Bureau du surintendant
des institutions financières

Office of the Superintendent
of Financial Institutions

Bureau de l'actuaire en chef

Office of the Chief Actuary

Global Aging and its impact on the Financial Markets

Presentation to the Retirement Committee of Mouvement Desjardins

8 october 2003

Presentation

- Mandate of the Office of the Chief Actuary
- Canadian aging
- Global aging
- Possible Impact on Financial Markets
- Future challenges

Mission of OSFI – Mandate of OCA

Primary regulator in Canada of federal financial institutions and pension plans.

- protects policyholders, depositors, and pension plan members against any undue loss.

- provides services and actuarial advice to the Government of Canada through the ***Office of the Chief Actuary***.

  – Prepares actuarial reports for the Canada Pension Plan, the Old Age Security and the Canada Student Loans Program.

  – Prepares actuarial reports of the public sector pension plans: Public Service, Canadian Forces, RCMP, and others …

  – Provides actuarial advice to our clients.

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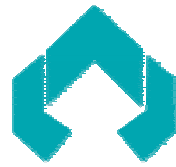
Canadian retirement system with mixed funding approaches is well recognized in the world for its capacity to adapt rapidly to changing conditions.

- Full funding (RPP/RRSP)

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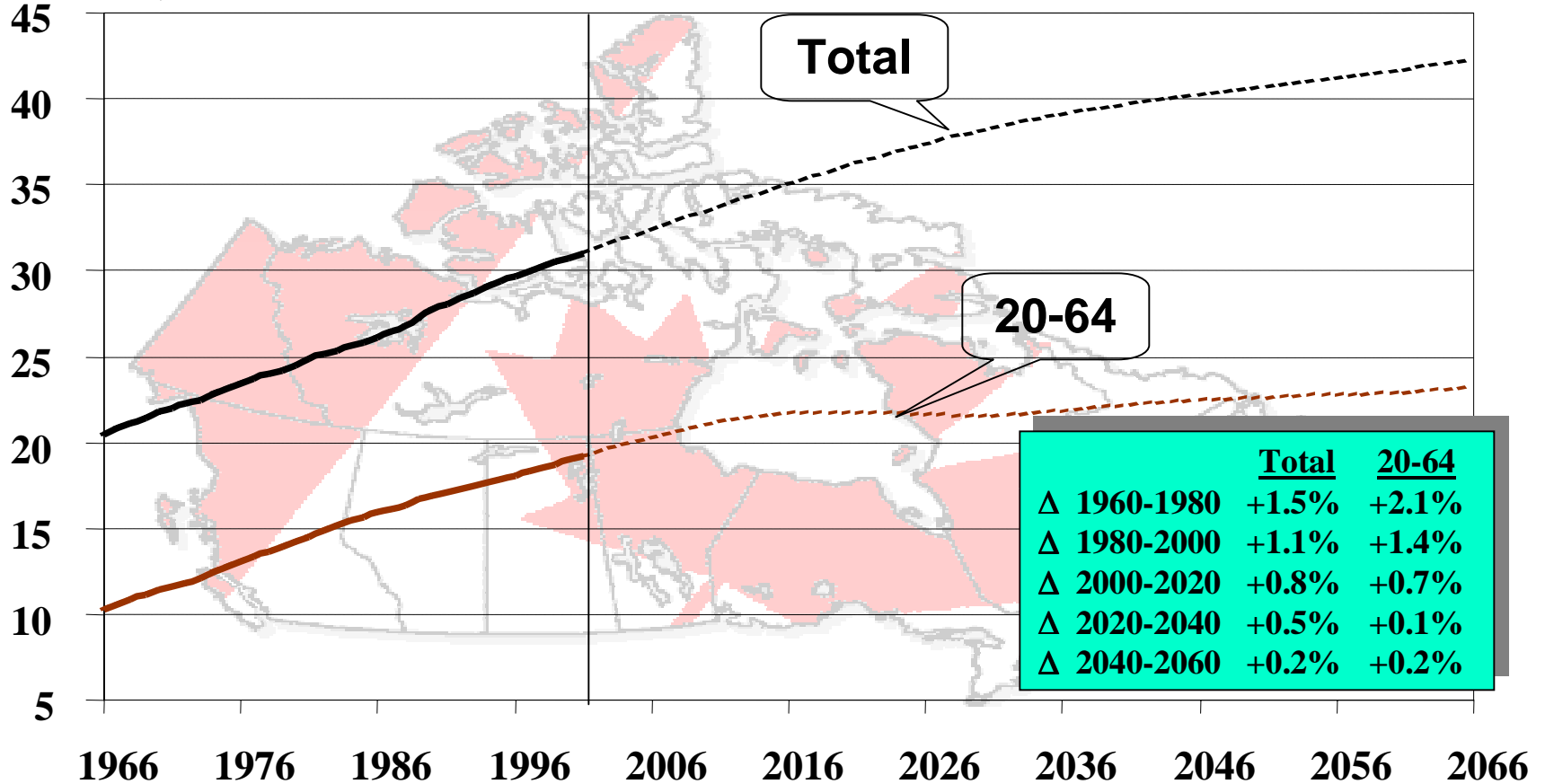
- Pay-as-you-go funding (OAS/GIS)

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

Population of Canada

(in millions)

		Total	20-64
Δ	1960-1980	+1.5%	+2.1%
Δ	1980-2000	+1.1%	+1.4%
Δ	2000-2020	+0.8%	+0.7%
Δ	2020-2040	+0.5%	+0.1%
Δ	2040-2060	+0.2%	+0.2%

After 2025, all projected population increase will come from migration.

Migration
(1986-2000)

	Canada less Quebec	Quebec	Canada
Immigration	+165,000	+32,000	197,000
Emigration	-37,000	-7,000	-44,000
From Québec	+11,000	-11,000	0
Net Migration	139,000	14,000	153,000
% of Population	0.64 %	0.20 %	0.53 %

Assumptions of the reports : CPP and QPP

2001	0.61 %	0.14%	0.48 %
2015	0.58 %	0.25%	0.51 %

Population Evolution
(in millions)
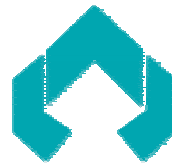
	QPP	CPP	QPP Proportion
1966	5,8	14,2	29 %
1980	6,5	18,0	27 %
1990	7,0	20,7	25 %
2000	7,4	23,4	24 %
2020	7,9	28,1	22 %
2050	7,8	32,8	19 %

(Need 3.1 million more in 2050 in order to maintain the 25% proportion of year 1990)

