

The E3ME Employment Forecasts: Background information and Scenario Development

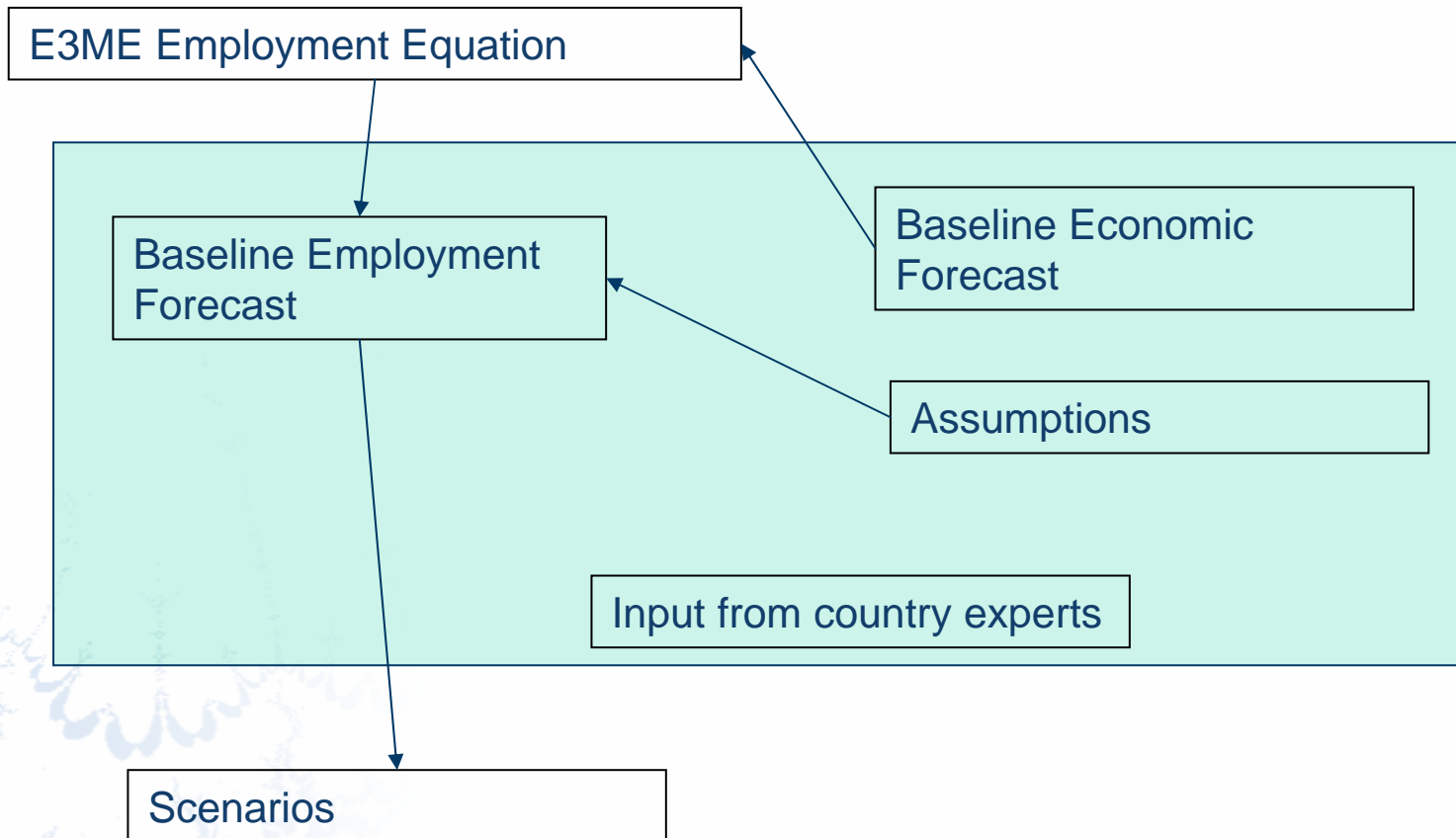
**Medium-term Forecasts of Occupational Skill
Needs in Europe, 3rd Technical Workshop,
Maastricht, The Netherlands**

