



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

25th Actuarial Report on the Canada Pension Plan as at 31 December 2009

*Presentation to the Board of Directors of the
Canada Pension Plan Investment Board*



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8 February 2011

Canada 

Presentation

- 25th CPP Actuarial Report
 - Purpose
 - Assumptions
 - Main Findings
 - Uncertainty of Results
 - Peer Review Process
- Comparison with the latest QPP Actuarial Report
- Pension Reform to date



Purpose of the CPP Actuarial Report



- Tabled by the Minister of Finance on 15 November 2010
- Inform contributors and beneficiaries of the current and projected future financial status of the Canada Pension Plan
- Calculate the minimum contribution rate
- Actuarial report is based on “best-estimate” assumptions over a long period of time (75 years). Although secondary, recent trends are also taken into account.



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Presentation

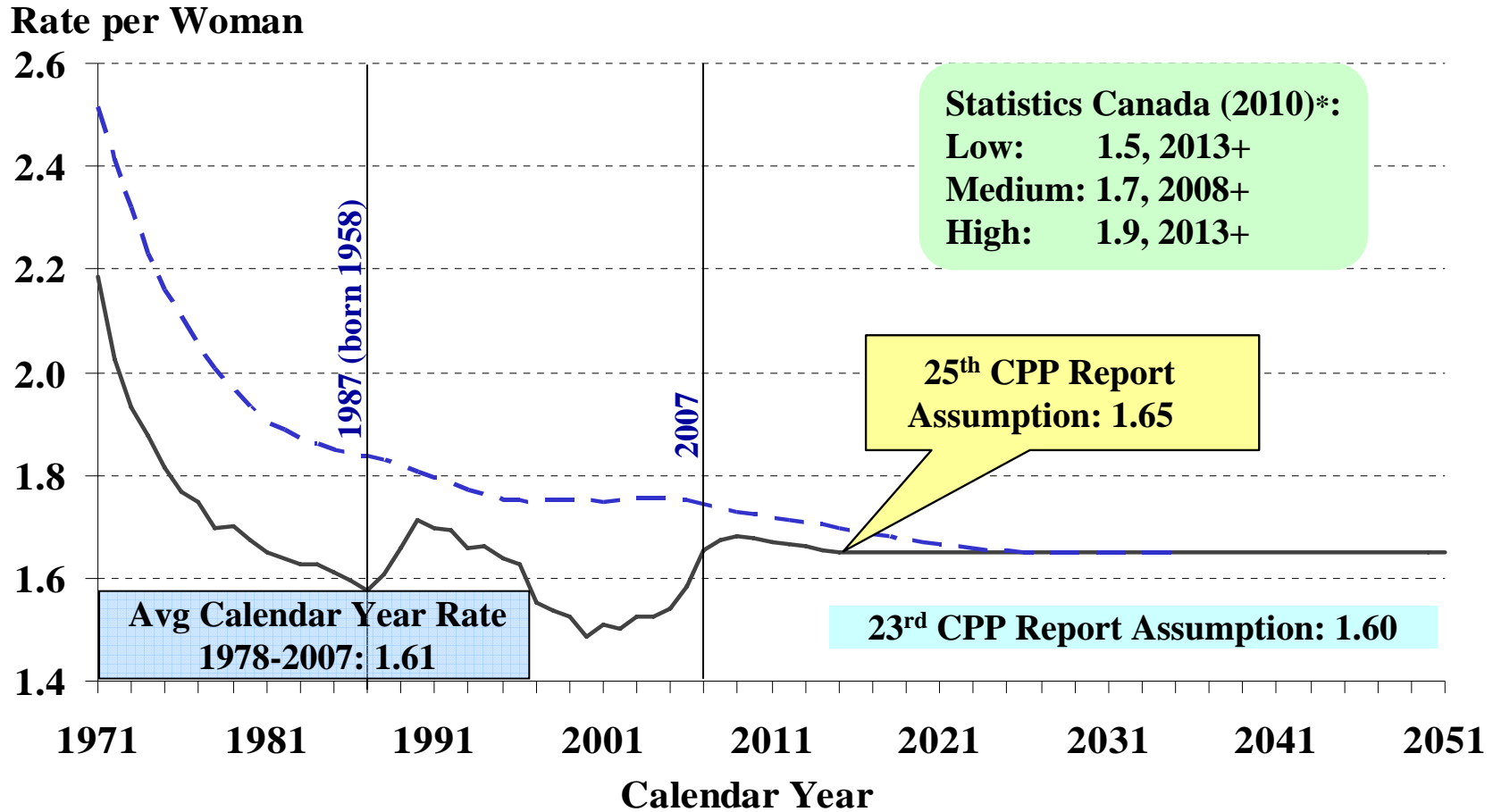
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Fertility Rates for Canada

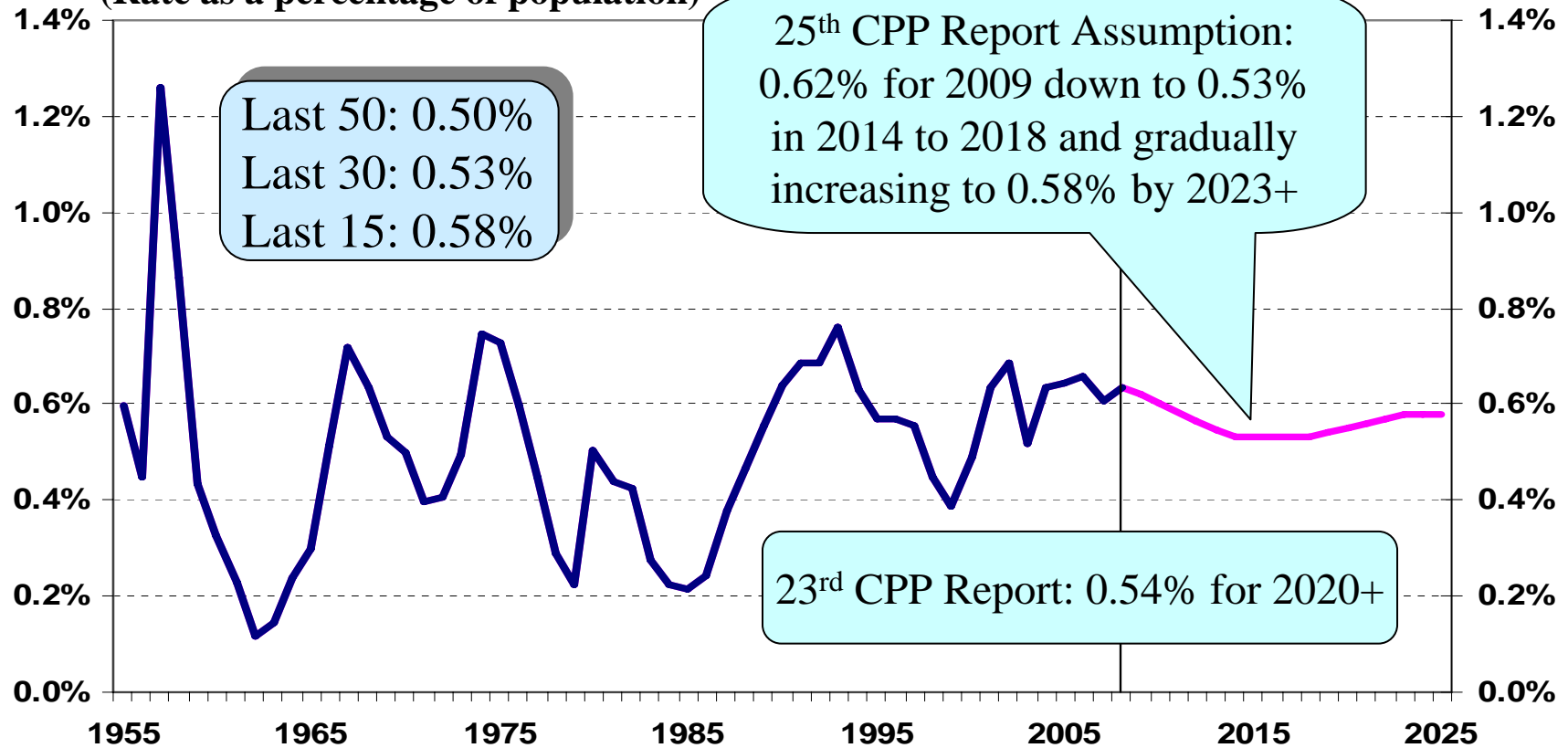


— Calendar Year Rates - - Cohort Rates - avg age 29 in given year



Net Migration Rate

(Rate as a percentage of population)



Last 50: 0.50%
Last 30: 0.53%
Last 15: 0.58%

25th CPP Report Assumption:
0.62% for 2009 down to 0.53%
in 2014 to 2018 and gradually
increasing to 0.58% by 2023+

