

Labour supply projections within the E3ME framework

Medium-term forecast of skills supply in Europe:
Final results

Hector Pollitt, Cambridge Econometrics

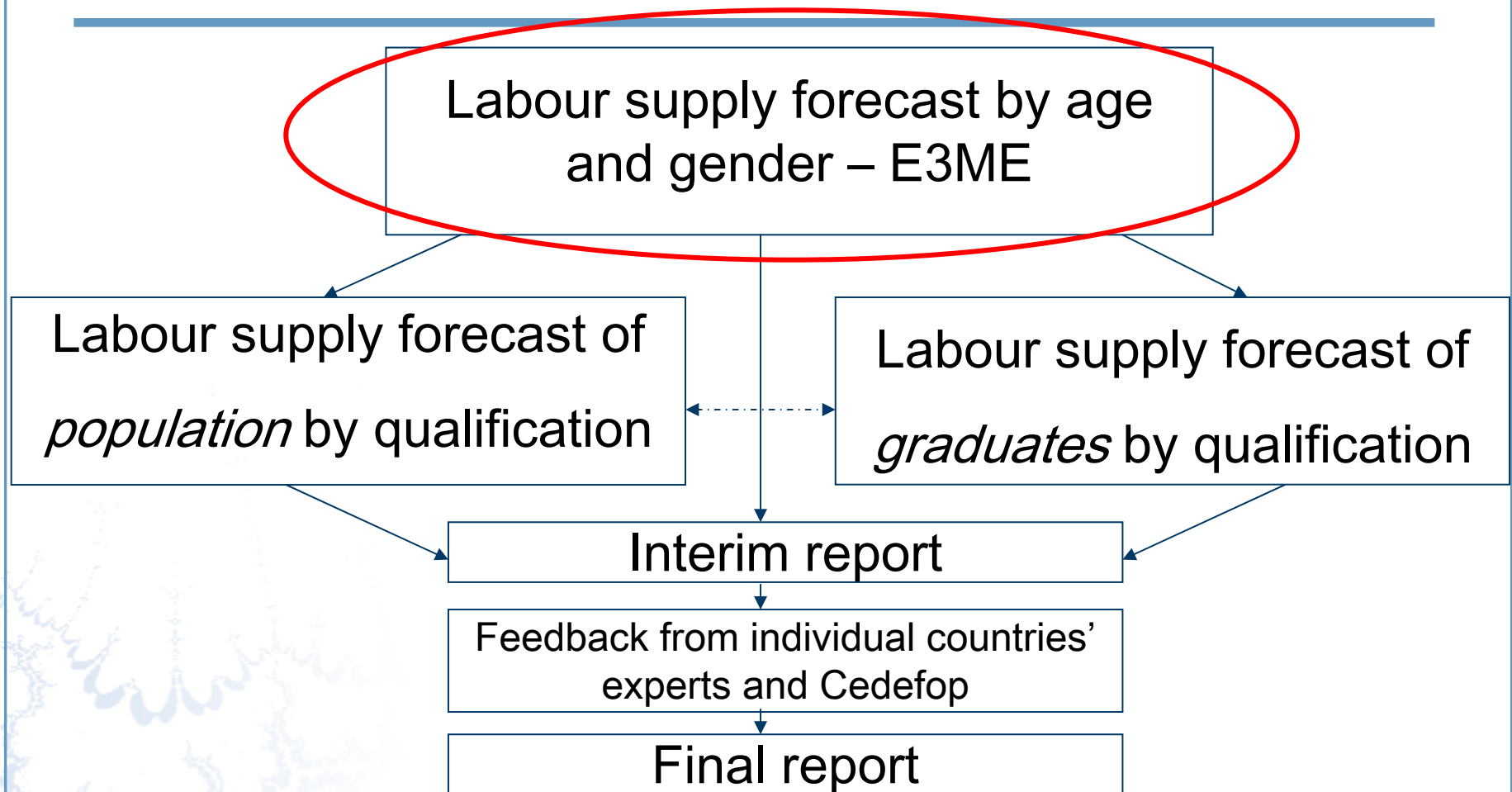
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Aims and Objectives

- To be able to explain patterns in aggregate labour supply over history
- To use these patterns to predict future trends
 - provide inputs to modules 5 and 6 looking at qualifications, graduate numbers

Project Overview



A very short description of E3ME...