Office of the Chief Actuary   Bureau de l'actuaire en chef
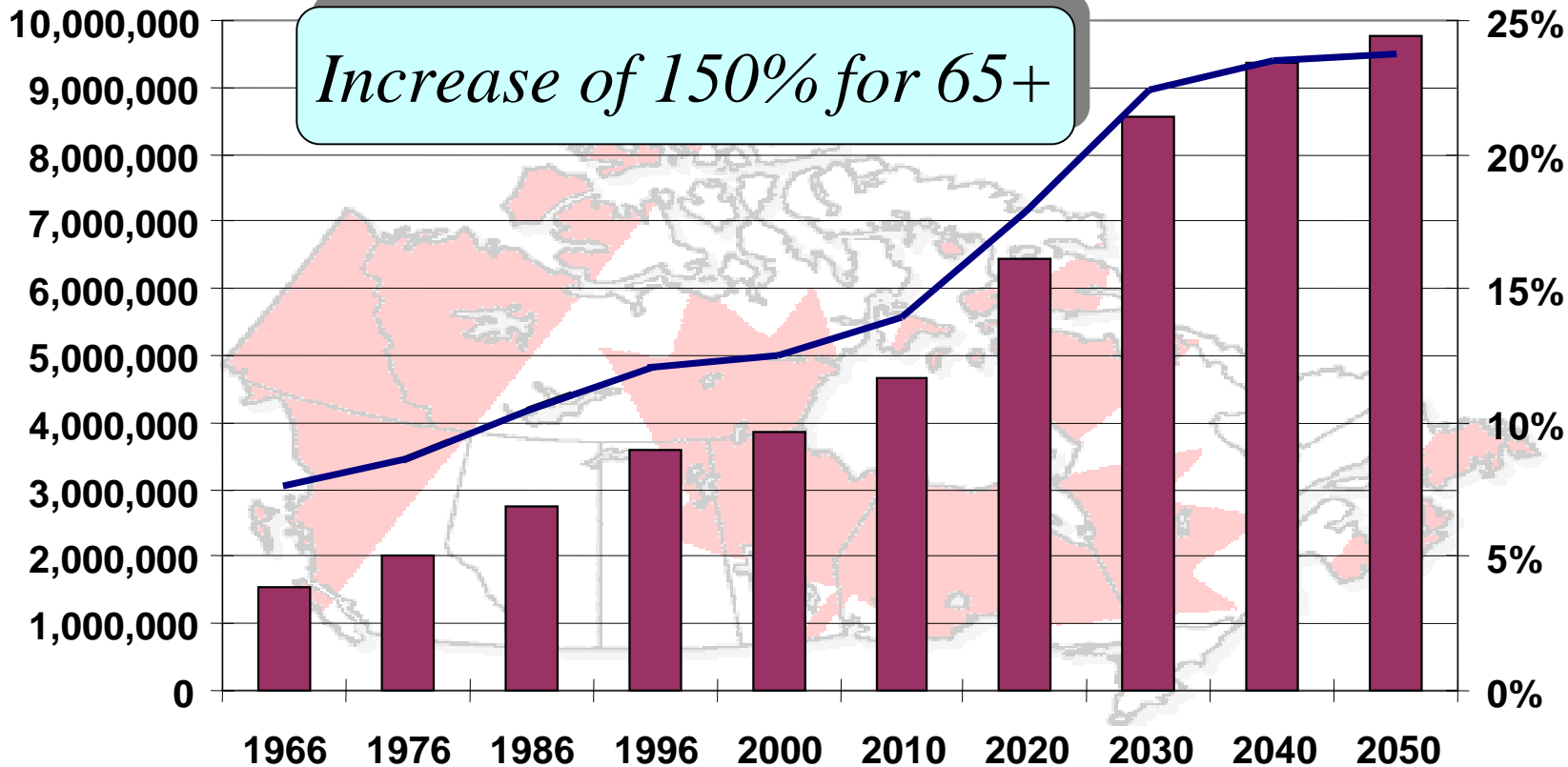
Canadian Aging

(Population 65+)

Increase of 275% for 80+

Increase of 150% for 65+

Legend: ■ Number —— % population

Public Pension Plans Expenses in % of GDP

Year	CPP/QPP	OAS/GIS	Total
1980	0.9%	2.2%	3.1%
1990	2.0%	2.5%	4.5%
2000	2.4%	2.3%	4.7%
2010	2.8%	2.4%	5.2%
2020	3.3%	2.8%	6.1%
2030	3.8%	3.2%	7.0%
2040	3.9%	3.0%	6.9%
2050	4.0%	2.7%	6.7%

Mortality rate

- In Canada and U.S., the leading causes of death are circulatory diseases (40% of deaths), cancer (20% of deaths) and accidents (9% of deaths).

- How long can we live?

- Can we reach 100 years old?

- From 1900 back 130,000 years, life expectancy remained approximately at the same level.

- It has increased by three decades since 1900 from 49 to 79.

- Analysts argue that **further progress will come more slowly** because we are approaching lower limits to death rates and we have already won the easier medical battles.
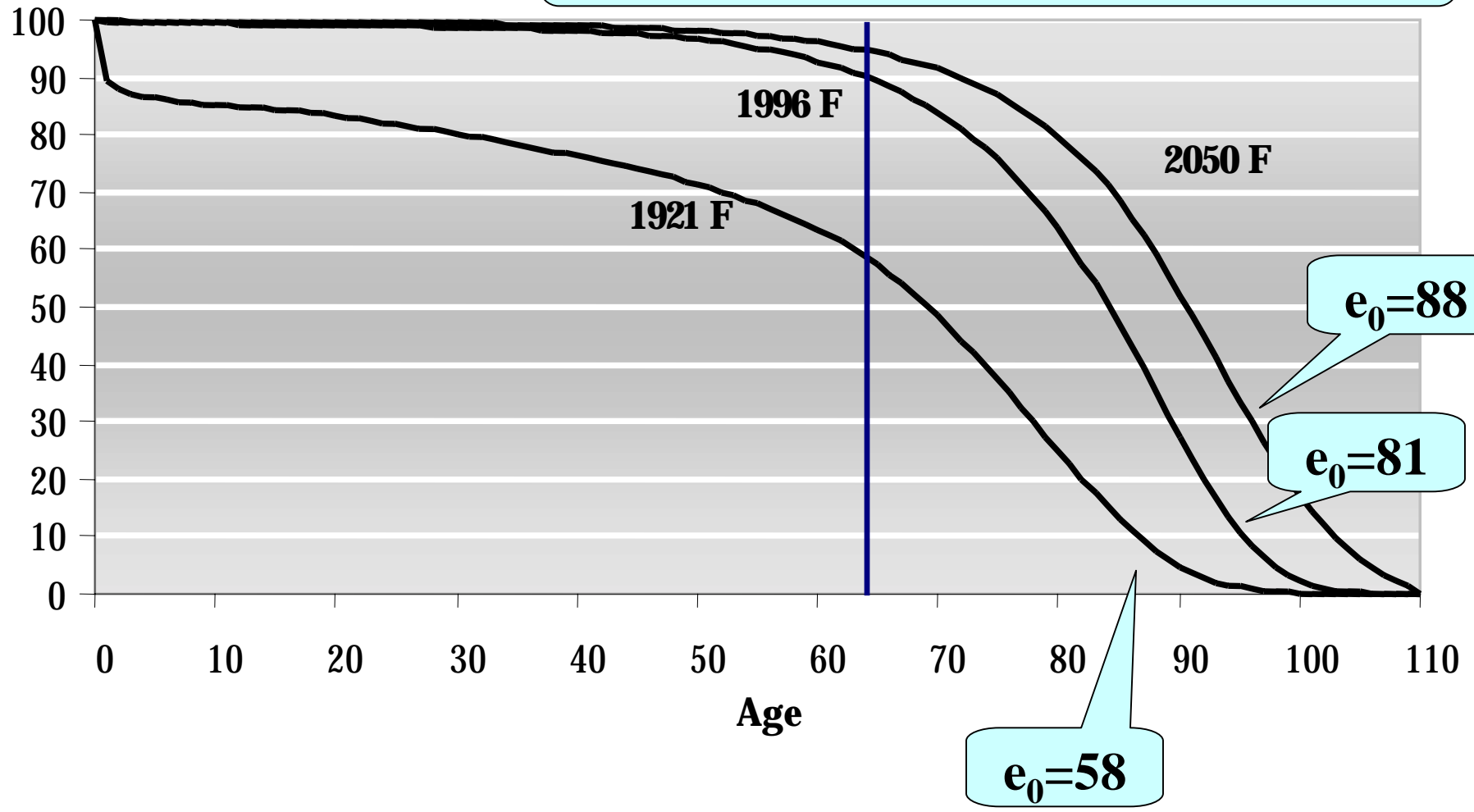
Probability of surviving

