EMPIRICAL MACRO-ECONOMIC ANALYSIS FOR PENSION SYSTEM ANALYSTS

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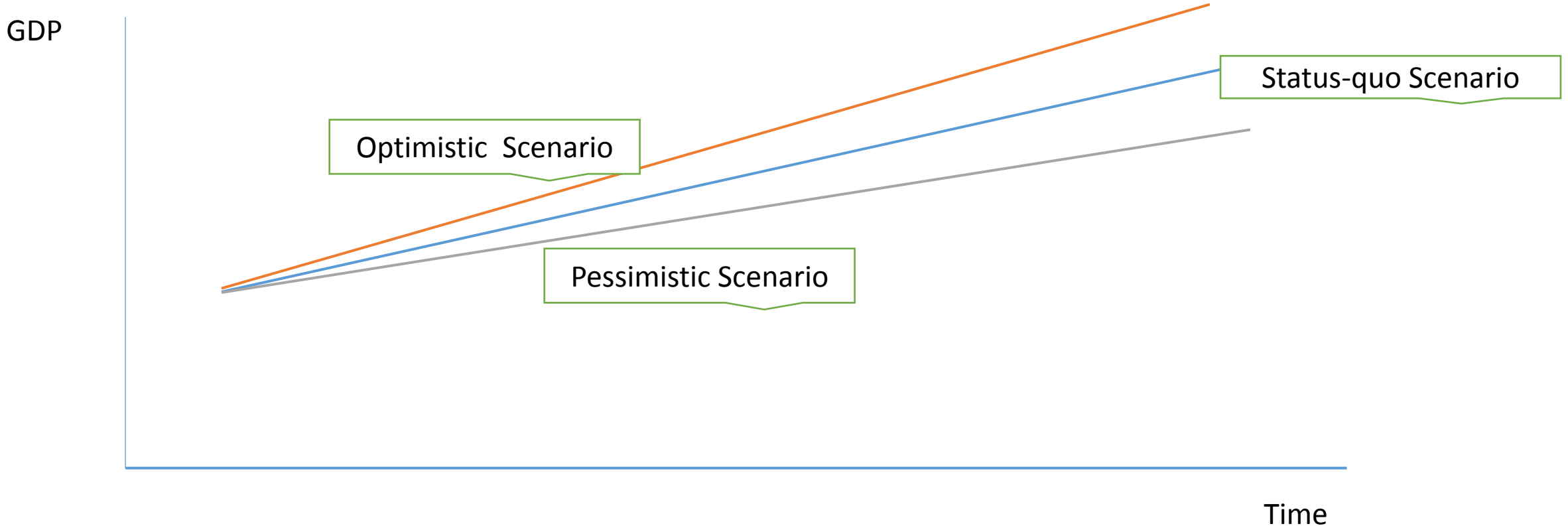
SCENARIO TECHNIQUE FOR THE ANALYSIS OF LONG-TERM TRENDS

SCHEMATIC PRESENTATION OF A SCENARIO



ELEMENTS OF SCENARIO DEVELOPMENT (1)

- Status quo forecast
  - … is based on the **continuity** of recent trends (current values)
  - … is based on the continuity of current policies
- Optimistic scenario
  - … is based on the **improvement** of recent trends (current values)
  - … is based on the continuity of current policies
- Pessimistic scenario
  - … is based on the **deterioration** of recent trends (current values)
  - … is based on the continuity of current policies

ELEMENTS OF SCENARIO DEVELOPMENT (2)

- Sensitivity Analysis
  - … is based on the **change of model parameter or assumptions**
  - … is based on the continuity of current policies
- Policy Analysis
  - …… is based on the adjustment of current policies

ELEMENTS OF SCENARIO DEVELOPMENT

- EXAMPLES
  - Germany: Prognos-Report of 1984 on long-term perspectives of the German economy
  - European Commission: The 2015 Ageing Report
  - IMF: Fiscal Monitor
  - World Bank: EU 11 Report; Inverting pyramid