23rd CPP Report: 0.54% for 2020+



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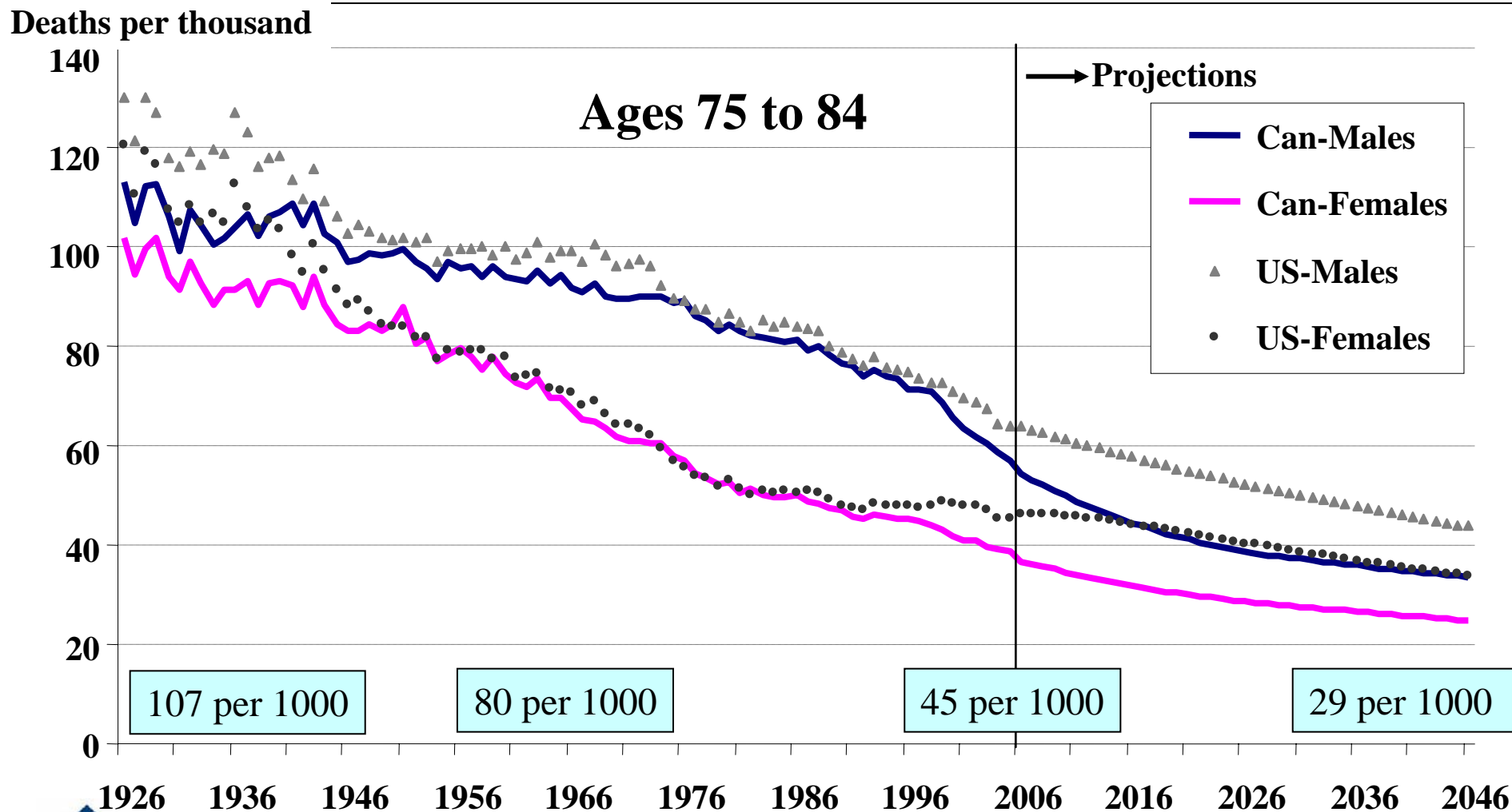
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Contribution to increase in life expectancy at birth has gradually shifted to elderly, more so since 1985

Change attributable to (in years)	Males			Females		
	1925-1965	1965-1985	1985-2005	1925-1965	1965-1985	1985-2005
Infant mortality (<1)	5.8	1.2	0.2	4.6	1.0	0.2
Child mortality (1-14)	2.5	0.3	0.2	2.5	0.3	0.1
Young adult mortality (15-44)	2.1	0.6	0.6	3.9	0.4	0.2
Older adult mortality (45-64)	0.1	1.3	1.5	1.9	0.8	0.7
Elderly mortality (65+)	0.3	1.0	<u>2.6</u>	2.2	2.3	<u>1.7</u>
Estimated Multivariate Effect	-0.1	-0.1	-0.2	-0.4	-0.2	-0.1
Total Change in Life Expectancy	10.7	4.3	4.8	14.7	4.6	2.8



Elderly mortality rates have decreased over the last 80 years, more so over the last 40 years

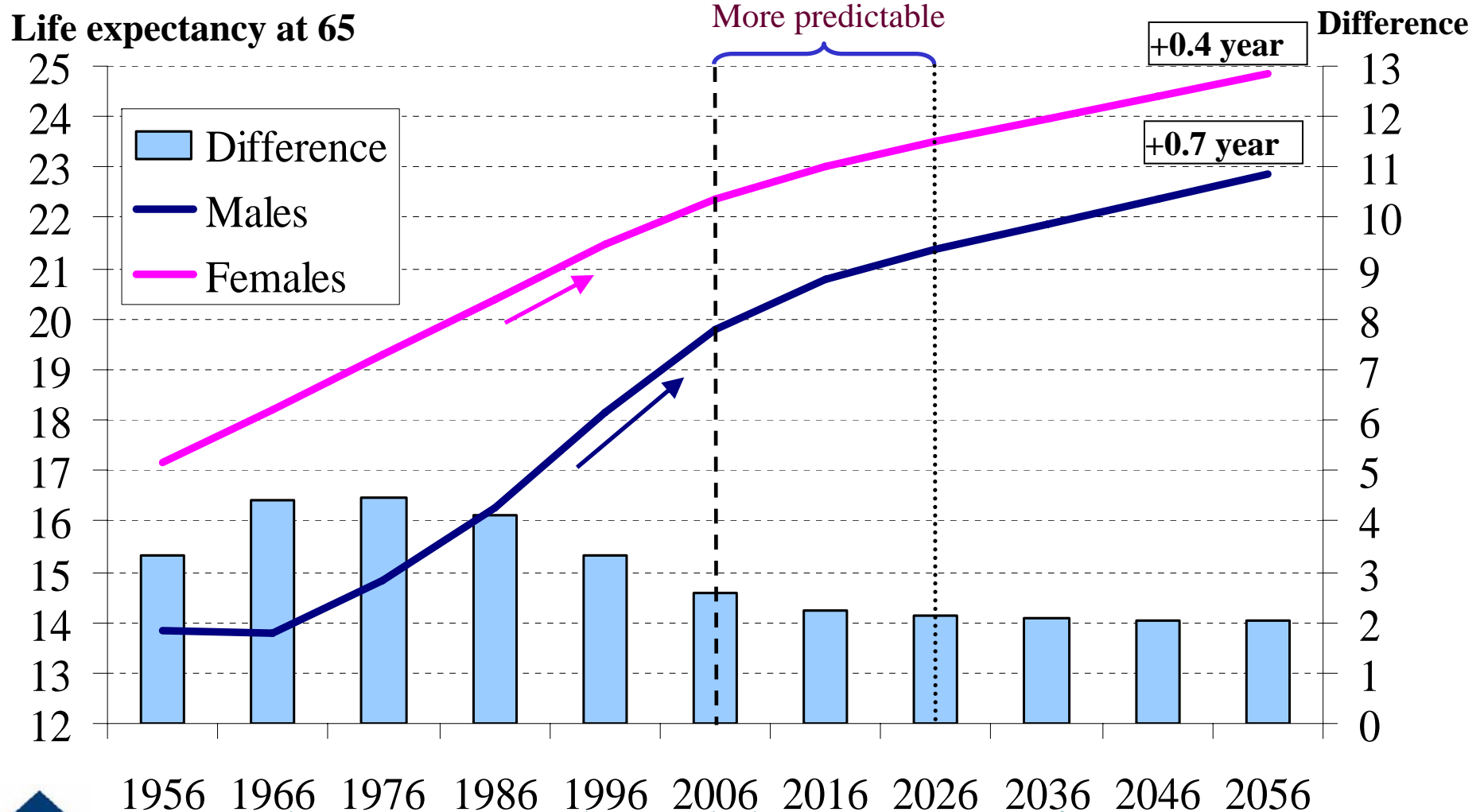


Source : Office of the Chief Actuary, 25th CPP Actuarial Report and 2009 OASDI Trustees Report

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Life Expectancy at 65 (with future mortality improvements)



1956 1966 1976 1986 1996 2006 2016 2026 2036 2046 2056
More contributors are expected to reach the retirement age of 65.

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

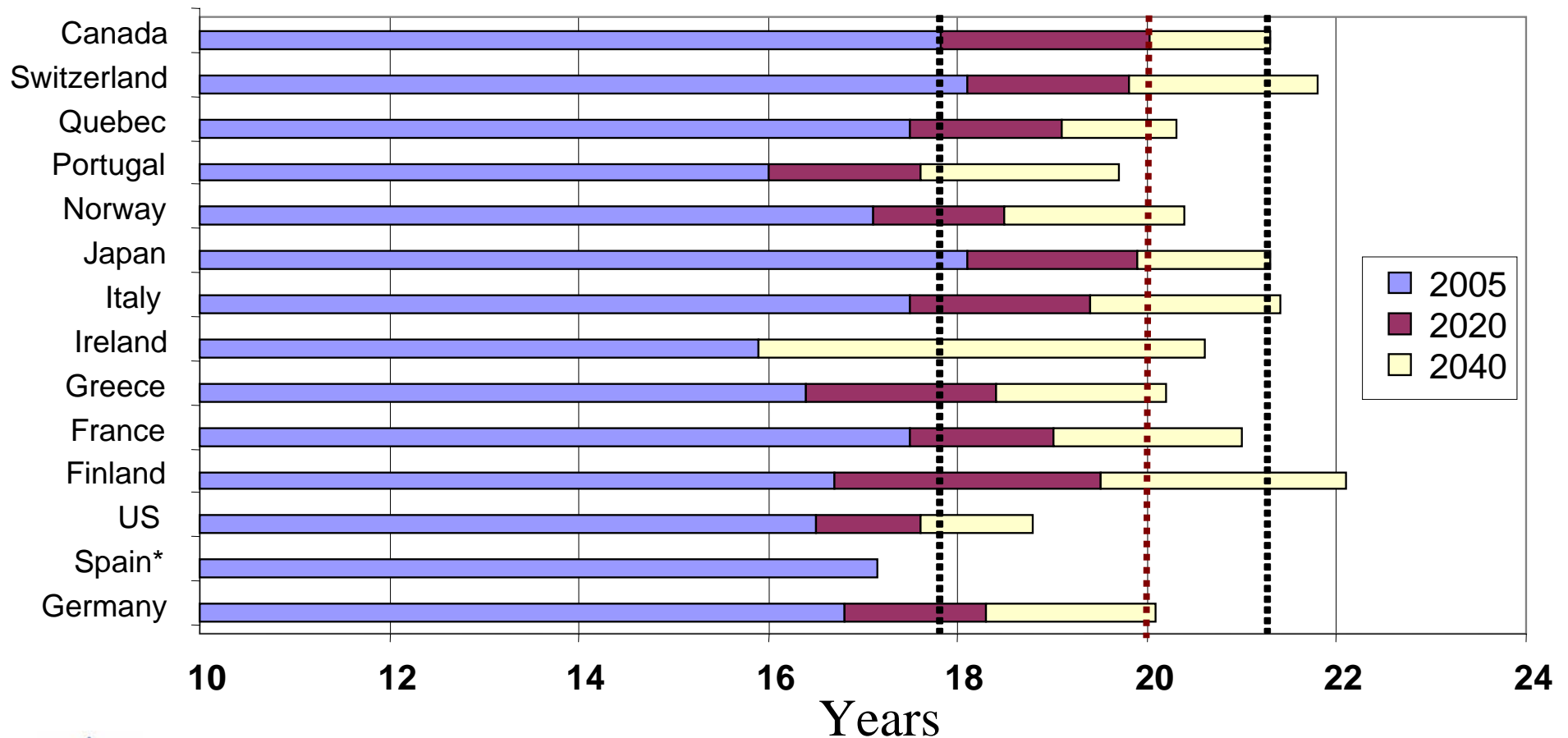


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Canada ranks 3rd and is expected to maintain a similar position over time

Life Expectancy at 65 – Males



Source: 16th International Conference of Social Security Actuaries and Statisticians presentations and reports.