- **Econometric model**
 - covers EU27 + Norway and Switzerland
 - based on the system of national accounts
 - large sectoral disaggregation
 - long and short-term specification
- For more details see www.e3me.com

Data Sources

- Eurostat National Accounts data
- OECD Structural Analysis (STAN)
- Labour Force Survey (Eurostat)
- Other
 - AMECO database
 - national statistical agencies
- Model parameters are estimated on time series covering 1970-2006
 - 1993-2006 for New Members

The starting point for our analysis

- The approach used a combination of flexible econometric analysis and formal modelling with E3ME
- The starting point was E3ME's existing specification
 - labour supply split by gender but not by age
 - participation rates determined by five explanatory factors

Participation-Rate equations

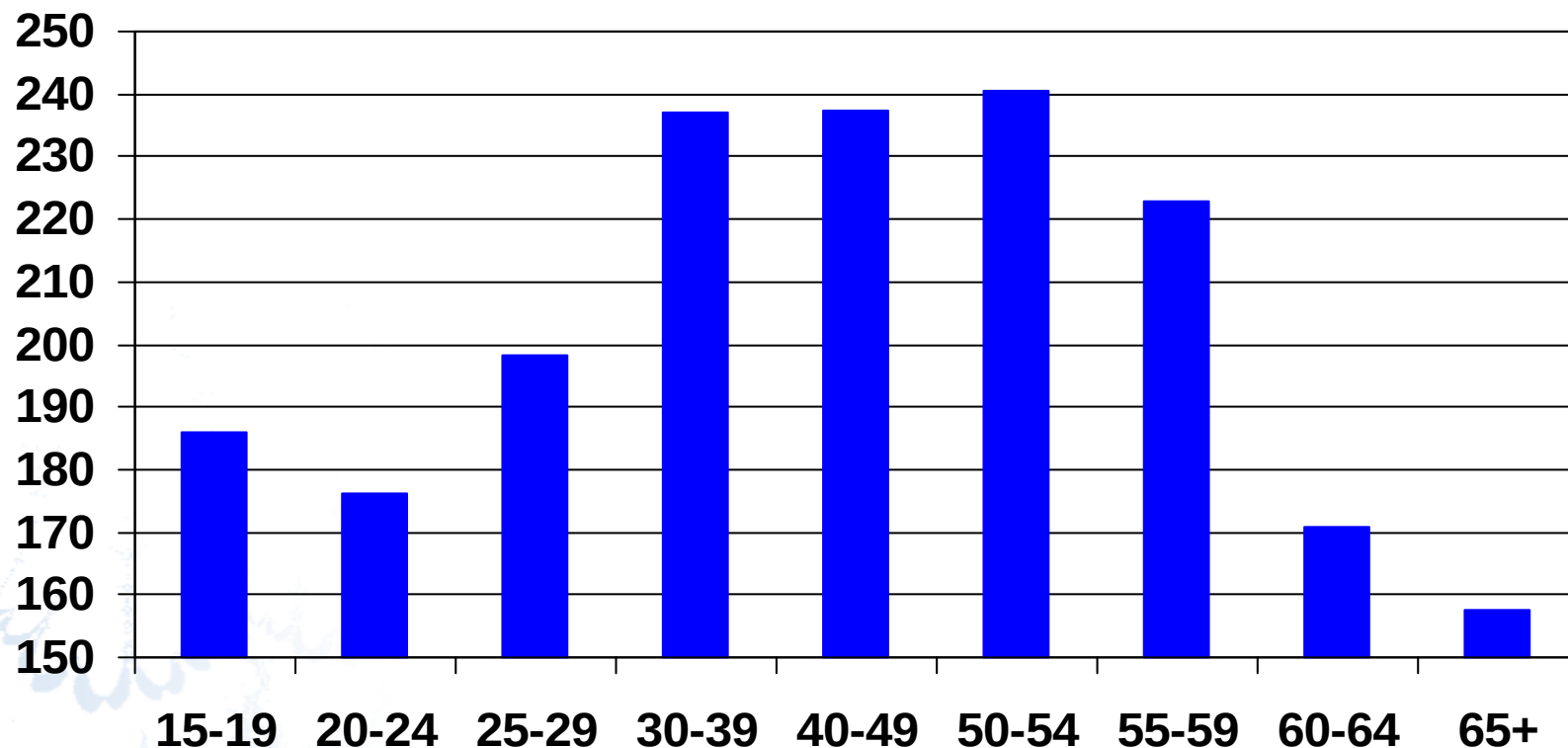
- Labour market participation rates are determined by:
 - average wages
 - economic activity
 - unemployment rates
 - benefit rates
 - relative levels of services/manufacturing activity
- Labour supply is participation rate * exogenous population (Eurostat baseline projections)

Improving the treatment: Step 1

- The first step was to expand E3ME to have a more detailed set of age ranges...
 - five and ten year age bands
- ...but results showed that the current equation specification could not explain participation in the youngest and oldest age groups

Estimation Results (original spec.)

