

# Graduate jobs and graduate wages across Europe in the 21st century

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# Is this the typical European graduate labour market?



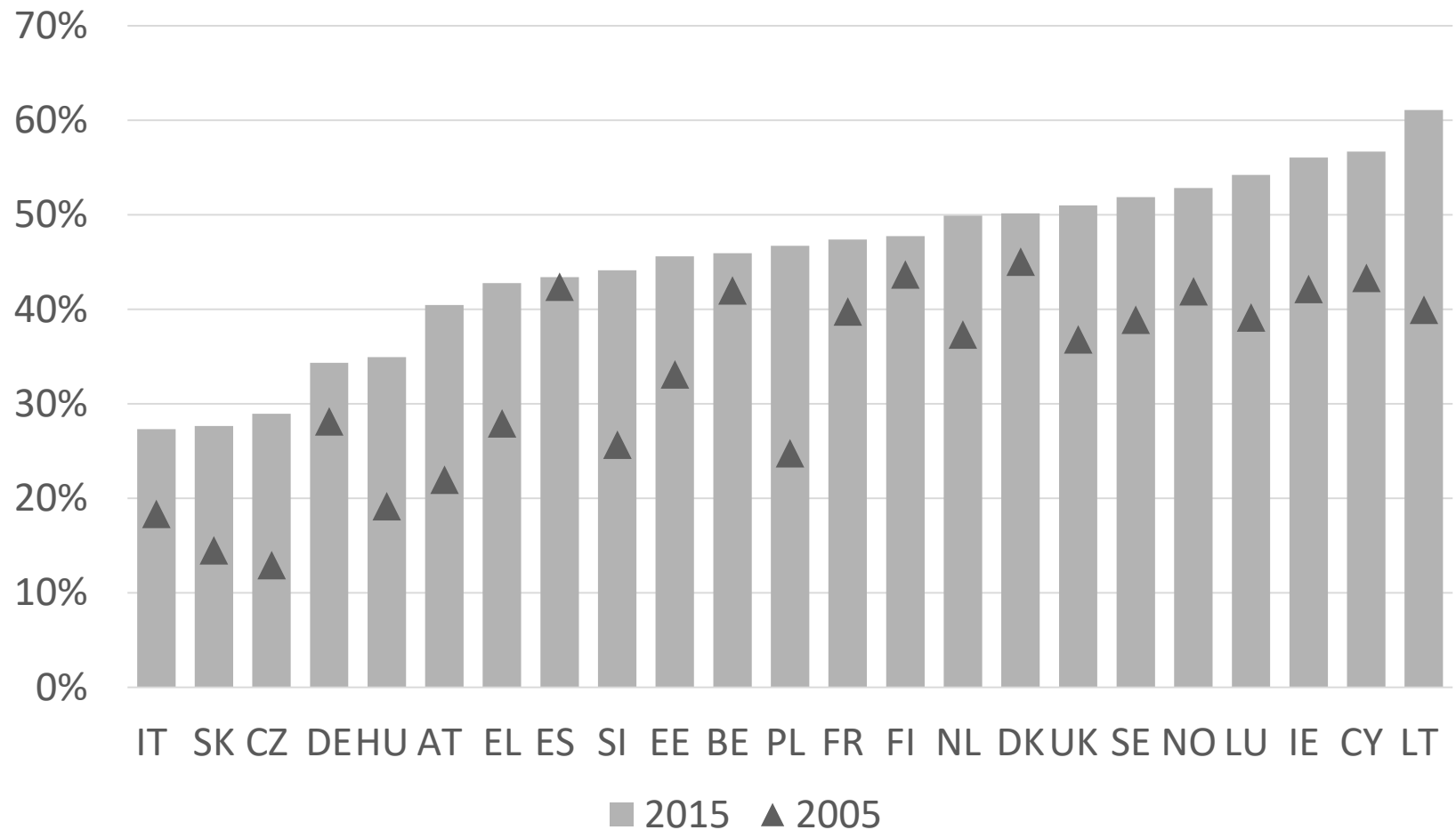
# Today's outline: focus on heterogeneity

1. Context: graduate labour supply trends, "graduate jobs" & graduate underemployment.
2. A picture of heterogeneity within Europe's graduate labour markets

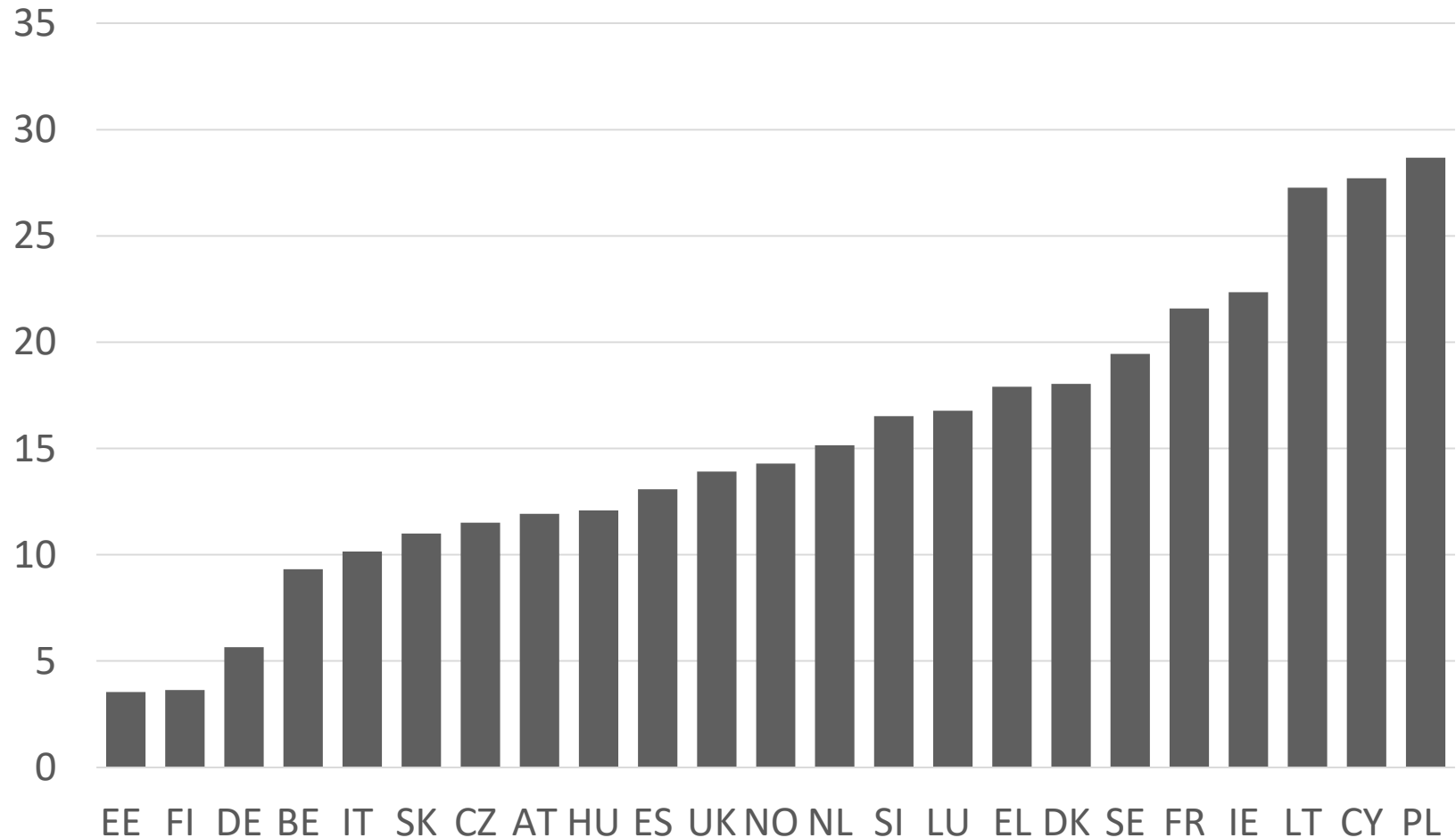
# Graduate labour supply, in brief

- Tertiary-educated graduates have become more prevalent everywhere, but at a widely varying pace
- They will go on growing everywhere for some time to come
- (No strong evidence of convergence)