CASE STUDY:
THE 2015 EU AGEING REPORT

INTRODUCTION

- The 2015 Ageing Report
  - Underlying Assumptions and Projection Methodologies

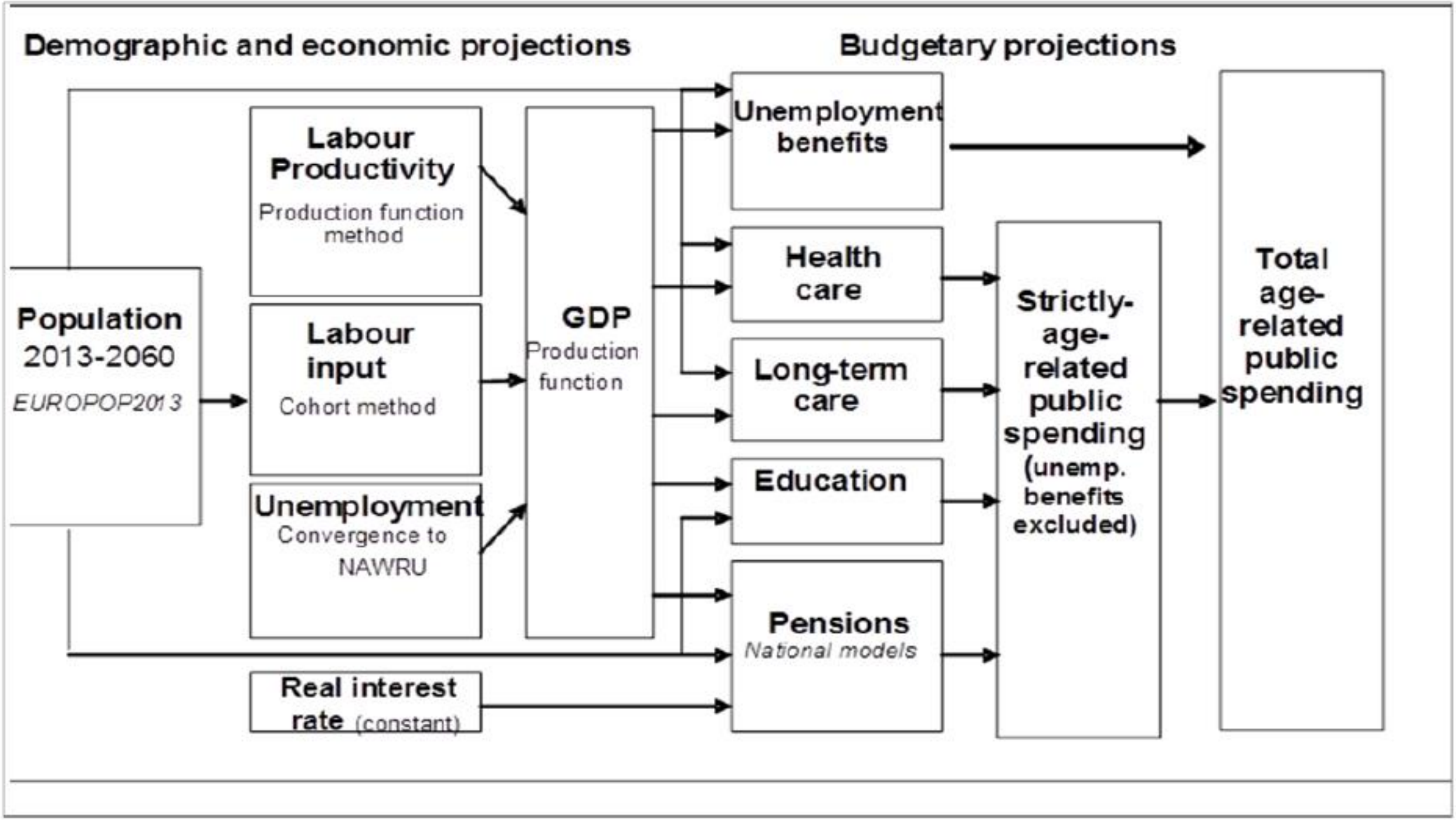
    European Economy 8/2014
  - Economic and budgetary projections for the 28 EU member states (2013-2060)

    European Economy 3/2015.