Ave rank



Note(s) : Chart shows average ranking (out of 405) of R-squared values in long-run equation estimation. Higher is better.

Source(s) : E3ME.

Improving the treatment: Step 2

- **A large number of possible additional explanatory variables were considered**
 - many raised at the last workshop
- **Methodology for including:**
 - find data
 - choose suitable method of econometric estimation
 - assess significance of results

Factors with no available data

- Nationality of workforce
- Returns to education
- Disability benefits
- Family backgrounds

No significant relationship found

- **Cost of education**
 - data poorly defined for purpose (student support)
- **Number of dependents**
- **Availability of subsidised childcare**
 - data did not take into account level of subsidies
- **State school and retirement ages were largely constant over history**
 - although they are likely to change during the forecast period

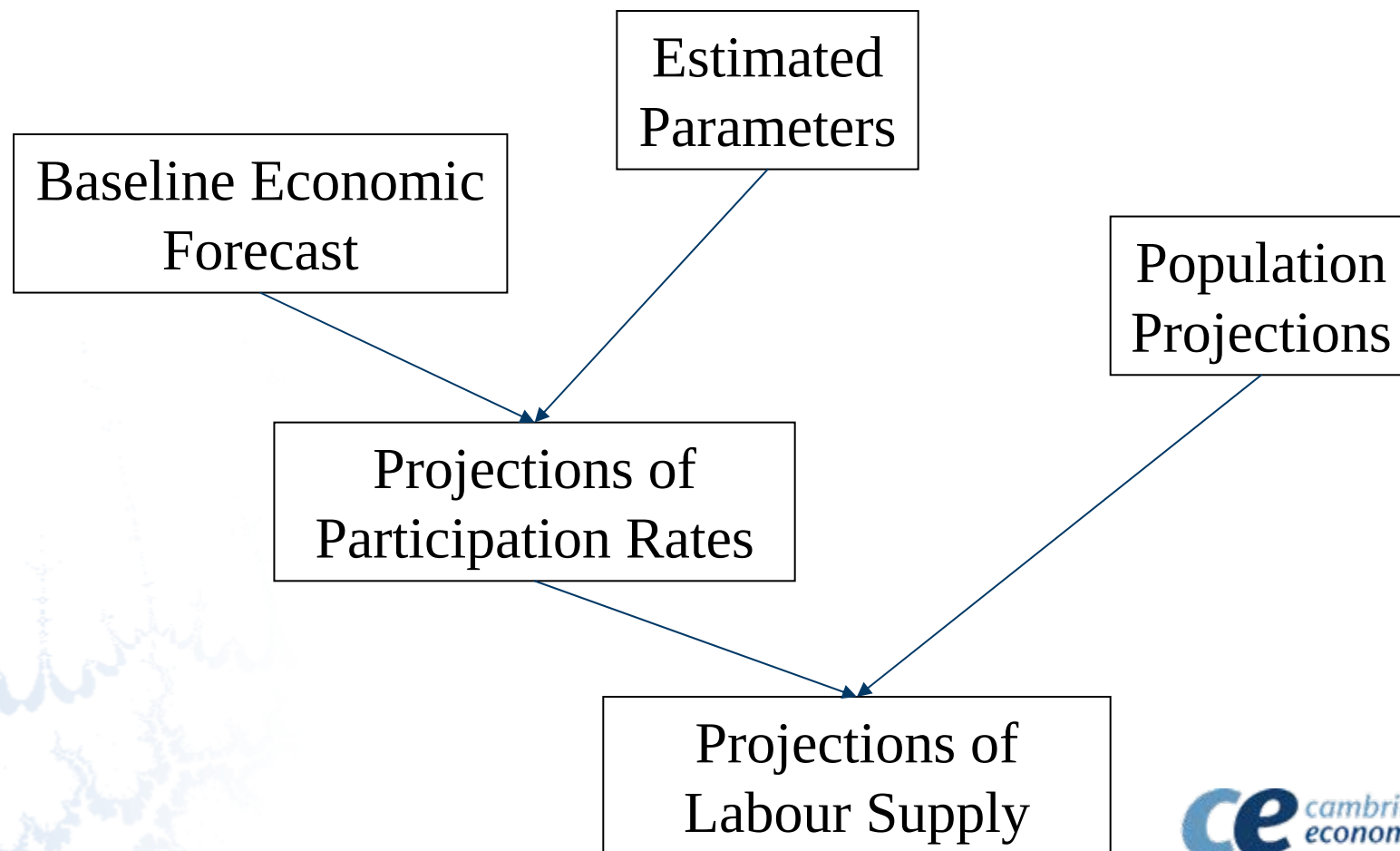
Many significant relationships found

- Working hours
- Qualification mix
- Retirement benefits (older groups)
- Unemployment by age group

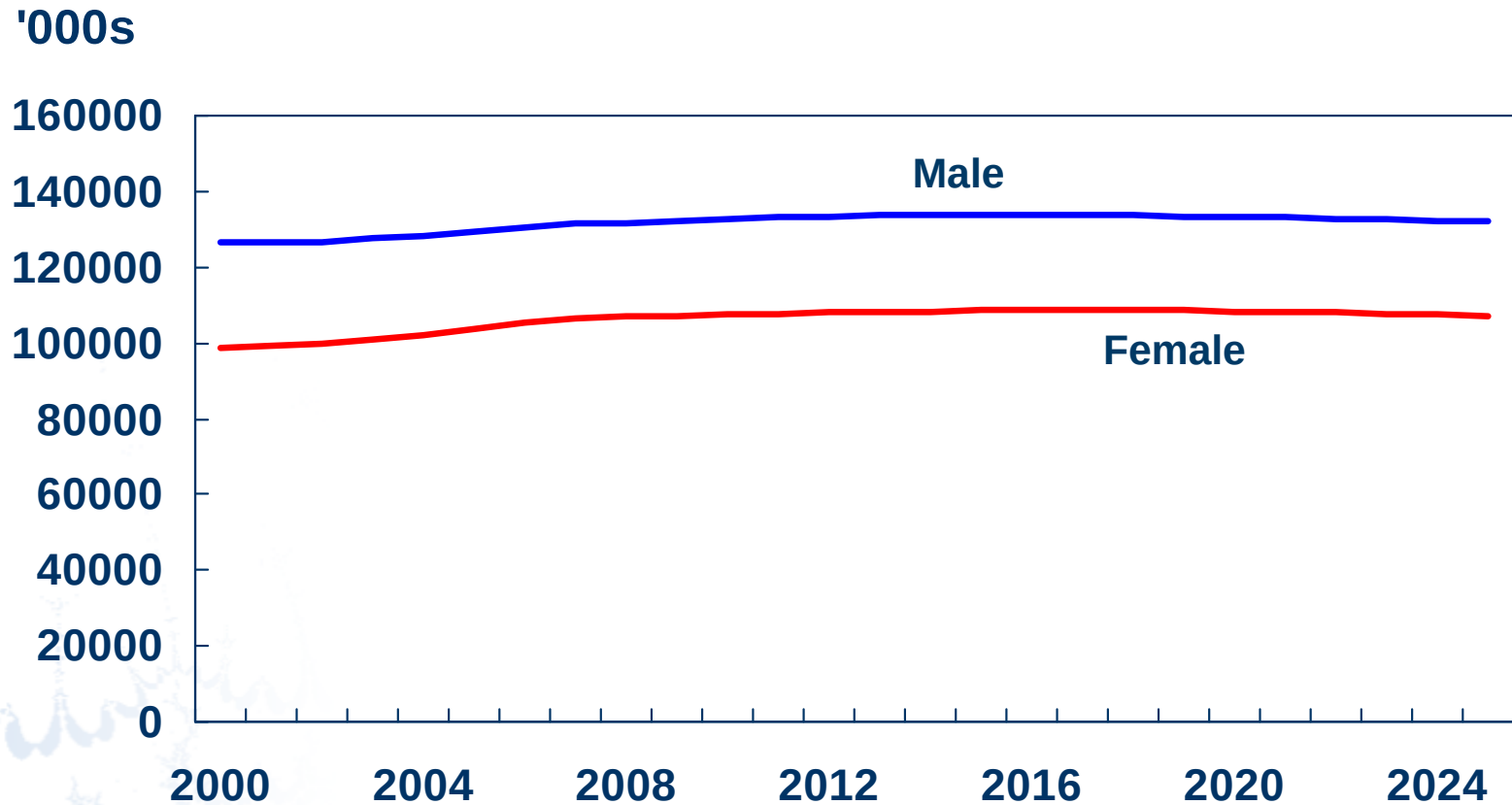
Revised Equation Specification

- **Labour market participation is determined by:**
 - average wages
 - economic activity
 - unemployment rates, by demographic group
 - benefit rates, pension rates for older groups
 - relative levels of services/manufacturing activity
 - average working hours
 - level of qualifications