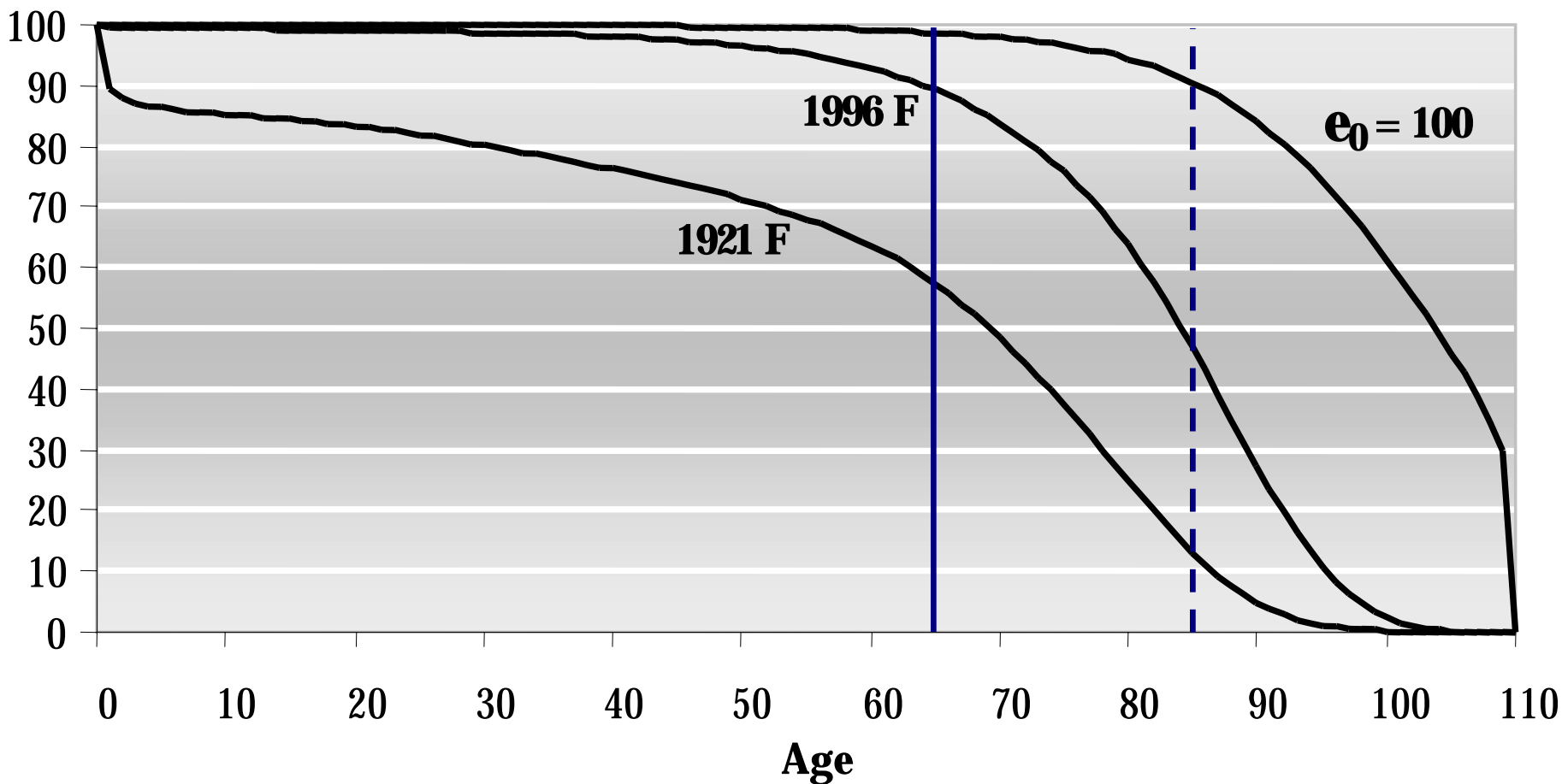« 70% of males would die between 74 and 94 »
Globe and Mail, March 2002

1996 M   2050 M

1921 M

$e_0=85$

$e_0=75$

$e_0=57$

Age

Probability of surviving

1996 F

2050 F

1921 F

$e_0=88$

$e_0=81$

$e_0=58$

Age

Probability of surviving

1996 F

1921 F

$e_0 = 100$

Age

Future Labour Shortage
(More people leaving than entering)

Ratio of 60-64 over 20-24

For every 6 who leave, 10 enter

Source: UN Population Projections Jan 2003
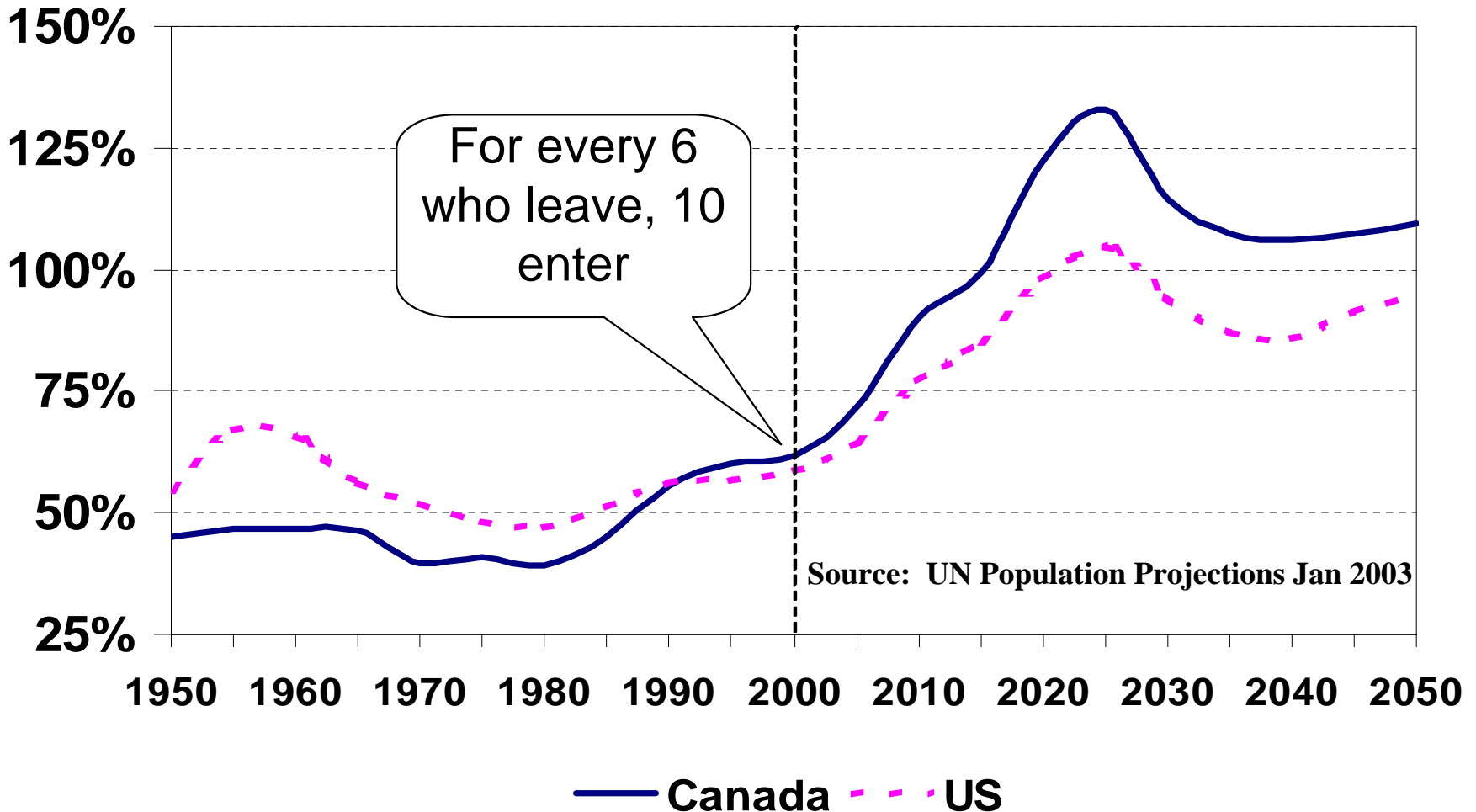
Canada – – US

