

Round Table for the future path of healthcare in the Czech Republic



Workshop
Forecasting and modeling of financial flows
in healthcare and long-term care sector

Prague, 19-20 December 2007

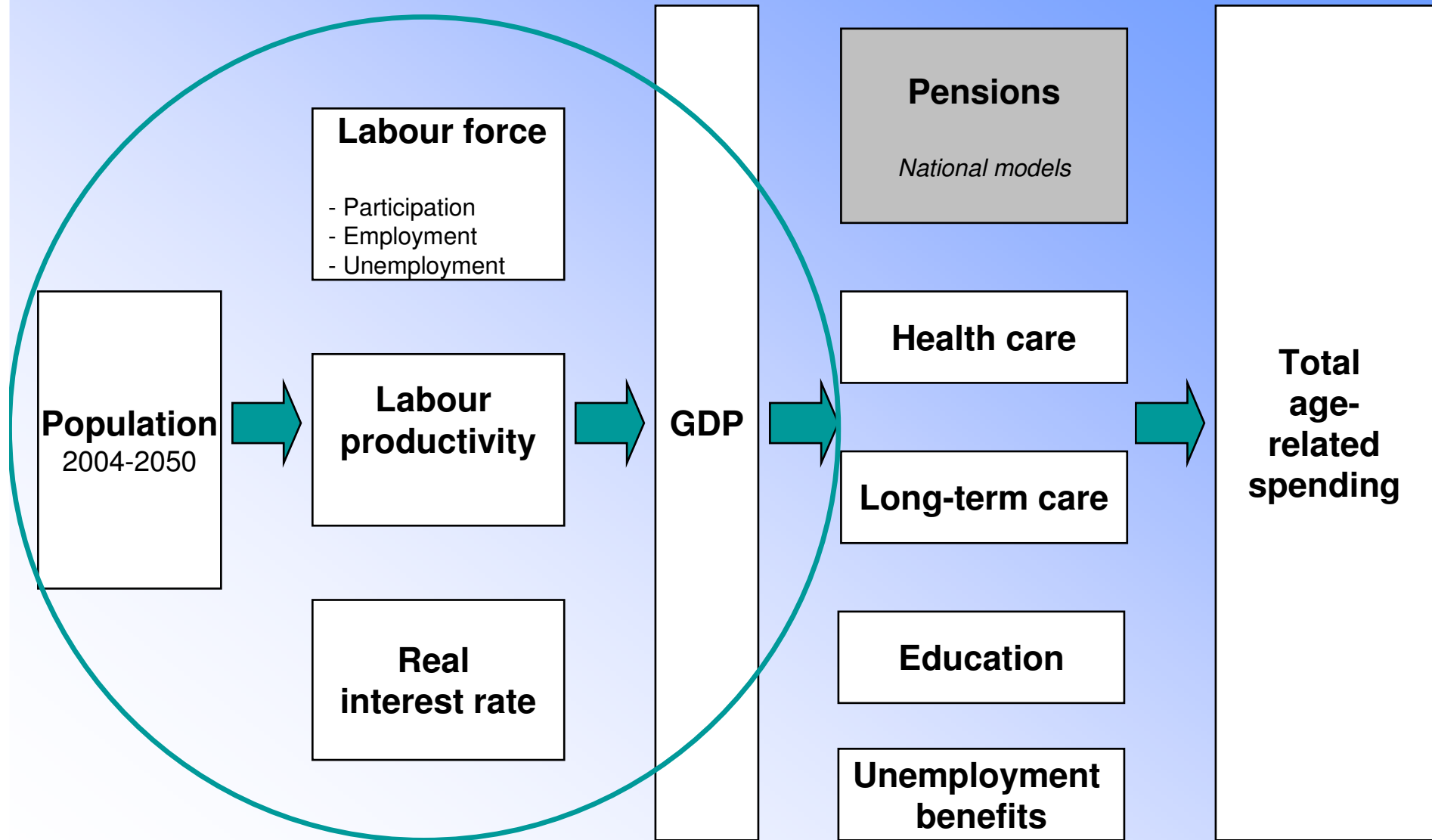
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European Commission
(DG ECFIN)

The EU-Ageing model and projections on the economic and budgetary impact of ageing

Outline of the presentation

- Overview of the projection exercise
- Underlying population and economic assumptions
- Budgetary projection results
 - Pensions
 - Health care and long-term care
 - Education
 - Overall budgetary impact of ageing
- The assessment of long-term fiscal sustainability

Overview of 2005 projection exercise

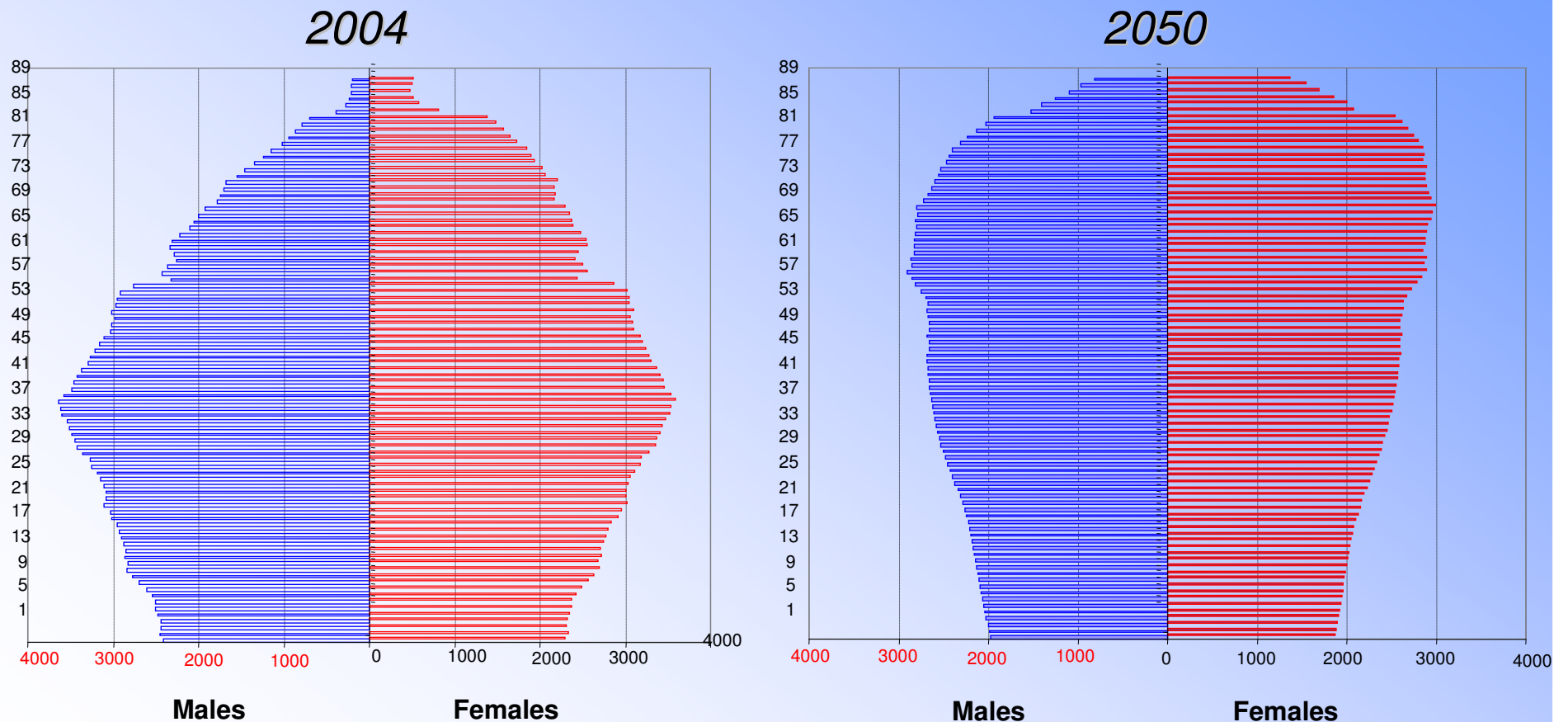


Main demographic drivers

	EU15		EU10		CZ	
	2004	2050	2004	2050	2004	2050
Fertility rate	1,5	1,6	1,2	1,6	1,15	1,5
Life expectancy at birth - men	76,4	82,1	70,1	78,7	72,4	79,7
Life expectancy at birth - women	82,2	87	78,2	84,1	78,8	84,1
Net migration flows (thousands)	1347	778	-3	101	4	20
Net migration flows (as % of population)	0,4	0,2	0	0,1	0,1	0,2