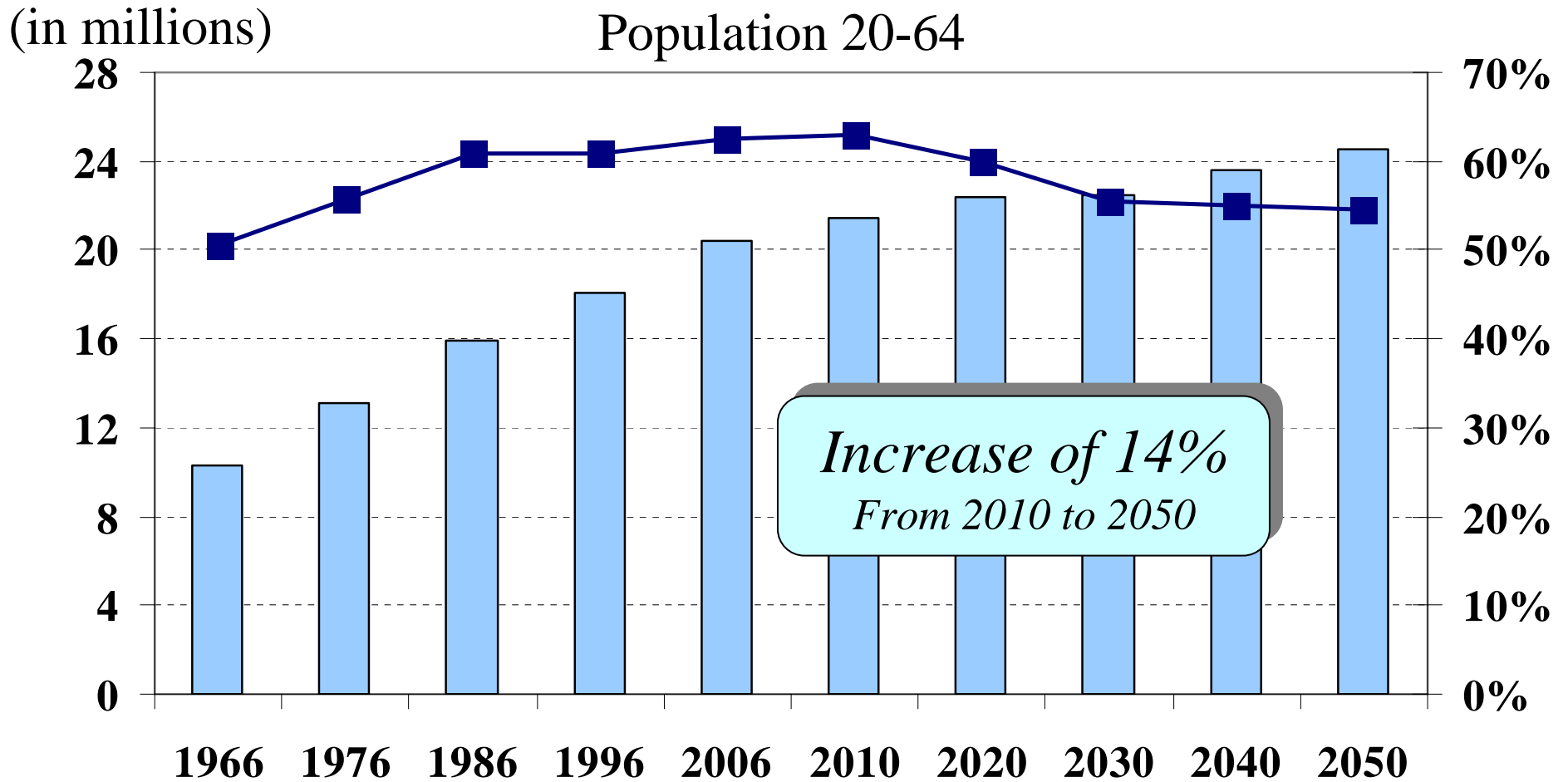
* Projection for Spain is not available.



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The working-age population is projected to slightly increase

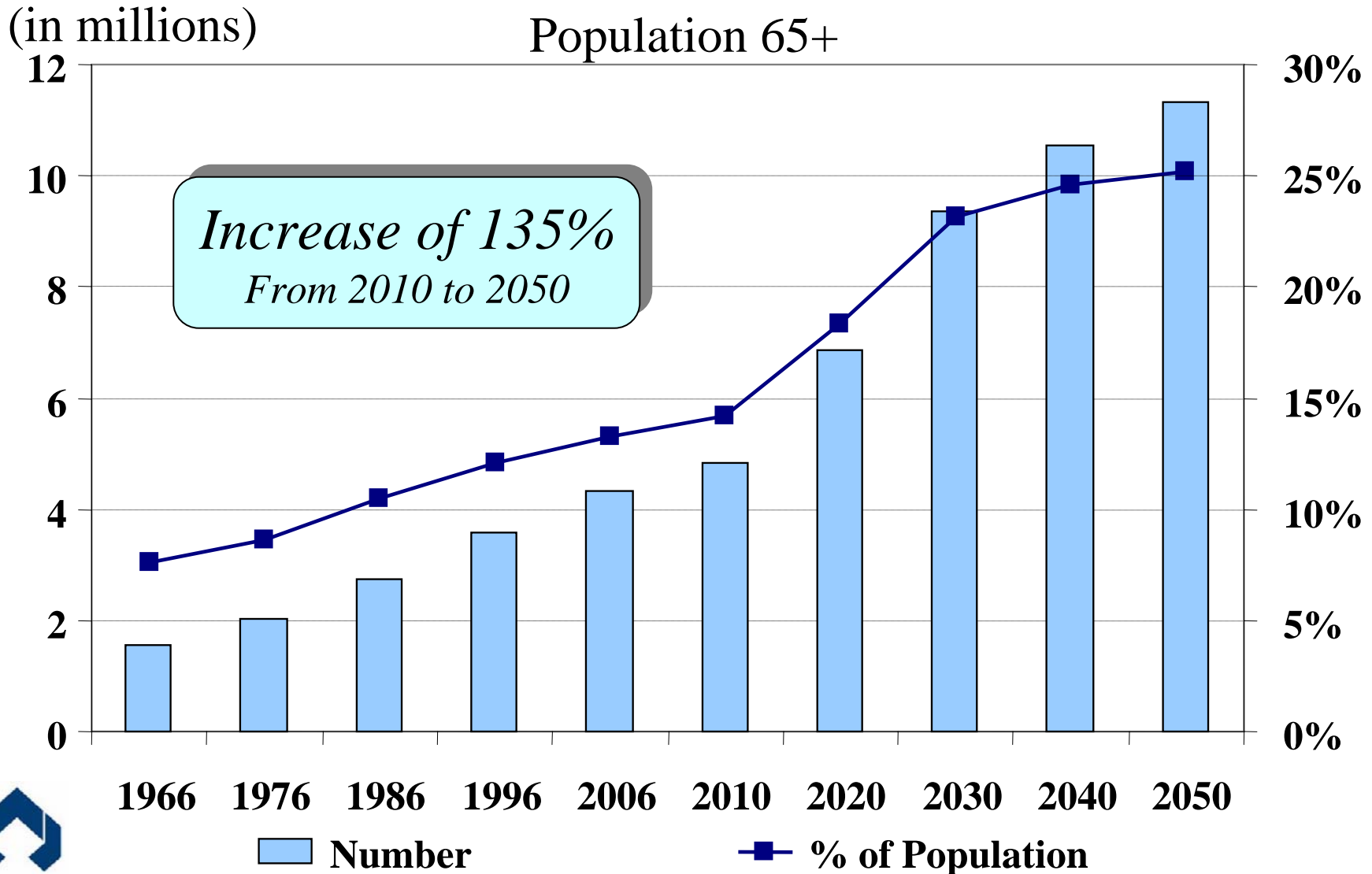


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Number % of Population

The elderly population is projected to significantly increase



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Economic (other than investment) Assumptions

- Participation rates
- Employment increase (Job creation rate)
- Unemployment rate
- Inflation rate
- Increase of average employment earnings

Sources:

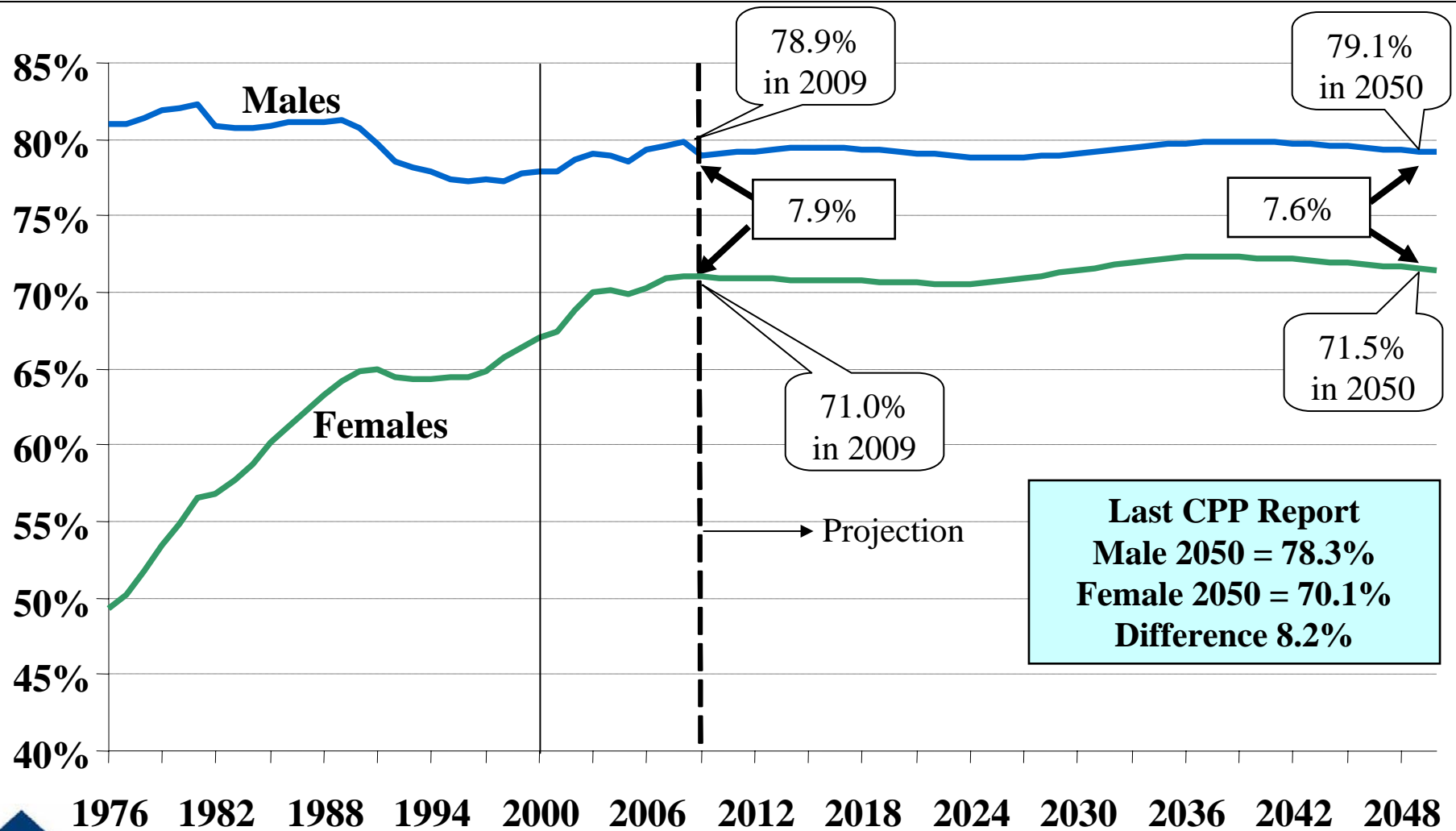
*Historical trends, recent experience, PEAP from U of T,
Department of Finance estimates, Conference Board,
CIA Report on Canadian Economic Statistics,
Towers Watson Economic Expectations Survey,
16th International Conference of Social Security Actuaries and Statisticians,
QPP Seminar*



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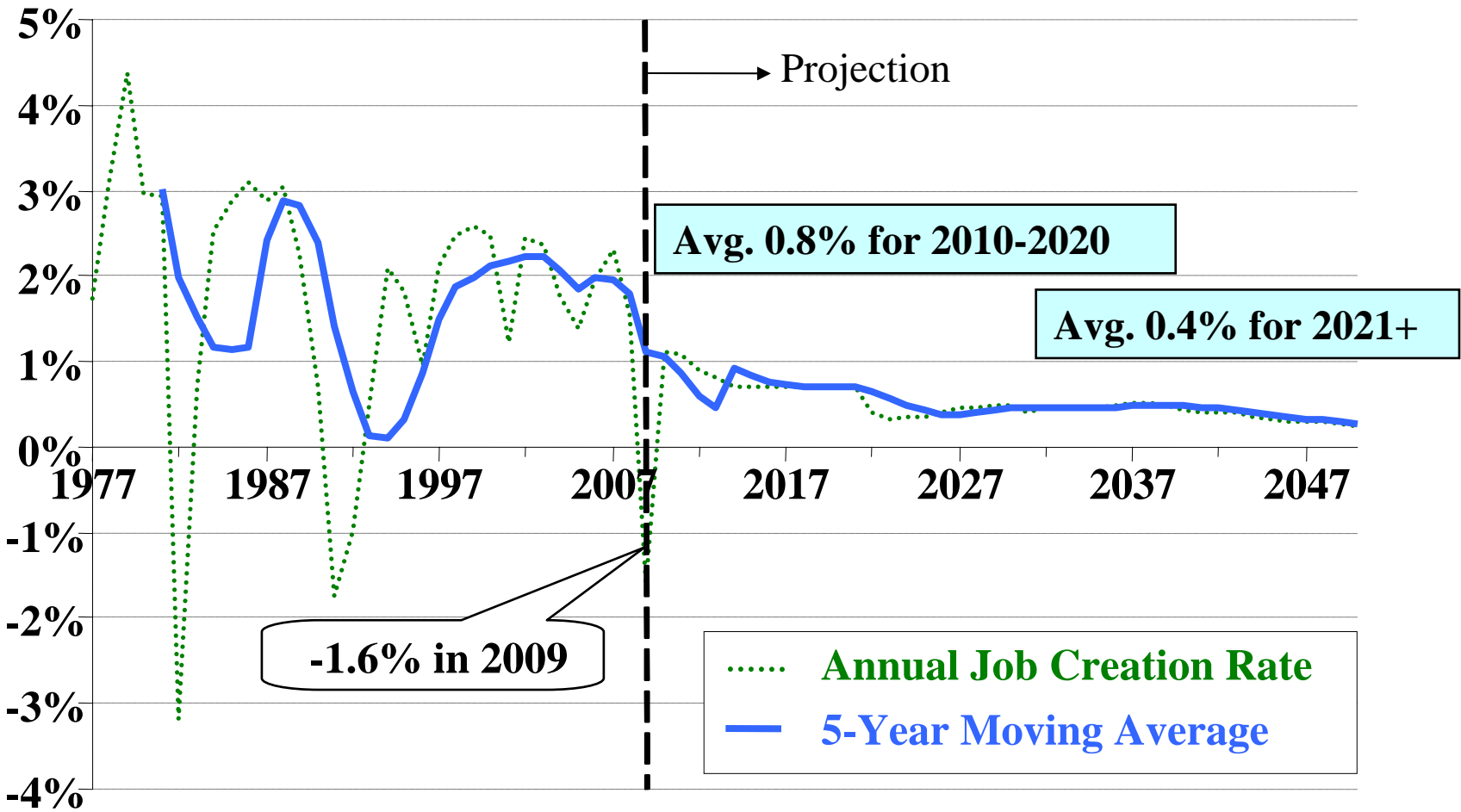
Participation Rates (Canada, 15-69)



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Job Creation Rate (15+, Canada)