Female Participation Rates
(Canada)

Legend:
- **Maximum Historical Rate of Male** (dashed)
- **Female 2030** (dotted)
- **Female 1999** (orange dash-dot)
- **Female 1976** (solid blue)

X-axis: 15 - 19, 25 - 29, 35 - 39, 45 - 49, 55 - 59, 65 - 69

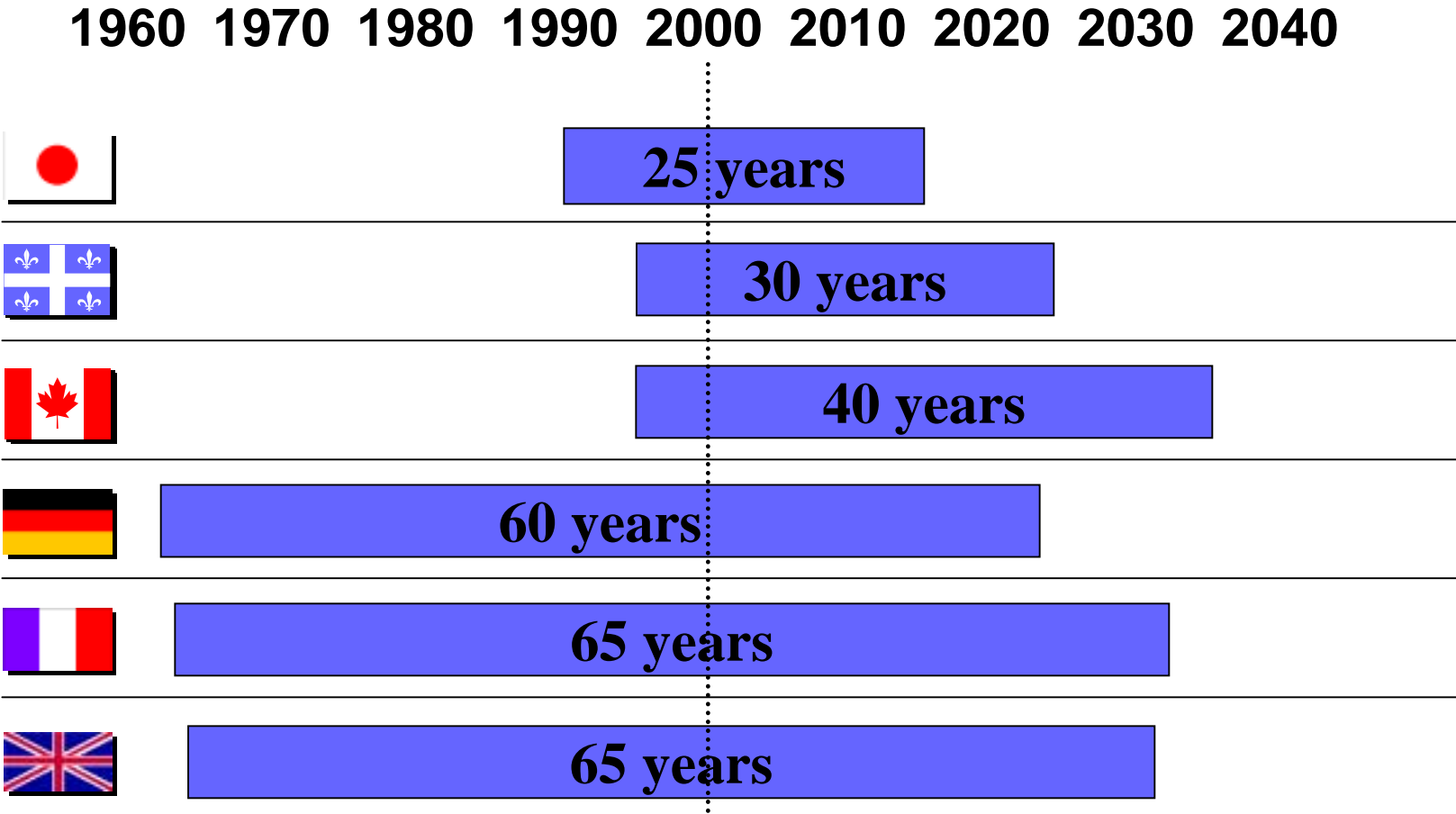Y-axis: 0.0 to 1.0
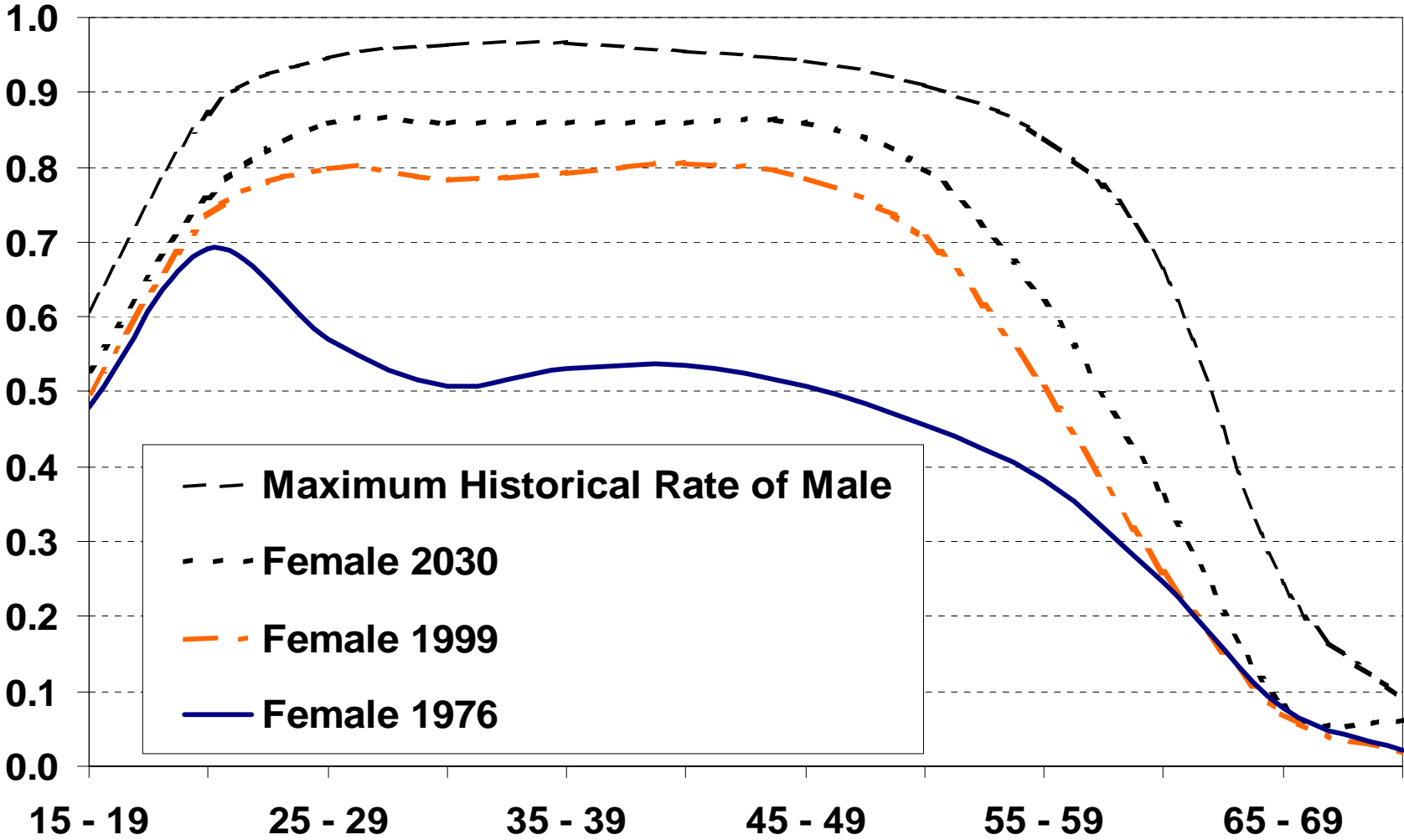
Global Aging

