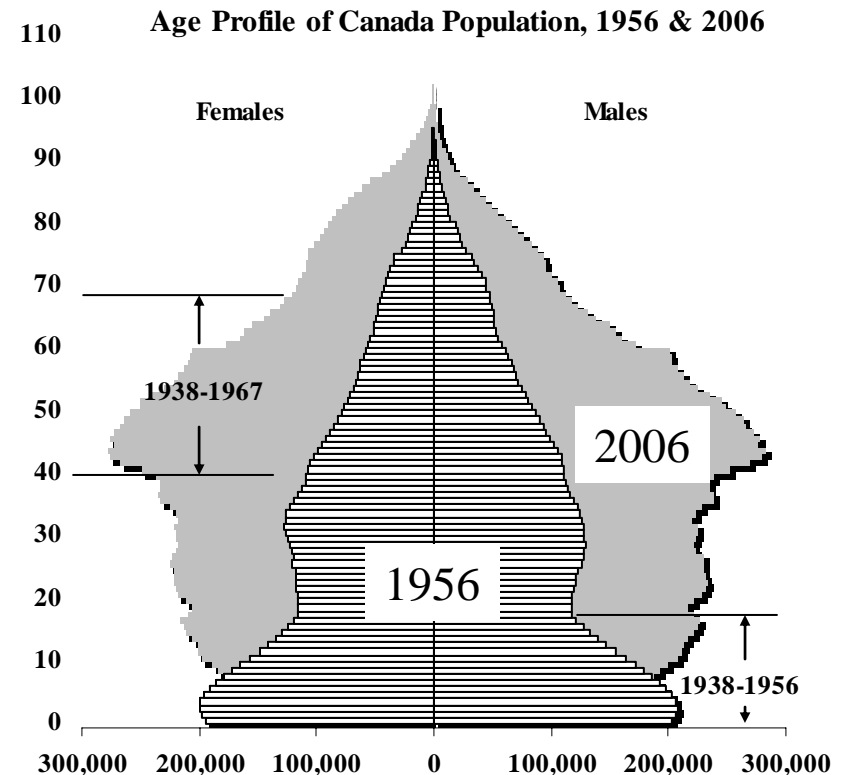
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- Seminar organized to get opinions from a wide range of experts in the fields of demography, economics and investments.
- Federal and provincial officials attended these seminars.



# Demographic Assumptions

- Fertility (Number of births)
- Migration
- Mortality (Life expectancy)
- Disability Rates } Benefit Assumptions
- Retirement Rates }



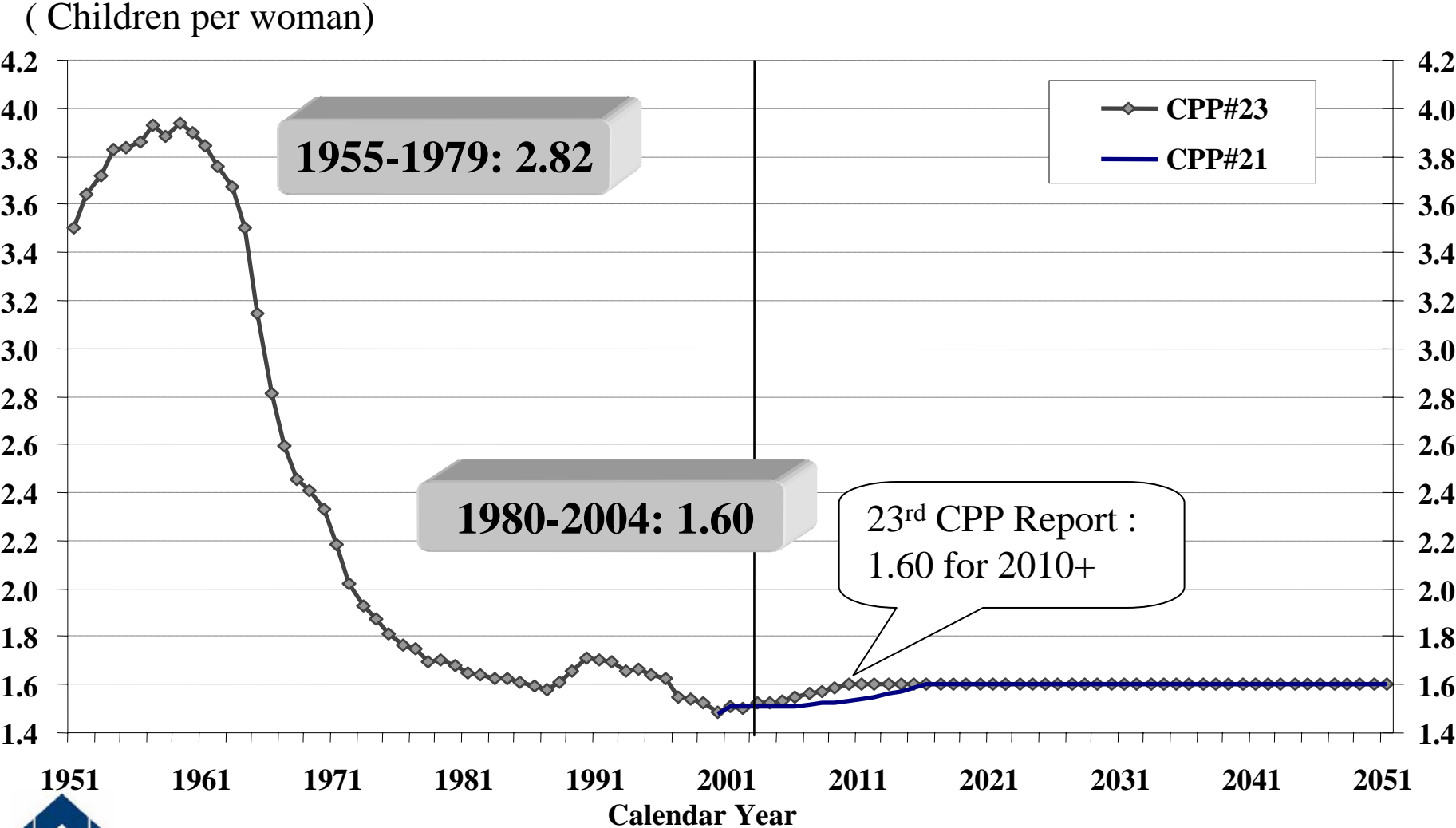
Sources: *Statistics Canada, U.N. population projections, CPP/QPP Seminars, Human Mortality Database, SSA 2006 U.S. Trustees Report, World Population Reference Bureau, HRSDC*