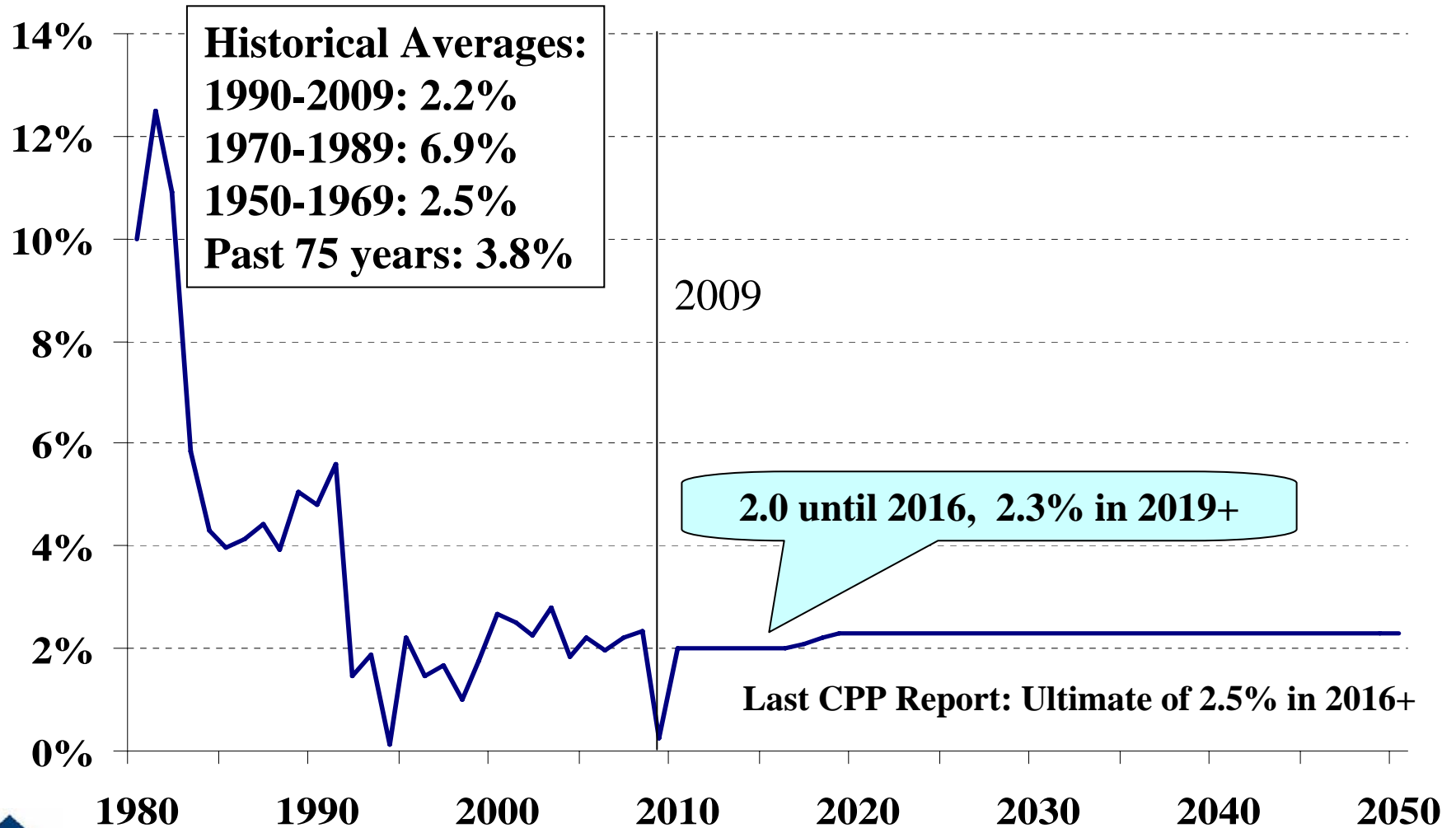


Labour Force Forecasts Comparison for Canada, 2025

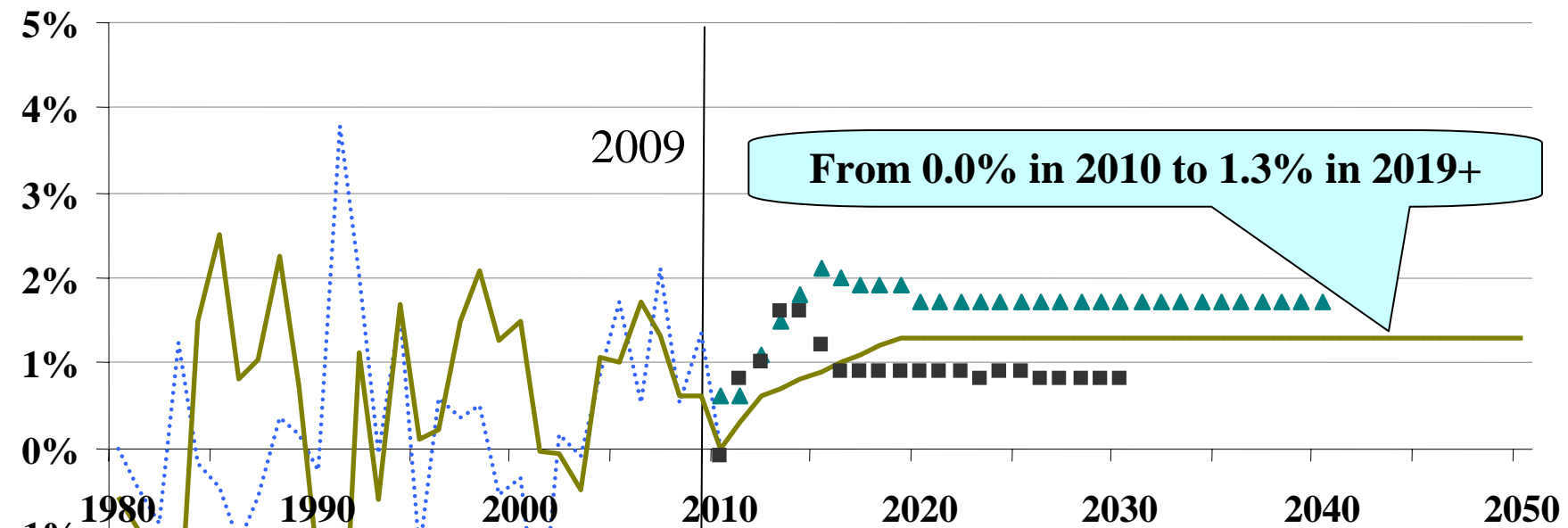
	Conf Board	U of T PEAP	25th CPP Actuarial Report	Towers Watson Survey (median 2015-24)
Participation Rates	N/A	64.1%	63.4%	N/A
Labour Force Increases	0.5%	0.6%	0.4%	N/A
Job Creation Rate	0.5%	0.6%	0.4%	N/A
Unemployment Rate	5.4%	6.0%	6.1%	7.0% (OCA 6.9% average 2015-2024)



Annual Increase in Consumer Price Index



Real Increases in Average Weekly Earnings and Average Employment Earnings



Historical Averages:
 1990-2009: 0.6%
 1970-1989: 0.9%
 1950-1969: 2.7%
 1950-2009: 1.4%

..... Real Increase Avg. Weekly Earnings
——— Real Increase Avg. Employment Earnings
▲ PEAP projections
■ CBOC projections

Last CPP Report: from 0.2% in 2007 to 1.3% in 2015+



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Investment Assumptions

- Methodology
- “Risk-free” interest rate and bond yields
- Equity risk premium (additional return over bonds)
- Real rates of return by asset class
- Expenses
- Asset mix
- Portfolio return

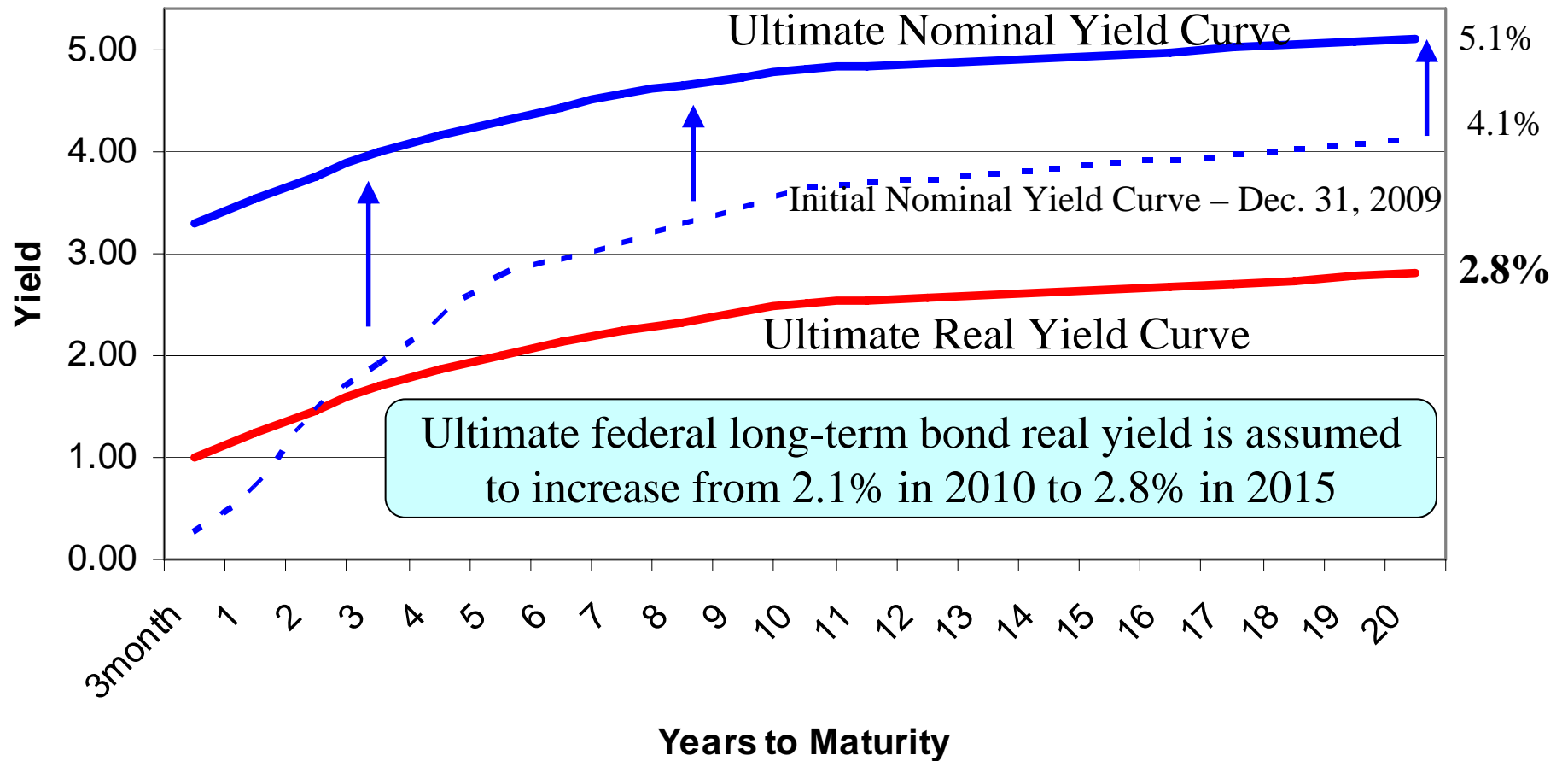


A building block methodology is used to determine the real rates of return

- Bonds:
 - Start with long-term Federal bond yield (10+)
 - Add bond spread above long-term Federal bond yield
 - Convert bond yields into bond returns
- Equities
 - Start with long-term Federal bond real rate of return (10+)
 - Add Equity Risk Premium
- Real Estate & Infrastructure
 - 1/2 developed market equity return + 1/2 marketable bond return
- Investment Expenses
 - Applied as a reduction of expected real rates of return
 - Assumed to reduce the portfolio return by 15 bps.