# Level of tertiary educational attainment 2005 & 2015 (30-34 years)



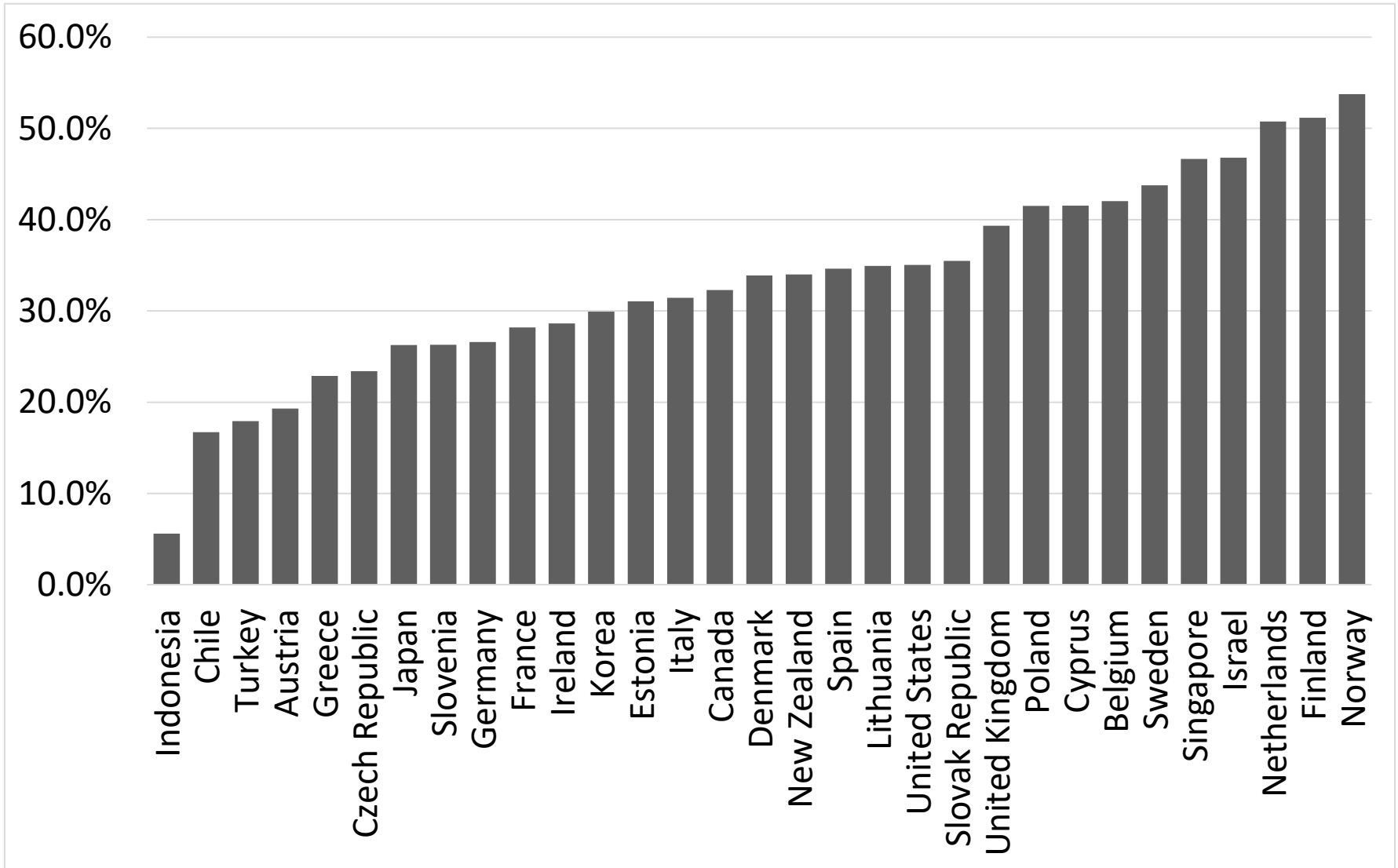
# Gap in tertiary education between 30-34 and 55-59 years olds, 2015



# Graduate jobs, in brief

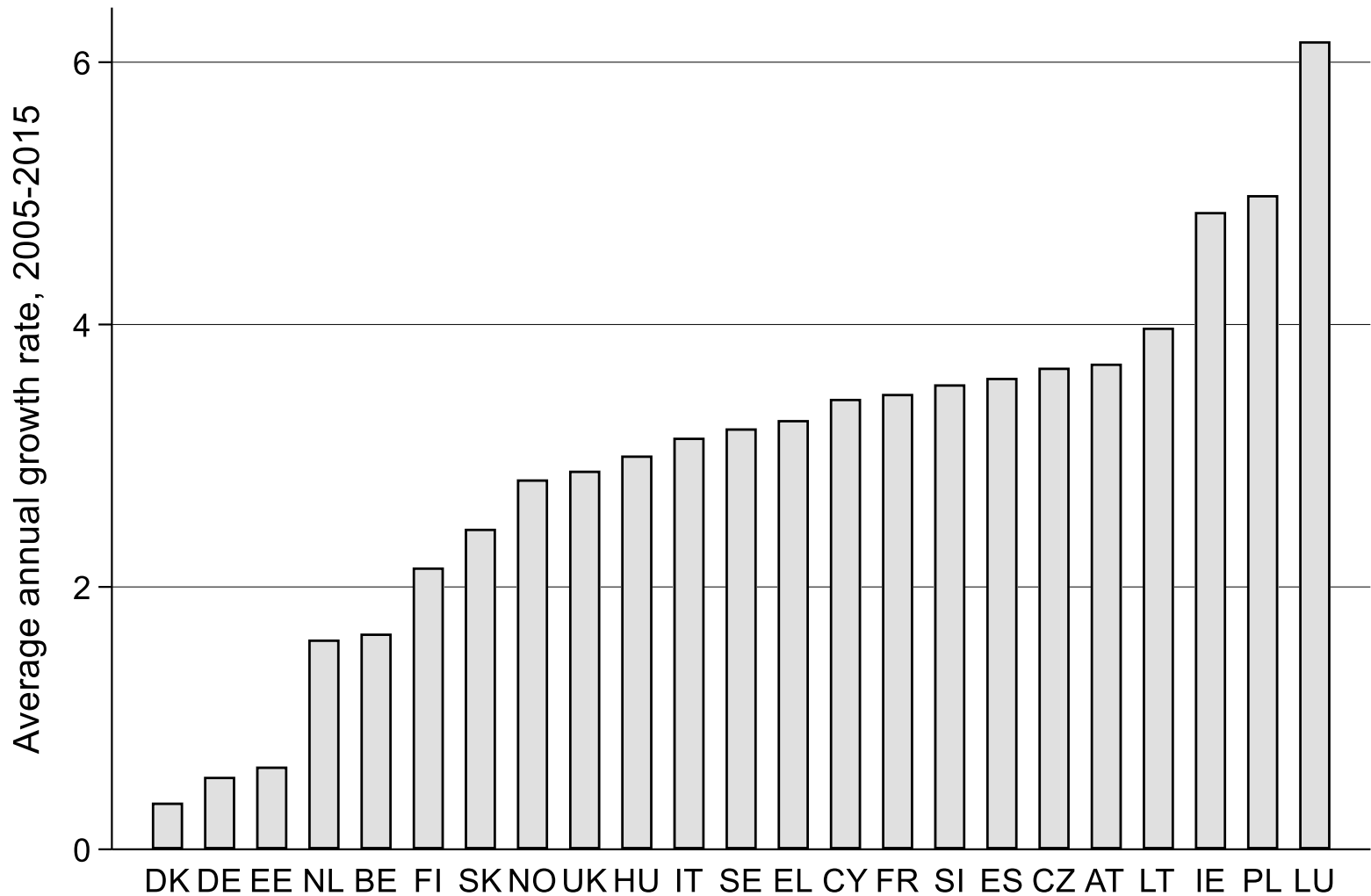
- Prevalence of graduate jobs varies a lot
- Considerable variation, which correlates with the 'quality' of graduates relative to non-graduates
- They have grown more prevalent almost everywhere, though at a varying pace
- Some occupations can switch between graduate and non-graduate
- But future growth is very uncertain

