Decomposing changes in the income distribution in Europe in 2030

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Motivation

- EU facing demographic challenges: increase in life expectancy, changes in fertility $\rightarrow$ population ageing
- ... and uncertainty from other population developments such as changing skill distribution (up-skilling) and migration (within and between countries) $\rightarrow$ amplify or smooth shocks?
- Impact on future labour markets

Research questions

1. How will demographic changes shape household income distributions in the EU?
2. *How well existing tax-benefit systems can cope with potential adverse effects?*

Related literature

- Future labour market and/or income distribution
  - Aziz et al. (2013) - distributional impact of population ageing and changes to labour force participation in New Zealand up to 2060; reweight and MSM; inequality stable, poverty declines
  - Edwards and Lange (2013) - evolution of returns to education and gender in US by 2030 given projections of education attainment and demographics, trend towards high skilled and female labour continues
- Decomposing changes in hh income distribution: policy vs other factors
  - Long tradition in microsimulation literature
  - Bargain and Callan (2010) provide a formal framework
  - Recent applications: UK (Bargain, 2012a,b), US (Bargain et al., 2013b), EU countries (Bargain et al., 2013a; De Agostini et al., 2014; Hills et al., 2014)

Population projections for 2030

Huisman et al. (2013):

- A cohort component model → age-gender distribution
- KC et al. (2010) for education projections
- 2 demographic scenarios (lower and upper bound)

Characteristic	Scenario	
	tough	friendly
International migration	low	high
Rural-to-urban migration	high	low
Fertility	low	high
Increase in life expectancy	low	high
Old-age dependency ratio	high	low
Educational attainment	low	high

- Skill levels align well with Cedefop (2012) projections for 2020

EUROMOD

- Tax-benefit model for EU-27
- A single common framework → comparative!
  - Input = household characteristics and market incomes
  - Calculates direct taxes and cash benefits for alternative policy scenarios (or using alternative inputs)
  - Output = (counterfactual) distribution of disposable income
- 2010 policies
- SILC 2008 as input data (FRS 2009/10 for UK)
  - Sample size: from 9,000 (LU) to 57,000 (UK) individuals
  - 2007 incomes (updated to 2010 levels by components)
- Re-weighted
  - Age, education attainment, hh structure, rural/urban
  - (2010 and) 2030 population structure

Labour market adjustments

- Demographic changes affect directly labour supply
- Labour supply elasticities:
  - Bargain et al. (2014) estimated with EUROMOD
  - Extensive and intensive
  - By gender, marital status and skill level: higher for low-skilled
  - Aggregated by country groups: lower in Eastern Europe, higher for Anglo-Saxon and Southern Europe
- Labour demand elasticities:
  - Lichter et al. (2013), a meta-regression analysis
  - Benchmark own-wage elasticities by skill and country grouping
  - Higher for low-skilled and in Eastern Europe
- Solve system of equations (iteratively) to obtain new equilibrium wage and employment levels (hours)
- Elasticities assumed to be constant over time

Decomposition of income distribution

- Bargain and Callan (2010) framework: $I\left[d_i(p^j, y^l)\right]$
  - y hh market income (and socio-demogr. characteristics)
  - d 'tax-benefit function'
  - p policy parameters with monetary values
  - I distributional index
- Total change = (direct) policy effect + other factors

$$\Delta I = \left\{ I\left[d_1(p^1, y^1)\right] - I\left[d_0(\alpha^1 p^0, y^1)\right] \right\} + \left\{ I\left[d_0(\alpha^1 p^0, y^1)\right] - I\left[d_0(p^0, y^0)\right] \right\}$$

Our approach

- Focus on market factors (assuming current policies continue $d_0 = d_1$, $p_0 = p_1$)
- Distinguish further between demographic and wage effects:

$$\Delta I^c = \left\{ I[d(\alpha^1 p, y_w^1)] - I[d(\alpha_d^1 p, y_d^1)] \right\} + \left\{ I[d(\alpha_d^1 p, y_d^1)] - I[d(p, y^0)] \right\}$$