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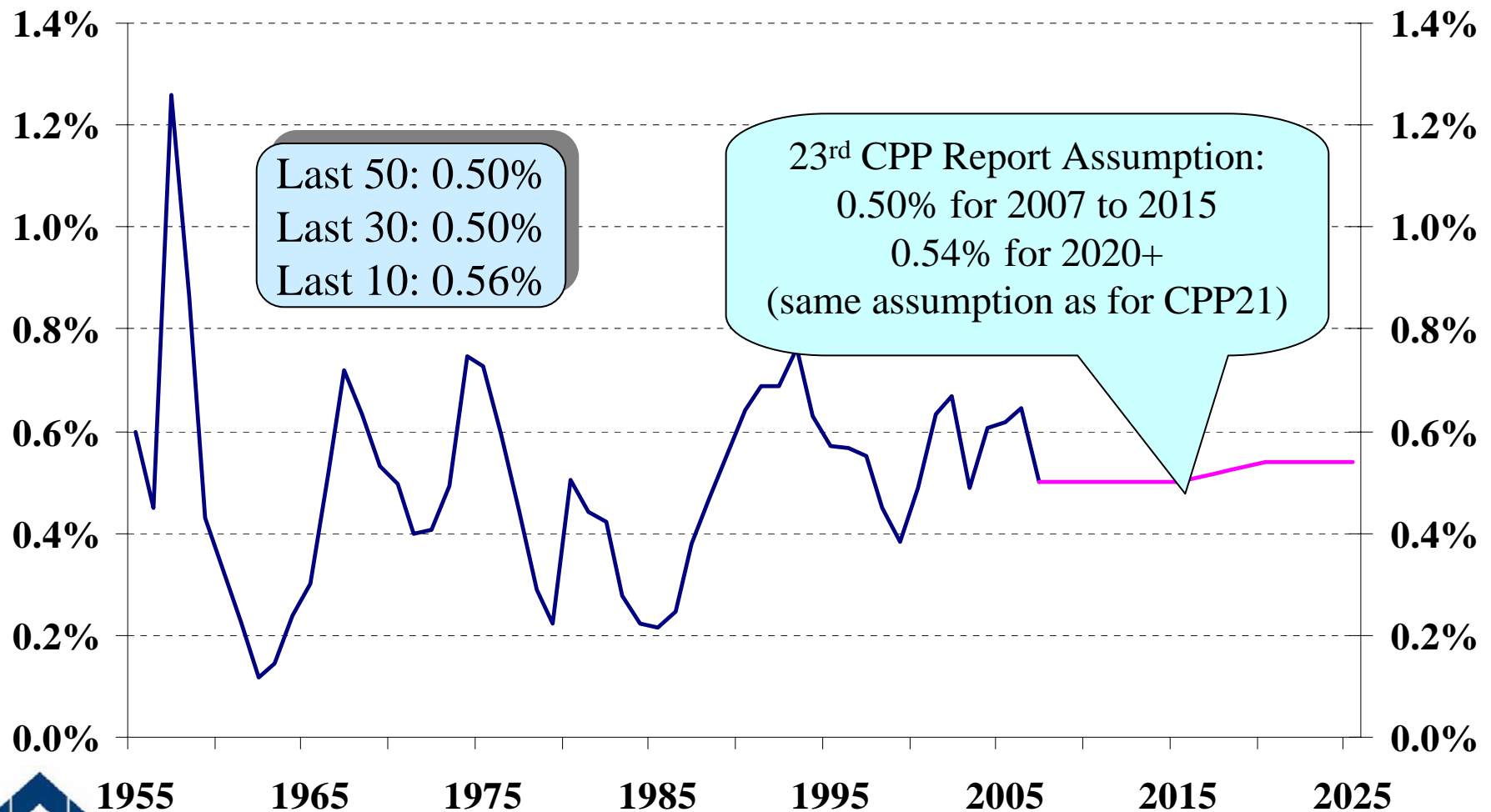
# Fertility Rate