# Proportion of labour in graduate jobs across countries





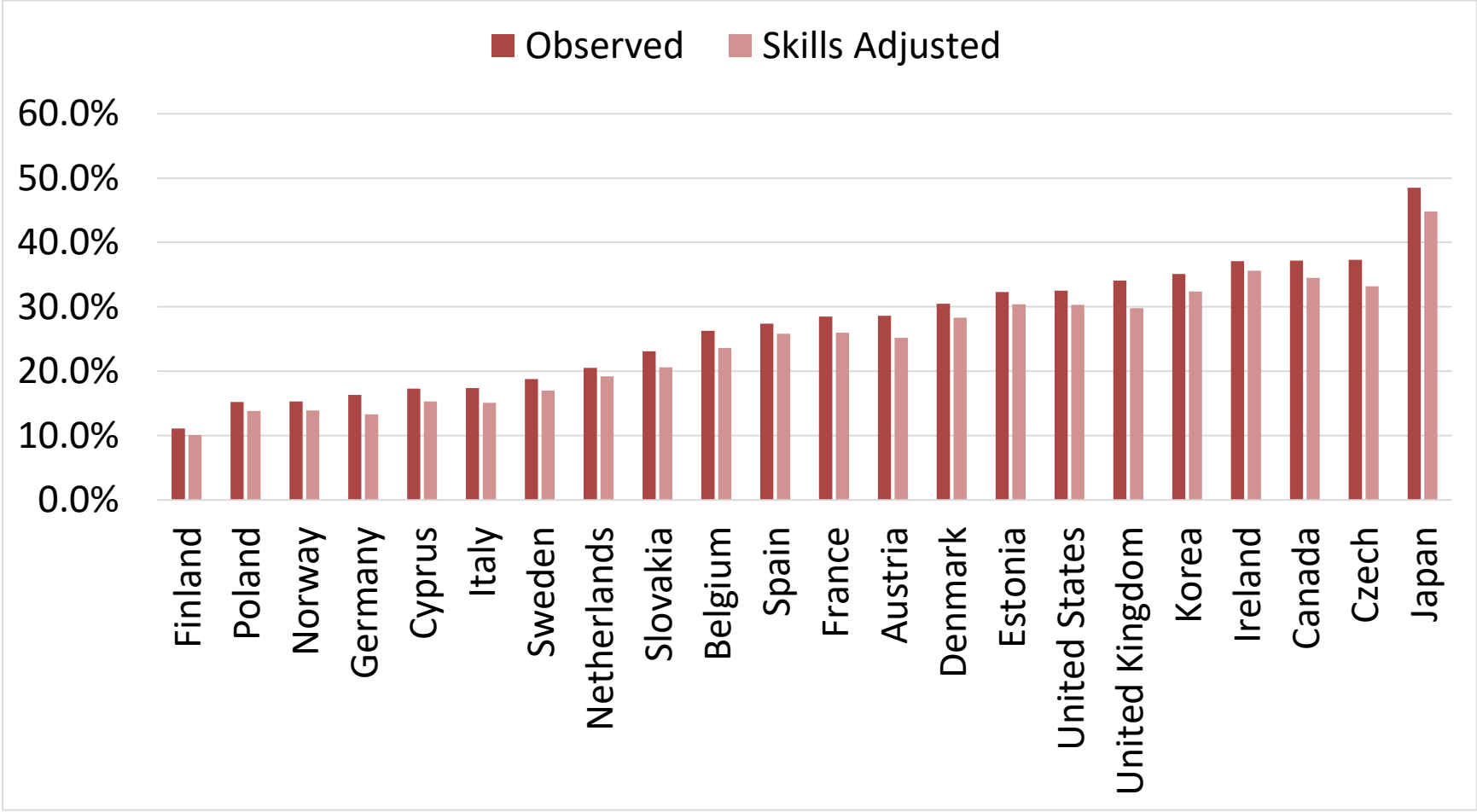
# High-skill job growth (2005/2015)



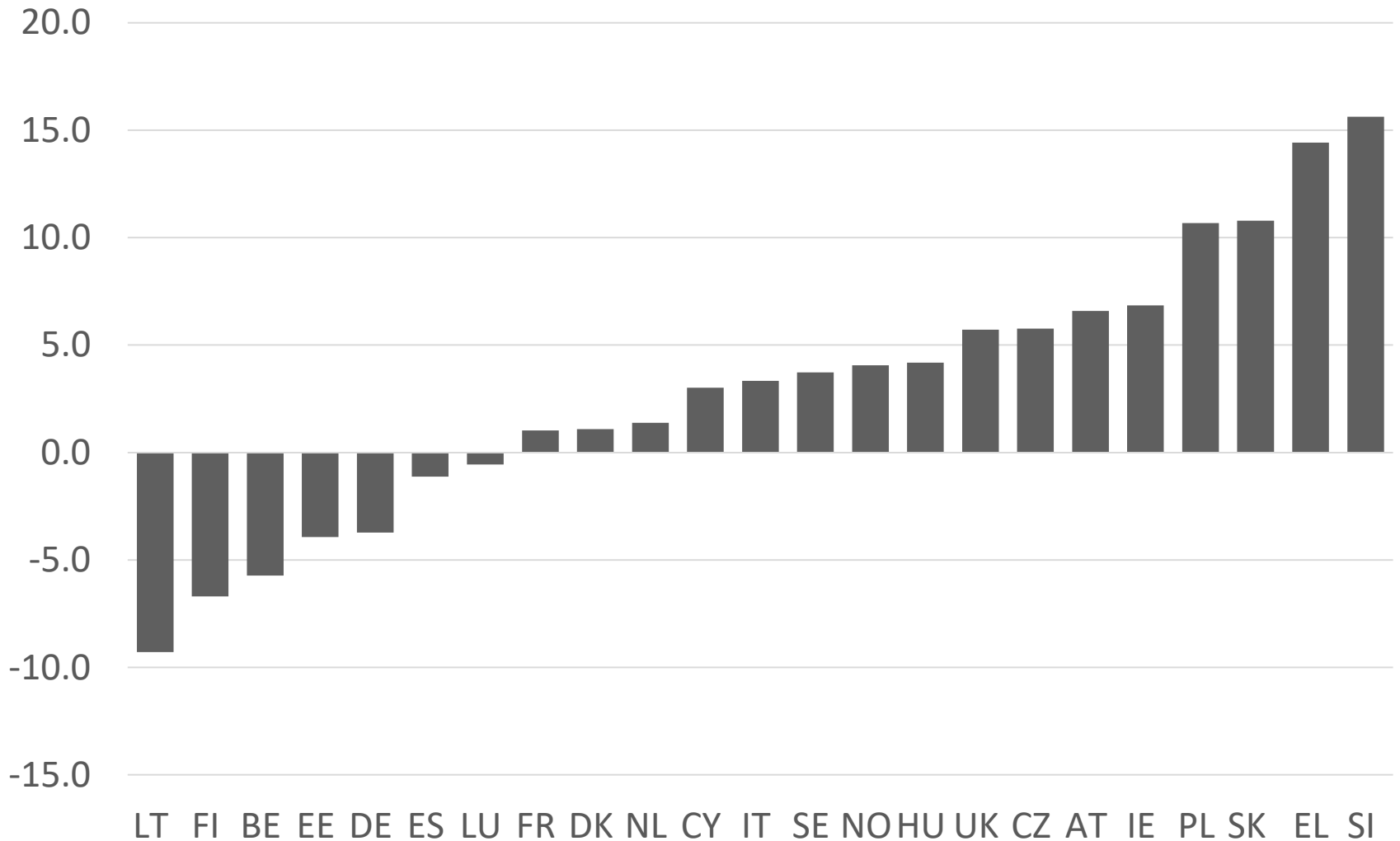
# Graduate underemployment, in brief:

- Graduate underemployment varies considerably across countries
- Graduate underemployment is increasing in the majority of countries, but not all
- Rising excess supply of graduates is strongly associated with a growing prevalence of underemployment

# Underemployed graduates, observed and skills adjusted



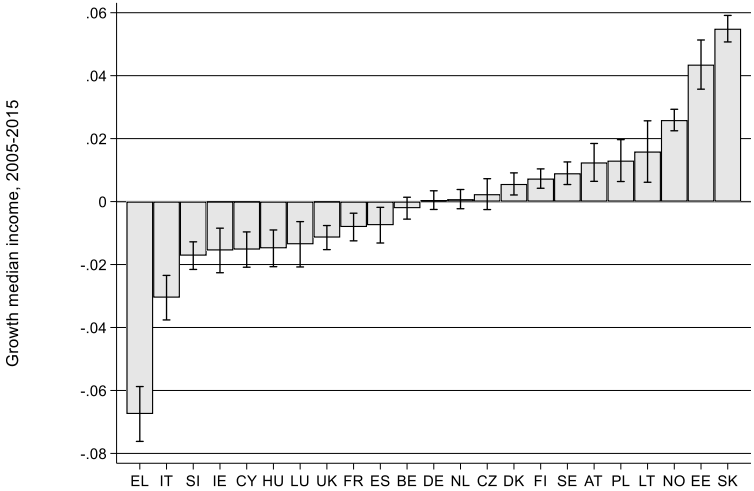
# Change in the proportion of employed graduates in medium-skilled or low-skilled jobs (2005/2015, ages 30-34)



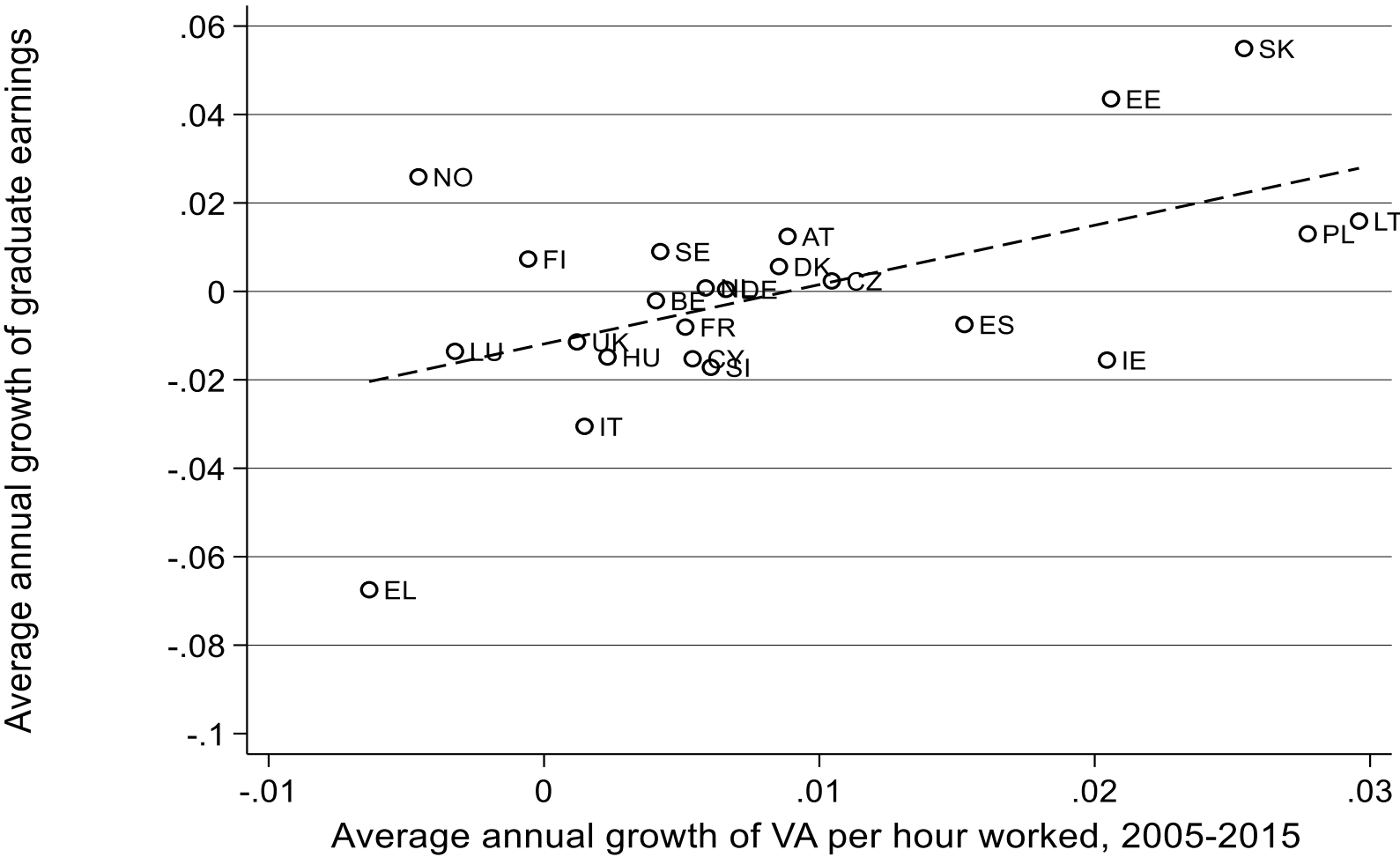
# Graduate earning trends, in brief

- Great cross-national differences in the evolution of graduate earnings
- Growth of average graduate earnings is closely associated with labour productivity trends, increasing excess supply of graduate labour, ...
- Earnings gap between graduates and lower educated groups is broadly stable in most countries

# Growth rate of average graduate earning, 2005-2015



# Labour productivity and graduate earnings



# Rising graduate wage heterogeneity?

Changing wage inequality = wages grow at different paces across the graduate wage distribution.

Relevance to:

- risk and student debt?
- limits to the power of education to deliver on its promise of social mobility?



# Graduate wage heterogeneity

Excess supply and occupational downward shifting of graduates?

Technological change (and/or globalisation): differential effects on skills demand within graduate jobs?

Changing management practices (e.g. digital Taylorism): differential effects on skill use and development?

Increasing skills heterogeneity among new graduates?

Wage setting institutions: union power, minimum wages, occupational licensing?