Forecasting Labour Supply

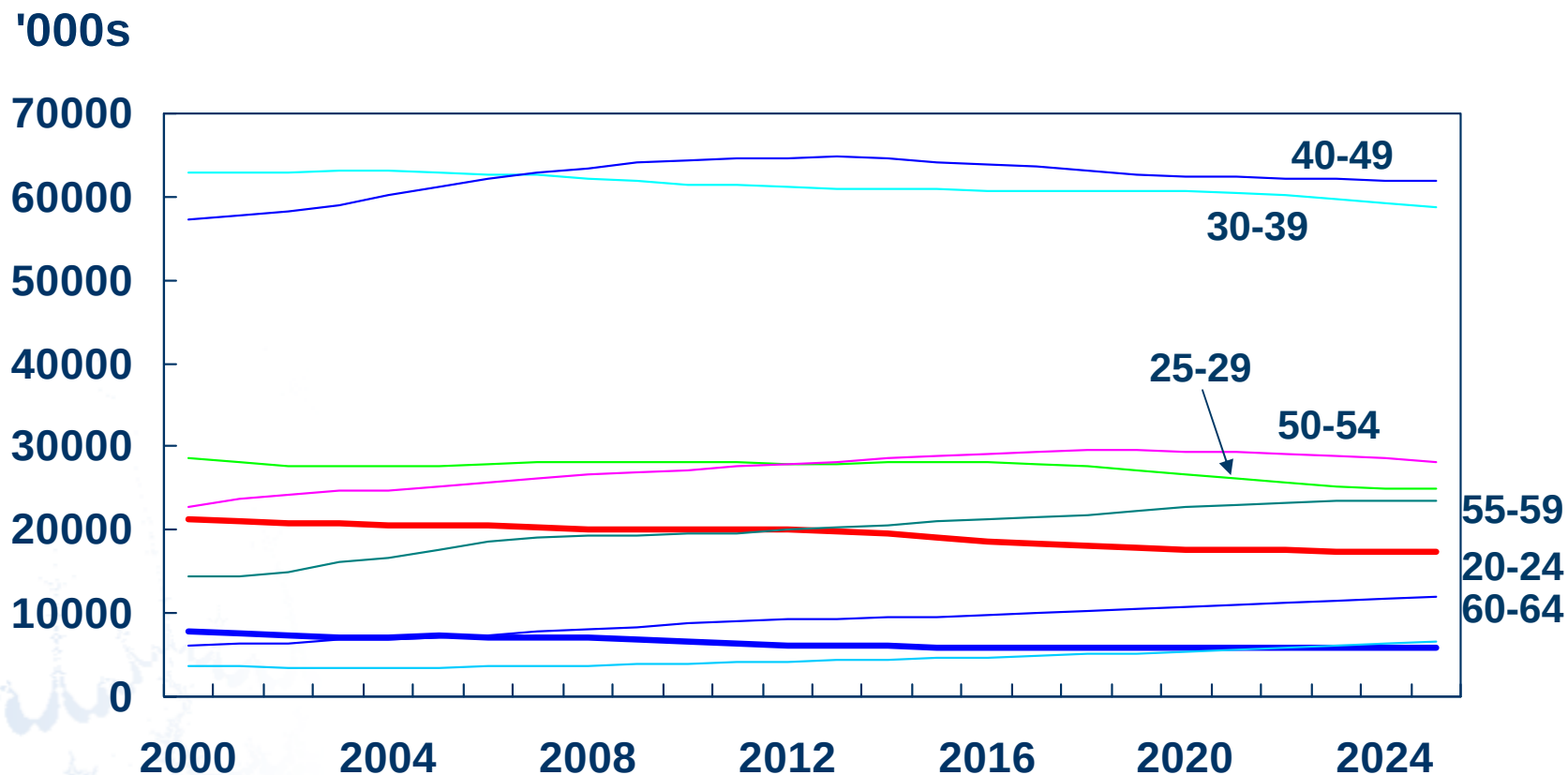


Aggregate EU27 Labour Supply



Source(s) : E3ME.