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# Net Migration Rate

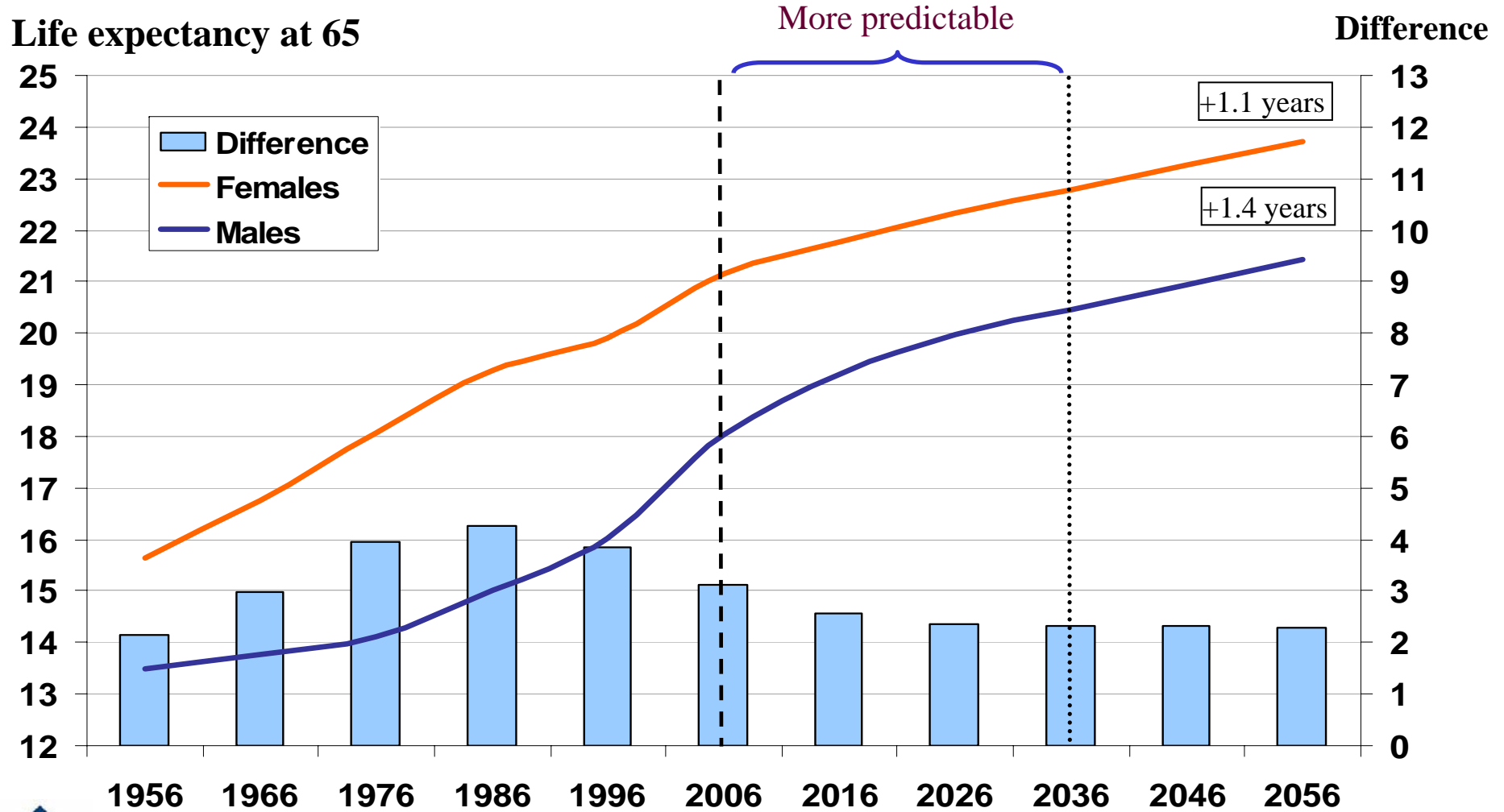


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# Increase in Life Expectancy at 65\*