Federal bond yield curve is expected to increase



Ultimate federal long-term bond real yield is assumed to increase from 2.1% in 2010 to 2.8% in 2015

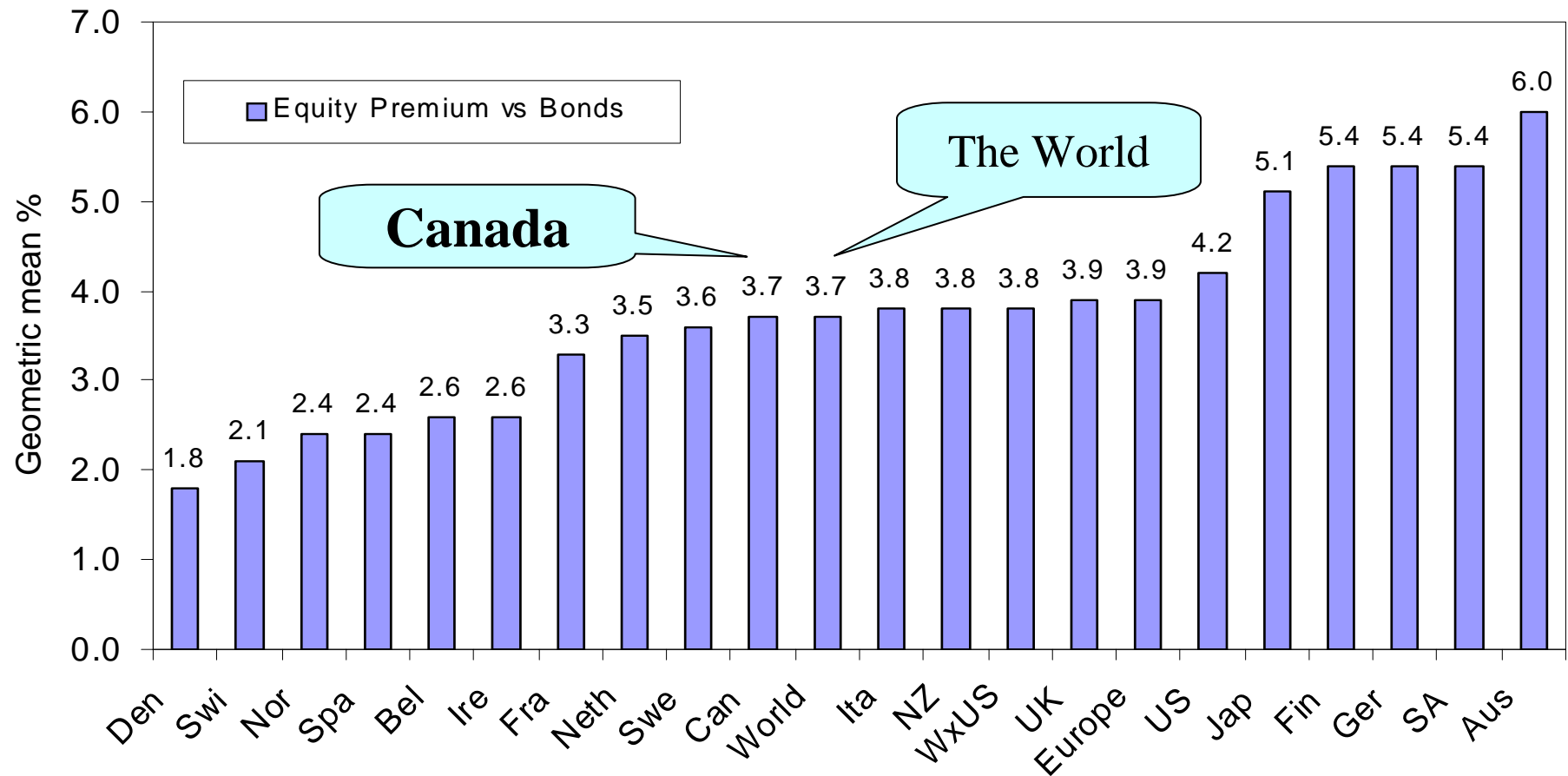
Last CPP Report: Ultimate long-term real yield: 2.8%



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Over the 110-year period 1900-2009, Canada experienced an equity risk premium of 3.7%



Source: Credit Suisse Global Investment Returns Sourcebook 2010, Dimson, Marsh and Staunton

In the literature, the expected ERP varies between -1% and 5.5%.

Equity risk premium is set at 2.0%, down from 2.3% in last CPP Report.



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Real Rates of Return by Asset Class

	Equity			Fixed Income			Inflation-Sensitive
Year	Canadian	Foreign Developed Market	Emerging Markets	Marketable Bonds	Non-Marketable Bonds	Short Term	Real Estate & Infrastructure
	(%)	(%)	(%)	(%)	(%)	(%)	(%)
2010	(0.4)	(0.4)	0.7	(0.6)	0.5	0.5	(0.5)
2015	4.8	4.8	5.8	3.0	3.4	0.5	3.9
2020	4.8	4.8	5.8	3.0	2.8	0.5	3.9
2025	4.8	4.8	5.8	3.1	3.1	0.5	4.0
2030	4.8	4.8	5.8	3.1	3.4	0.5	4.0
2035	4.8	4.8	5.8	3.2	2.6	0.5	4.0
2044+	4.8	4.8	5.8	3.2	-	0.5	4.0



Last CPP Report: 5.1%

n/a

3.2%

-

1.0%

4.0%

Long-Term Asset Mix

- As a larger portion of benefit payments will be covered by investment income, the asset mix of the portfolio should be adjusted:
 - Investment in more volatile assets, such as equities are projected to decline over time
 - Projected increase in fixed income assets
 - Projected increase in real estate and infrastructure assets



Asset Mix Evolution

Dec. 31, Year	Fixed Income				Equities				Real Estate and Infrast.	TOTAL
	Marketable	Non- Marketable	Cash	Total	Canadian	Foreign	Emerging	Total		
2010	16%	15%	1%	32%	15%	36%	5%	56%	12%	100%
2020	30%	6%	1%	37%	15%	28%	5%	48%	15%	100%
2030	36%	2%	1%	39%	15%	24%	5%	44%	17%	100%
2044+ CPP25	39%	0%	1%	40%	15%	22%	5%	42%	18%	100%
2040+ CPP23	39%	0%	1%	40%	15%	35%	0%	50%	10%	100%
Current Asset Mix of Large Plans	24% to 55%				34% to 65%				9% to 29%	



Portfolio Real Rates of Return

Lower equity risk premium and lower risk through asset mix lead to lower real return assumptions.

	Portfolio Real Rates of Return Net of Investment Expenses (%)	
	CPP25	CPP23
First 5 years	2.7	3.6
Ultimate	4.0	4.2



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Minimum Contribution Rate

Steady-state contribution rate: 9.84% for years 2013+

- Lowest rate that generally stabilizes the ratio of assets to expenditures over the long term, before the consideration of any full funding of increased or new benefits (without Bill C-36).

Full funding contribution rate: 0.02% 2010-2022, 0.01% 2023+

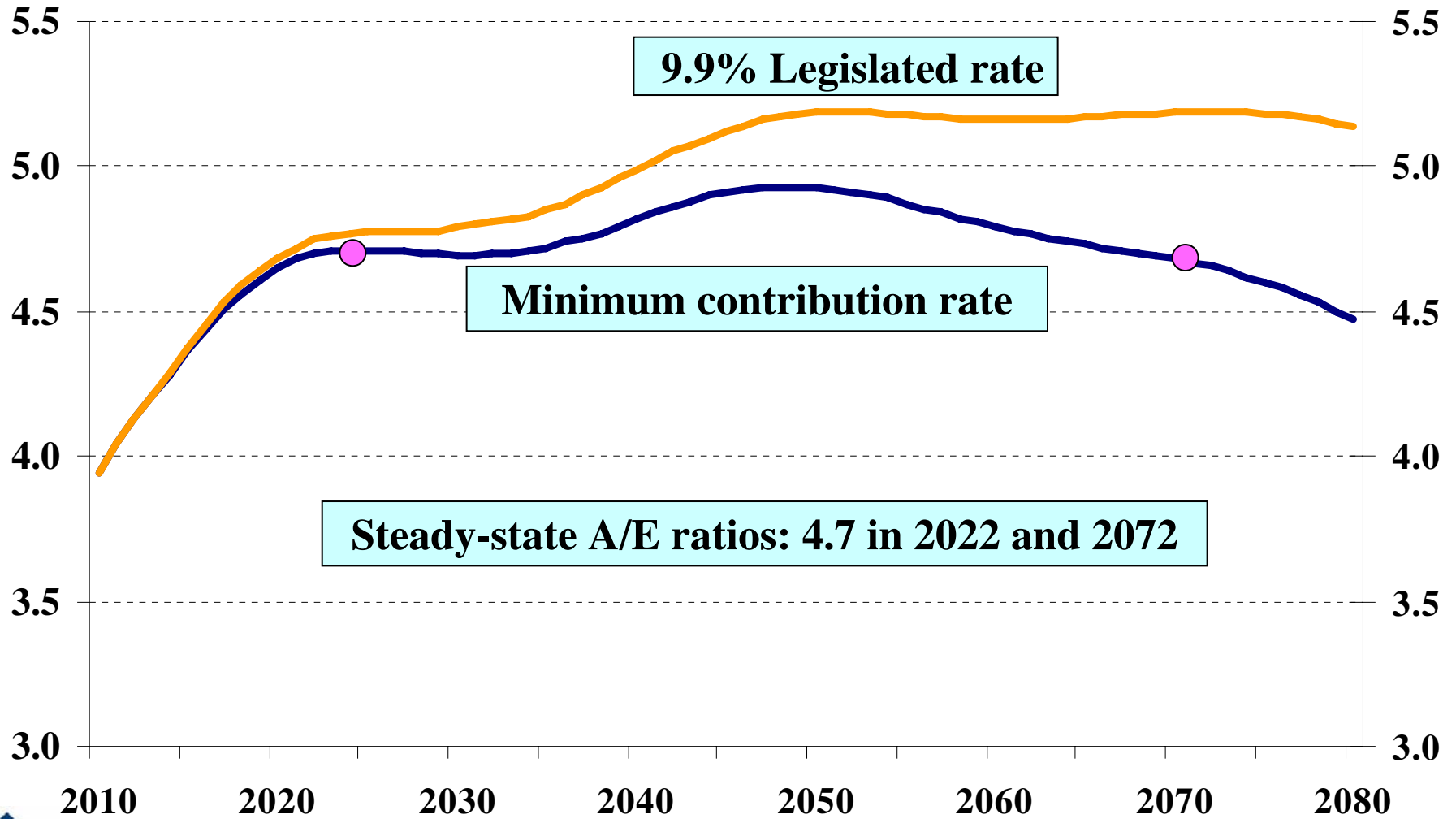
- Required rate to pay for any changes to the CPP that increase or add new benefits.
- Pays for associated future costs and any resulting past unfunded liability.
- Fully funds expanded eligibility for disability benefits for long-term contributors (Bill C-36).