A much older population structure in the EU25

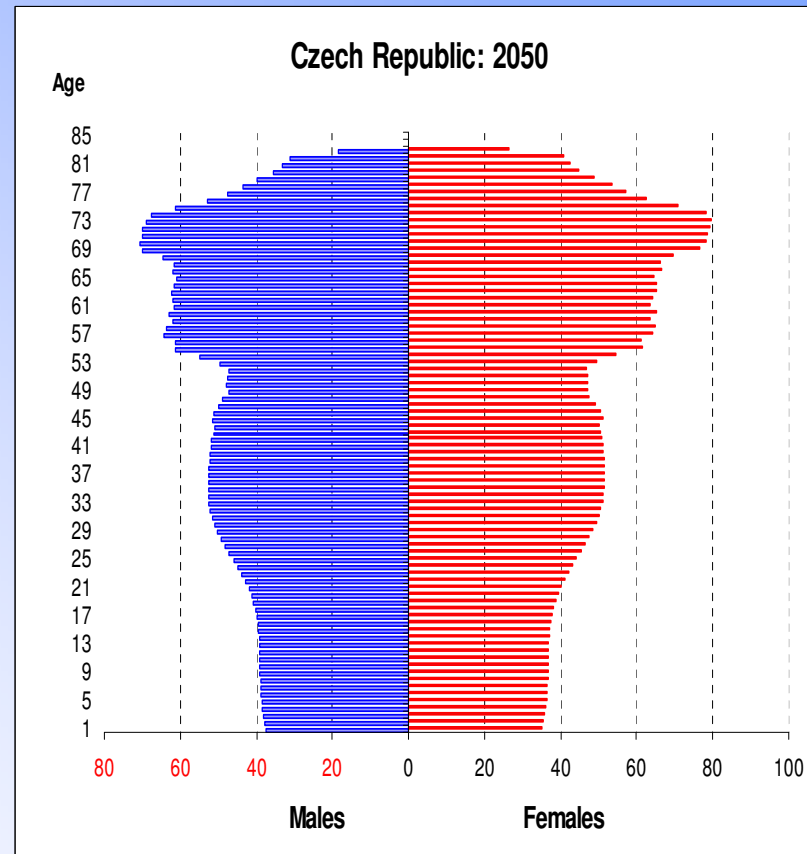
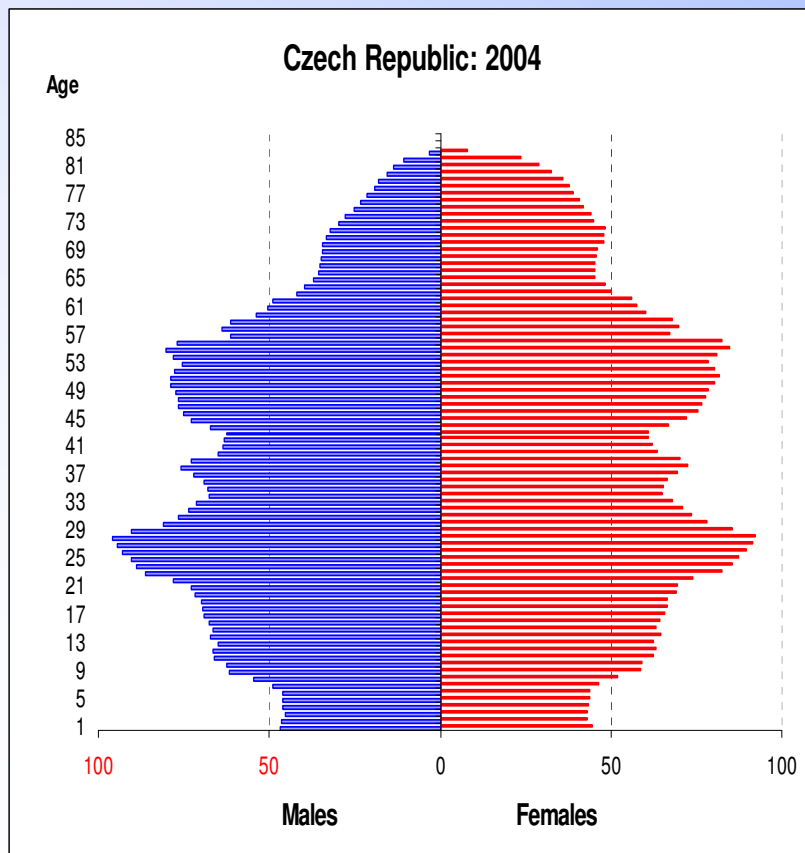
- Total population: **457 mill. in 2004, 471 mill. in 2030, 454 mill. in 2050**
- Most numerous age cohorts: **age 36 in 2004, age 57-59 in 2050**
- Population aged 65+ doubles until 2050 (from **75 to 133 millions in 2050**)
- Old age dependency ratio (65+/15-64): **doubles from 26 to 52**



Source: 2006 EPC/Commission report on ageing.

Czech Republic

- Total population: 10.2 mill. in 2004, 8.9 mill. in 2050
- Most numerous age cohorts: age 28 in 2004, age 72-73 in 2050
- Population aged 65+ : from 1.4 in 2004 to 2.8 millions in 2050)
- Old age dependency ratio (65+/15-64): doubles from 20 to 55



Participation rate projections: the cohort approach

Three Main Features of the Methodology :

1) Use of entry rates and exit rates:

1997-2003 average rates kept
constant over the period of projection

2) Participation rates are projected for each single year of age and gender

3) Incorporate the impact of pension reforms

Methodology to estimate the impact of recent pension reforms on participation rates

FIRST STEP:

- Analysis of the exit rates, probability of retirement and the cumulative distribution function at different ages
- Analysis of the impact of different pension rules and their changes on the rate of exit and probability of retirement

SECOND STEP:

- Change the probability of retirement
- Change the corresponding exit rates
- Re-run the cohort model to get new participation rates

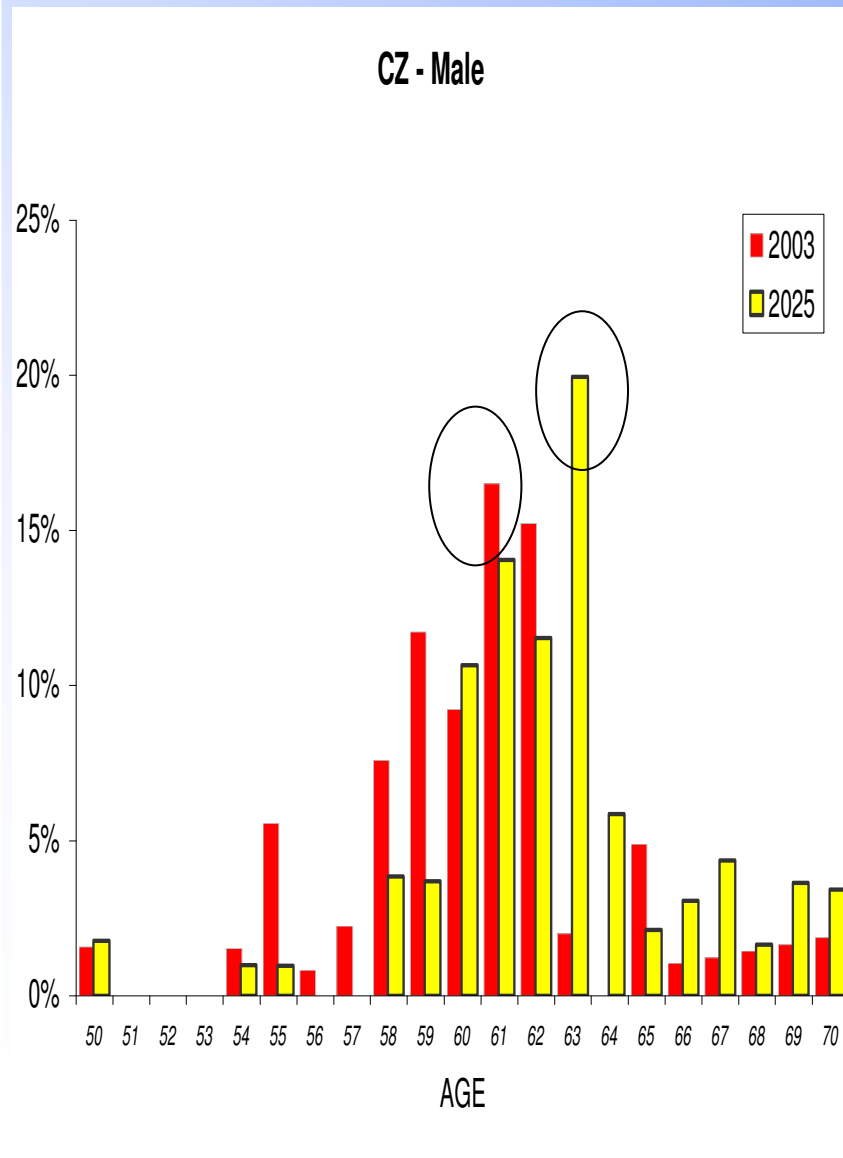
Recent pension reform

Czech Republic

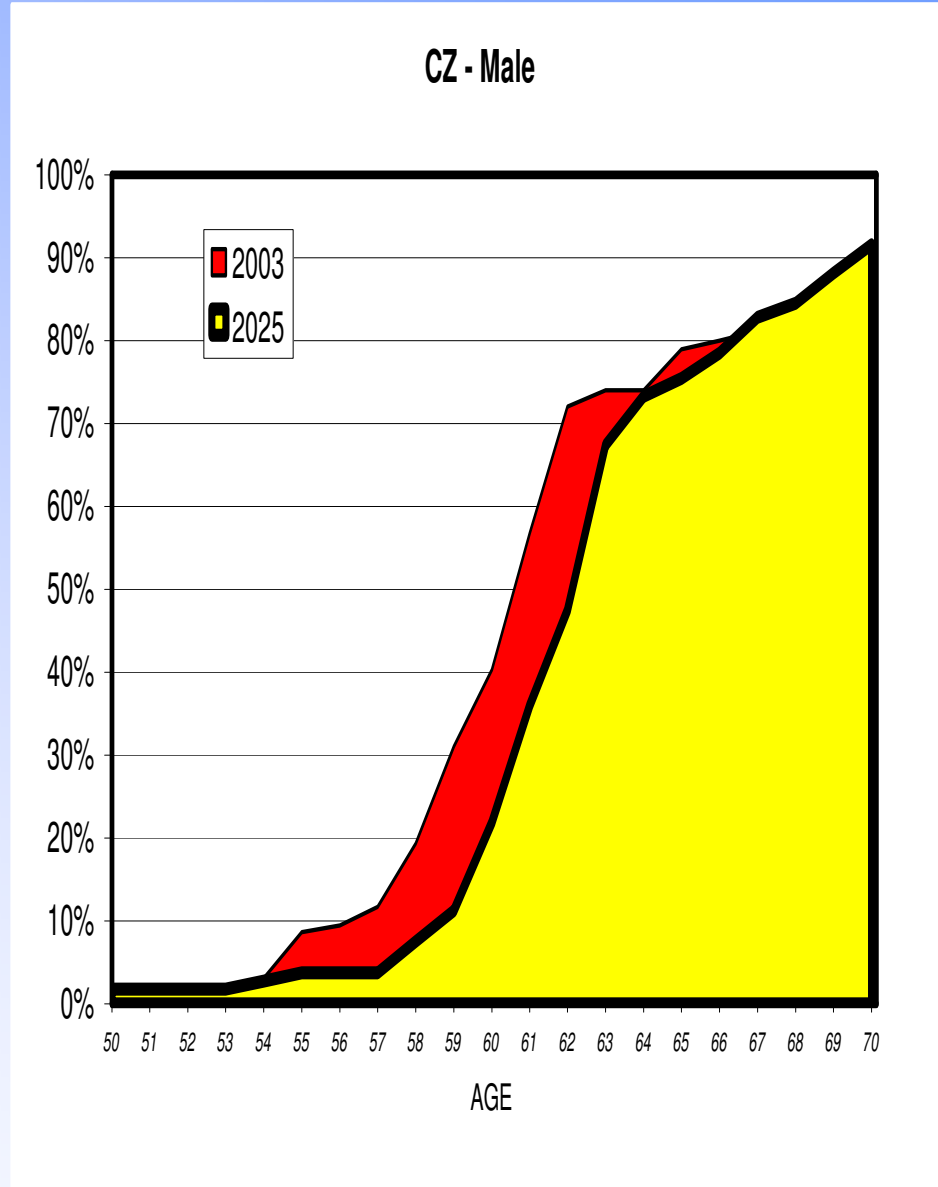
- *Before the pension reform in 2003, men retired at the age of 60 and women at 53-57, depending on the number of children (one year less per child).*
- *Since January 2004, the age of retirement is increased constantly over time (2 months per year for men and 4 months per year for women) to reach 63 year per men and 59-63 per women (still depending on the number of children) in 2013.*
- *The so-called “temporarily reduced pension”, an early retirement scheme, has been abolished, while the so-called “permanently reduced pension” scheme (allowing early retirement up to three years before the normal retirement age) is still in place but with a stronger reduction of the pension benefit (0.9% for each 90 calendar days from the statutory retirement age)*