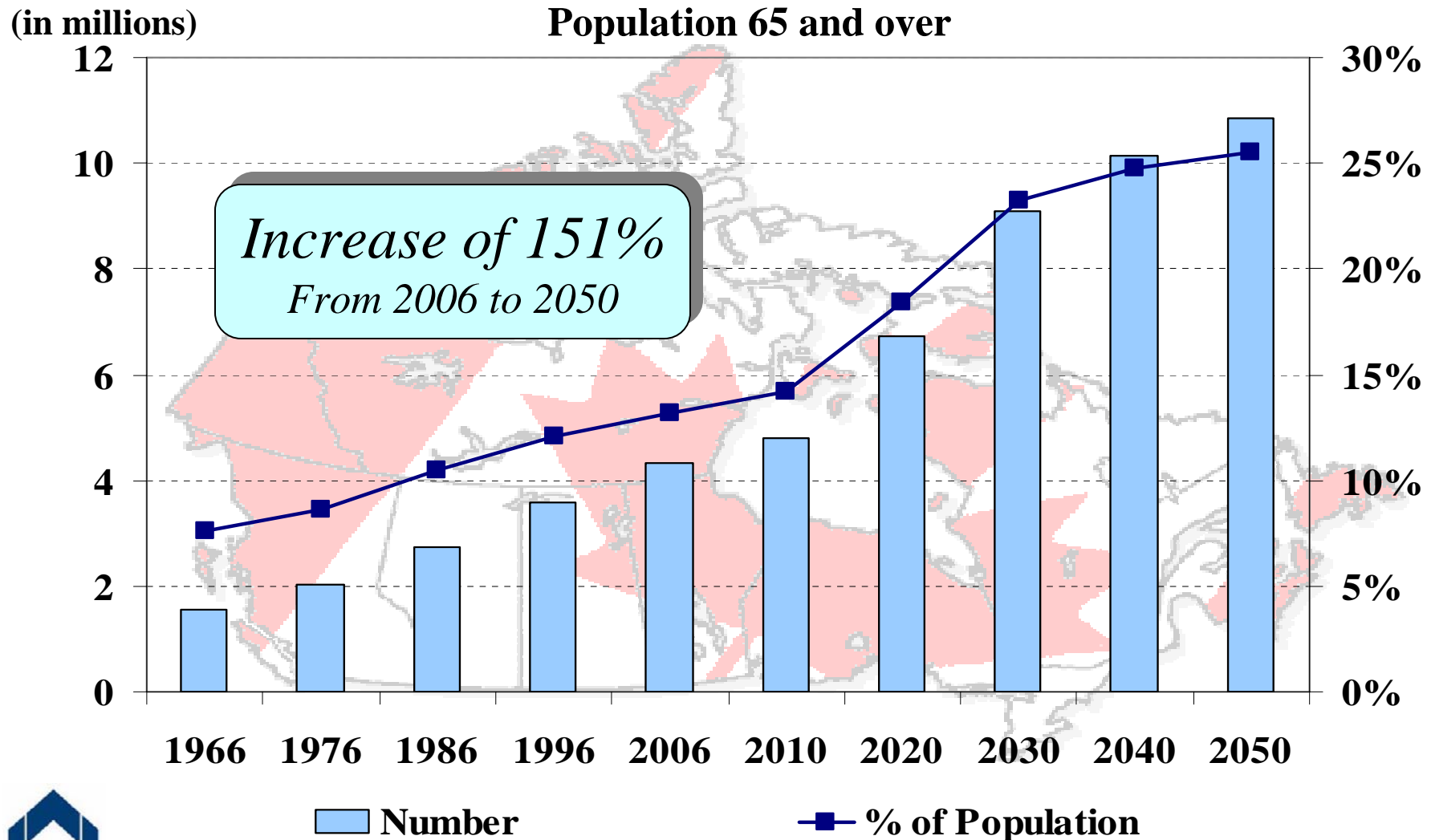
\*Life expectancies shown are without assumed future mortality improvements.



*More contributors are expected to reach the retirement age of 65.*

*Retirement beneficiaries are expected to receive their benefit for a longer period.*