- Aging indicators
  - Magnitude of the aging
  - Speed of the aging
  - Impact on the working labour force

- Effective age of retirement *(OECD said the adverse impact of early retirement on future living standards could be as large as that of population aging itself.)*
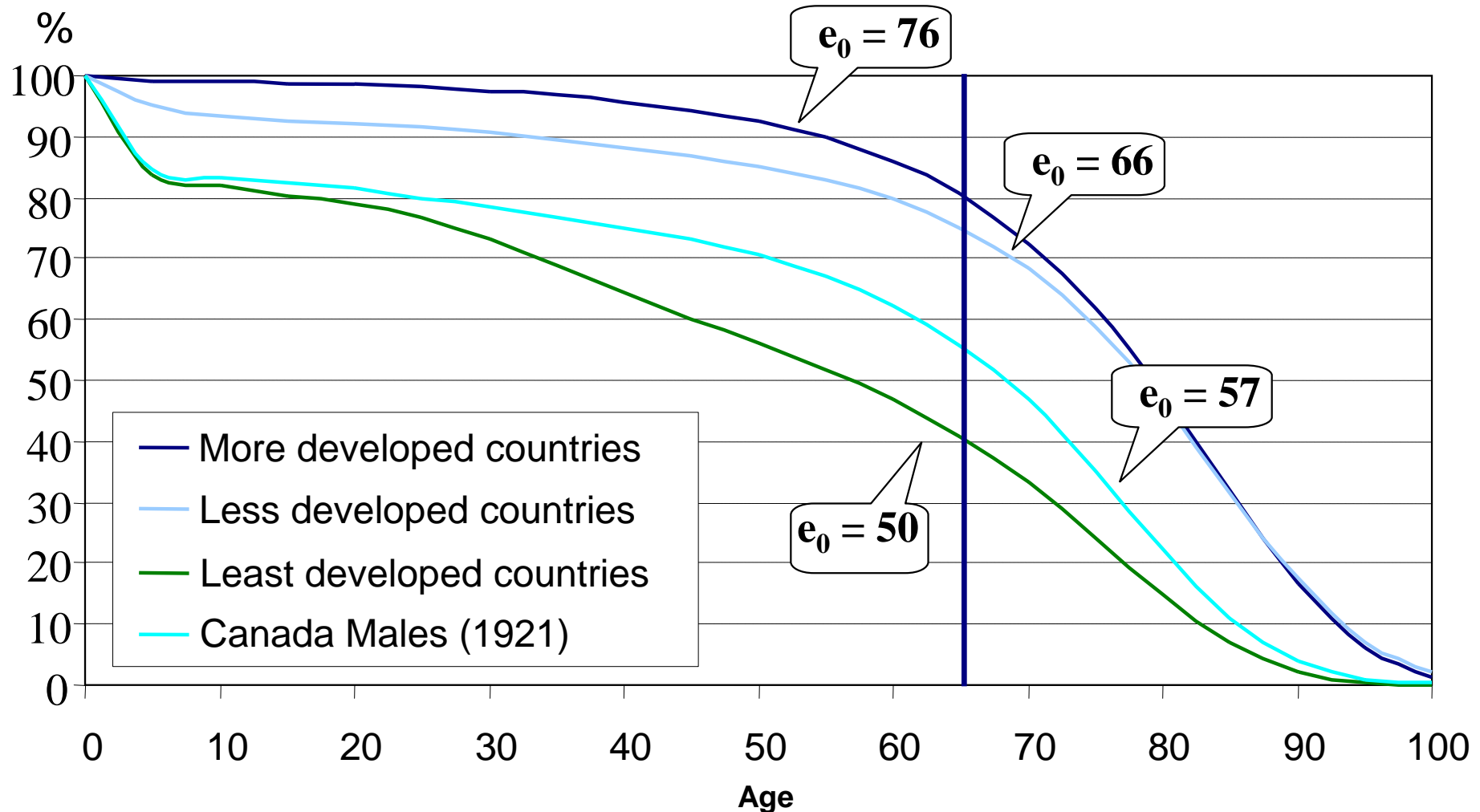
Projected number of years needed to go from 12% to 24% of 65 and over as a % the total population
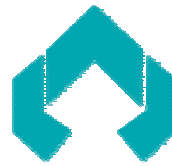
	1960	1970	1980	1990	2000	2010	2020	2030	2040

Japan: 25 years

Quebec: 30 years

Canada: 40 years

Germany: 60 years

France: 65 years

United Kingdom: 65 years

Probability of surviving
(World comparison)

$e_0 = 76$

$e_0 = 66$

$e_0 = 57$

$e_0 = 50$

%

Legend:
- More developed countries
- Less developed countries
- Least developed countries
- Canada Males (1921)