Hector Pollitt
Cambridge Econometrics

www.e3me.com

7-8 May 2007

Overview



The Baseline Economic Forecast

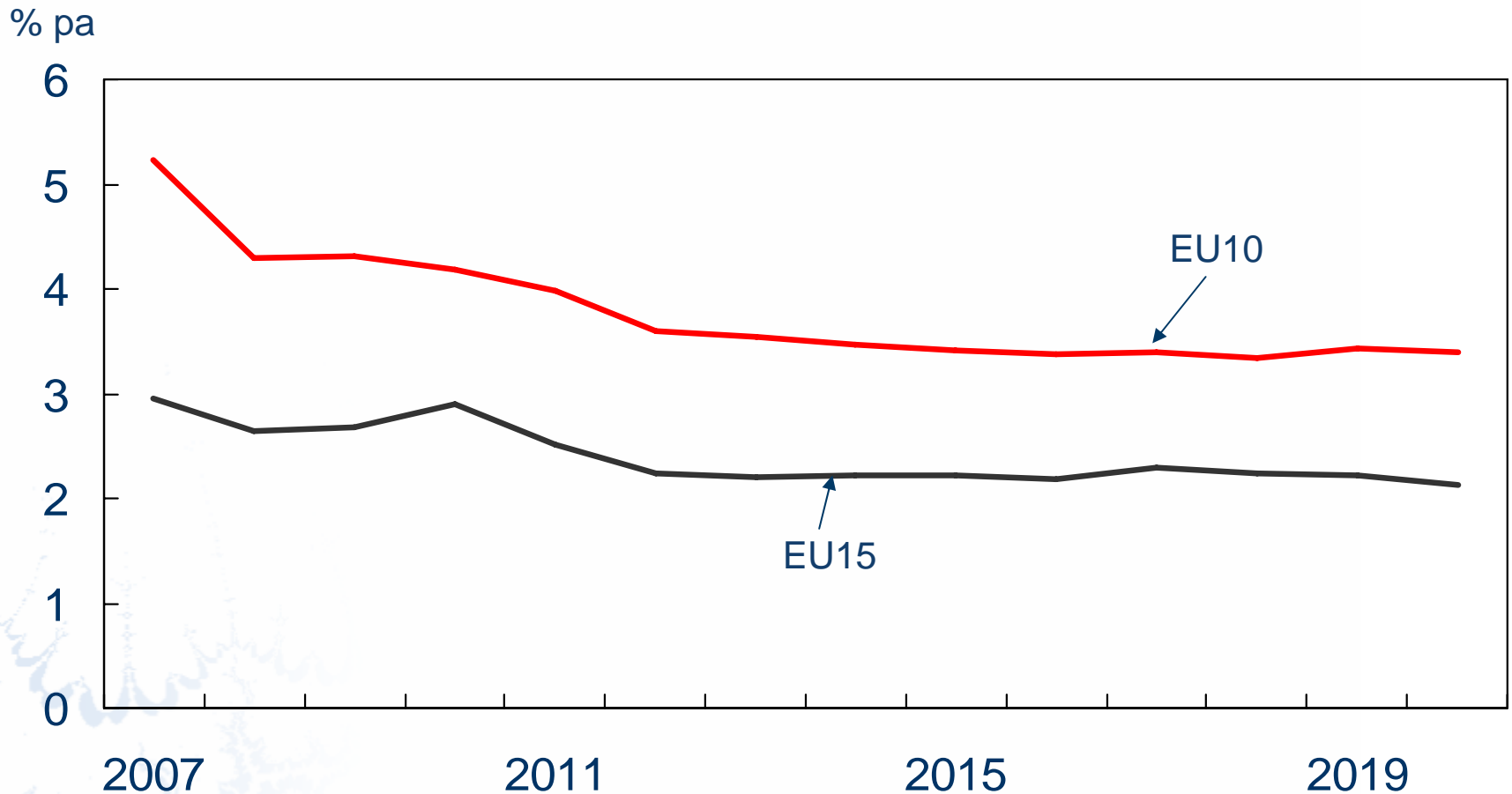
- Covers all variables except employment
- Derived from DG Tren forecast and CE's European Sectoral Prospects



The Economic Forecast (cont)