EU27 Labour Supply by Age Group



Source(s) : E3ME.

Final Results, by Country



Note(s) : Chart shows average growth in labour supply, %, 2008-25, by country.

Source(s) : E3ME.

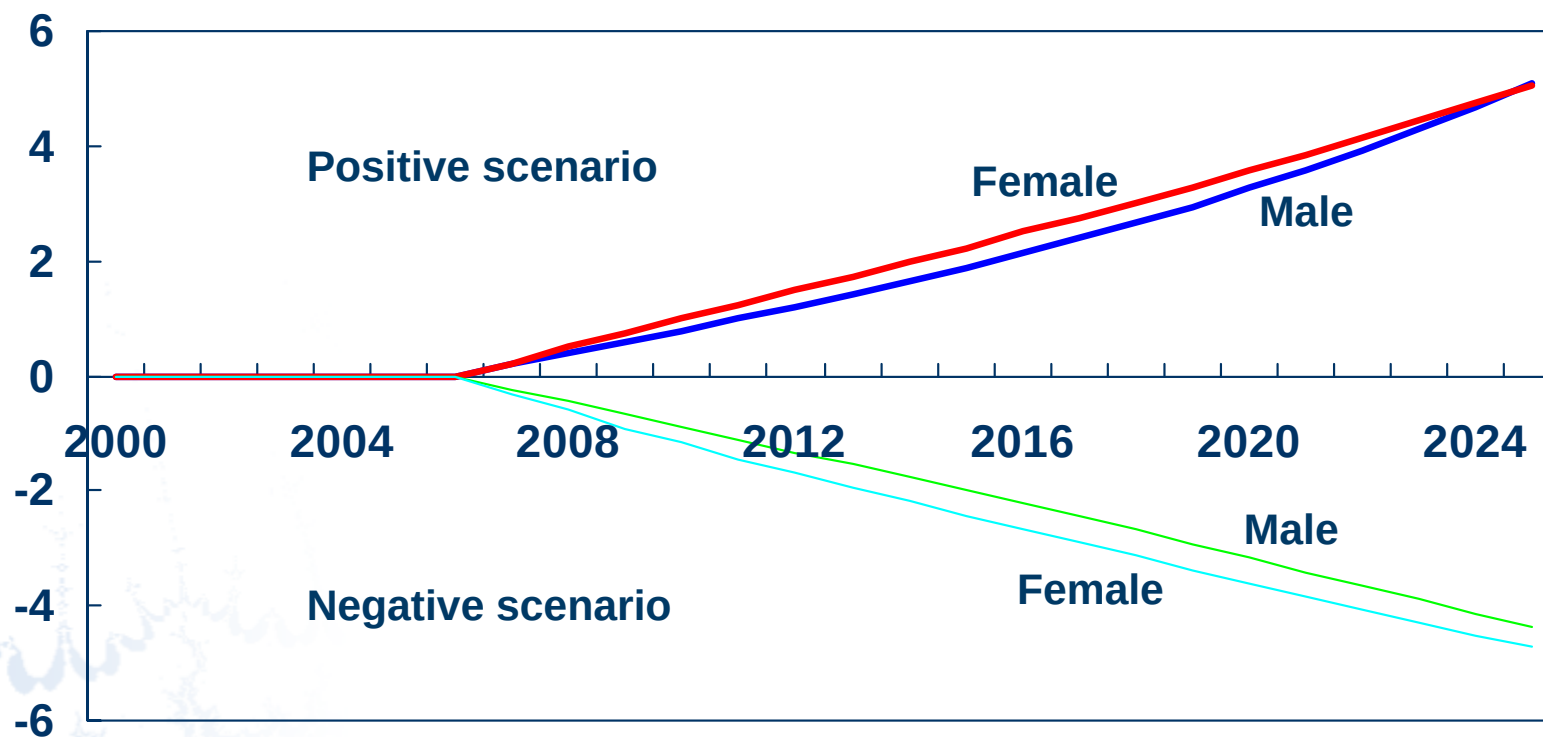
Scenarios - Specifications

Scenario	Economic growth and competitiveness	Social welfare and govt	Technological change	Globalization and mobility
A: Baseline	Base	No change	Medium	Base
B: Optimistic	Higher	Lower taxes and benefits	Higher	Higher
C: Pessimistic	Lower	Higher taxes and benefits	Lower	Lower

Note(s) : No specific changes were made for the current financial crisis as there was too much uncertainty at the time.