Age

United Nations, Population Division, Years 2000-2005

Life expectancy at birth

Country	(in 1980)	(in 2000)		(in 2050)	
Japan	- 5	**82**	(9 th)	+ 6	
United States	- 4	**77**	(3 rd)	+ 5	(3 rd)
Mexico	- 5	**73**	(11 th)	+ 7	
China	- 4	**71**	(1 st)	+ 6	(2 nd)
Brazil	- 5	**68**	(5 th)	+ 10	
Indonesia	-11	**67**	(4 th)	+ 10	(5 th)
Russia	+ 1	**67**	(6 th)	+ 7	
India	- 9	**64**	(2 nd)	+ 10	(1 st)
Zambia	+ 20	**32**	(74 th)	+ 20	

Since 1980, the difference in e_0 between the best and the worst country has actually increased from around 40 to 50 years !
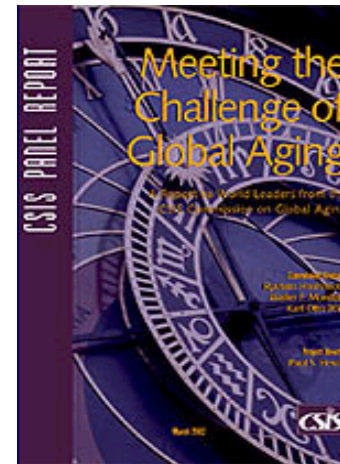
Inpact on financial markets
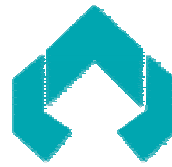
- # Yale University

- # Merrill Lynch

- # CSIS Reports
  (Center for Strategic and International Studies)

Demography and Predictability of Stock Market
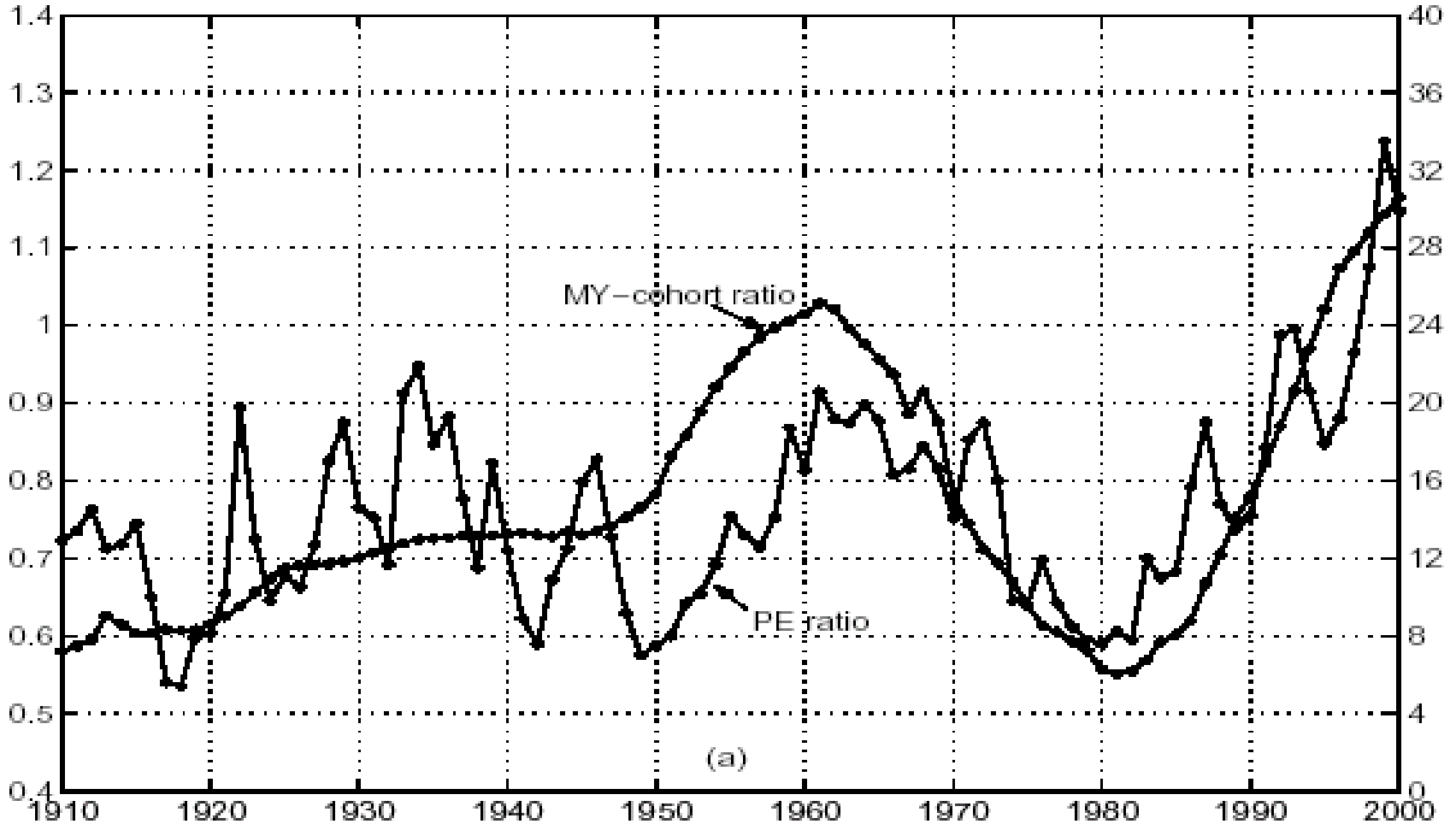## (Geanakoplos, Magill & Quinzii, Yale University)

- **Borrowing when young (20-39)**

- **Investing for retirement in middle age (40-59)**

- **Disinvesting in retirement (60+)**

- Objective: provide a framework for studying the relation between changing demographic structure and capital market equilibrium

- Methodology: Divide the 20th century into five 20-year periods of alternatively high and low birth rates.