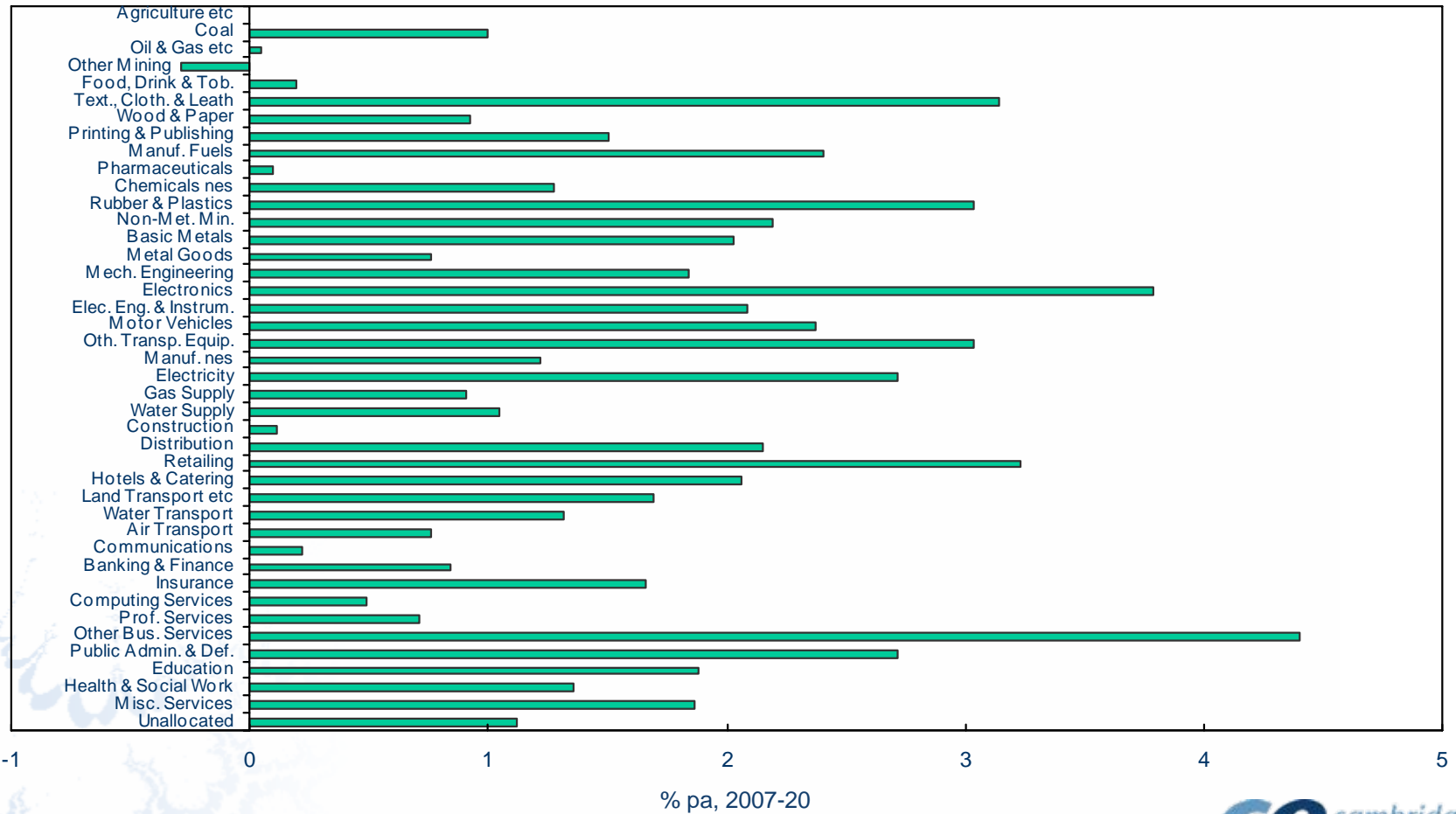
- **Energy variables updated for more recent data**
 - oil prices
 - European ETS
- **Minor impact overall but affects some sectors**

Annual real GDP Growth in the EU



Source(s) : EEA Forecast, E3ME database.

Annual real GVA Growth in the EU



Source(s) : EEA Forecast, E3ME database.