Minimum contribution rate: 9.86% 2013-2022, 9.85% 2023+

- Equals the sum of the rounded steady-state and full funding rates.
- Lowest rate that can be charged that is sufficient to sustain the Plan with respect to the two financing objectives without further increase.



Evolution of Asset/Expenditure Ratio



Comparison with Previous Report

	Minimum Rate
23rd CPP Actuarial Report as at 31 December 2006	9.82
Amendments of Bill C-51	(0.17)
Experience – Higher participation rates (2007 and 2008)	(0.08)
Experience – Benefits and Demography	(0.02)
Experience – Investment losses (2008)	0.14
Assumptions – Higher fertility and migration rates	(0.10)
Assumptions – Higher projected life expectancies	0.09
Assumptions – Inflation, Wages and participation rates	0.03
Assumptions – Lower rate of return	0.12
Other Assumptions and Methodology	0.03
25th CPP Actuarial Report as at 31 December 2009	9.86



The legislated contribution rate of 9.9% is sufficient to sustain the Plan over the projection period of 75 years

- With the legislated contribution rate of 9.9%, contributions are more than sufficient to cover expenditures until 2020.
- Thereafter, a proportion of investment income is required to pay the expenditures. In 2030, 27% of investment earnings is required to pay for benefits.
- Asset/Expenditure ratio increases from 3.9 to 4.7 over the next 10 years.
- Results contained in this report confirm that the 9.9% contribution rate is sufficient to pay for future expenditures and to accumulate assets of \$275 billion in 2020.



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Uncertainty of Results

- Two demographically based scenarios were developed that portray a younger and older population. These scenarios produced minimum contribution rates (MCR) of 9.1% and 10.4% respectively.
- Sensitivity tests were performed on the main assumptions; MCR were between 9.3% and 10.3%.
- If recent short-term improvements in life expectancies, especially for age 75 to 89 continue, the long-term assumptions will need to be adjusted accordingly. This will put additional pressure on the contribution rate.



Investment income is much more volatile than the two other components

Reconciliation of financial status over two consecutive actuarial reports (cost accrual basis, \$ billion)

	2007 to 2009			2004 to 2006		
	Actual	Expected	% Change	Actual	Expected	% Change
Contributions	106.5	102.1	4%	89.0	88.8	0%
Expenditures	87.8	87.6	0%	75.0	75.0	0%
Investment Income	(6.1)	22.0	(128%)	32.3	16.4	97%



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5th Independent Peer Review of the CPP Actuarial Report since 1998

- Role of the Auditor General, selection process, and overseeing of the Peer Review by UK Government Actuary's Department (GAD)
 - Press release of May 2010 seeking panel
 - GAD selects panel members
 - Panel announced September 2010
 - Panel's report to be published by end of April 2011
 - GAD reviews panel's report and issues own opinion
 - Panel's recommendations first discussed with CPP stakeholders before any action taken for future reports. Ultimately, Chief Actuary's decision as to what action to take.



5th Independent Peer Review of the CPP Actuarial Report since 1998 (cont'd)

- Terms of Reference
 - Is the professional **experience** of the Chief Actuary and his staff adequate for carrying out the work required?
 - Does the work comply with professional **standards of practice** and statutory requirements?
 - Did the Chief Actuary have access to the **information** required, and were the data validated?
 - Were the actuarial **methods and assumptions** used reasonable?
 - Does the 25th Actuarial Report fairly **communicate** the results?
 - Does the **24th Actuarial Report** use appropriate assumptions and fairly communicate the **change in results from the 23rd Actuarial Report**?



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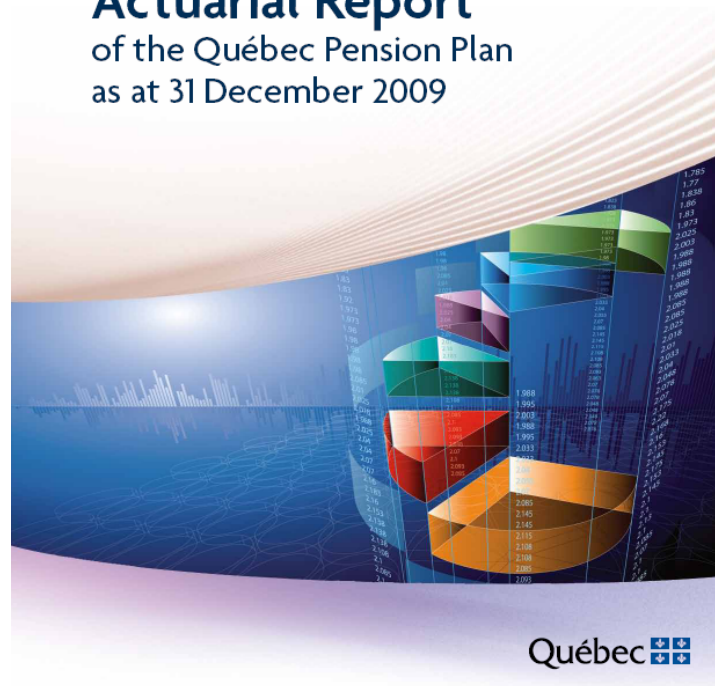
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QPP Actuarial Report as at 31 December 2009

Tabled on 10 December 2010

RÉGIE DES RENTES
DU QUÉBEC

Actuarial Report
of the Québec Pension Plan
as at 31 December 2009



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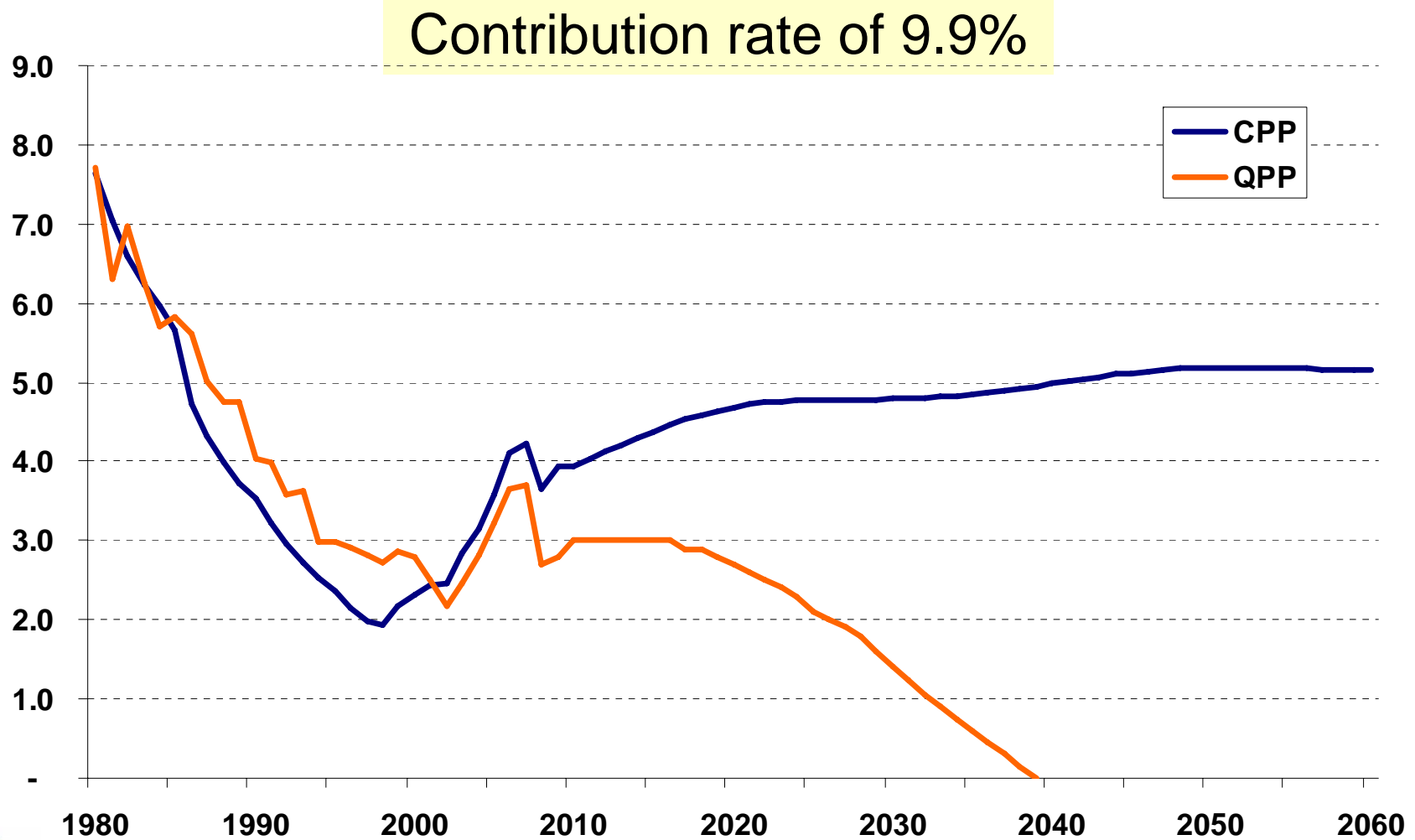
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CPP vs. QPP Assumptions

Demographic	CPP (Can-Qc)	QPP	Impact on MCR
Fertility Rate	1.65	1.65	—
Net Migration Rate	0.60%	0.36%	↑
Life Expectancy @65 in 2050	M: 21.9	M: 21.4	↓
	F: 23.9	F: 23.9	
Economic			
Inflation Rate	2.3% in 2019	2.5% in 2016	↓
Real-Wage Differential	1.3% in 2019	1.2% in 2019	↑
Real Rate of Return	4.0% (2020+)	4.5% (2025+)	↓
Unemployment Rate	6.0% in 2022	5.9% in 2019	↑
Participation rates 20-64)	83.4% (2030)	82.9% (2030)	



Evolution of Asset / Expenditure Ratio



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Canadian men with lower average earnings have higher replacement rates

Net Pension Replacement Rates by Earnings – Men in OECD Countries*

Country	Individual Earnings, multiple of mean				
	0.5	0.75	1	1.5	2
	(%)	(%)	(%)	(%)	(%)
Canada	89.1	68.9	57.9	40.0	30.9
UK	63.8	48.0	40.9	29.2	22.8
U.S.	57.9	49.2	44.8	39.5	33.3
OECD	82.4	74.0	70.3	65.5	60.8
Netherlands	105.0	107.4	103.2	98.6	95.5