CONTENTS

SURVEY

- Demographic forecast: EUROPOP2013, calibrated by EUROSTAT, entirely independent and in its own responsibility
- Labour market forecast
- Production (GDP) forecast
- Fiscal forecast: age-related expenditure (and other)
- Pension analysis
- Sensitivity or risk analysis


Demographic and economic projections
Budgetary projections
Population
2013-2060
EUROPOP2013
Labour Productivity
Production function method
Labour input
Cohort method
Unemployment
Convergence to NAWRU
Real interest rate (constant)
GDP
Production function
Unemployment benefits
Health care
Long-term care
Education
Pensions
National models
Strictly-age-related public spending (unemp. benefits excluded)
Total age-related public spending

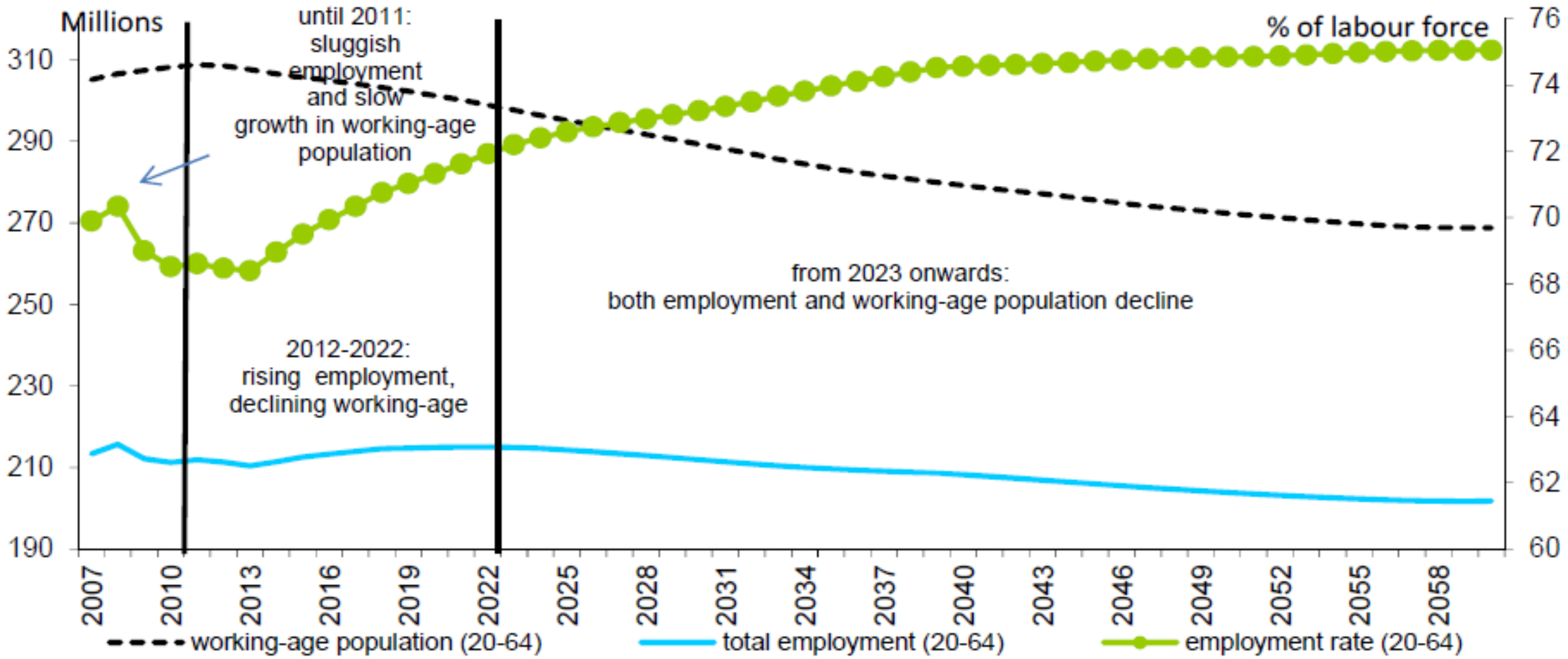
ASSUMPTIONS ON DEMOGRAPHICS

- Model approach: Demographic parameters converge to the values of the front-runners in the very long run
- Fertility: TFR >1.8; Front-runners are Ireland, France, Finland, Sweden, UK; TFR will remain below the natural replacement rate of 2.1 in the period to 2060
- Mortality decreases; life expectancy, longevity: continuous increase, but diverse
- Net-migration to EU; migration within EU member states
- EU population will slightly grow. Diversity in demographic development across member states;
- Old age dependency ratio (over 65/15-64) will double in the period to 2060