Great recession: low capital investments, lack of openings in high-skill jobs, sluggish productivity growth

Composition: migration, population ageing, growing female lfp

# Some manifestations of changing heterogeneity

- Grade (Naylor et al (2016) for Britain)
  - by underemployment (e.g. Green & Zhu (2010), Green and Henseke (2017) for Britain)
- (cf: the theory of "effectively maintained inequality")
- by qualification level (cf "maximally maintained inequality") e.g. Lindley & Machin (2016) for US & Britain; Lee (2016) for Hong Kong;
- (cf: the theory of "maximally maintained inequality")
- subject studied?; university rank/type; achieved grade. e.g. Sullivan et al (2017); Walker and Zhu, 2011; 2017

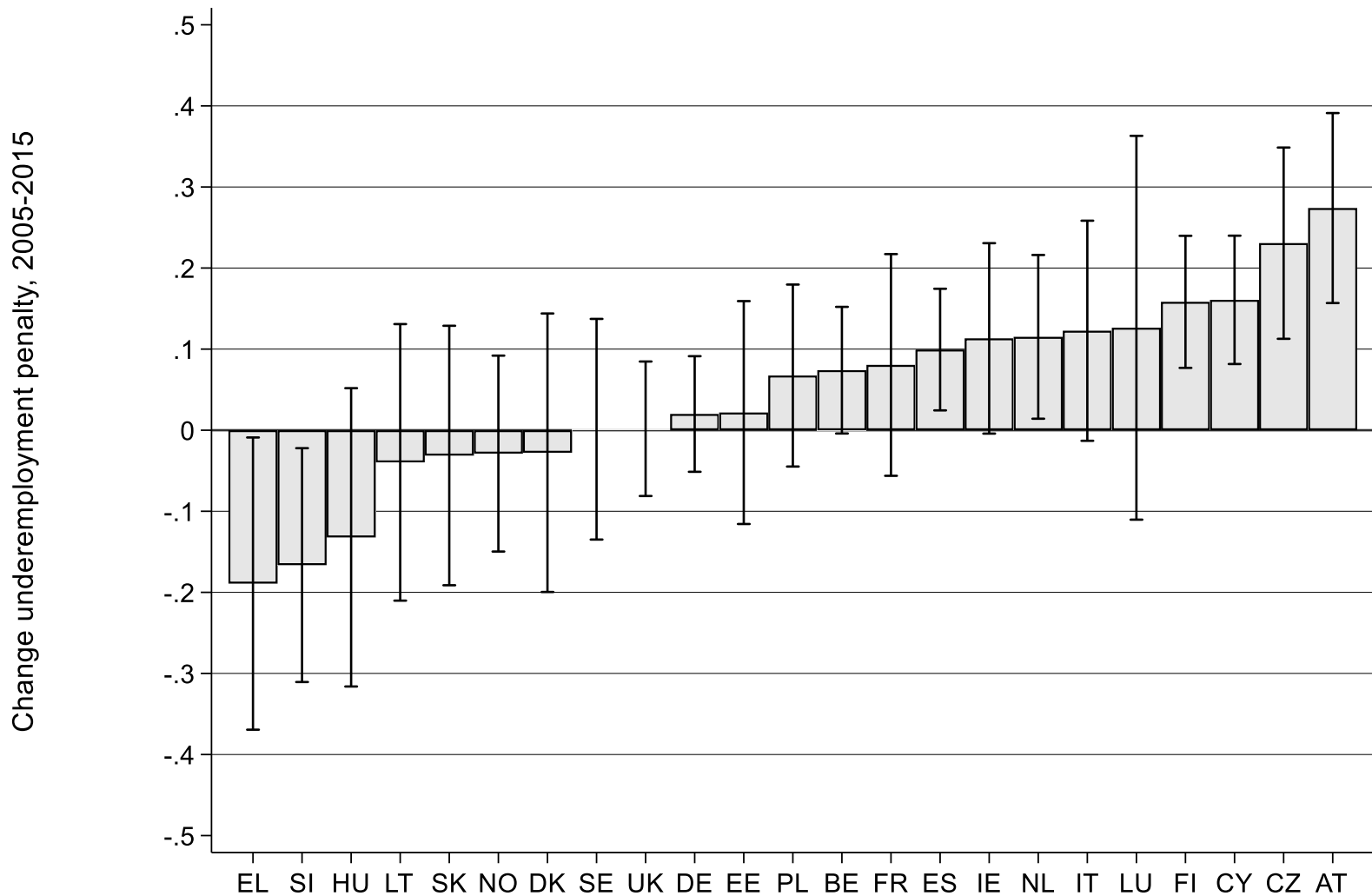
# Data

- European Statistics on Income and Living Conditions (EU-SILC), 2004-2015
- Sample:
  - Male graduates aged 30 to 59 years who worked for at least one fte-month in the year before the interview.

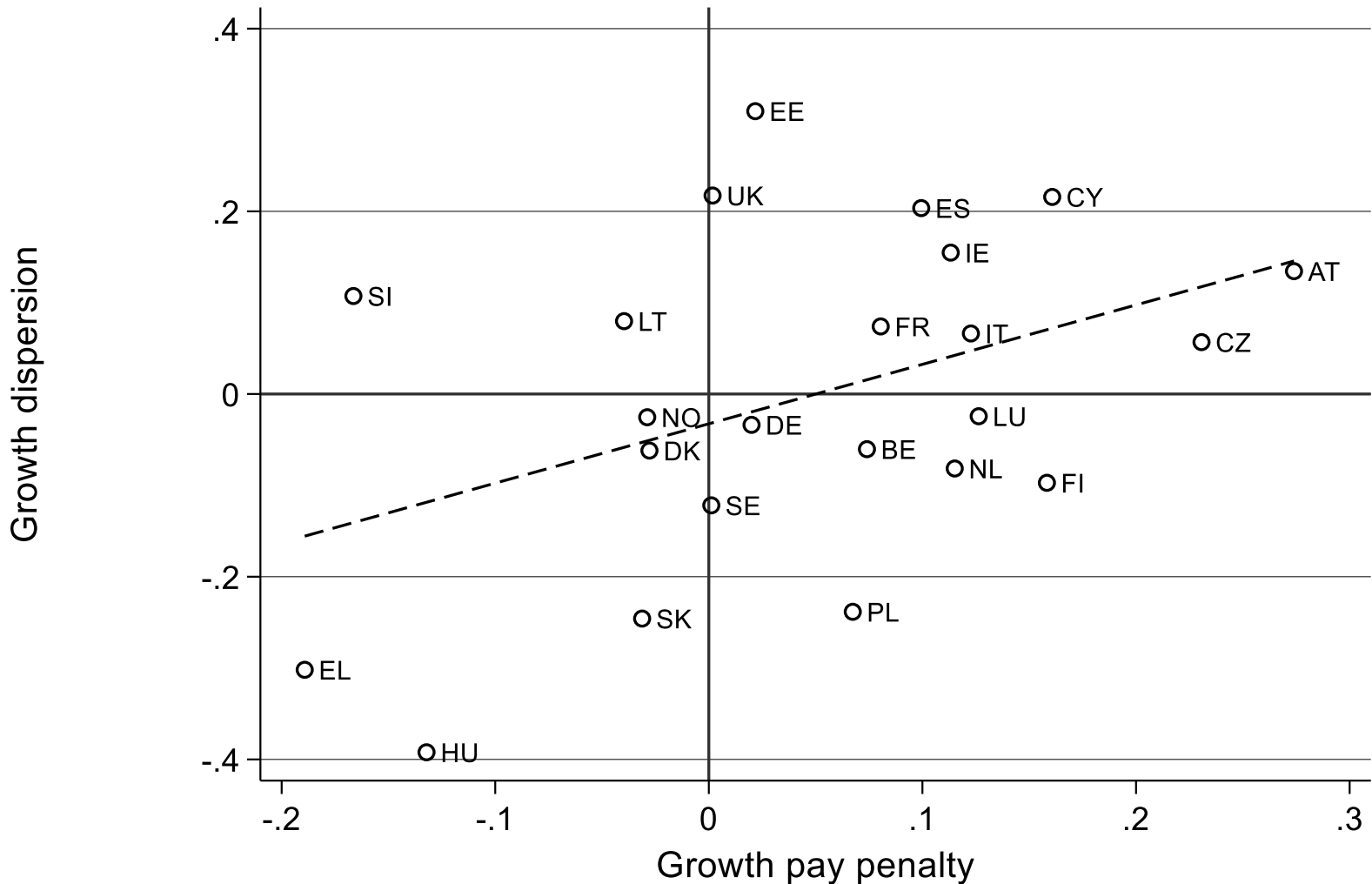
# Underemployment pay penalty

- Pay penalty associated with underemployment has risen significantly in ES, NL, FI, CY, CZ, AT and potentially in IT, IE, BE
- It dropped significantly in EL and SI
- Overall, a 1 percentage point rise of the underemployment pay penalty is associated with a 0.6 rise of the P90/P10 ratio