Estimating the impact of recent pension reforms

Probability of retirement

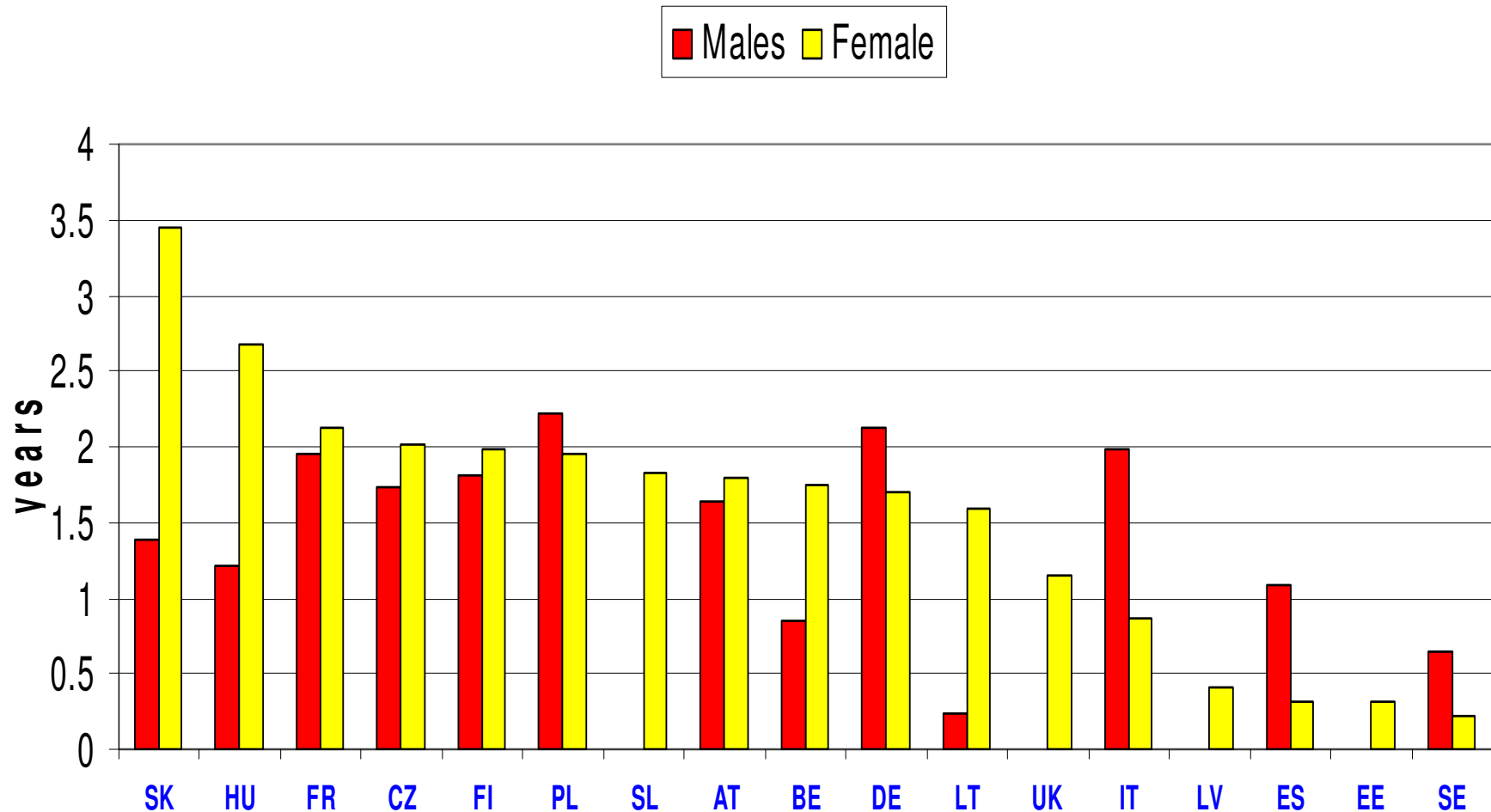


Cumulative probability of retirement at or before a given age

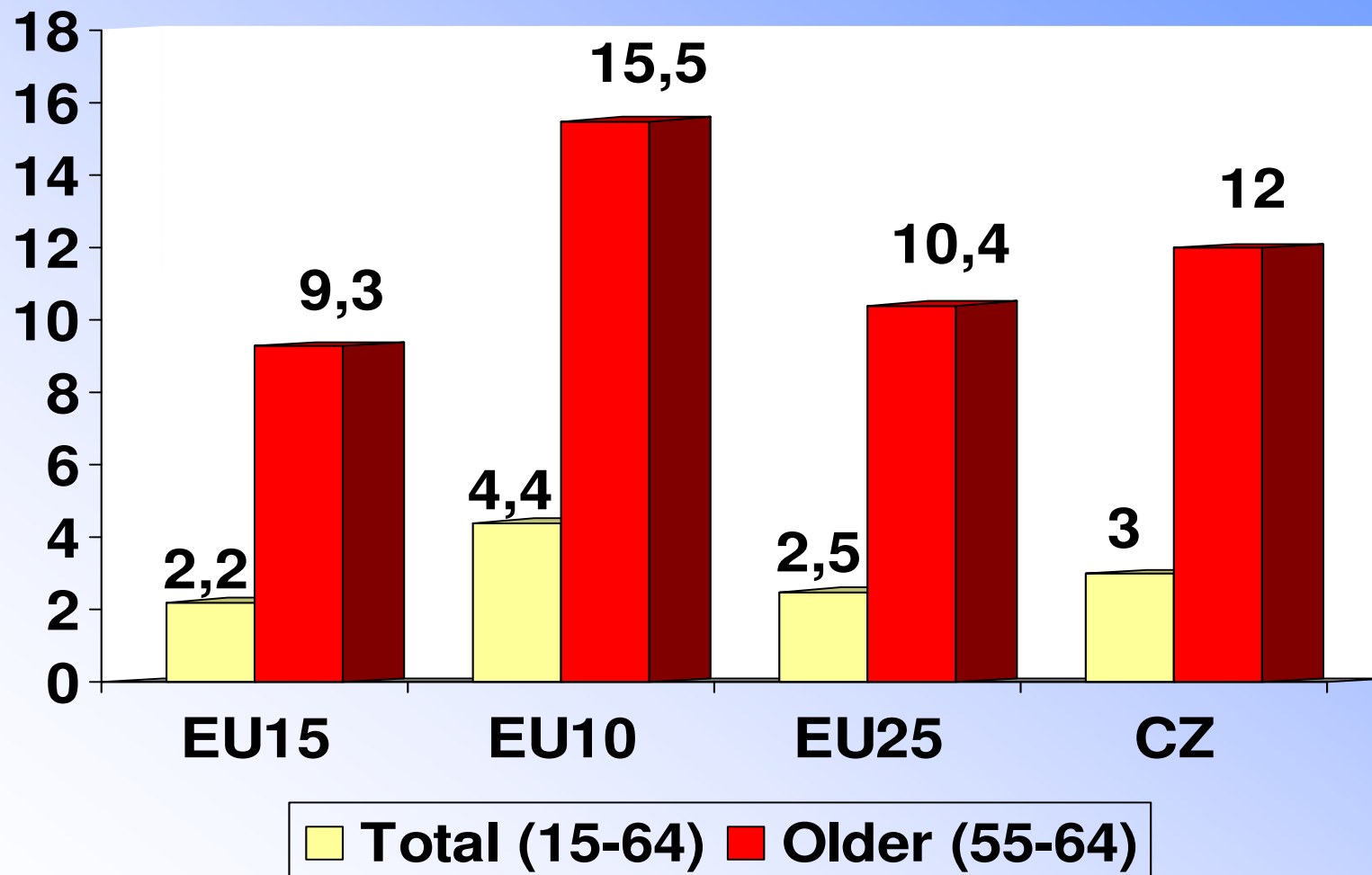


Impact of recent pension reforms (2003 - 2025)

Increase in the average exit age



Increase in participation rates due to pension reforms (2003- 2050)