E3ME's Employment Equation

- **Two-stage econometric approach**
 - error-correction model
- **Specification of long and short-term relationships**
- **Includes short-term dynamics, but moves to long-term equilibrium**

E3ME's Employment Equation (cont)

- **Employment is a function of:**
 - gross output
 - labour costs
 - average hours worked
 - energy prices
 - technical progress
- **All of these (except energy prices) are defined by country and sector**

Summary Estimation Results

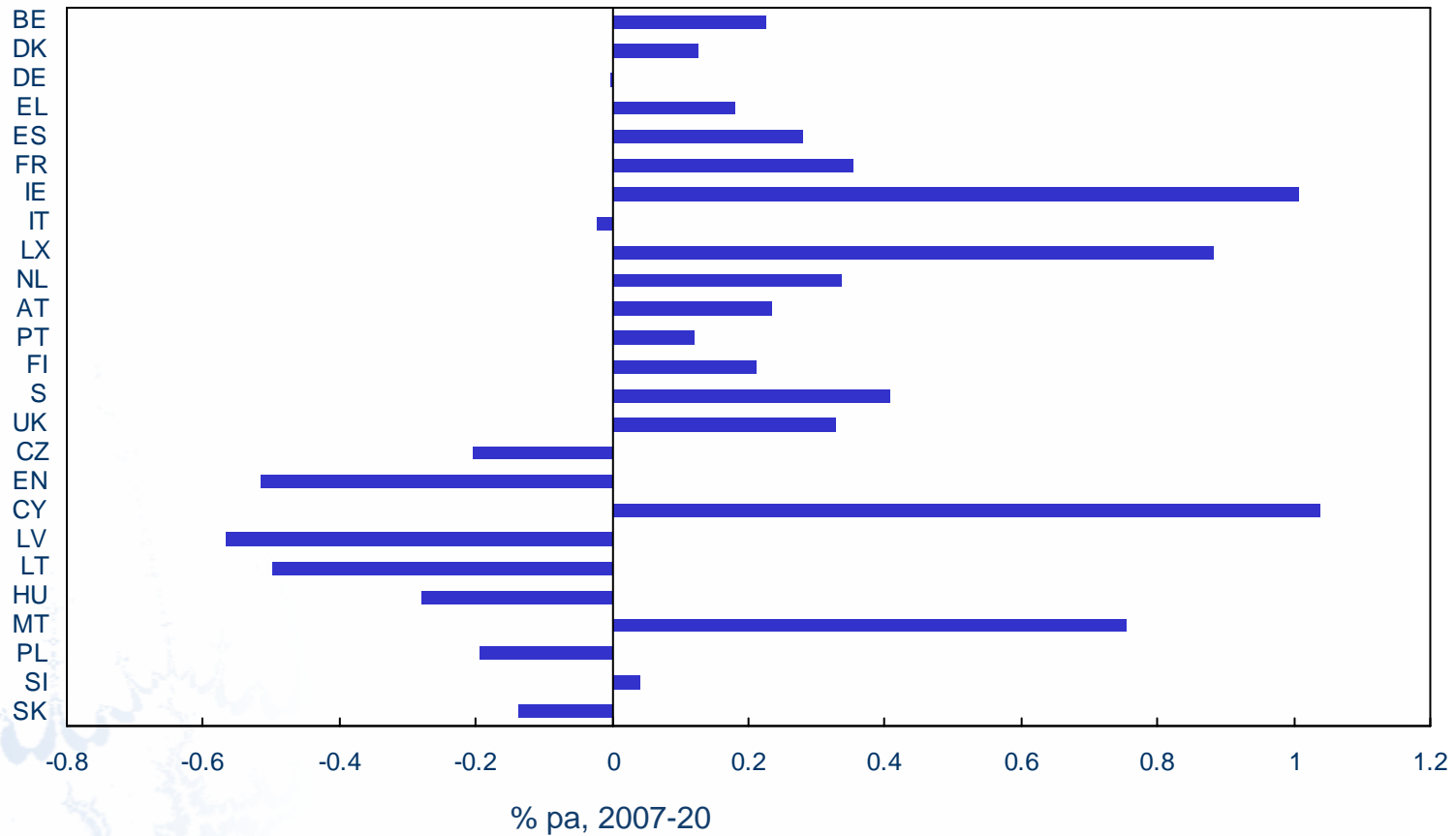
- Employment is estimated independently for each country and sector (ie 42x27 equations)
- Key elasticities are shown below (27 country average)

	Gross Output		Labour Costs	
	Short-term	Long-term	Short-term	Long-term
Ave. Elasticity	0.37	0.46	-0.26	-0.32