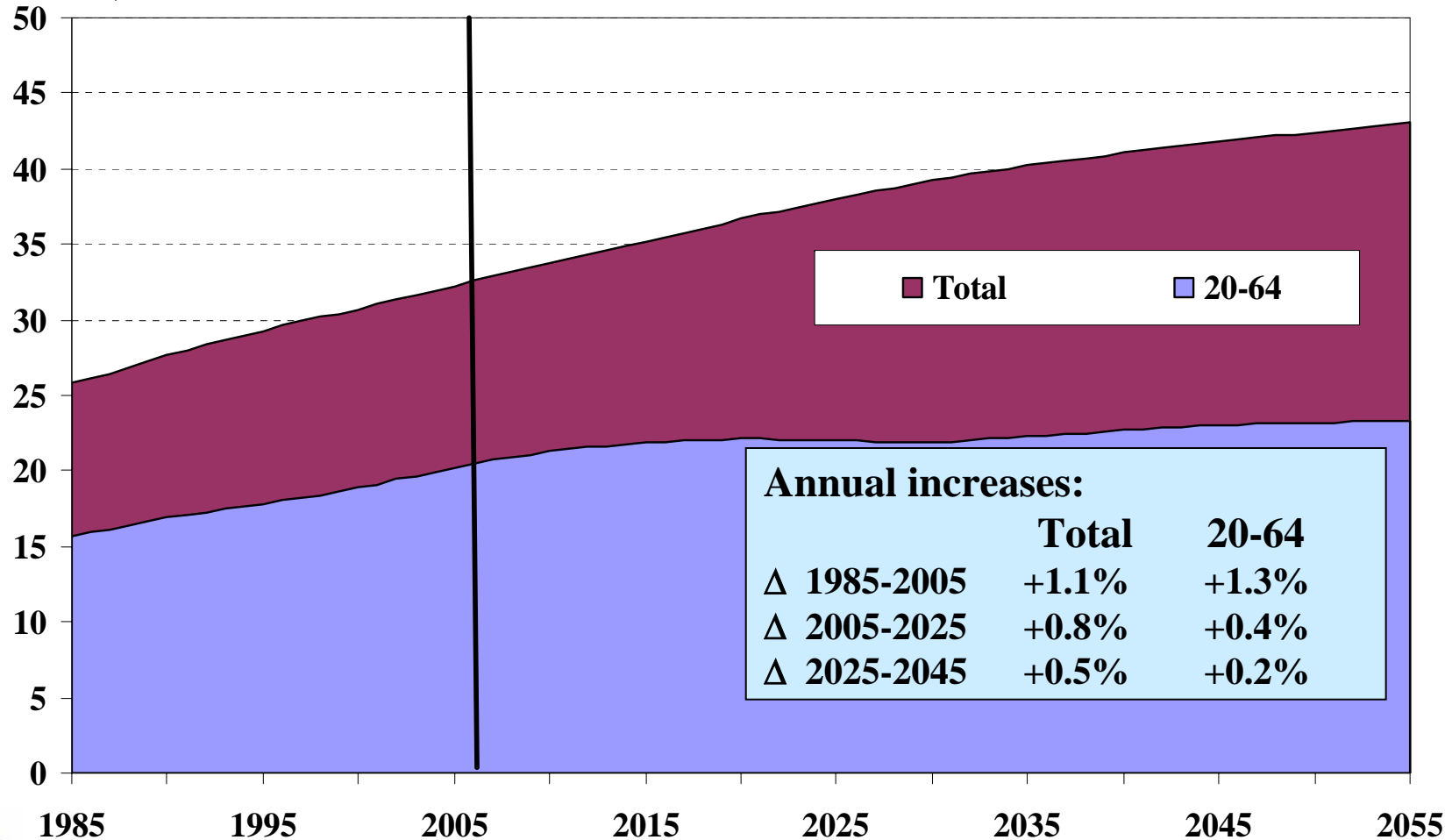
# Aging of the Canadian Population





# After 2025, almost all of the projected population increase will come from migration

(in millions)



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# Economic Assumptions

- Participation rates
  - Employment increase (Job creation rate)
  - Unemployment rate
  - Inflation rate
  - Increase of average employment earnings
  - Interest rate and rate of return by asset class
- } # of Earners

Sources: *Historical Trends, Recent Experience, PEAP (U of T), Conference Board, Department of Finance, CIA Report on Canadian Economic Statistics, Watson Wyatt Economic Expectations Survey, Canada Revenue Agency, Bank of Canada, CPP/QPP Seminars, CPPIB*