Adult life spent in retirement

EU25	Men		Women	
	2003	2050	2003	2050
Employment rate of older workers	50.0	64.8	30.4	53.0
Average exit age	61.9	62.9	61.1	61.9
Life expectancy at the time of withdrawal	19.0	22.1	23.3	26.6
% of adult life spent in retirement	28.8	31.6	33.6	36.2
Requested exit postponement, in years (to keep % life spent in retirement constant)		1.9		2.0

Adult life spent in retirement

CZ	Men		Women	
	2003	2050	2003	2050
Employment rate of older workers	57.8	68.0	28.6	50.0
Average exit age	62.0	63.1	60	61
Life expectancy at the time of withdrawal	16.8	20.3	22	24.9
% of adult life spent in retirement	26%	30%	33	35
Requested exit postponement, in years (to keep % life spent in retirement constant)		2.3		1.6

FROM PARTICIPATION RATES TO EMPLOYMENT

Unemployment assumptions

3 Groups of countries

1) THOSE BELOW THE EU-15 AVERAGE :

☞ *project further decline in the ECFIN 2005 NAIRU up to 2008
(a simple rule that allows for 50% of the most recent decline:*

$$NAIRU_{t+1} = NAIRU_t - 0.5 * (NAIRU_t - NAIRU_{t-1})$$

2) THOSE ABOVE EU-15 AVERAGE:

☞ *convergence to the 2008 EU15 NAIRU average (about 7%) by 2015*

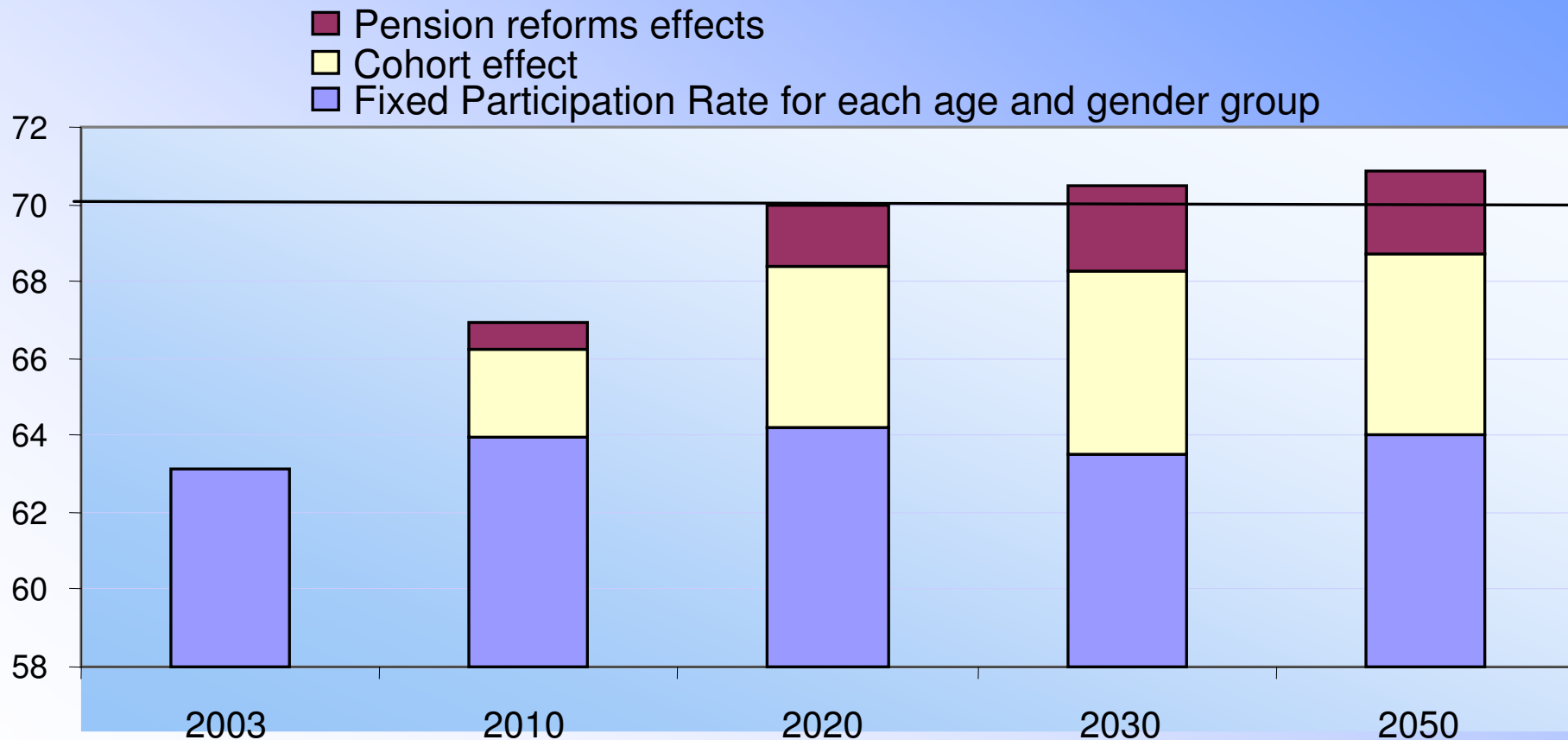
3) POLAND AND SLOVACK REPUBLIC (with very high UR)

☞ *convergence to the 2008 EU15 NAIRU average
(about 7%) by 2025*

➤ **Employment rate for the EU25:**

from 63% in 2003 to 71% in 2050 mainly due to:

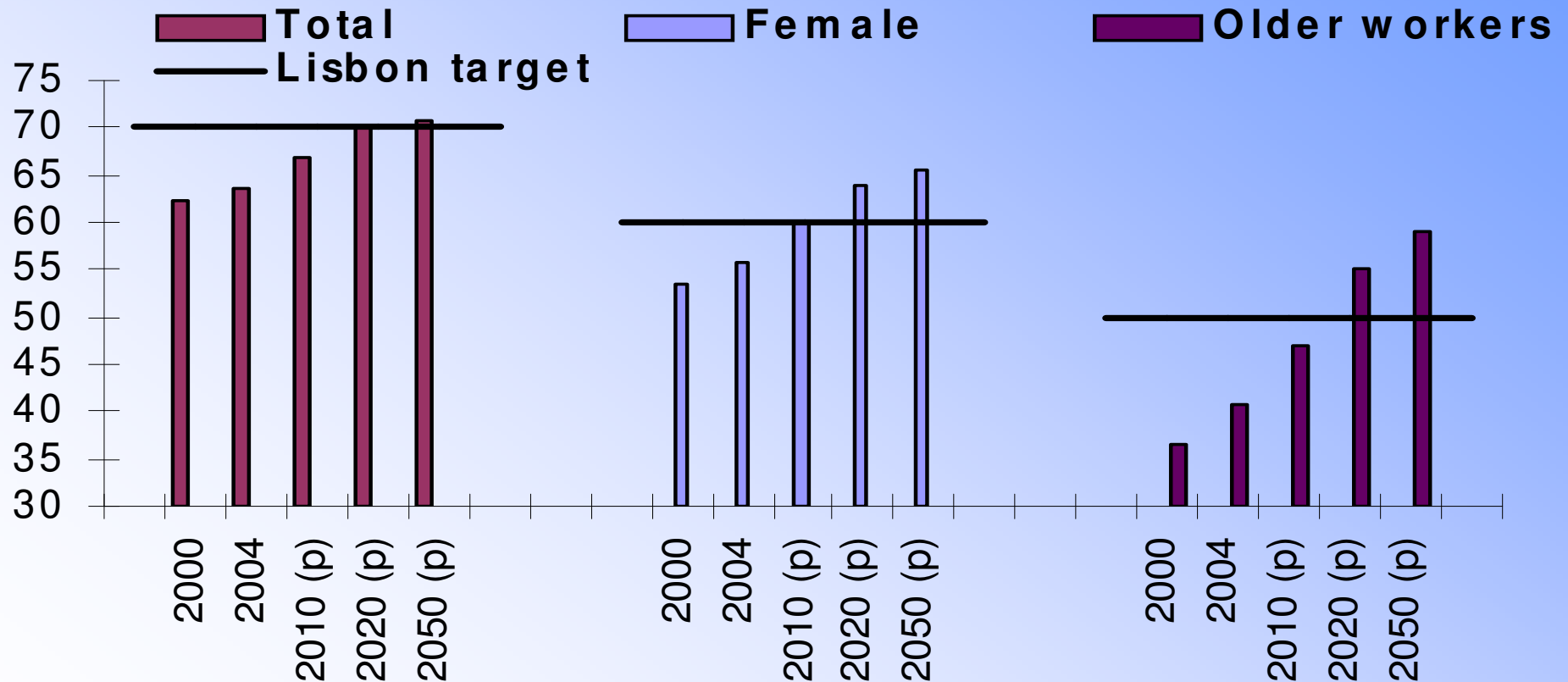
- **women's employment:** from 55% to 65%
- **older workers (aged 55-64):** from 40% to 59%



Source: 2006 EPC/Commission report on ageing.