*OECD Pensions at a Glance 2009: Retirement-Income Systems in OECD Countries

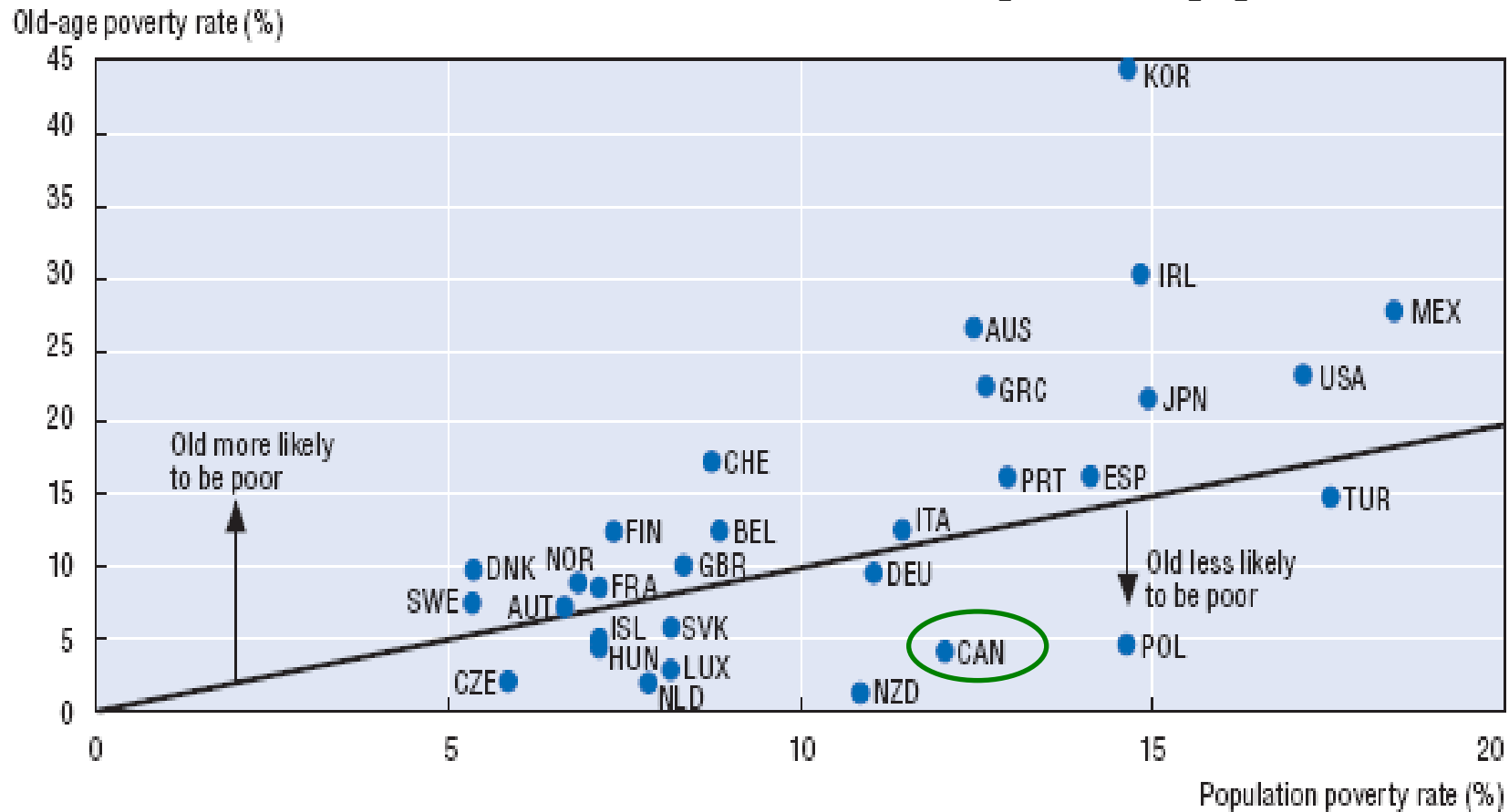


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Canada has one of lowest old-age poverty rates, but much higher population poverty rate

Income Poverty Rates of Older People and the Population, mid-2000s, % with incomes of less than half median equivalised population incomes*



*OECD Pensions at a Glance 2009: Retirement-Income Systems in OECD Countries



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OECD: Men's Pensionable Age, 2010 and 2050*

2010 (average age: 63.0)		
< 65	65	> 65
Belgium (60), Czech Republic (61), France (60.5), Greece (57), Hungary (60), Italy (59), Korea (60), Luxembourg (60), Slovak Republic (62), Turkey (44.9)	Australia, Austria, Canada , Denmark, Finland, Germany, Ireland, Japan, Mexico, Netherlands, New Zealand, Poland, Portugal, Spain, Sweden, Switzerland, UK	Iceland (67), Norway (67), U.S. (66)
10 countries	17 countries	3 countries
2050 (average age: 64.6)		
< 65	65	> 65
Belgium (60), France (62) , Greece (60) , Luxembourg (60), Slovak Republic (62), Turkey (62.3)	Austria, Canada , Czech Republic , Finland, Germany, Hungary , Ireland, Italy , Japan, Korea , Mexico, Netherlands, New Zealand, Poland, Portugal, Spain, Sweden, Switzerland	Australia (67) , Denmark (67) , Iceland (67), Norway (67), UK (68) , U.S (67)
6 countries	18 countries	6 countries

*Source: Chomik, R. and E. R. Whitehouse (2010), "Trends in Pension Eligibility Ages and Life Expectancy, 1950-2050", *OECD Social, Employment and Migration Working Papers*, No. 105, OECD Publishing. [doi: 10.1787/5km68fzhs2q4-en](https://doi.org/10.1787/5km68fzhs2q4-en)



OECD: Women's Pensionable Age, 2010 and 2050*

2010 (average age: 61.9)		
< 65	65	> 65
Australia (62), Austria (60), Belgium (60), Czech Republic (58.7), France (60.5), Greece (57), Hungary (59), Italy (59), Korea (60), Luxembourg (60), Poland (60), Slovak Republic (57), Switzerland (63), Turkey (41), UK (60)	Canada , Denmark, Finland, Germany, Ireland, Japan, Mexico, Netherlands, New Zealand, Portugal, Spain, Sweden	Iceland (67), Norway (67), U.S. (66)
15 countries	12 countries	3 countries
2050 (average age: 64.4)		
< 65	65	> 65
Belgium (60), France (62), Greece (60), Luxembourg (60), Poland (60), Slovak Republic (62), Switzerland (64), Turkey (60.8)	Austria, Canada, Czech Republic, Finland, Germany, Hungary, Ireland, Italy, Japan, Korea, Mexico, Netherlands, New Zealand, Portugal, Spain, Sweden	Australia (67), Denmark (67), Iceland (67), Norway (67), UK (68), U.S. (67)
8 countries	16 countries	6 countries



*Source: Chomik, R. and E. R. Whitehouse (2010), "Trends in Pension Eligibility Ages and Life Expectancy, 1950-2050", *OECD Social, Employment and Migration Working Papers*, No. 105, OECD Publishing. [doi: 10.1787/5km68fzhs2q4-en](https://doi.org/10.1787/5km68fzhs2q4-en)

CPP Recent Amendments phased in 2011 to 2016

- Changes to the CPP agreed by Finance Ministers at last CPP triennial review meeting in May 2009; changes were set out in Part 2 of Bill C-51.
- Bill C-51 received Royal Assent 15 December 2009.
- Part 2 amends the CPP to:
 - remove the Work Cessation Test starting 2012.
 - increase the General Drop-Out Provision to 17% by 2014.
 - require working beneficiaries under 65 to contribute and allow (optional) for those 65+ (up to 70), with employers required to contribute. Additional contributions provide additional post-retirement benefits.



CPP Recent Amendments phased in 2011 to 2016

(cont'd)

- Part 2 amends the CPP to:
 - change pension adjustment factors to restore factors to actuarially fair values:
 - early pension take-up (60 up to 65): downward adjustment of 0.5% per month → 0.6% per month 2012-2016.
Similar to Finland.
 - late pension take-up (65 to 70): upward adjustment of 0.5% per month → 0.7% per month 2011-2013.
Similar to Japan.



Pension Reform – to date

- Much research and analysis conducted to date:
 - “Research Study on the Canadian Retirement Income System” (Bob Baldwin, November 2009).
 - “Summary Report on Retirement Income Adequacy Research” (Jack Mintz - Research Working Group on Retirement Income Adequacy December 2009).
 - “Options for Increasing Pension Coverage Among Private Sector Workers in Canada” (Colin Hansen - Steering Committee of Ministers on Pension Coverage and Retirement Income Adequacy, January 2010).
 - Public consultations by Federal Department of Finance and Ministries of Finance: Ontario, BC, Alberta, New Brunswick, Yukon.



Pension Reform – to date (cont'd)

- In June 2010, federal Government proposed increasing retirement income adequacy by:
 - creation of broad-based DC pension plans (Pooled Registered Pension Plans (PRPPs)) aimed at those not covered by workplace RPP;
 - increasing disclosure relating to retirement savings;
 - improving financial literacy;
 - expanding the CPP by way of “modest, phased-in, and fully funded enhancement” to its defined benefits.



Pension Reform – to date (cont'd)

- In December 2010, six provinces issued joint statement supporting:
 - modest, phased-in, fully funded enhancement to CPP, and
 - pension innovation to provide more Canadians with access to low-cost pensions by way of harmonized nationwide framework.
- Governments agreed to go forward with:
 - PRPPs - framework set out:
 - accessible, straightforward, low cost (large pools of capital), portable, customized per member, education resources provided;
 - fiduciary duty and responsibilities of administrators (regulated financial institutions);
 - default option and manageable number of investment options;
 - full disclosure: plan provisions, account activity, performance, fees, illustrations of retirement income;
 - tax changes and high level regulatory harmonization required.
 - improving financial literacy.





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Thank you

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