ASSUMPTIONS ON THE LABOUR MARKET

- Potential labour supply
- Cohort Method: Labour market participation according to gender and age, error correction mechanism for age groups 15-24
- Modelling of pension reforms: impact on LMP of age groups 55-74
- Results: higher LMP of women and older workers and higher effective employment rates
- Declining labour supply after 2023

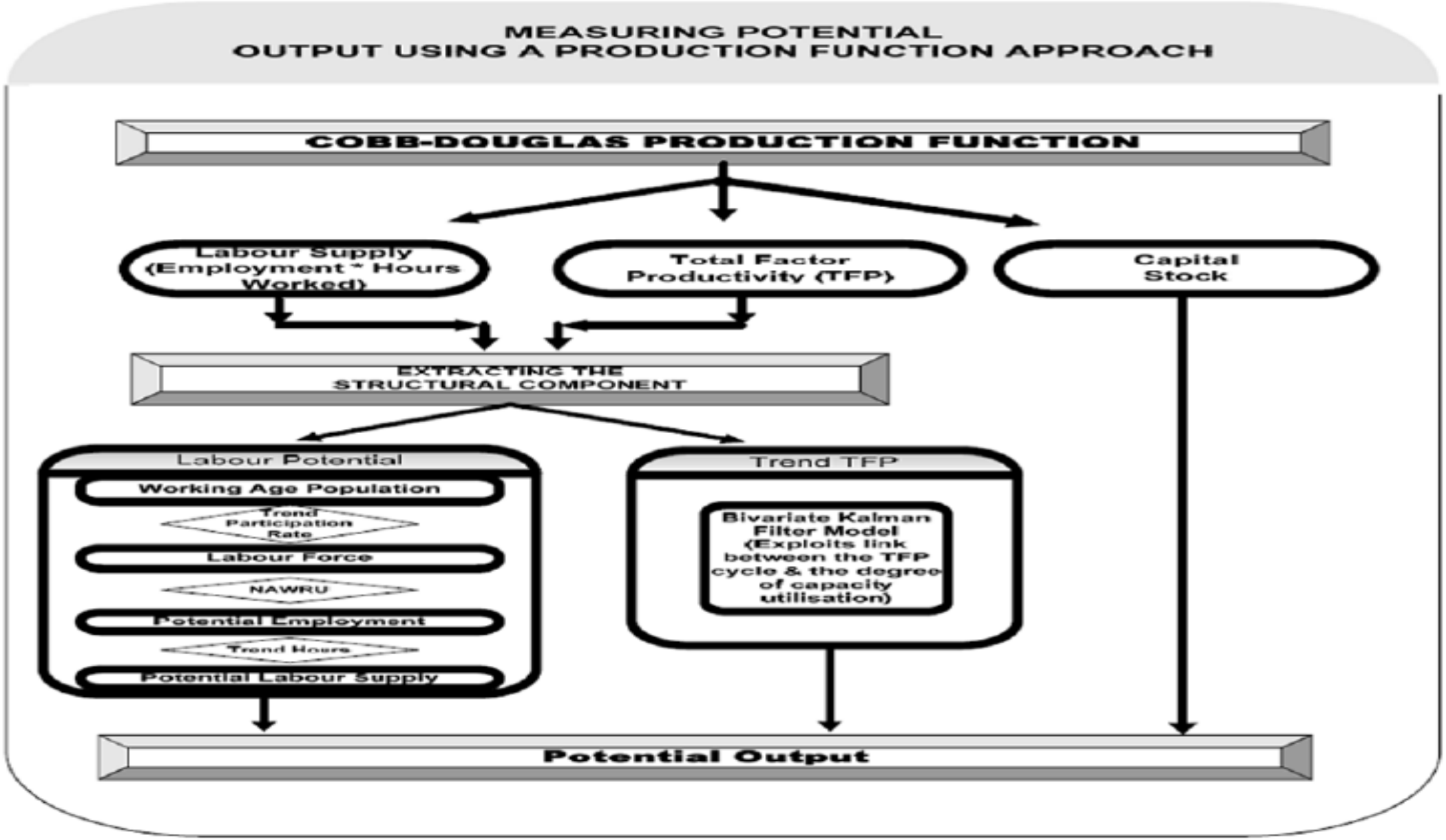
Graph 1: **Population and employment developments, EU (million)**



Source: Commission services, EUROPOP 2013, EPC.