The consequences of ageing populations on employment and growth

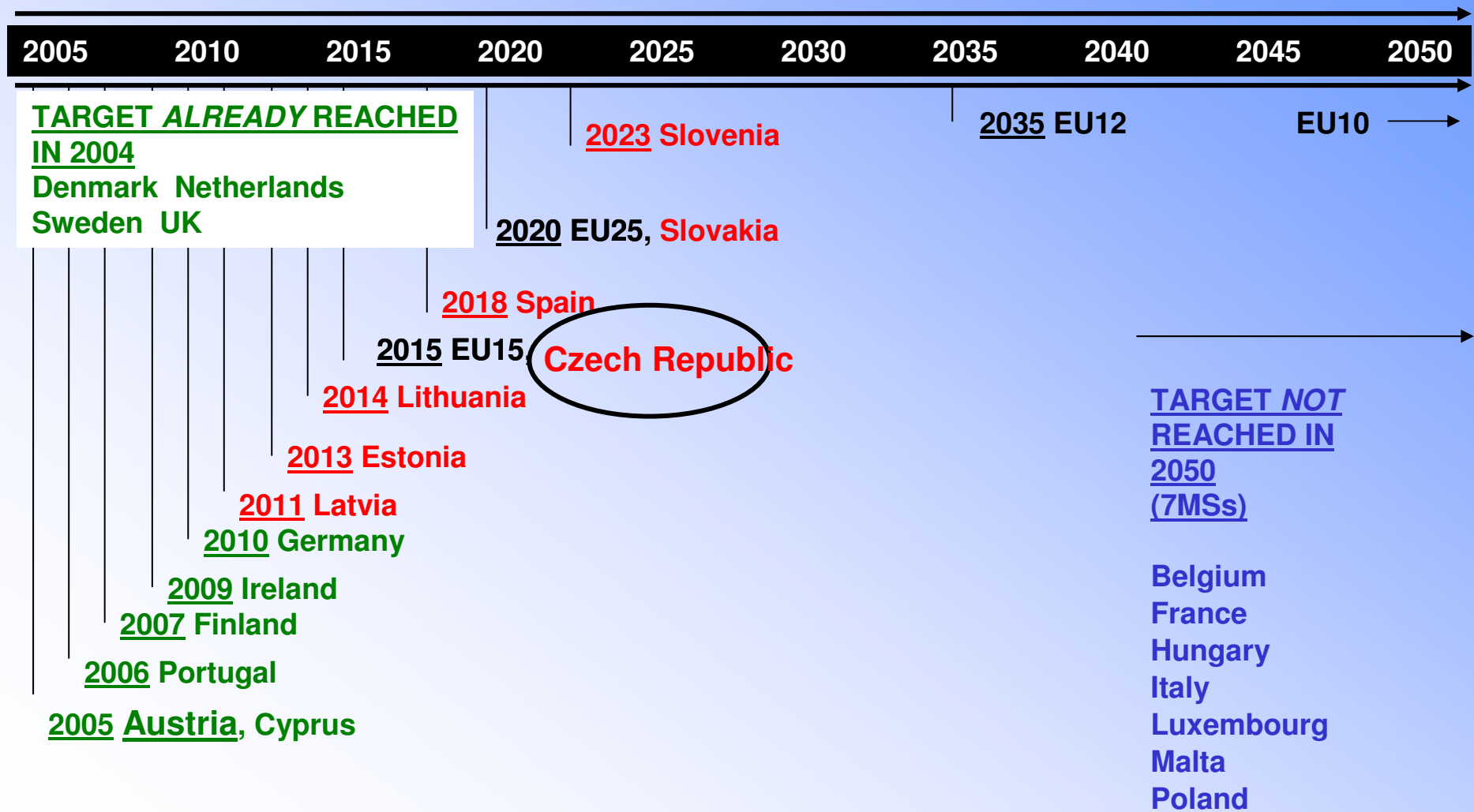
Projected employment rates and Lisbon targets for the EU25



Source: 2006 EPC/Commission report on ageing.

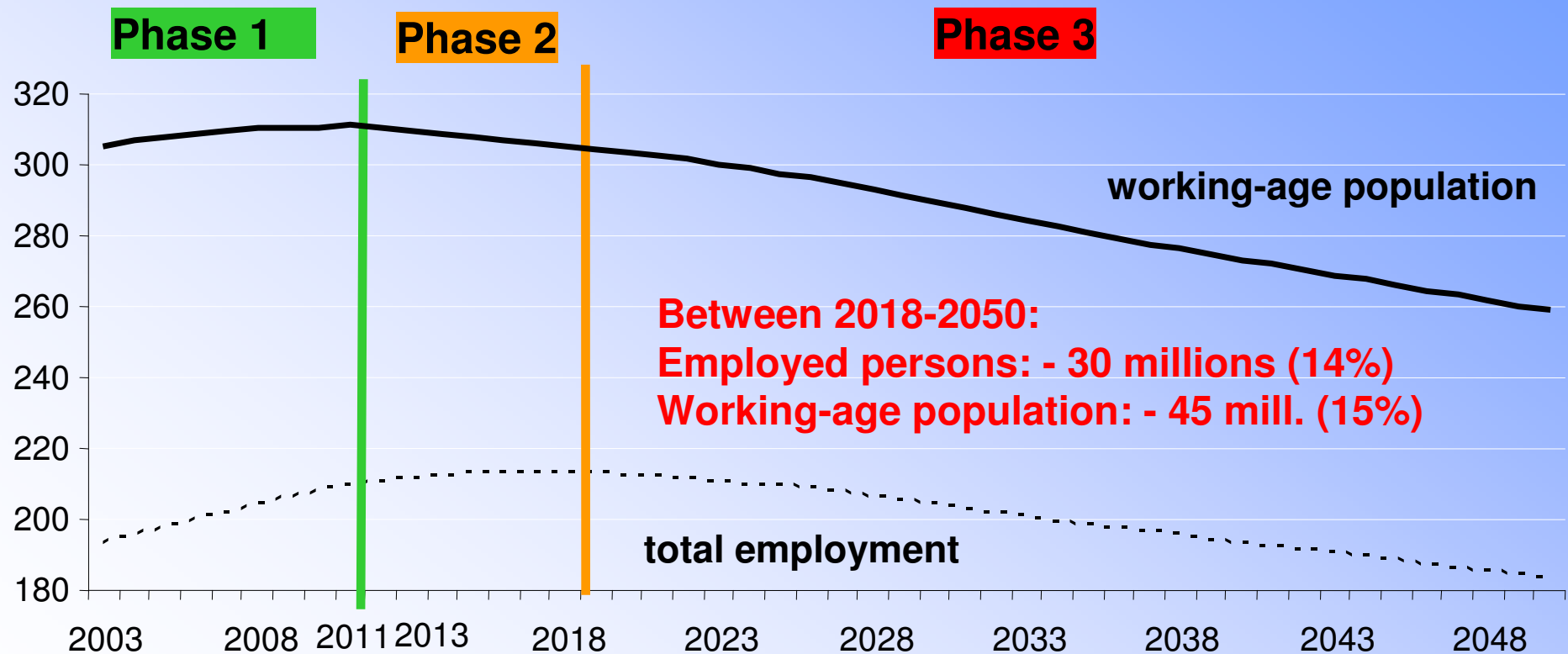
The consequences of ageing populations on employment and growth

Projected time frame for meeting the Lisbon employment target:70%



The consequences of ageing populations on employment

Phase 1: A “window of opportunity”: both working-age population and employment increasing



Source: 2006 EPC/Commission report on ageing.

Impact of ageing on economic growth

***Production function approach
based on the projections of the main components:***

$$\dot{GDP} = \underbrace{\dot{POP} + \frac{\dot{POP}_{15-64}}{POP} + \frac{\dot{E}}{POP_{15-64}}}_{\text{Employment growth}} + \underbrace{\dot{TFP} + (1-\alpha)\frac{\dot{K}}{E}}_{\text{Productivity growth}}$$

Employment growth

Productivity growth

GDP growth = Δ labour input (Δ population + Δ Active ageing population + Δ employment rate)

+

Δ labour productivity (TFP growth + contribution from capital deepening)

- long run equilibrium in Solow model: $\Delta Y/L = \Delta K/L = \Delta TFP/a =$

(labour augmenting technical progress)

Labour input: employment growth

- EU 25 Annual growth rate of -0.1% over the period 2010 to 2030

CZ -0.4

- Negative annual growth rate of -0.5% in 2031-2050

CZ -1.1

- Overall number of employed people in the EU-25 is projected to fall by about 25 millions (-12%) over the period 2025 to 2050
(Males: -13 millions Females: -12 millions)

Productivity

Δ labour productivity :

- Δ TFP assumptions is key :

- convergence to 1.1% in 2030

(EU10:2050)

+

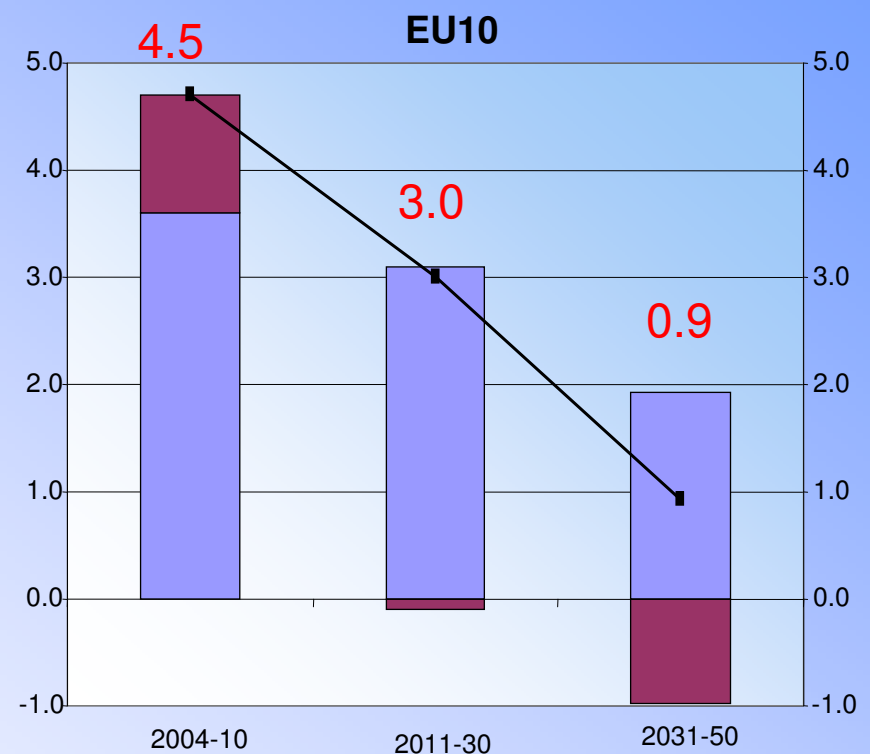
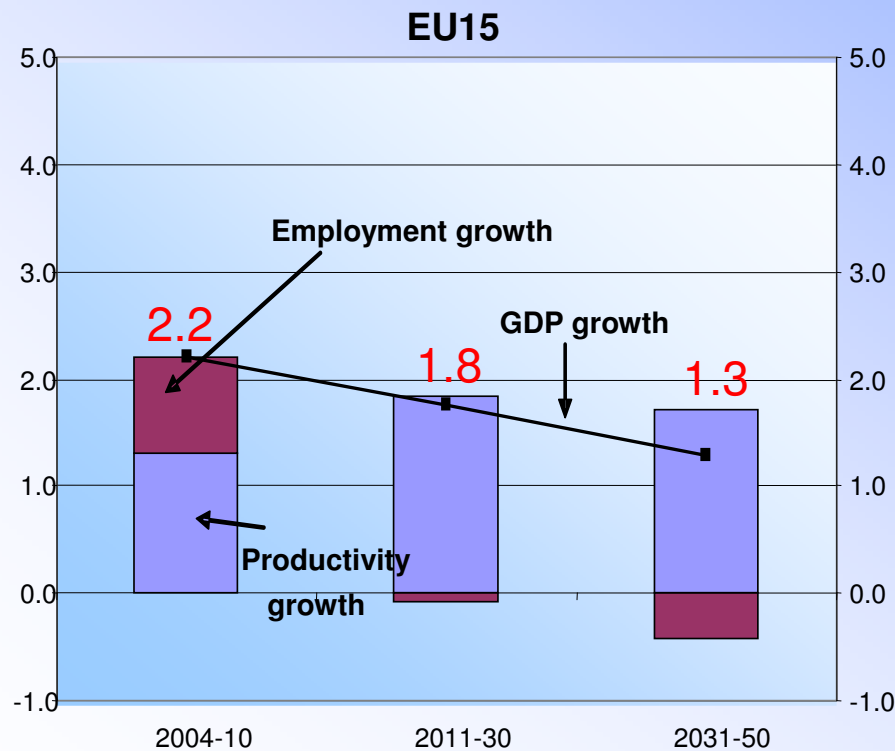
- Contr. from capital deepening: 0.6% in 2030