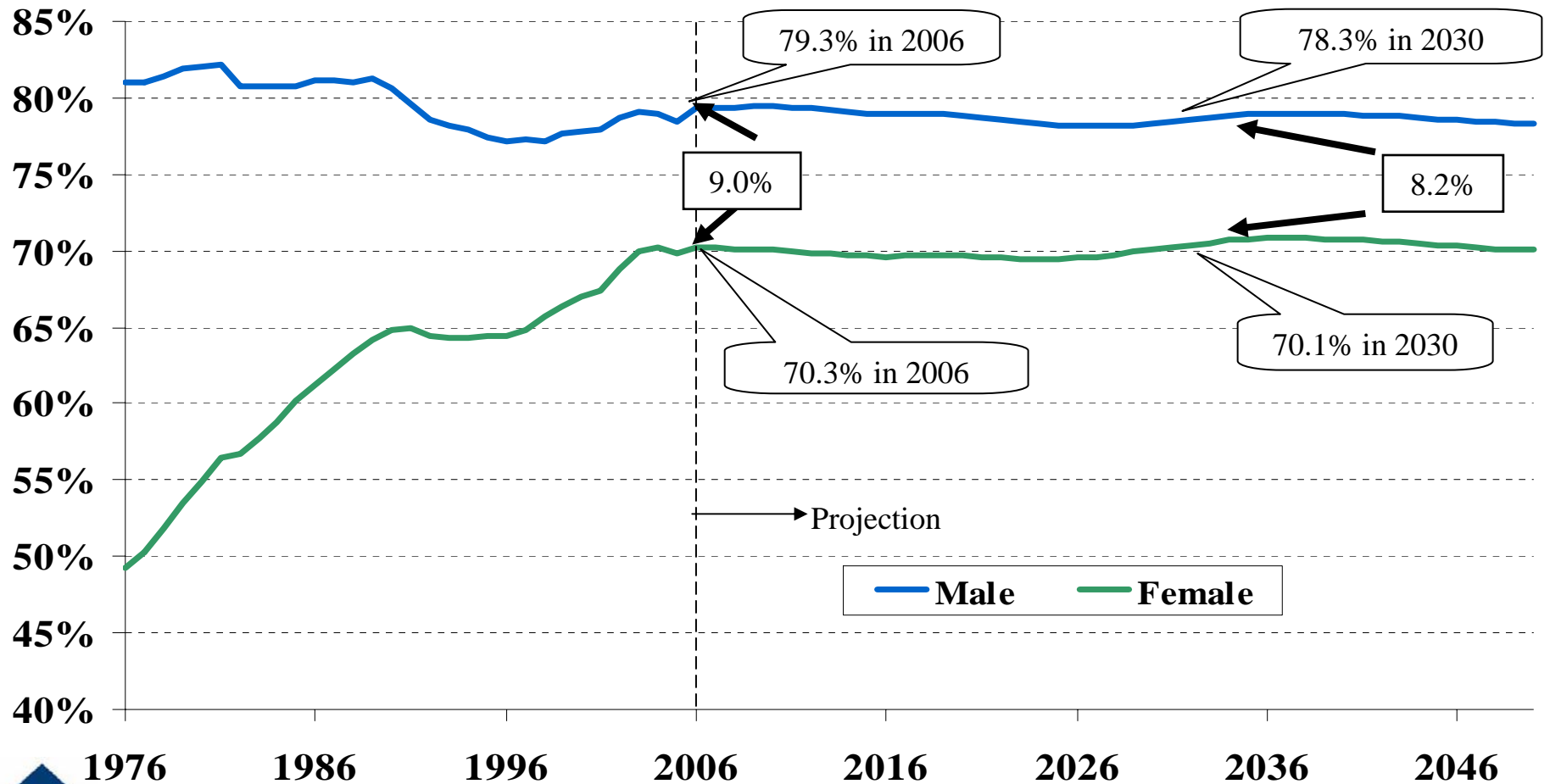


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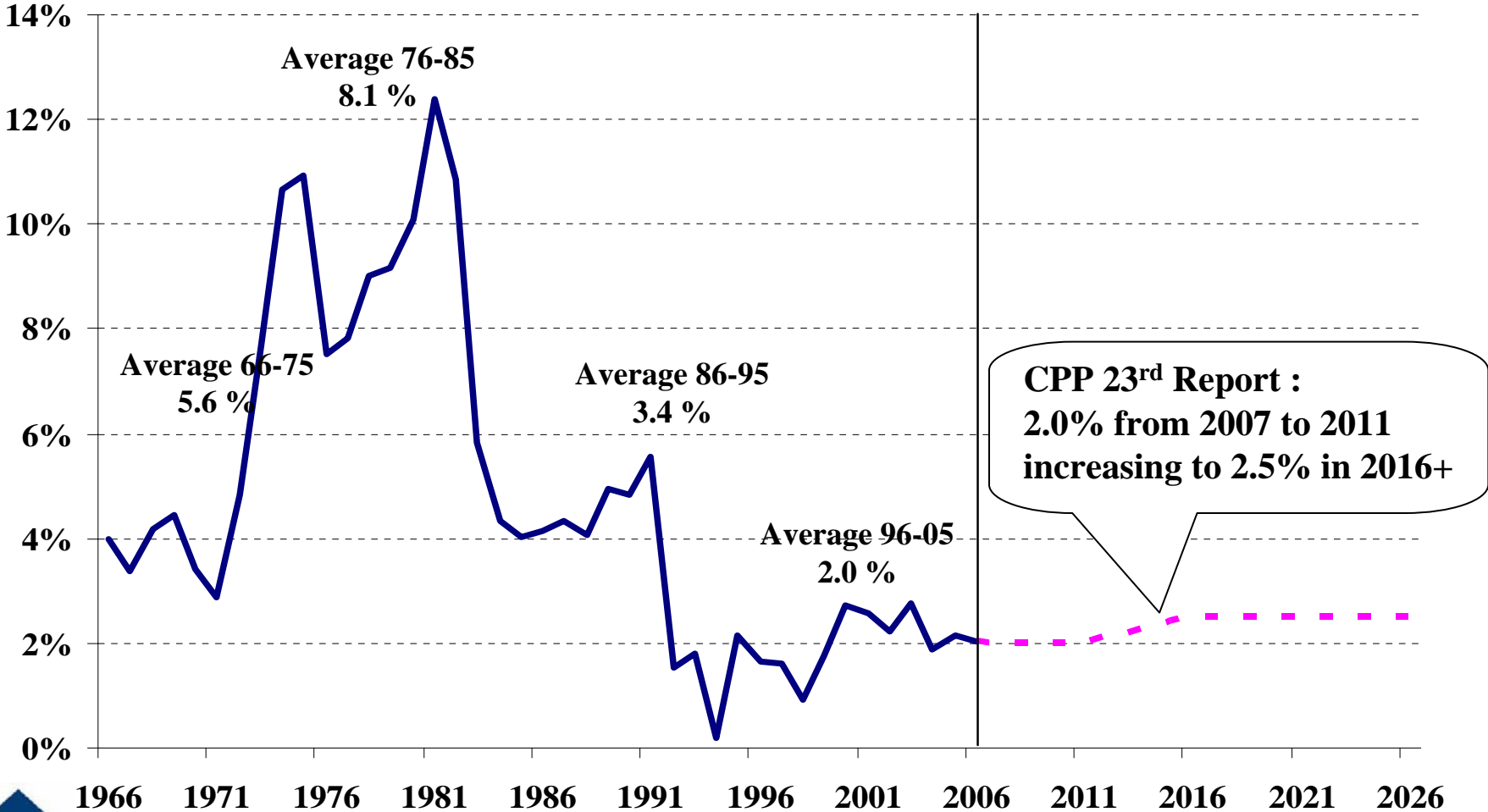
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# Gap between male and female participation rates will continue to decrease but at a slower pace