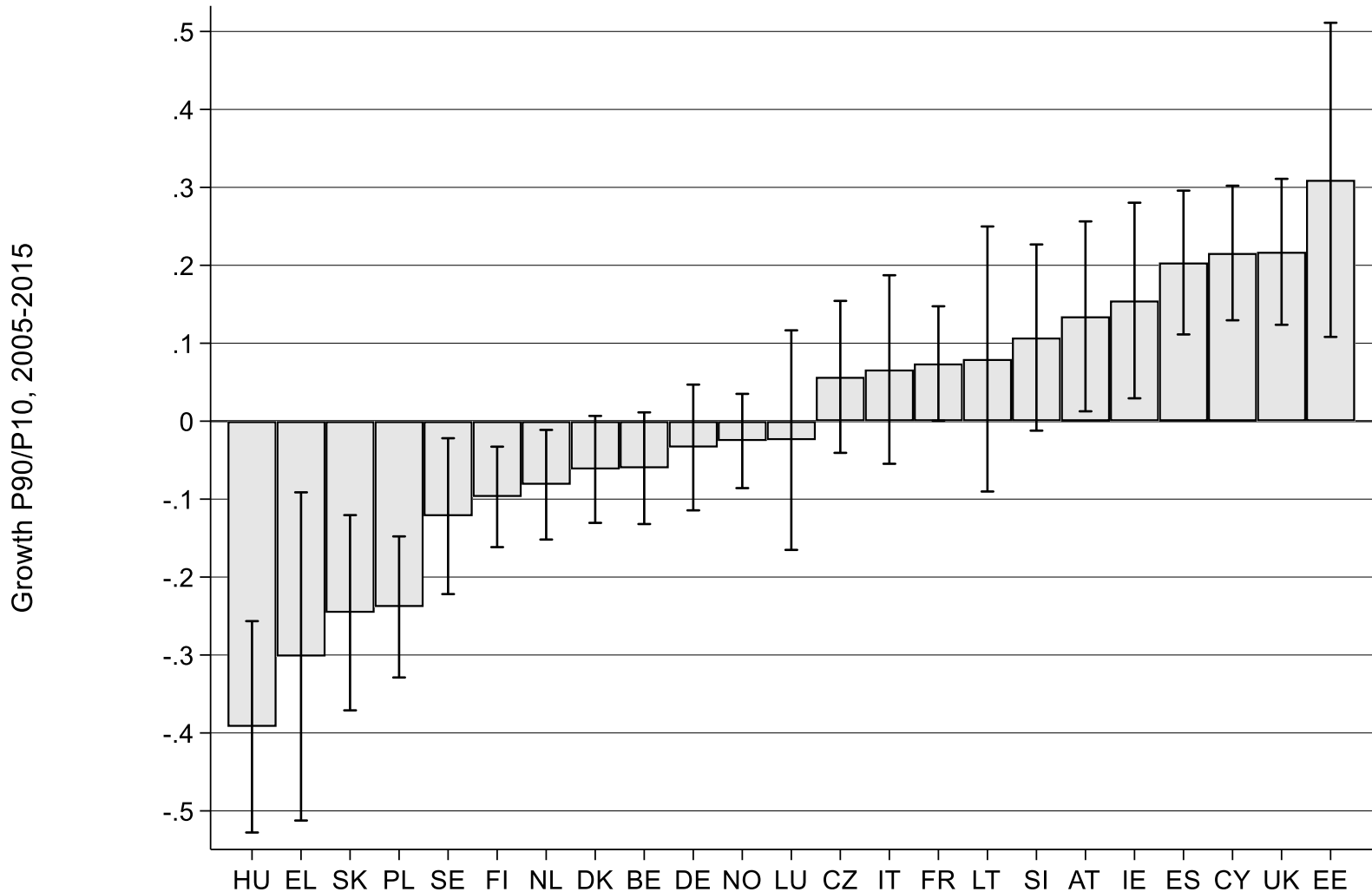
# Underemployment pay penalty rose in many but not all countries, 2005-2015



# Trends in income dispersion and underemployment penalty



# How has wage inequality within graduates evolved? 2005-2015



# Composition effects were overall minute

- Decomposition changing graduate earnings (averages and dispersion) into a composition (e.g., age, experience, work status) and 'price' component
- Significant but limited contribution of composition in 5 out of 23 countries



# Potential drivers of changing dispersion

- Excess supply of graduates: Associated with reduced lower tail wage inequality, but only if Greece is in the country selection
- Technological change (and/or globalisation)
  - ICT capital stocks associated with widening underemployment pay penalty
  - There is no association of 'offshoring' or investment into intangible assets with changing wage dispersion across countries
  - Rising proportion of foreign-born graduates correlates with widening upper tail inequality conditional on high-skills demand

# Summary 1

- Universal rise in the supply of graduates and graduate jobs
- Latter grew slower than former in many but not all countries. The result is growing underemployment
- Average “returns” to tertiary education were relatively stable in most countries

# Summary 2: trends in graduate wage dispersion

- Underemployment pay penalty rose in many but not all countries.
- Changing underemployment pay penalty and rising wage dispersion correlate
- But no general trend towards greater heterogeneity
- Contribution of composition (age, gender, work status) is minute
- Mixed evidence for labour market antecedents

# What now: Graduate Employment Clouds?

- Ongoing rise in supply of graduates
  - young-old achievement gap ubiquitous
- Demand uncertainty:
  - maturity of existing ICT?
  - new-wave automation ... or skills-intensive innovation?
  - politically-induced uncertainties (the B word)
- Will we see:
  - rising underemployment? Probably
  - increasing dispersion of graduate wages? ??

Green, F. and G. Henseke (2016a) "[Should governments of OECD countries worry about graduate underemployment?](#)" *Oxford Review of Economic Policy*. (Open access at: <http://discovery.ucl.ac.uk/1522165/> ).

Green, F. and G. Henseke (2016b). "[The Changing Graduate Labour Market: Analysis Using a New Indicator of Graduate Jobs](#)". *IZA Journal of Labor Policy*, 5:14. ( Open access at <http://discovery.ucl.ac.uk/1505789/> )