$$= (1 - \alpha) * \Delta K/L \text{ or } \Delta TFP(1 - \alpha) / \alpha \quad (\alpha = \text{labour share} = 0.65)$$

- **long run capital rule**: $\Delta \text{ capital stock} = \Delta E + \text{labour augmenting technical progress (or } TFP / \alpha \text{)}$, thus capital/labour ratio in efficiency units constant

The consequences of ageing populations on employment and growth

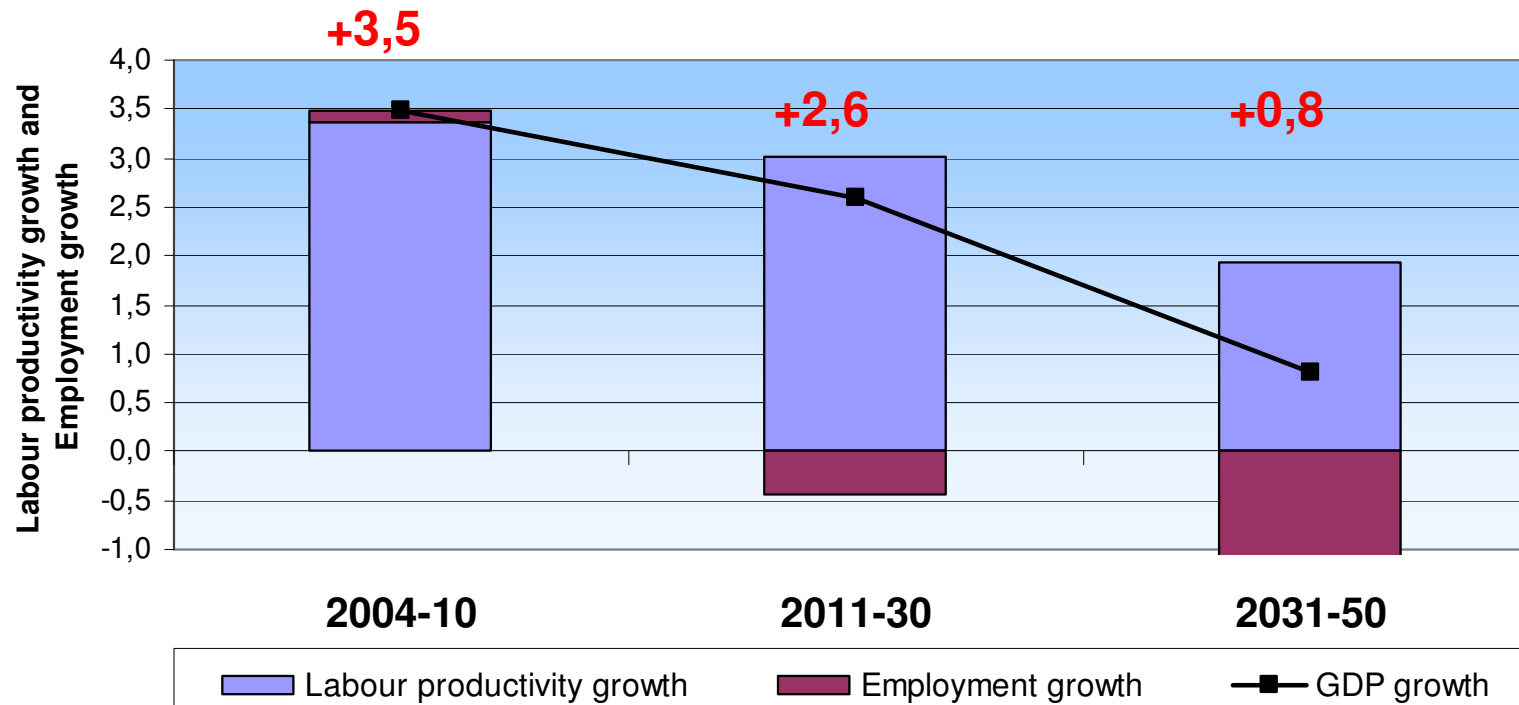
Projected Growth : EU15 & EU10



The consequences of ageing populations on employment and growth

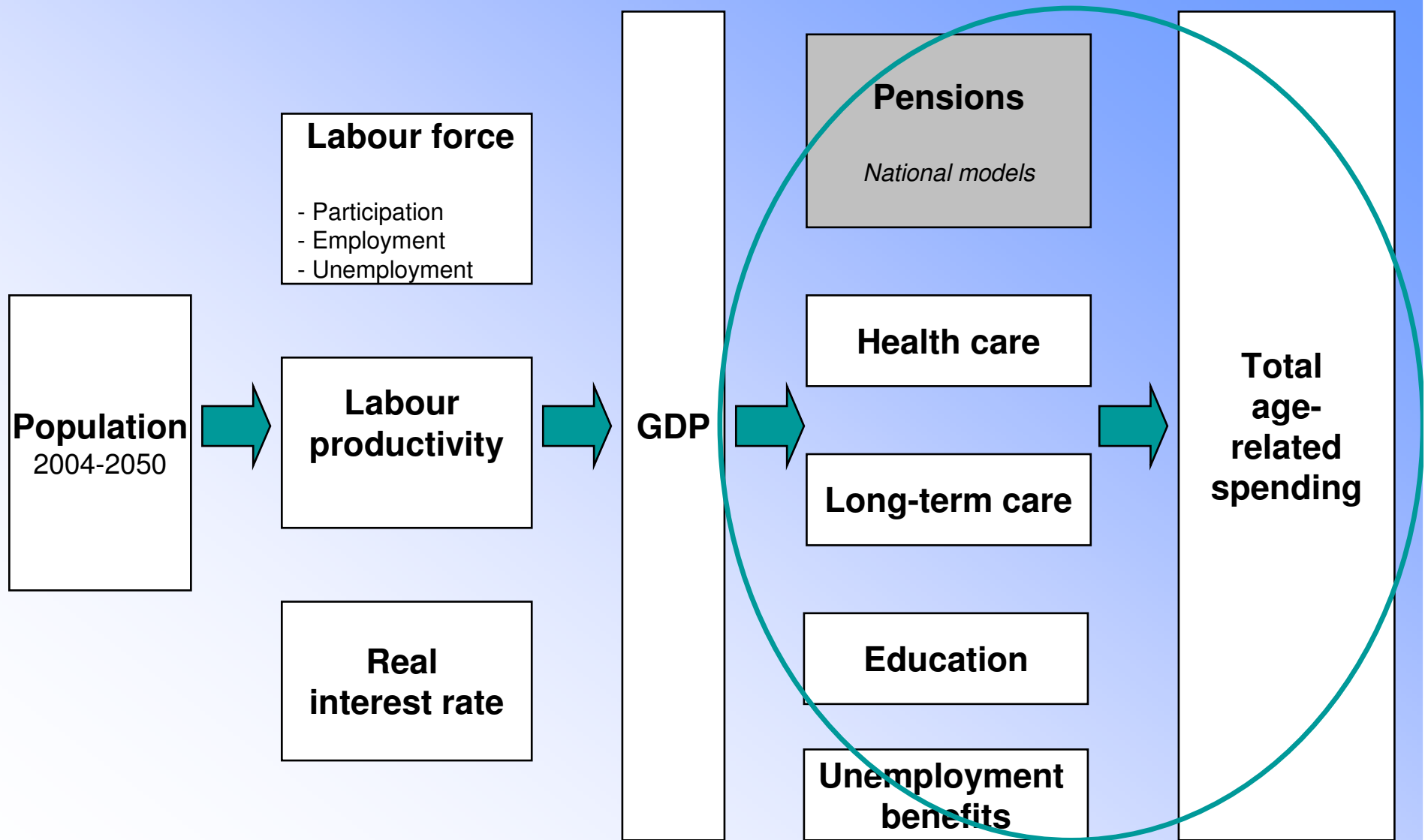