Assumptions to 2020

- **Largely “business as usual approach”**
 - tax rates remain unchanged
 - no major shift in social policy
- **These assumptions can be adjusted if we have the information**

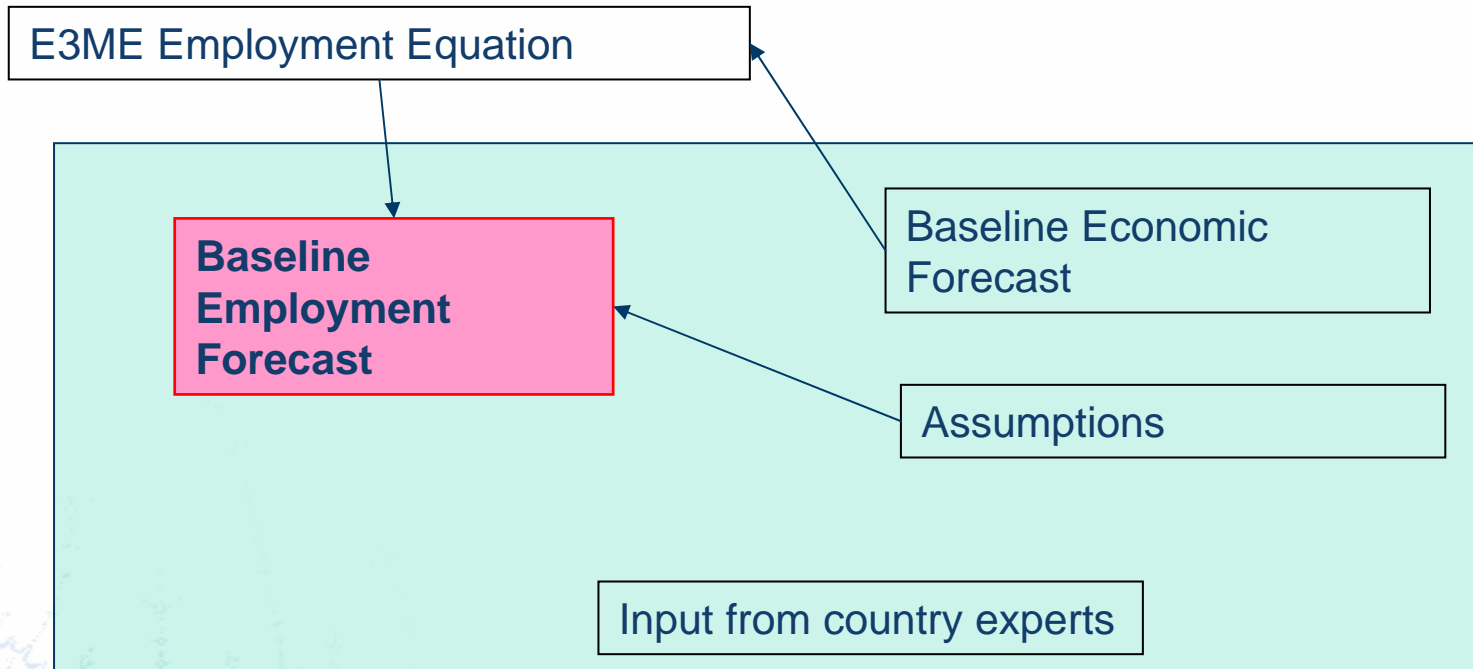
Population Assumptions



Note(s) : Chart shows average annual population growth, by country.

Source(s) : Eurostat, E3ME database.