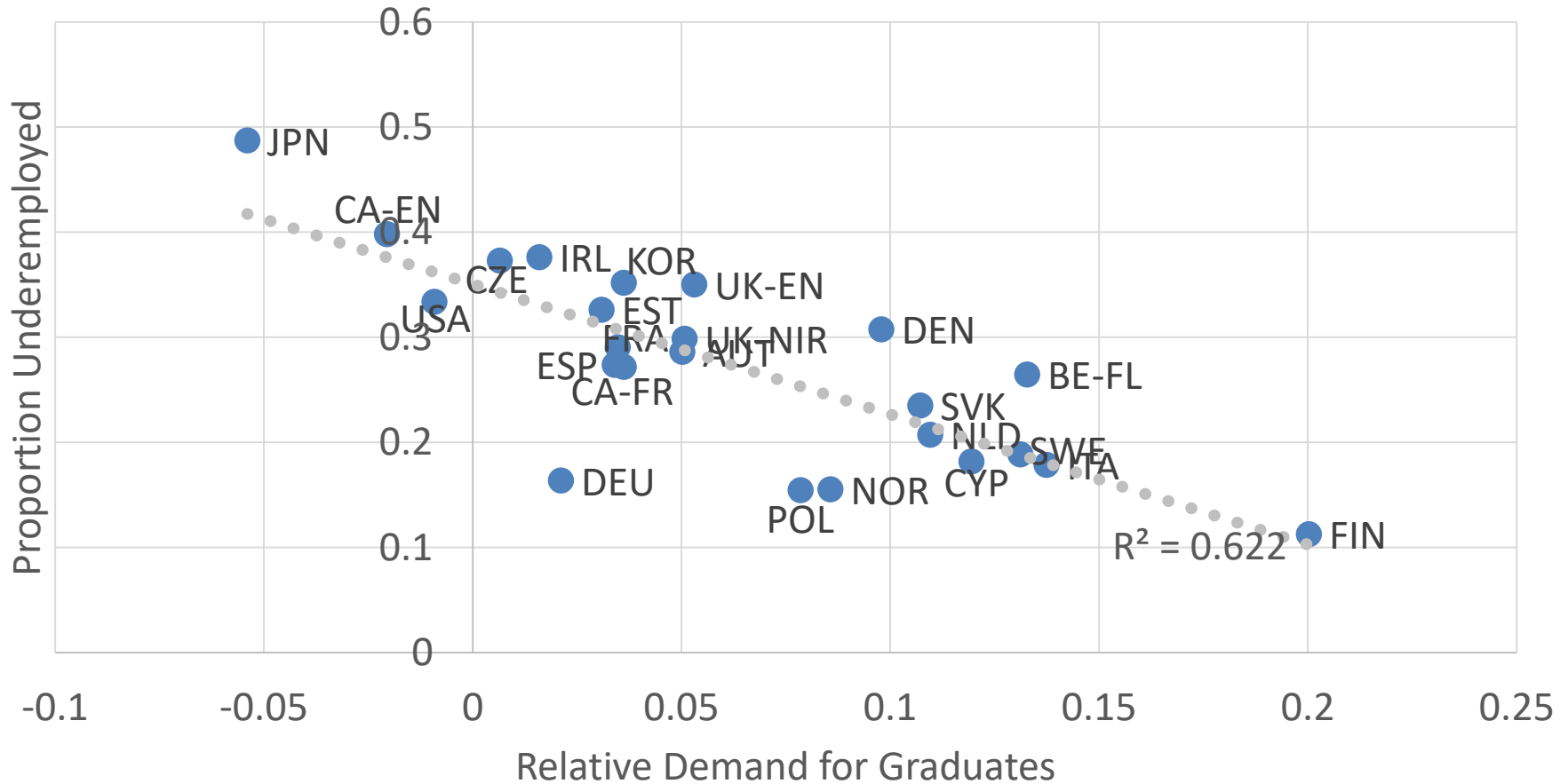
Henseke, G. and F. Green (2017) "[Cross-national Deployment of “Graduate Jobs”: Analysis Using a New Indicator Based on High Skills Use](#)". *Research In Labor Economics*. (Open access at: <http://discovery.ucl.ac.uk/1542476/> )

Green, F. (2013). *Skills and Skilled Work. An Economic and Social Analysis. Oxford, Oxford University Press.* <http://discovery.ucl.ac.uk/1490672/>

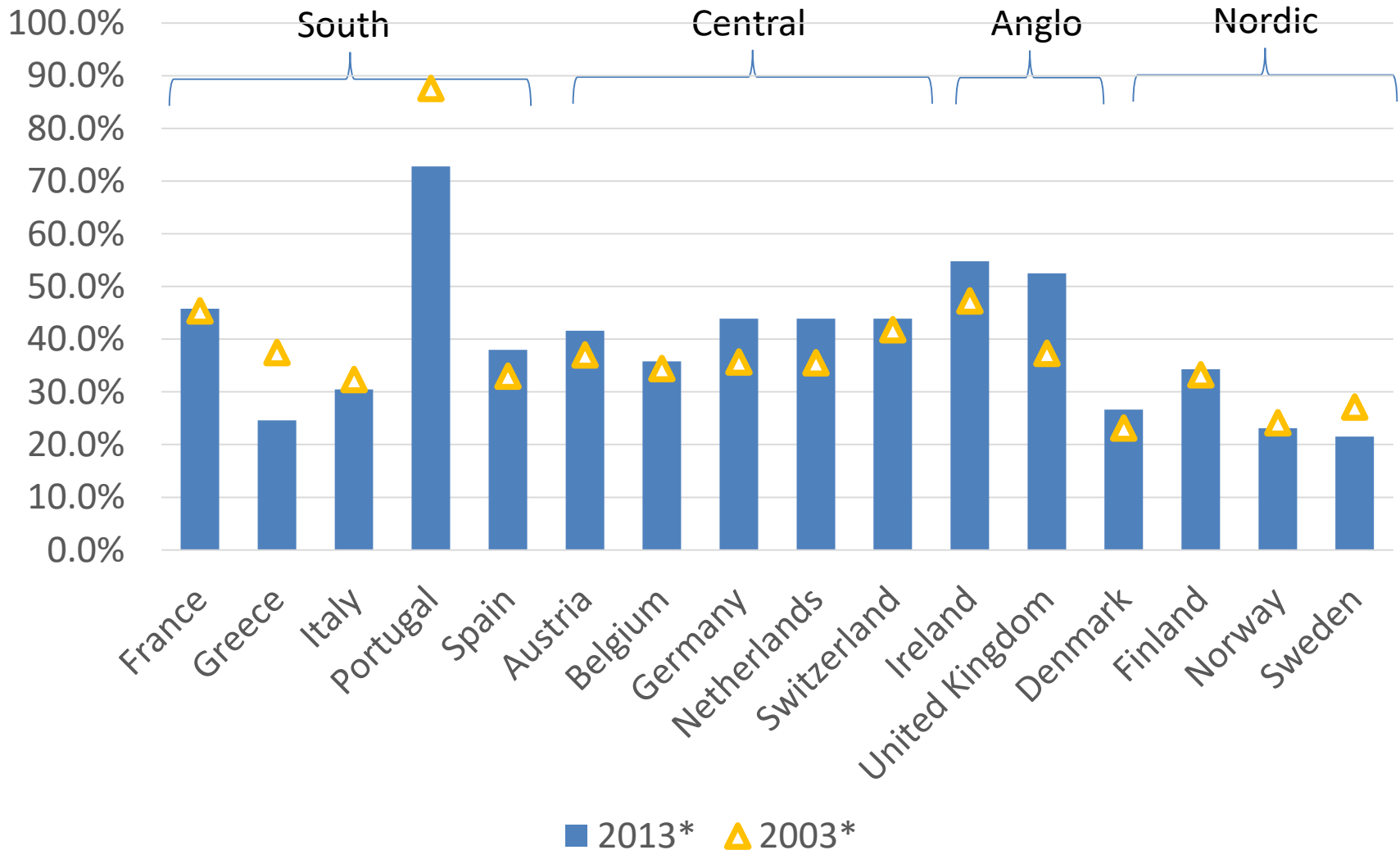
Henseke, G. (2018). “Against the Grain? Assessing Graduate Labour Market Trends in Germany Through a Task-Based Indicator of Graduate Jobs”. *Social Indicators Research* <http://rdcu.be/GJDs>