Projected Growth

CZ

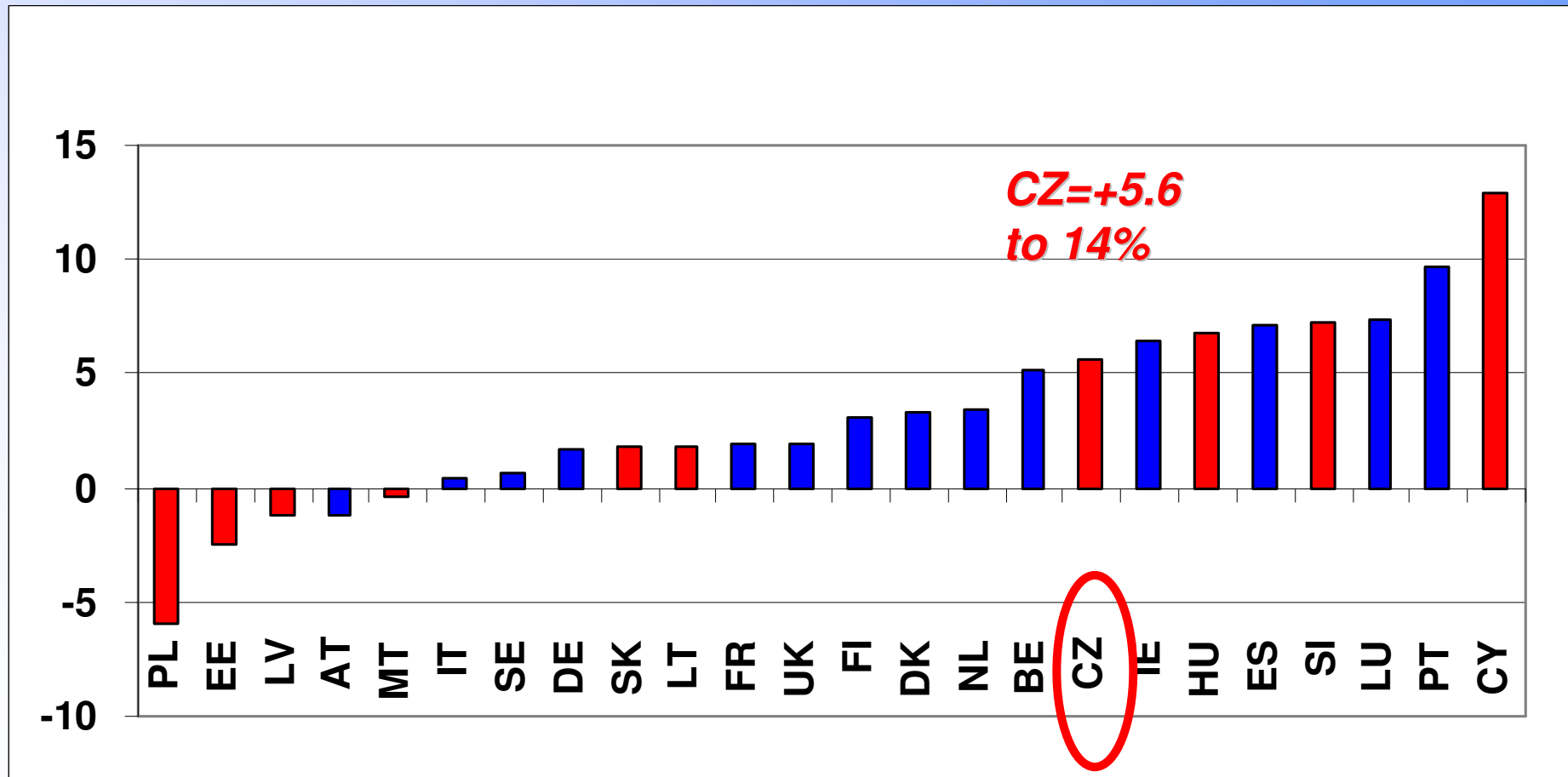


Source: 2006 EPC/Commission report on ageing.

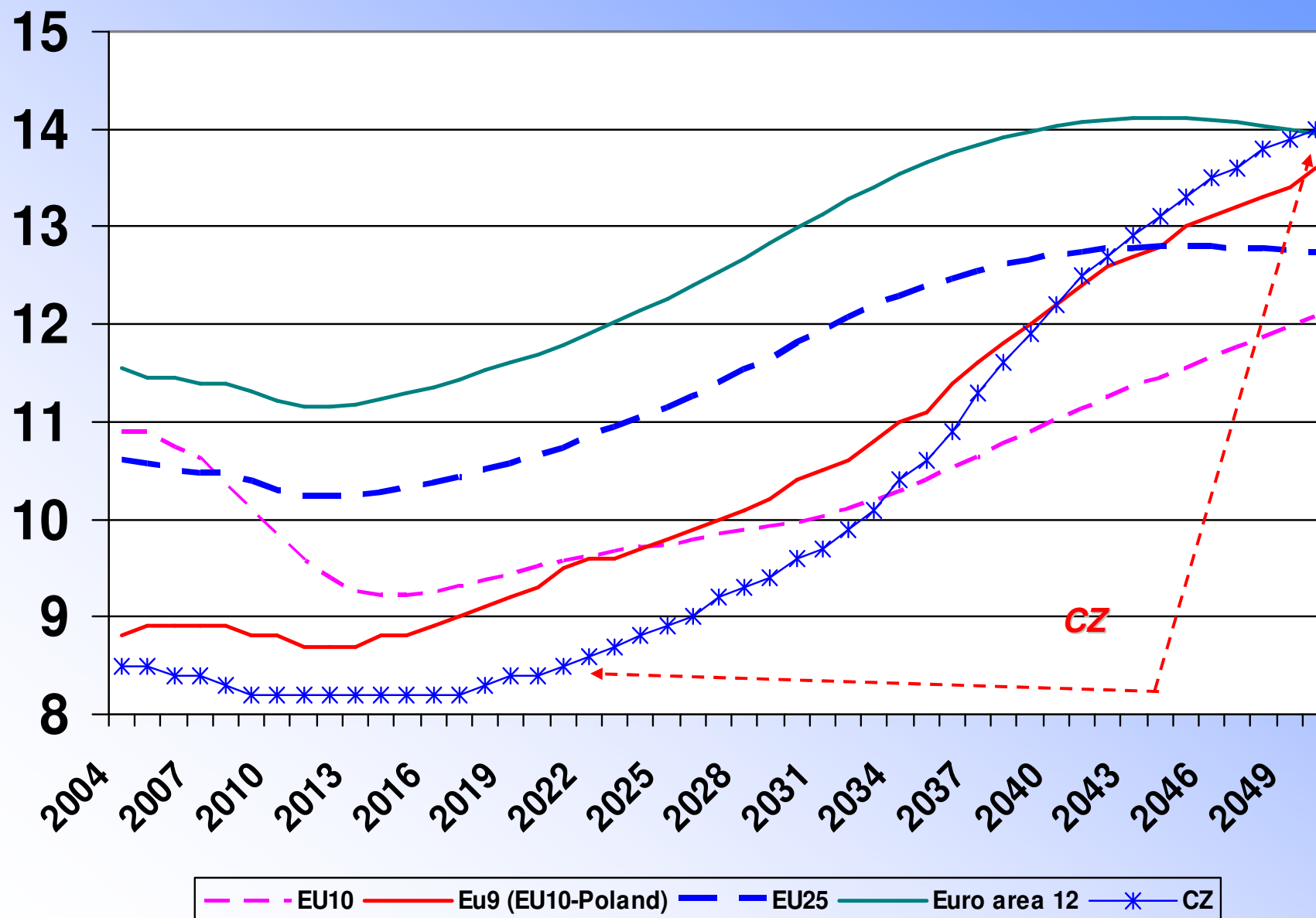
Results of the budgetary projections



Projected changes in public pension expenditure 2004-2050 (% of GDP)



Time profile of projected public pension expenditure 2004-2050 (% of GDP)



Decomposition of the increase in pension expenditure

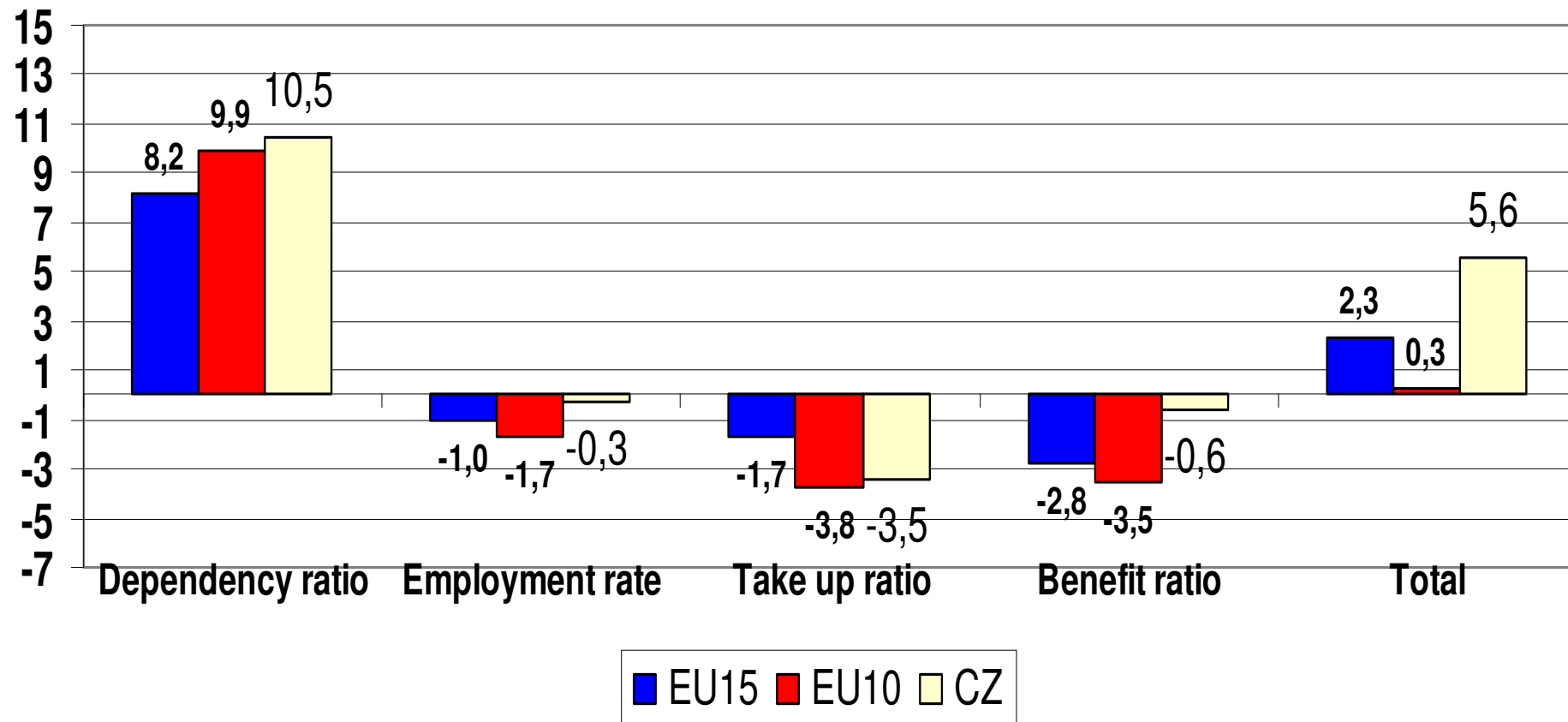
$$\frac{\text{PensExp}}{\text{GDP}} = \frac{\text{Dep. effect}}{\text{Pop}(15-64)} \times \frac{\text{Empl. effect}}{\text{EmplNo}}$$