The Baseline Employment Forecast



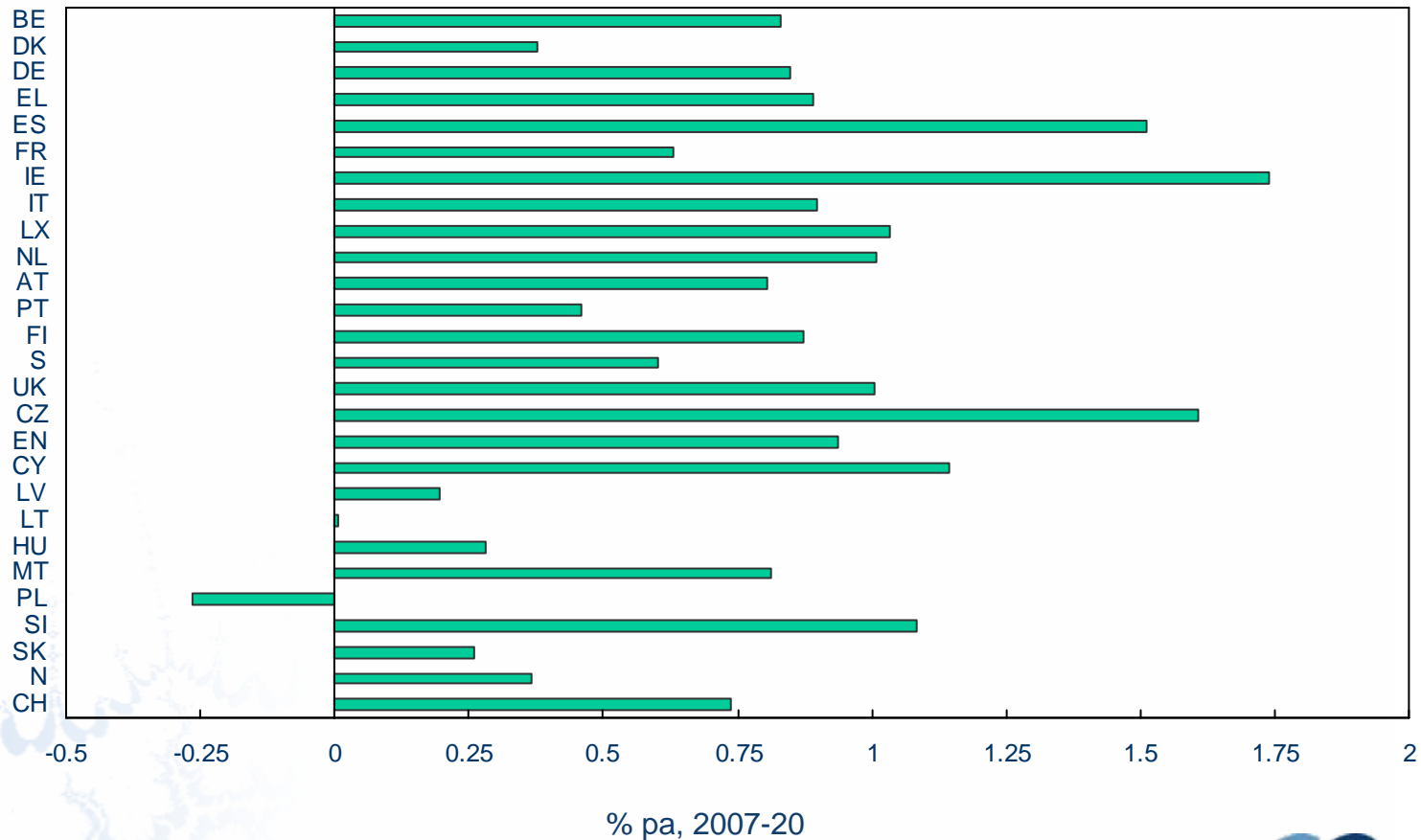
Forming the Employment Forecast

- **E3ME is partially solved**
 - all equations except employment are fixed to match other inputs
 - the employment equation is solved with no restrictions
- **This means that the forecast for employment is consistent with the economic forecast, described earlier**