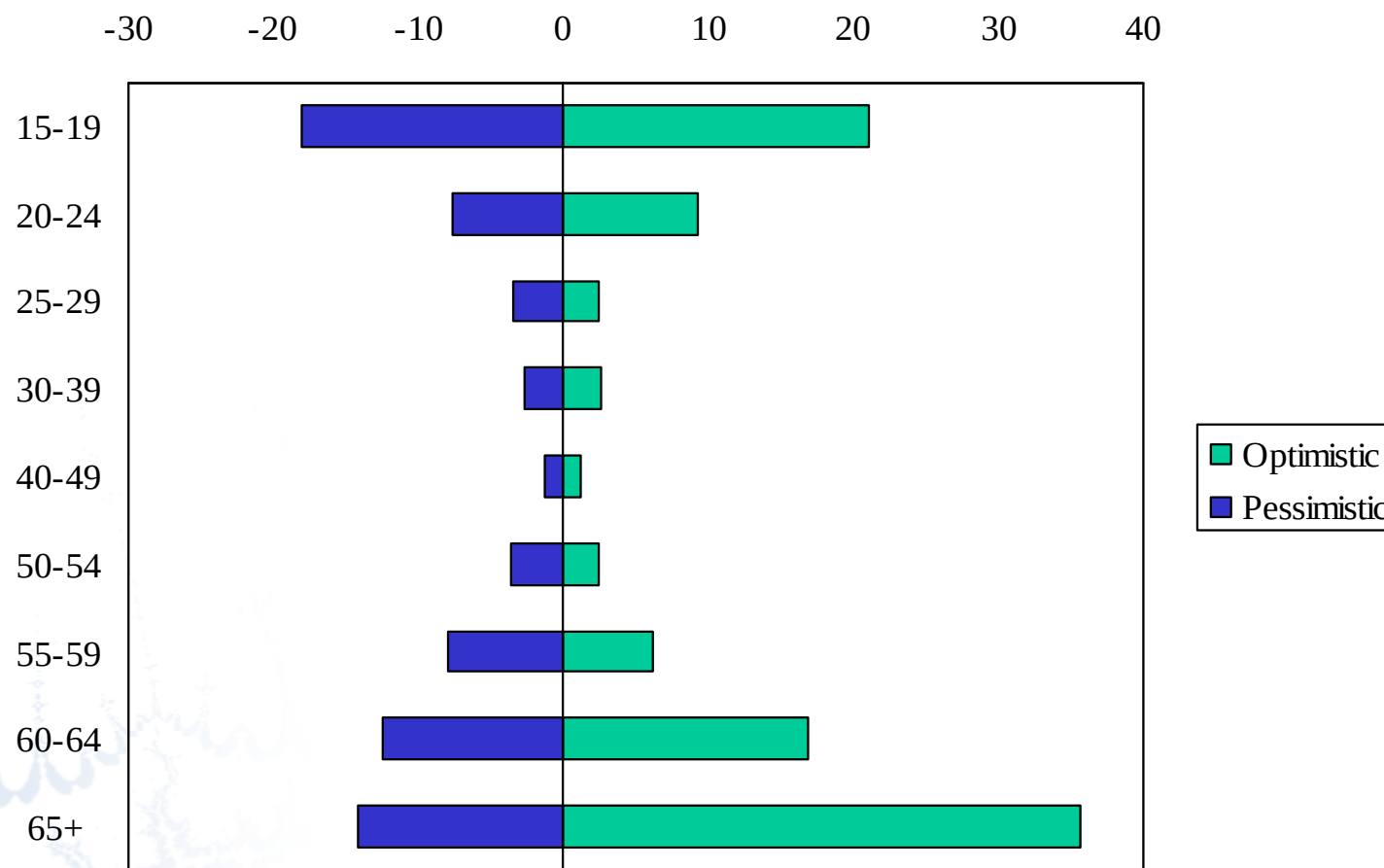
Sensitivity to the key inputs

% difference from
base



Source(s) : E3ME.