ASSUMPTIONS ON PRODUCTION (GDP)

- Cobb-Douglas production technology: $Q = A * L^{a} * K^{(1-a)}$
  - Q: Output (GDP), L: Labour input, K: Capital input, A: Technology
- SOLOW-Growth Model; same approach as for the economic and fiscal monitoring within the European Semester
  - Technological progress is exogenous
  - Technological progress is Harrod-neutral, labour augmenting
- Capital coefficient (Capital input / Output) without trend
- Real interest rate: constant in the long run (at 3%)
- Wage: trend increases
- Constant functional income distribution (labour ratio)
- Capacity output growth will rise from 1.1% to 1.4-1.5%



Source: Commission services.

INTEREST RATE

- Projections of private pensions are voluntary .
- Approach: Real rate of return of fully funded pension schemes is equal to the real interest rate for long term investments in all EU member states
- Definition
  - Real interest rate 3 %
  - Nominal interest rate 5%
- Based on past interest rates

INTEREST RATE FORECAST

Table I.4.1: **Average real long-term interest rates (1971-2013)**

BE	DK	DE	IE	FR	IT
3.5	4.3	3.5	2.9	2.9	2.0
NL	AT	FI	SE	UK	US
3.1	3.2	2.8	2.7	2.3	2.9

(1) DE: Data for Western Germany until 1991
(2) interest rates deflated with the GDP deflator.
Source: AMECO.