## Participation Rates of 15-69 (Canada)



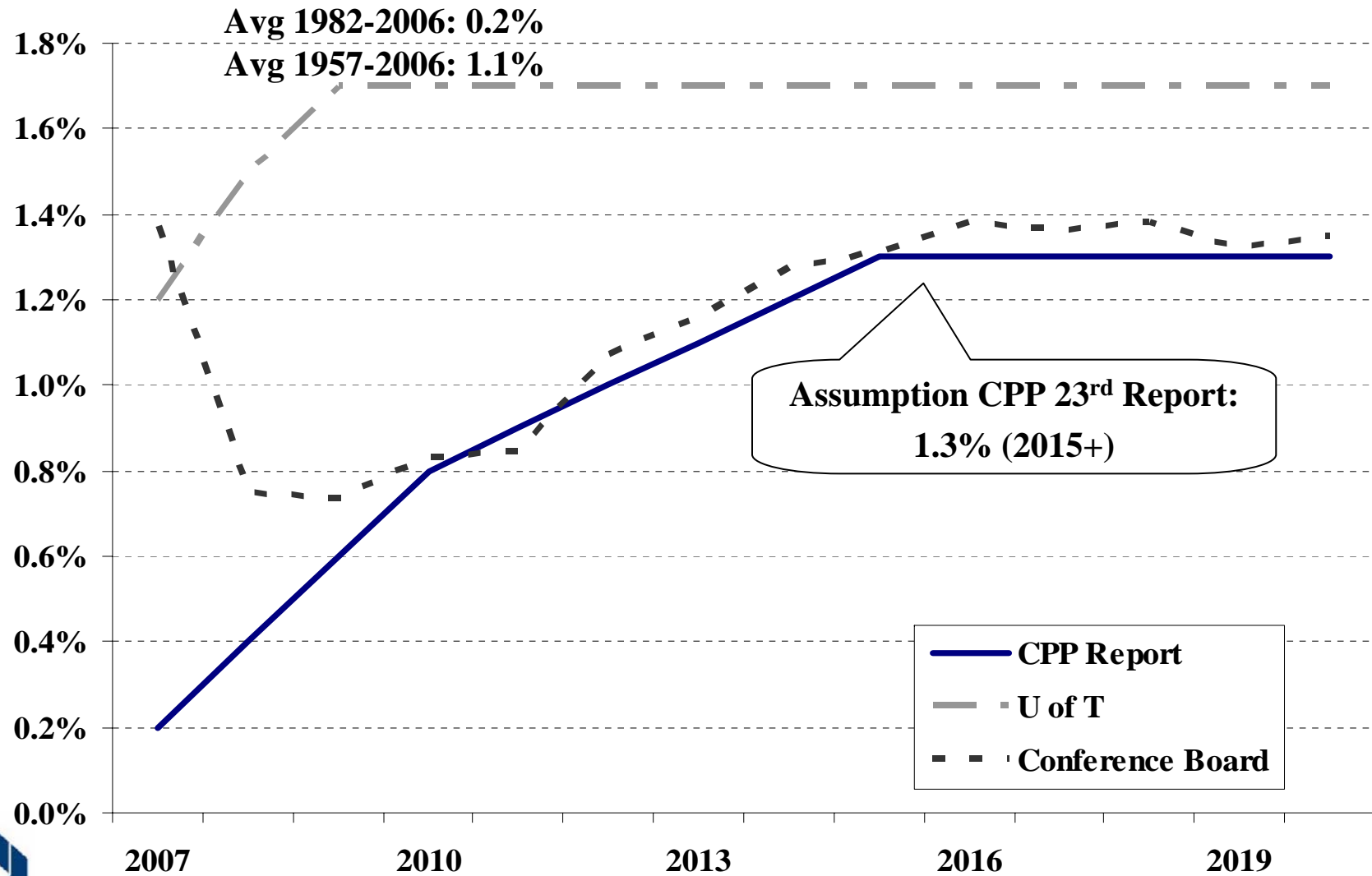
# Annual Increase in Consumer Price Index



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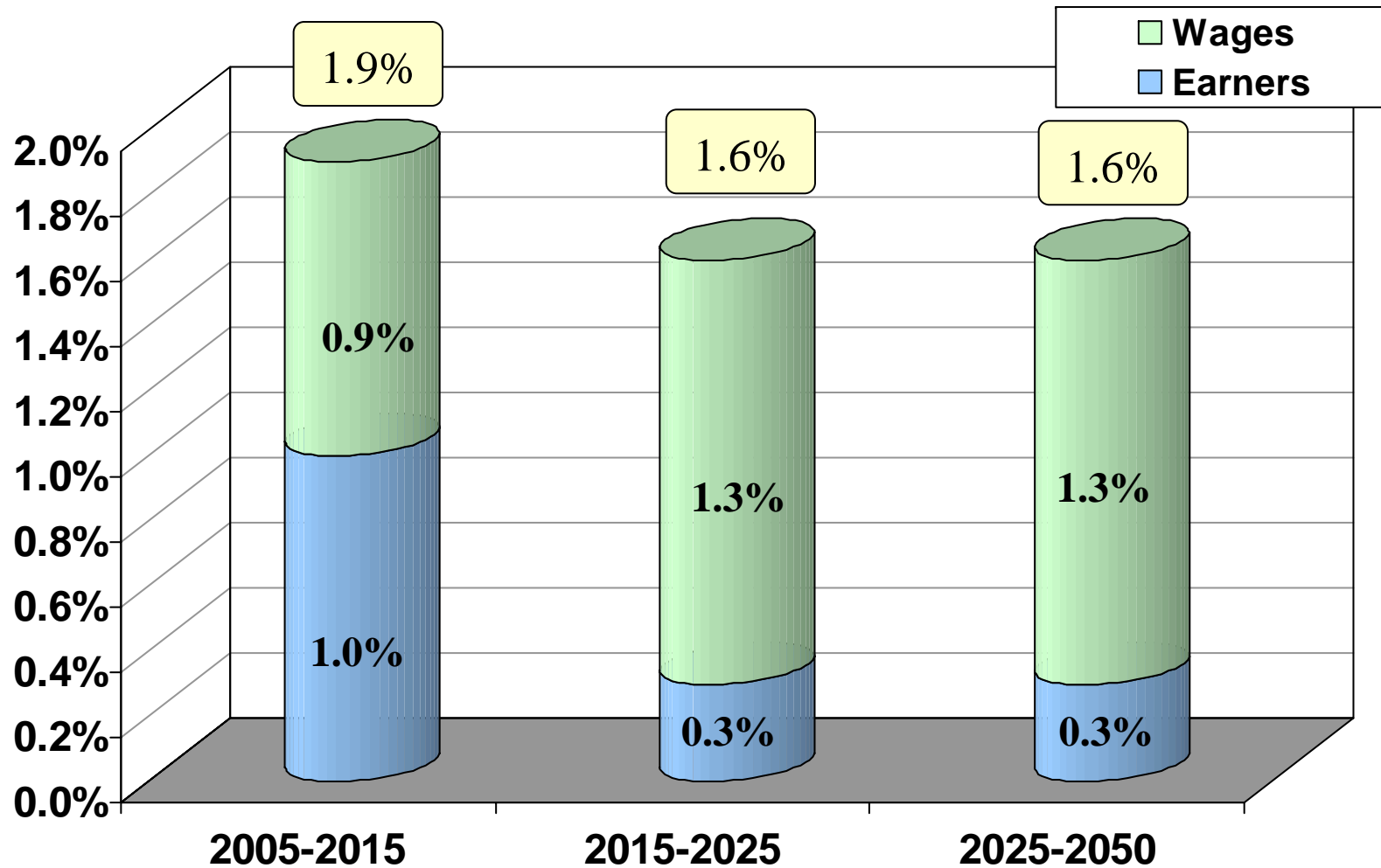
# Annual Increase in Real Wages