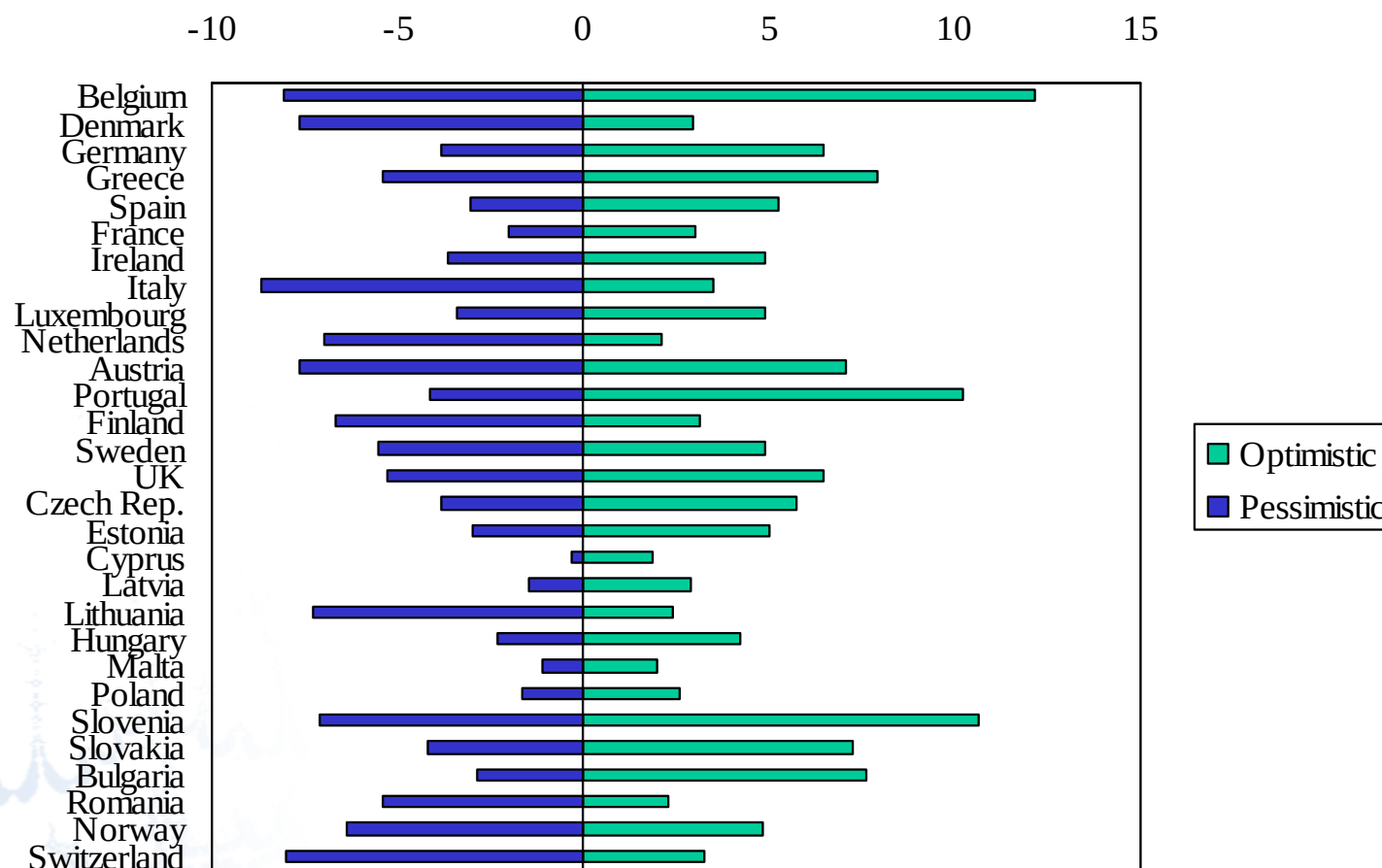
Scenario Results, by Age



Note(s) : Chart shows % difference in labour supply from baseline, 2025.

Source(s) : E3ME.

Scenario Results, by Country



Note(s) : Chart shows % difference in labour supply from baseline, 2025.

Source(s) : E3ME.

Conclusions

- **The existing E3ME specification was improved upon:**
 - age ranges expanded
 - additional explanatory factors (pension rates, detailed unemployment rates, hours worked and qualifications)
- **This was used to produce a forecast of labour supply:**
 - aggregate labour supply flat up to 2025
 - but big differences in the age ranges
- **Sensitivity analysis shows the main uncertainties still lie in the top and bottom age ranges**

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