Quelle: 2015 Ageing Report

RESULTS ON FISCAL AND PENSION EXPENDITURES

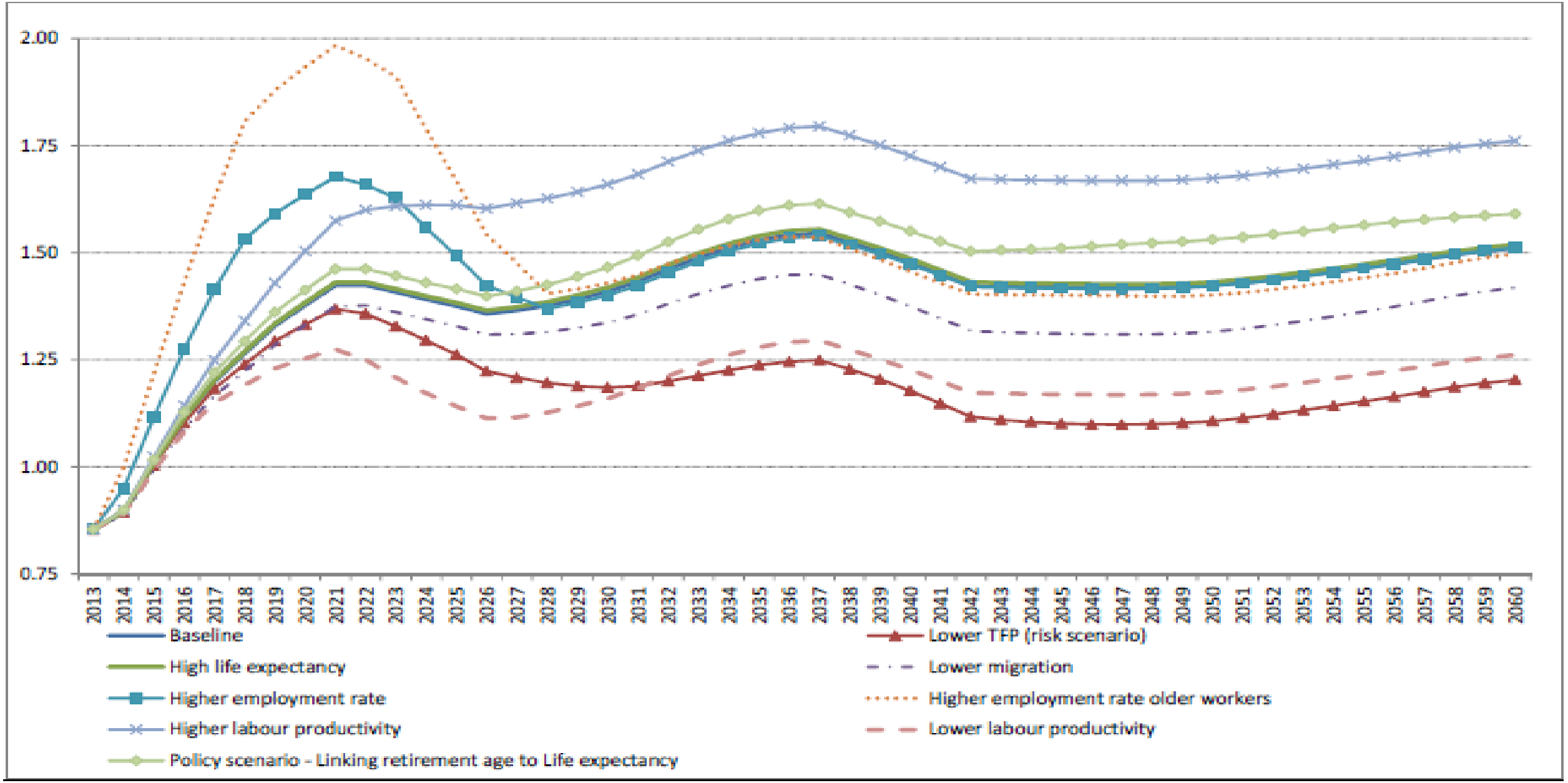
- Increase in ageing related spending (pensions, health and long term care, education, unemployment);
- Pension expenditures (% of GDP) peak around 2040; health and long term care expenditure follow trend increase to 2060; again: diversity across countries
- Comprehensive analysis of public and earnings related schemes; projections based on unchanged pension legislation (risk of underestimation)
- Pensions in payment are indexed to price inflation
- Age related spending in the 2015 projection is lower than in the 2012 projection

Table I.3.1: **Overview of sensitivity tests**

Unchanged policy scenarios						Changed policy scenario
Population		Labour force		Productivity		
High life expectancy	Lower migration	Higher employment rate	Higher employment rate older workers	Higher/lower labour productivity	Lower TFP (risk scenario)	Linking retirement ages with increases in life expectancy
A scenario with an increase of life expectancy at birth of two years by 2060 compared with the baseline projection.	A scenario with 20% less migration compared with the baseline projection.	A scenario with the employment rate being 2 p.p. higher compared with the baseline projection for the age-group 20-64. The increase is introduced linearly over the period 2016-2025 and remains 2 p.p. higher thereafter. The higher employment rate is assumed to be achieved by lowering the rate of structural unemployment (the NAWRU).	A scenario with the employment rate of older workers (55-74) being 10 p.p. higher compared with the baseline projection. The increase is introduced linearly over the period 2016-2025 and remains 10 p.p. higher thereafter. The higher employment rate of this group of workers is assumed to be achieved through a reduction of the inactive population.	A scenario with labour productivity growth being assumed to converge to a productivity growth rate which is 0.25 percentage points higher/lower than in the baseline scenario. The increase is introduced linearly during the period 2016-2025, and remains 0.25 p.p. above/below the baseline thereafter.	TFP growth would converge to 0.8%, with convergence to the target rate in 2035 from the latest outturn year, i.e. 2013, and the period of fast convergence limited to 5 years, i.e. until 2040.	Exit probabilities from the labour market are shifted to older ages in line with gains in life expectancy and legislated pension reforms. Potential increase in labour supply due to linking is reduced by 25% to account for older workers leaving prematurely the the labour market.

Source: Commission services, EPC

Graph I.3.1: **Potential GDP growth rates (five years centred moving average) - European Union**



Source: Commission services, EPC

Q & A

Thank you very much!
Vielen Dank!

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