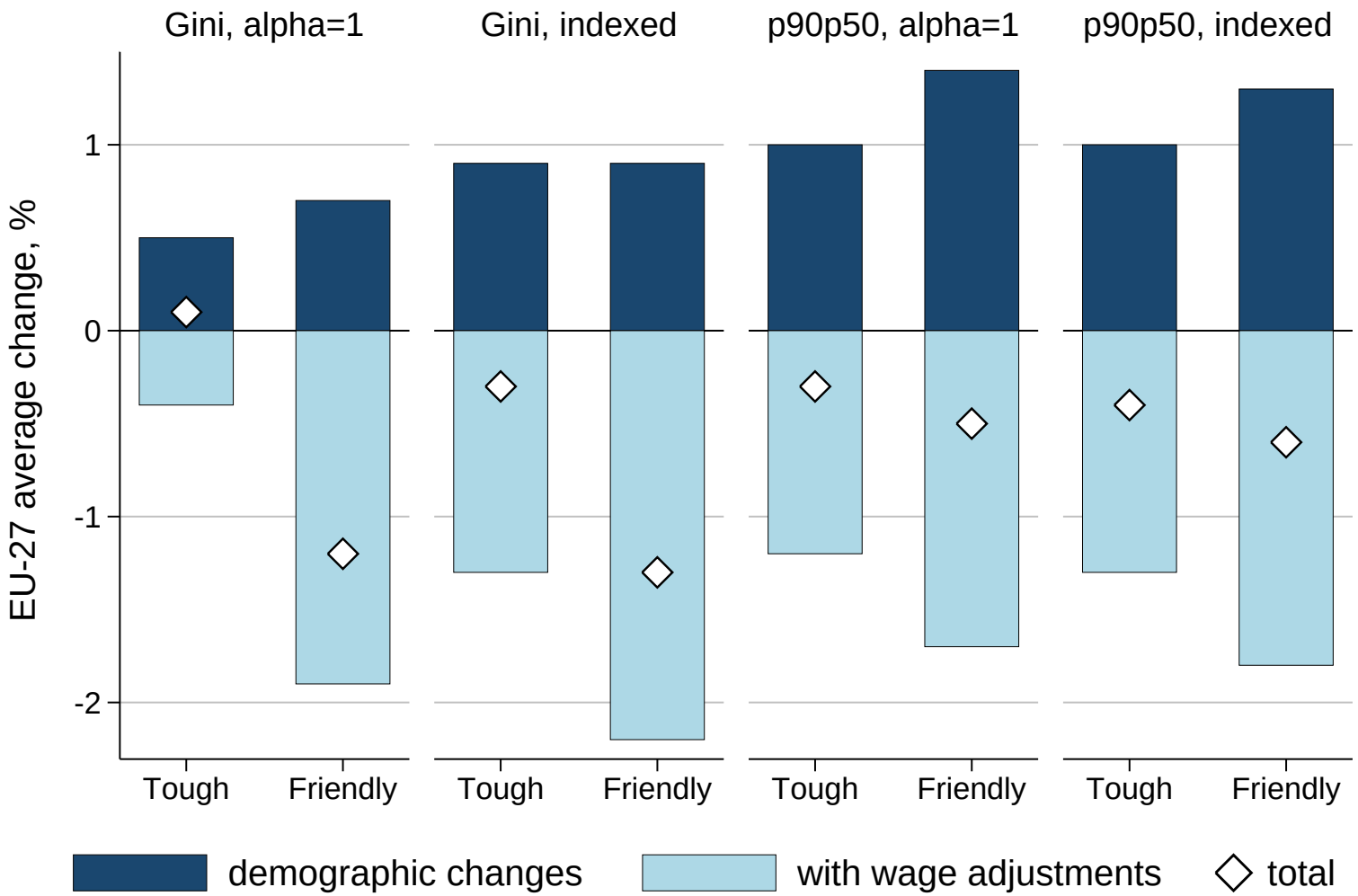
- Counterfactual indexation (α)
  - Choice still relevant
  - $\alpha = 1 \rightarrow$ benchmark policies with constant parameters in real terms
  - $\alpha = \bar{y}_w^1 / \bar{y}_0 \rightarrow$ benchmark policy parameters in line with (private) income growth