Dep. effect *Empl. effect*

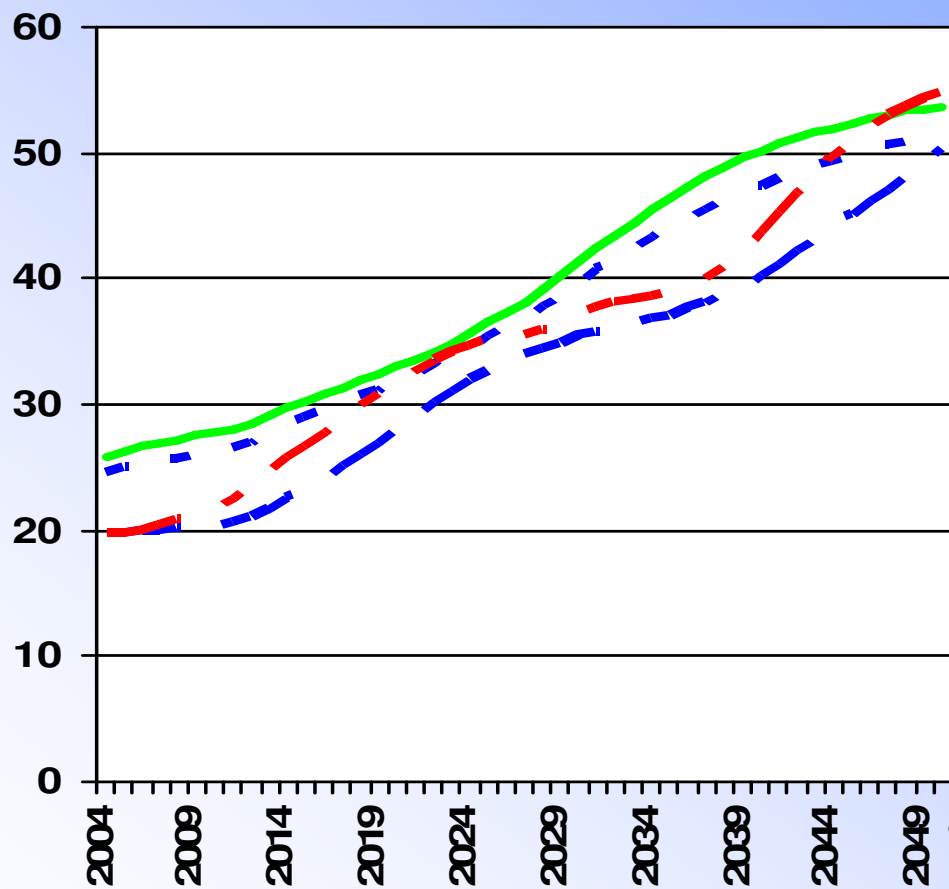
$$\times \frac{\text{Take-up eff.}}{\text{Pop}>65} \times \frac{\text{Benefit effect}}{\text{GDP/EmplNo}}$$

Take-up eff. *Benefit effect*

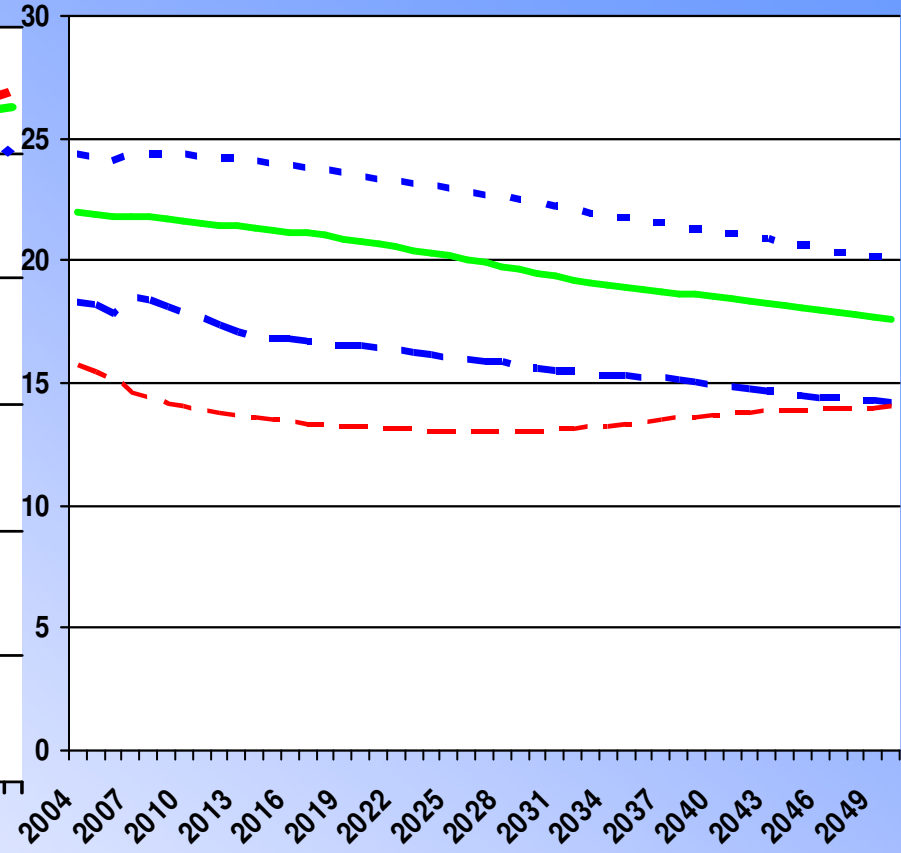
Factors contributing to pension expenditure changes, EU15, EU10, CZ (% of GDP)



Dependency ratio (+65/15-64)

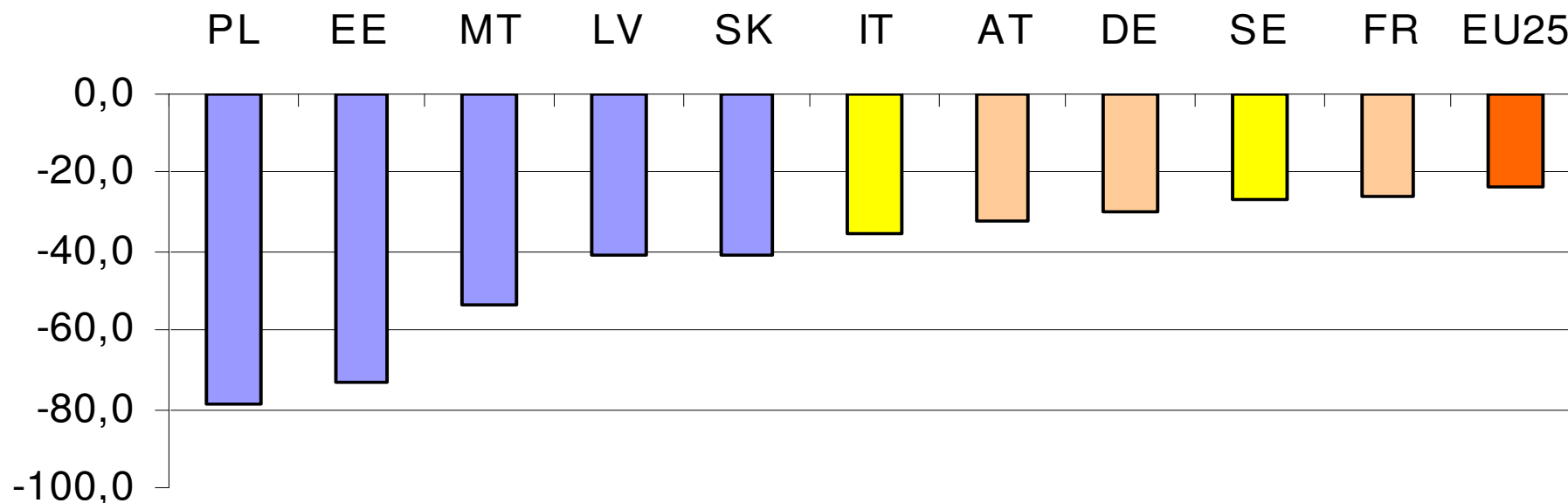


Benefit ratio



- EU10
- - EU25
- Euro area 12
- - CZ

Large reductions in the benefit ratio in several countries (2050 in percent of 2004)



Mainly resulting from:

- shift towards *private* funded schemes,
- pension inversely *linked to life expectancy gains*;
- shift towards *indexation* to prices

... and leading to possible adequacy challenges...