  - *1910s, 1950s, 1990s, babyboom*
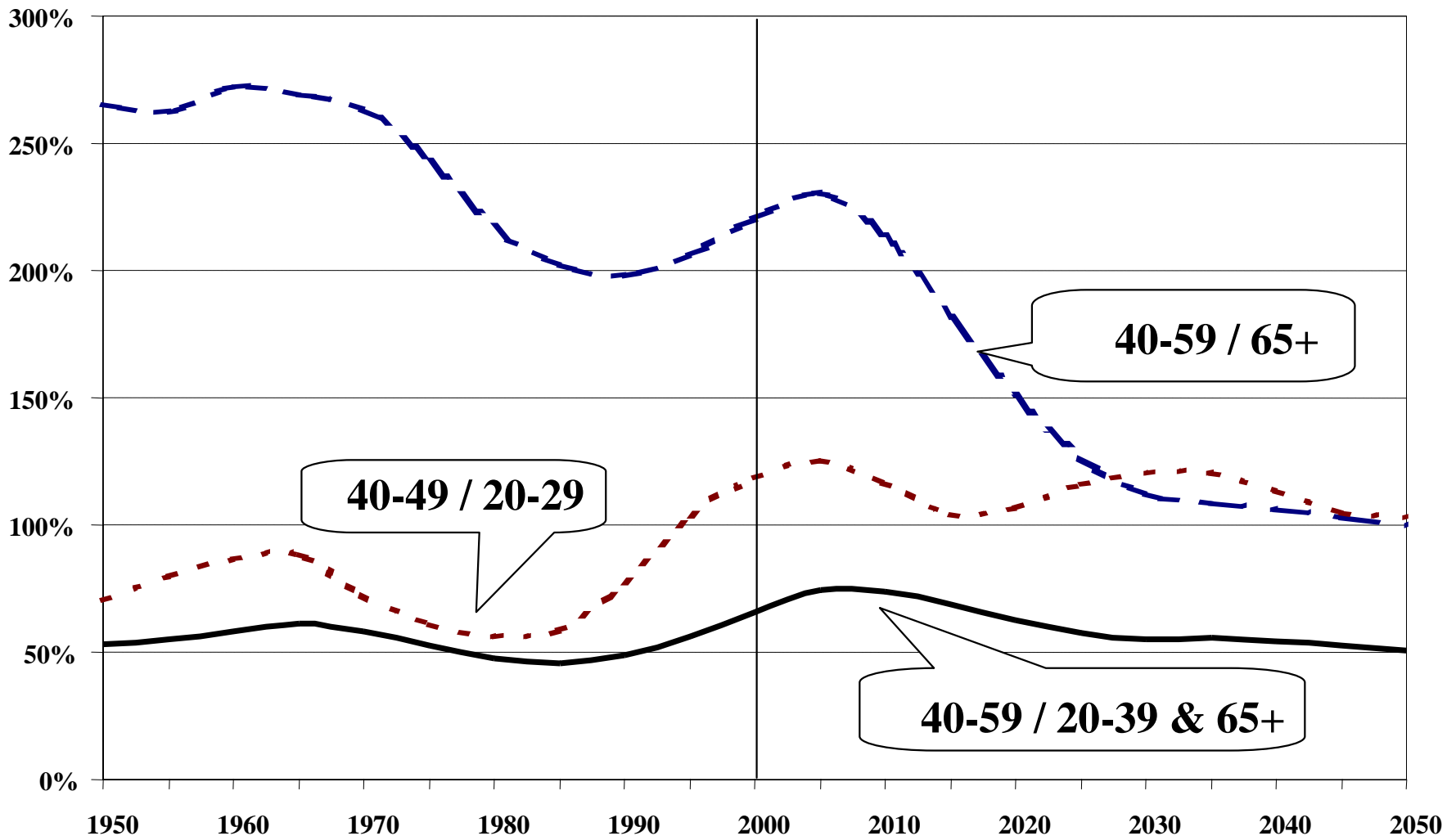
  - *1930s, 1970s, babybust*

(a)

MY–cohort ratio

PE ratio

What about other demographic ratios ? (Canada)

40-59 / 65+

40-49 / 20-29

40-59 / 20-39 & 65+

Demographics and Funded Pern Pension System

- Countries studied (Netherlands, United Kingdom, United States, Japan)

- What will happen to the **net cash flow** of funded pension systems when populations are increasingly aged?

- After 2010, number of people who retire and draw a pension will increase dramatically and net cash flow into the systems will start to decrease.

- However, the next five to ten years will continue to see good demand from the pension funds for investments.

- What will happen to the **asset allocation** of pension funds?

- It is likely that pension funds in the future will hold fewer equities and more fixed income products in their portfolios.
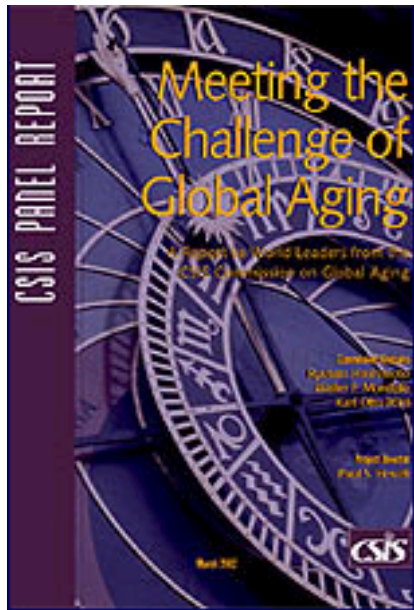
Findings
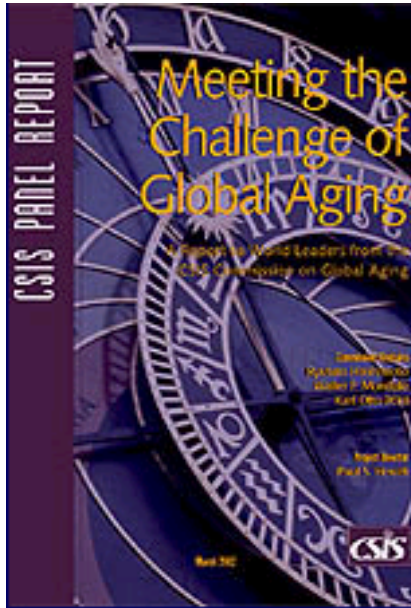
If the rates of labour force participation among older populations do not rise over time, **every developed country could face tight or shrinking labour markets that would significantly constrain their potential for economic growth.**
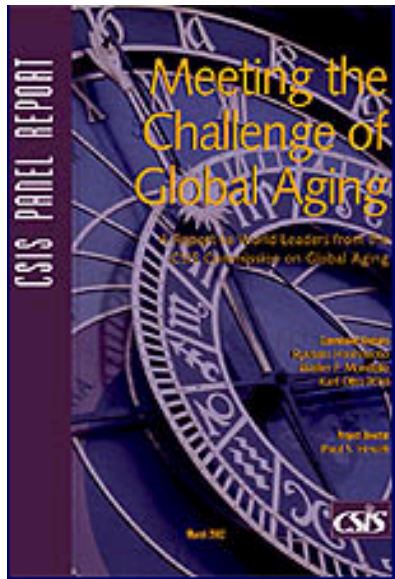
Findings

The populations of Japan and the EU-15 are projected to decline over the next 50 years, while the populations of the **United States and Canada will continue to grow**, albeit at a slower rate.