Aggregate statistics

	Tough			Friendly		
	average	min	max	average	min	max
Total population	-2.6%	-23% (BG)	21% (LU)	7.9%	-6% (LT)	30% (LU)
Share of aged 65+	5.8pp	2.5pp (SE)	10pp (MT)	6.2pp	3.6pp (SE)	9.7pp (MT)
Total labour force	-9.2%	-29% (BG)	16% (LU)	-1.0%	-14% (LT)	23% (LU)
Share of low skilled	-5.5pp	-15pp (PT)	1.7pp (EE)	-8.3pp	-14pp (MT)	-4.2pp (DE)
... medium skilled	-0.4pp	-11pp (LT)	8.0pp (PT)	-3.1pp	-10pp (LT)	1.7pp (MT)
... high skilled	5.9pp	0.9pp (DE)	11pp (PL)	11.4pp	8pp (DE)	16pp (PL)
Employment rate	0.0pp	-2.6pp (AT)	3.8pp (MT)	1.0pp	-1.9pp (AT)	4.7pp (MT)
Employm. rate (WA)	1.7pp	-1.7pp (AT)	5.5pp (MT)	2.7pp	-1.3pp (AT)	6.7pp (MT)
Hours worked	-8.8%	-30% (BG)	16% (LU)	1.0%	-11% (BG)	23% (LU)
Hours worked (WA)	-8.7%	-30% (BG)	14% (LU)	0.8%	-11% (BG)	20% (LU)

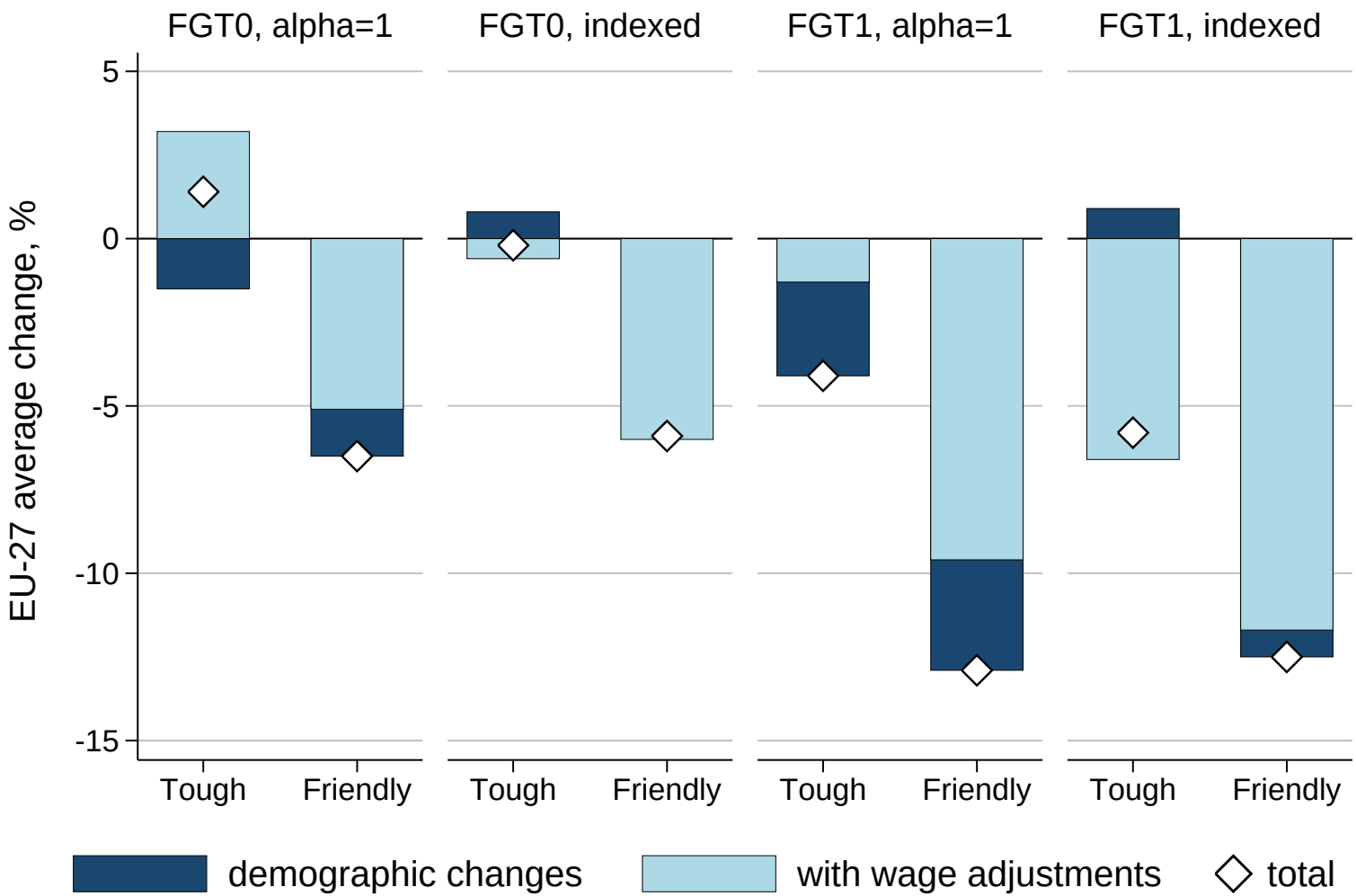
Notes: EU-27 average change (unweighted); WA = with wage adjustments.