Running E3ME

```
MREG-format output (if created) is in \E3ME\OUT\DUMPced.MRE
Summary results are in \E3ME\OUT\DUMPced.c61
IDIOM verification is included in QDUMP.VER
Parameters are FORECAST=c61 IN=F3B MOD=F2A30 ASMS=F1M DIRECTORY=C:\E3ME
SCENARIO=B_ETS REF=F3b OUTFILE=F3b VERIFICATION=QF3b MODEL=E3ME42
E3ME42 SUMMARY SOLUTION FOR EACH YEAR (See DATA\VER.TMP for details)
Last iteration for 27 region(s) as % change (D) previous year:
DATE IT GHG DGDP DSC DSU DSX DSM DSPH DPCE DPSX DPSP DAW BTRA PBRA UNRA
2003 11 1209 1.1 1.5 0.5 3.3 4.7 -1.8 -2.2 -2.1 -2.7 1.0 0.1 -0.2 8.5
2004 10 1210 2.4 2.3 3.1 7.3 7.5 0.0 2.0 1.4 1.7 4.2 0.1 -0.2 8.5
2005 15 1143 0.7 0.8 1.7 4.9 3.4 5.4 4.0 6.1 7.5 6.1 0.2 -0.2 8.9
2006 16 1115 2.1 1.6 2.4 5.5 5.2 4.7 4.2 5.2 5.6 6.9 0.2 -0.2 8.7
2007 17 1109 3.1 2.7 2.4 3.3 2.0 2.1 2.0 0.8 0.1 5.9 0.2 -0.4 8.1
2008 16 1101 2.7 2.1 3.1 3.5 2.7 2.1 1.7 1.0 0.2 4.4 0.2 -0.4 7.5
2009 23 1102 2.8 2.4 3.0 3.3 2.6 1.6 0.8 0.9 0.1 4.2 0.2 -0.5 7.4
2010 26 1102 3.0 2.5 3.2 3.4 2.6 2.2 2.6 2.3 1.4 4.1 0.2 -0.5 6.7
2011 23 1107 2.5 2.0 2.8 2.8 3.0 2.4 1.9 2.2 2.0 4.3 0.2 -0.5 6.3
2012 23 1113 2.3 2.1 2.2 2.4 2.8 2.7 2.5 2.5 2.8 4.8 0.2 -0.5 6.0
2013 22 1117 2.2 2.3 2.2 2.2 2.7 2.9 2.8 3.1 3.1 5.4 0.2 -0.5 6.0
2014 22 1113 2.3 2.2 2.2 2.1 2.5 2.8 2.8 3.0 3.0 5.4 0.2 -0.5 6.2
2015 22 1112 2.3 2.2 2.1 2.1 2.4 2.7 2.8 3.1 3.1 5.3 0.2 -0.4 6.4
2016 25 1113 2.2 2.2 2.1 2.1 2.4 2.8 2.8 3.2 3.1 5.0 0.2 -0.4 6.5
2017 29 1114 2.3 2.2 2.3 2.2 2.6 2.5 2.7 3.1 3.0 5.0 0.2 -0.4 6.9
2018 33 1118 2.3 2.2 2.3 2.3 2.6 2.5 2.6 2.9 2.8 4.9 0.2 -0.5 7.0
2019 36 1123 2.3 2.1 2.2 2.2 2.6 2.6 2.7 3.0 2.8 4.9 0.3 -0.5 7.0
2020 39 1127 2.2 2.1 2.0 2.1 2.4 2.6 2.7 3.0 2.9 5.0 0.3 -0.5 7.1
E3ME tables (if created) are in \E3ME\OUT\F3b.TAB
MREG-format output (if created) is in \E3ME\OUT\F3b.MRE
Summary results are in \E3ME\OUT\F3b.c61
IDIOM verification is included in QF3b.VER