Findings

Although funded pension systems are less susceptible to demographic shocks, **the transition from pay-as-you-go (state-funded) to fully funded pensions** can create a double-payment problem, in which one working-age generation must pay for the pension benefits promised to preceding generations while simultaneously saving for its own old age.
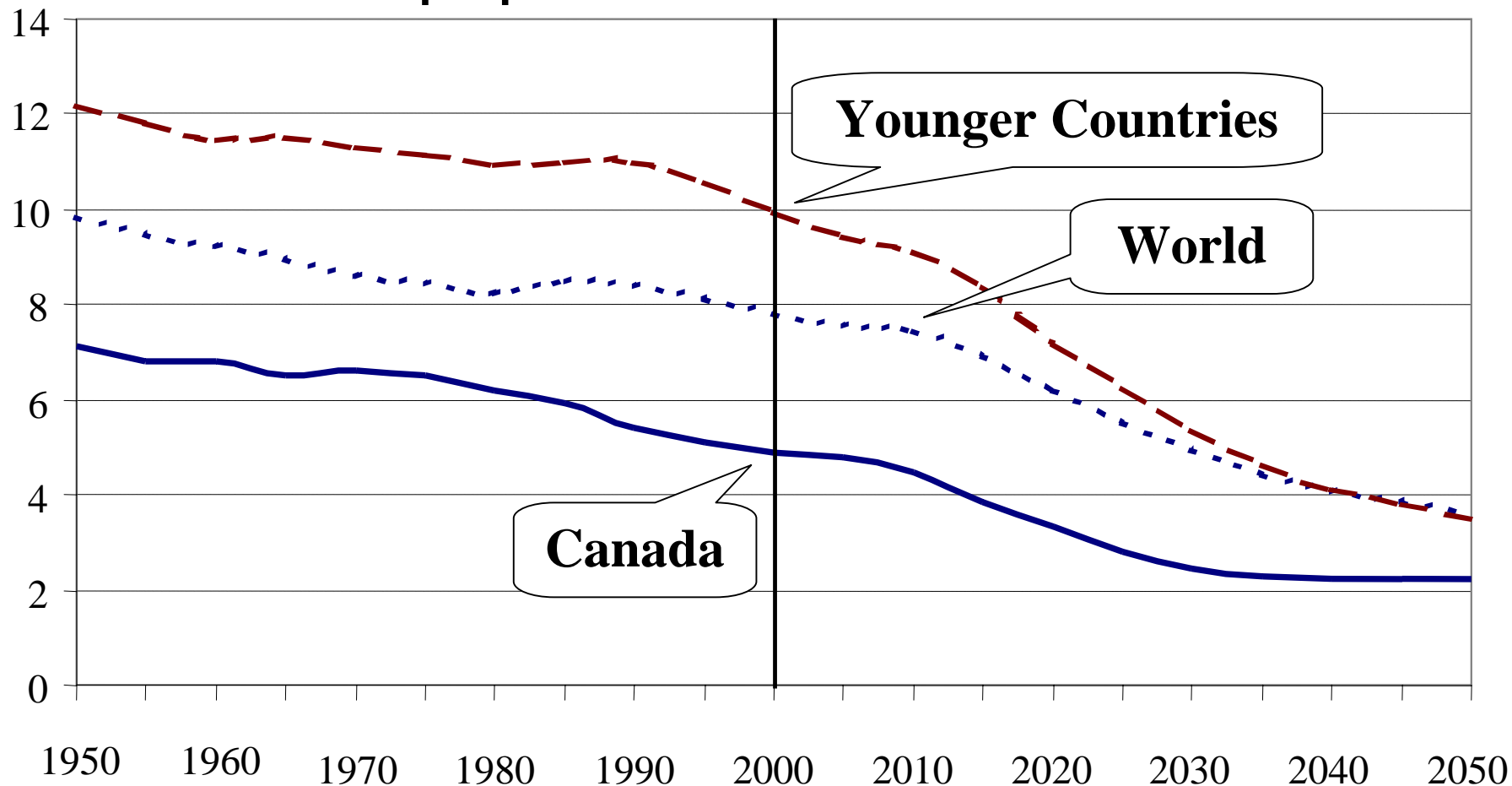
The Canadian retirement system could be viewed as about 40% to 45% funded.

How do we position for the aging of the World population?

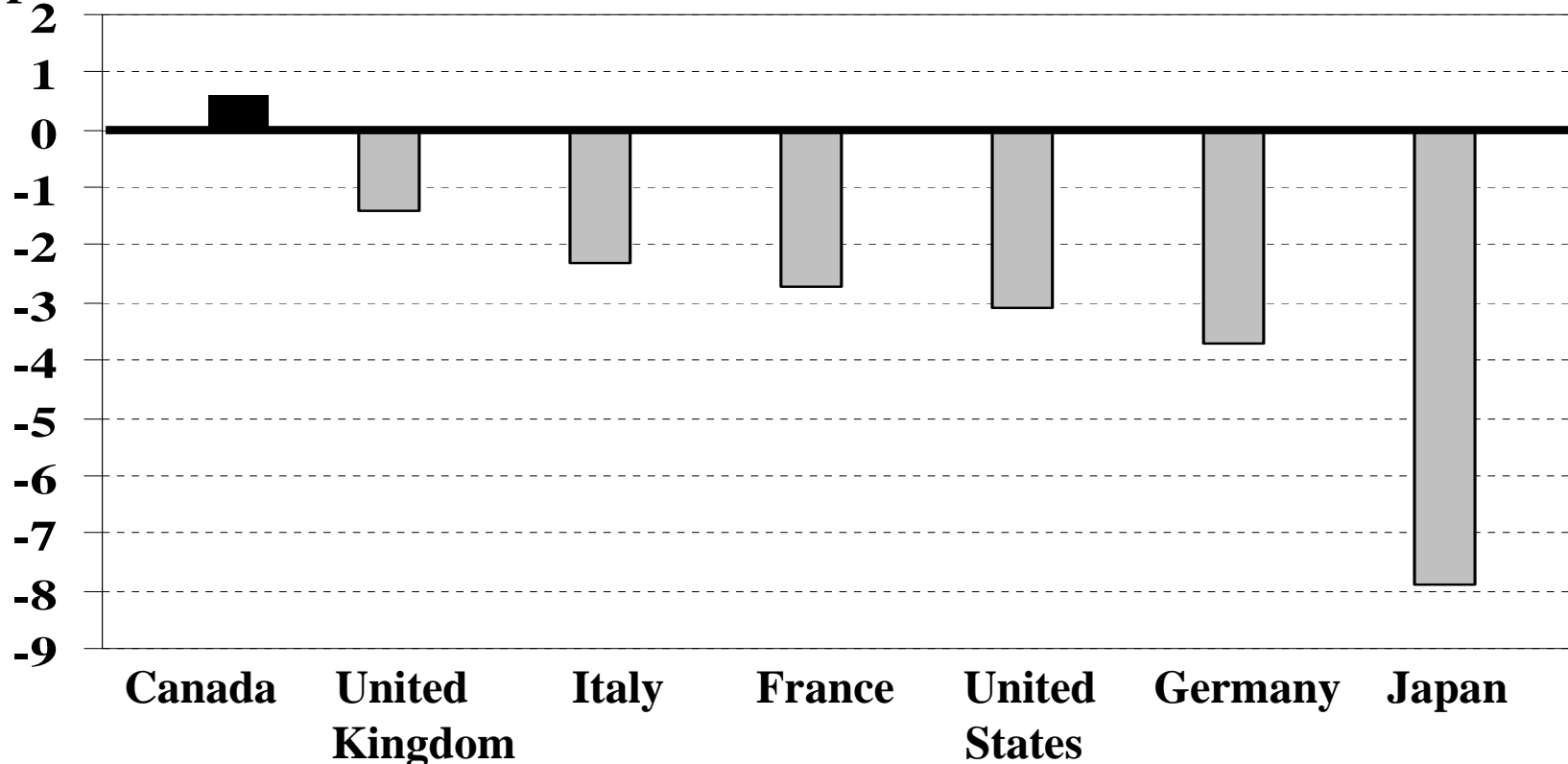## Ratio of population 20 to 64 Over 65 +

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

Total Government Financial Balances, 2002

per cent of GDP

Bar chart showing total government financial balances as a percent of GDP for 2002: Canada (about +0.5), United Kingdom (about -1.4), Italy (about -2.3), France (about -2.7), United States (about -3.1), Germany (about -3.7), Japan (about -7.9).

Balancing the budget and putting the debt-to-GDP ratio on a downward track are good ways to ensure that OAS can be financed on a sustainable basis.

Future challenges

- Retirement is a reality for a vast majority of Canadians.

- The aging is expected to be more severe in Canada than in United States, our main commercial partner.

- Contrary to the other industrialized countries, Canada should not undergo a fall of its working population thanks in particular to future immigration.

- The expected aging of the working labour force and the resulting labour shortage that could occur will represent one of the biggest challenge in the coming years.