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# Real Increase of Total Employment Earnings (18-69, Canada less Québec)



# Evolution of CPP Asset Mix

	<b>Fixed Income</b>	<b>Equity</b>	<b>Inflation-Sensitive</b>
<b>2007</b>	28%	65%	7%
<b>2010</b>	30%	60%	10%
<b>2015</b>	30%	60%	10%
<b>2020</b>	35%	55%	10%
<b>2025</b>	40%	50%	10%



# Real Rate of Return by Asset Class

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(2007-2011)



CPP23 (2025+)

Rate

Mix

- Canadian Equities: (3.5%)      5.1%      15.0%
- Foreign Equities: (3.5%)      5.1%      35.0%
- RE & Infrastructure: (2.9%)      3.95%      10.0%
- Marketable Bonds: (2.7%)      3.2%      39.5%
- Cash:      1.0%      0.5%
- Total Real Return      4.22%

***Average Real Rate of Return (2007-2016): 3.8%***



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# Actuarial Valuation Main findings

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- 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.
- Minimum Contribution Rate of 9.82%
- **Contribution rate of 9.9% is sufficient and takes into account the aging of the population.**
- From 2007 to 2019, contributions are more than sufficient to cover expenditures.
- Asset/Expenditure ratio increases from 4.3 to 5.5 over that period and reaches 6.0 in 2050.
- Important to show uncertainty of results by presenting sensitivity tests or alternative scenarios using stochastic modeling.



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# Independent Peer Review Process

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- Terms of Reference
- Selection Process
- Reviewers Report and GAD's Opinion



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# Independent Peer Review Process

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## Terms of Reference

- Is the professional **experience** of the Chief Actuary and his staff adequate for carrying out the work required?
- Has the work complied with professional **standards of practice** and statutory requirements?
- Did the Chief Actuary have access to the **information** required?
- Were the actuarial **methods and assumptions** used reasonable?
- Does the actuarial report fairly **communicate** the results?



# Independent Peer Review Process

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## Selection Process

- Process starts 8 months prior to the latest date that report can be sent to the Minister.
- To ensure transparency in the selection process the applications are sent to the GAD. GAD selects reviewers based on weighted criteria
- Reviewers have three months to produce their report
- The GAD provides opinion on reviewers process.
- Report and GAD's Opinion made public



# Independent Peer Review Process

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## Latest Review of 23<sup>rd</sup> CPP report confirmed that:

- the staff is competent and qualified to carry out the work required;
  - the work complies with all relevant professional standards of practice and statutory requirements;
  - the Chief Actuary had access to the data and he completed relevant tests on the data as might be expected ;
  - actuarial methods are reasonable;
  - assumptions are, in the aggregate, reasonable, but six of the nine major assumptions are near the centre of the reasonable range, and three assumptions are within, but towards the high or low side of, the reasonable range but towards the high-cost side of the reasonable range;
  - the report fairly communicates the results;
- GAD’s opinion on confirmed that review panel followed due process.
  - Over 40 recommendations from last four reviews on data, methodology, assumptions, communications of results and other actuarial issues.



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# Conclusions

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- ❖ 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

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- ❖ Changes from PayGo to partial funding of the CPP restored financial sustainability for current and future generations.
- ❖ Actuarial valuation
  - ❖ Deterministic approach based on “best-estimate” demographic, economic and investment assumptions.
  - ❖ Despite aging of the population, the Plan will remain financially sustainable with a contribution rate of 9.9%.
- ❖ Independent peer reviews
  - ❖ Ensure credibility of the information is indisputable and that standards of practice are respected.
  - ❖ Provide the Office of the Chief Actuary with recommendations on how to improve on data, methods, assumptions and communication of results.





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# Canada Pension Plan Financing, Actuarial Valuation and Independent Peer Review Process

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International Seminar, Seoul, 30 September 2008

Thank You



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# Financing Public Pensions (Canada)



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 2004-2008: \$42,460)
1. Old Age Security/ Guaranteed Income Supplement	Provide minimum income at retirement for seniors



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# Financing Public Pensions (Canada)



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

Funding

Employer / employee contributions (full funding)

2. CPP / QPP

Er/ee contribution rate of 9.9% applicable in 2003 (partial funding)

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1. Old Age Security

Income taxes from general revenue fund (pay-as-you-go funding)