Inequality: EU-27 average changes (unweighted)



Graphs by measure and indexed

Poverty: EU-27 average change (unweighted)



Graphs by measure and indexed

Preliminary conclusions

- Inequality
  - Effects small, likely to fall
  - Demographic changes ↑ inequality, wage adjustments ↓
  - Some convergence across countries
  - Large increases in DE, DK, FI and NL
- Poverty
  - Relative effects larger
  - More sensitive to demographic scenario and indexation
  - Demographics vs wage adjustments pattern noisier
  - Large increases in IE and PT
- Policy responses needed in some countries to avoid large adverse effects

Thank you!

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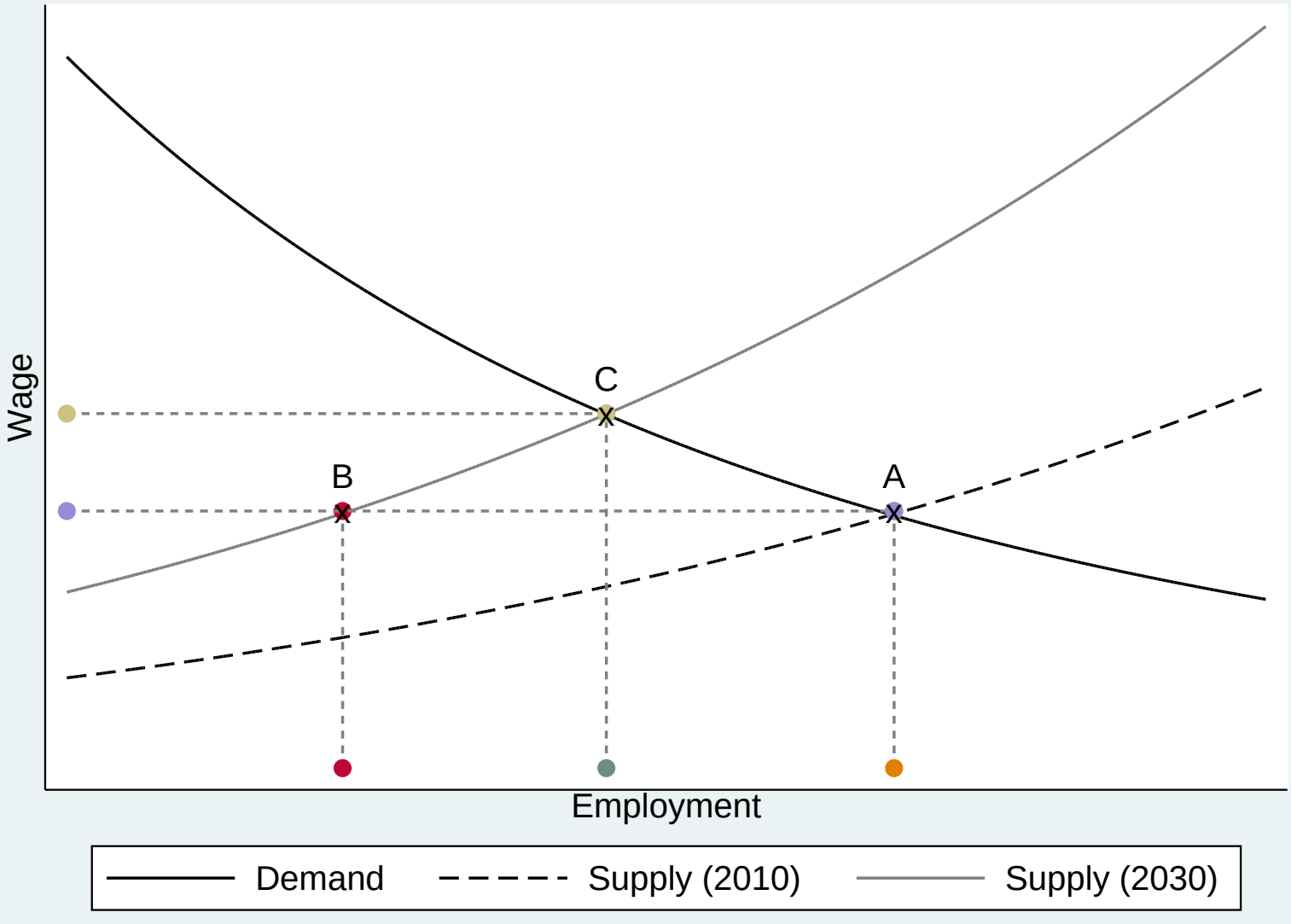
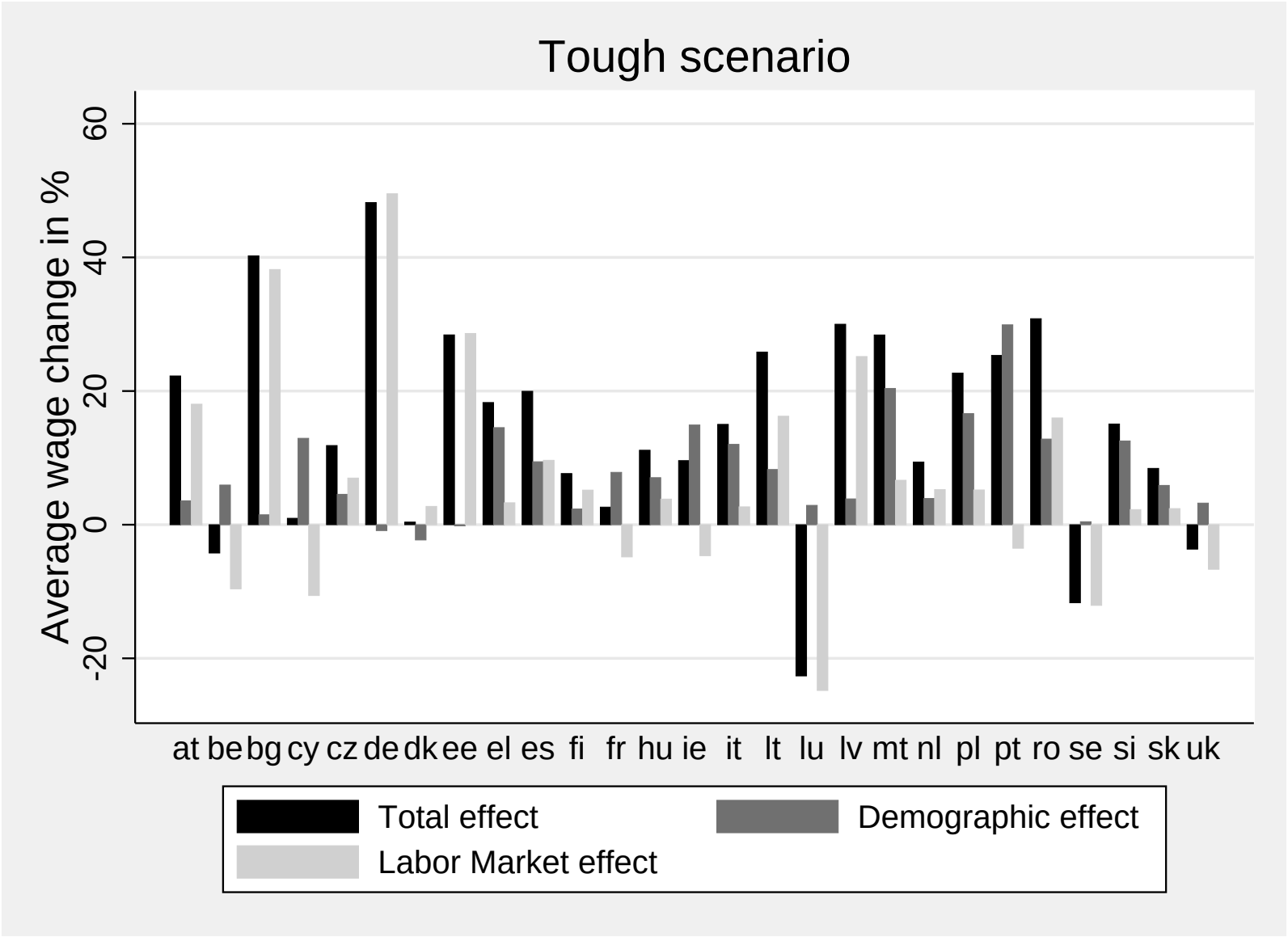
Labour market adjustments



Change in average wage, %



Change in average wage, %