Parameters are FORECAST=c61 IN=DAN230a MOD=F2a30 ASMS=F1M DIRECTORY=C:\E3ME
SCENARIO=B_ETS REF=DUMPF1A OUTFILE=DAN230a VERIFICATION=DAN230a MODEL=E3ME42
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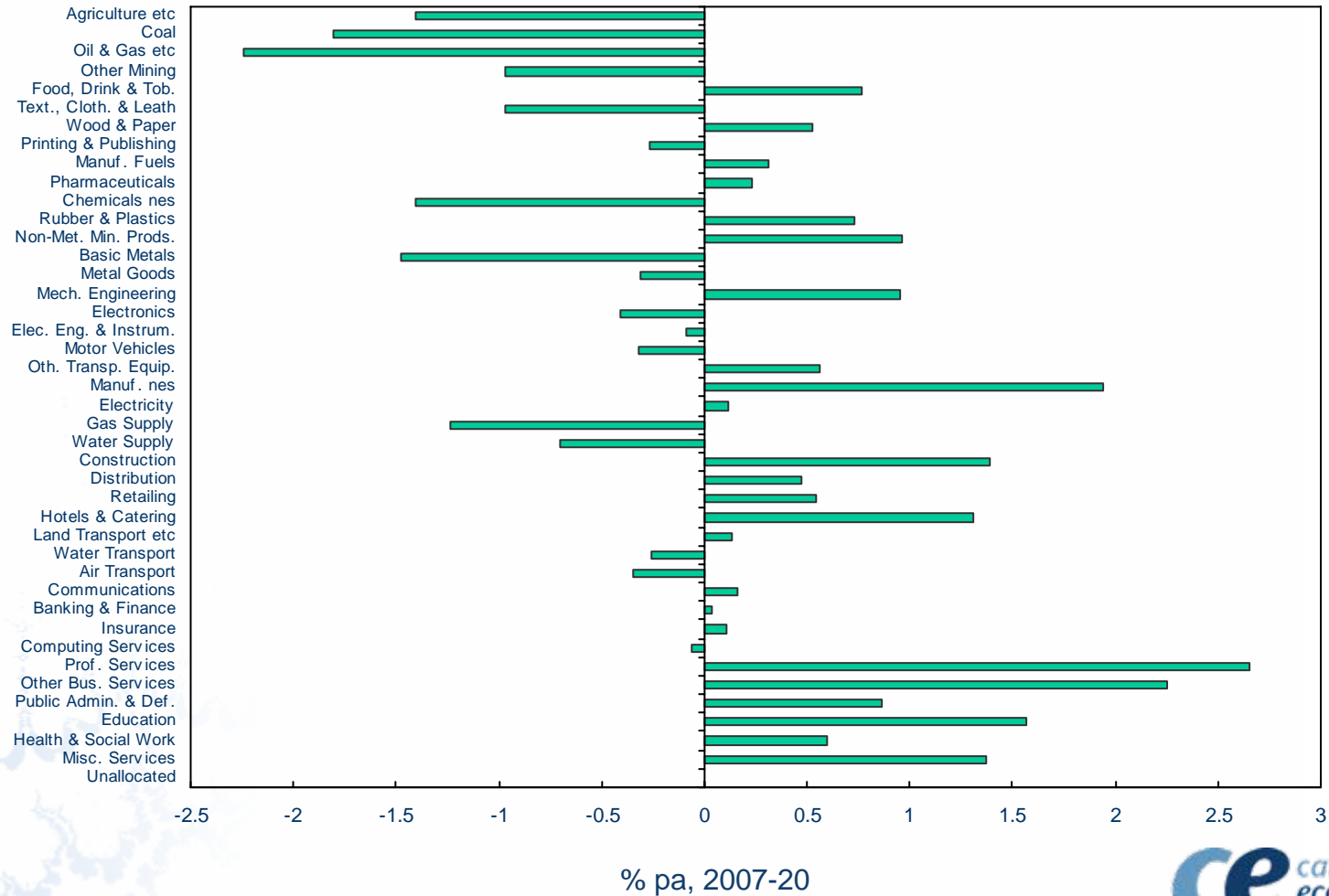
Summary results: Employment Growth



Note(s) : Chart shows average annual employment growth, by country.

Source(s) : E3ME.

Summary results: Employment Growth



Source(s) : E3ME.

Gender & Employment Status

- **LFS data provided by IER**
- **These are used to form shares**
- **Shares projected forward using shift-share system**
- **Disaggregated results will always be consistent with E3ME forecast**

Scenarios – Model Preparation

- **Baseline employment forecast saved**
- **Fully endogenous solution of E3ME created that matches economic and employment baselines**
 - the model equations determine results, but a set of scaling factors are introduced so that the results in the baseline match the prepared forecast

Scenarios - Specifications

Scenario	Economic growth and competitiveness	Social welfare and govt	Technological change	Globalization and mobility	Demography
A: Baseline	Base	No change	Medium	Base	Base (ageing population)
B: Optimistic	Higher	Lower taxes and benefits	Higher	Higher	Higher working age population
C: Pessimistic	Lower	Higher taxes and benefits	Lower	Lower	Higher life expectancy, even higher dependency

Scenarios – Specifications (cont)

- **Expand on the five broad areas**
- **Translate into model variables**
 - see paper
- **Final output will be a range of projections**

Progress and remaining tasks

- **Initial set of economic and employment projections complete**
 - comments from country experts to be incorporated
 - this will form final baseline
- **Scenario design at an advanced stage**
 - basic specification complete
 - changes need to be quantified
 - E3ME needs to be set up to run scenarios

Summary