Additional slides in reserve

# Relative demand and underemployment

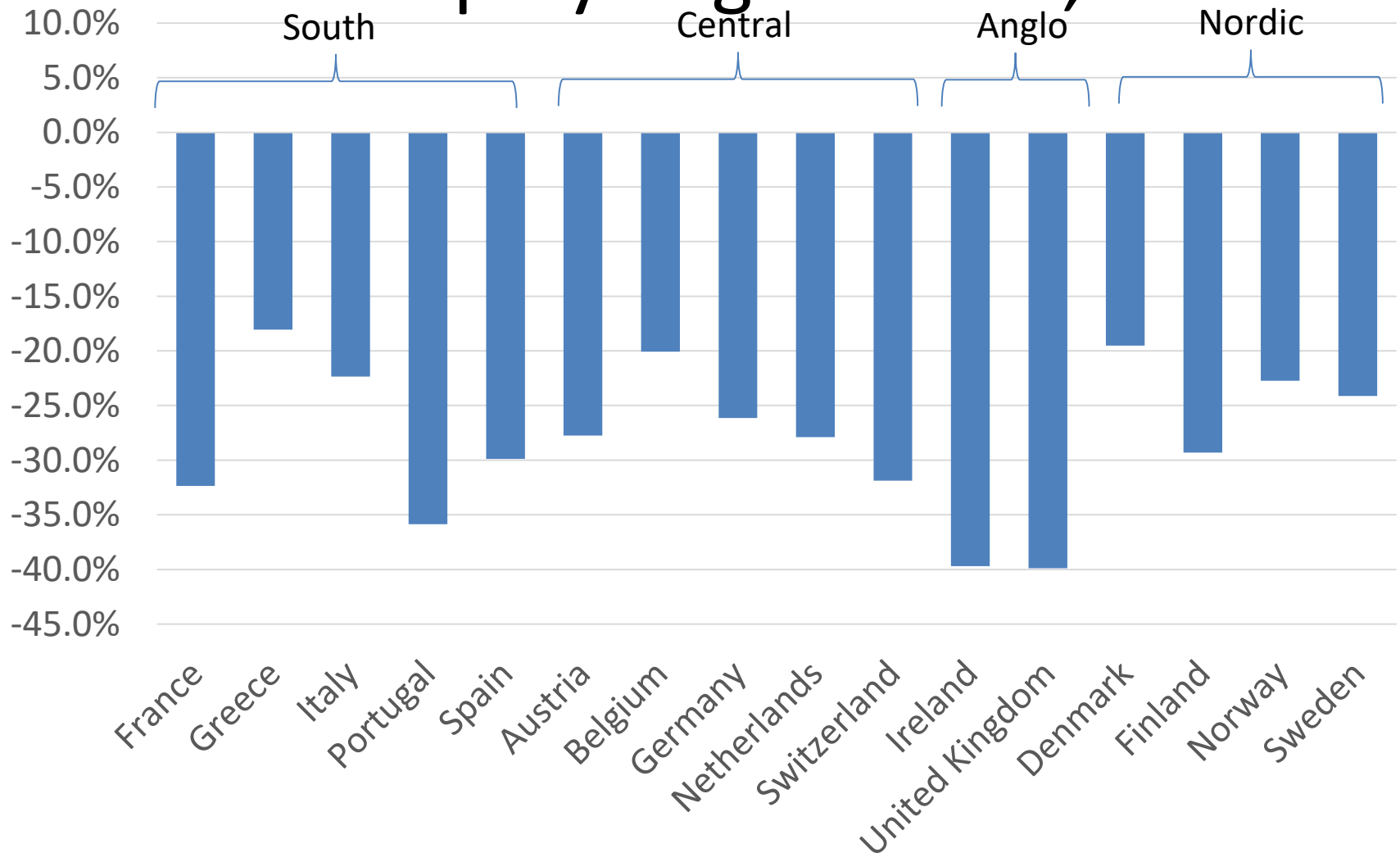


# Wage differential between tertiary and (upper-) secondary education, 2003 and 2013

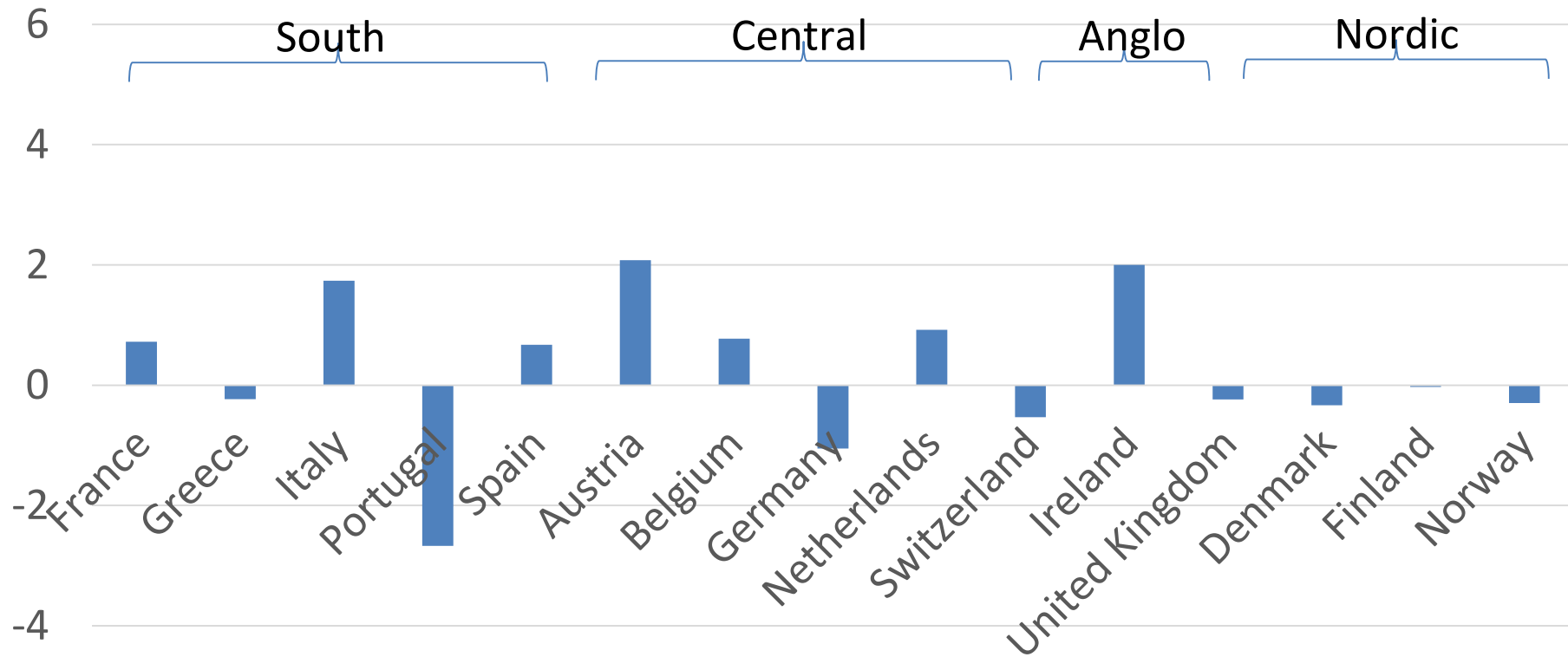




# Wage gap between matched and underemployed graduates, 2013



# Growing heterogeneity? Annual % change in the graduate underemployment wage penalty 2003-2013



# Appendix: Three steps to classifying occupations as graduate jobs

- Ingredients:
  - data with job tasks and educational requirements of job (e.g. SAS);
  - an Occupation coding system: ISCO08
- Step 1: Calculate the effect of each high-skilled task on the propensity for a job to require a level 4 qualification.
- Step 2: For each person, compute a score, which is the estimate of the probability that he/she will be in a graduate job, given the observed high-skilled tasks of the job, then compute the mean score for each occupation
- Step 3: Split occupations into two clusters using statistical methods.

# Step 1

- We calculate the effect of each of several high-skilled tasks on the propensity for a job to require a tertiary qualification.
- For each person, we then compute the GSR score, which is the estimate of the probability that he/she will be in a graduate job, given the observed high-skilled tasks of the job.
- e.g. high-level numeracy, complex problem solving, presenting, influencing, job autonomy  
+ more

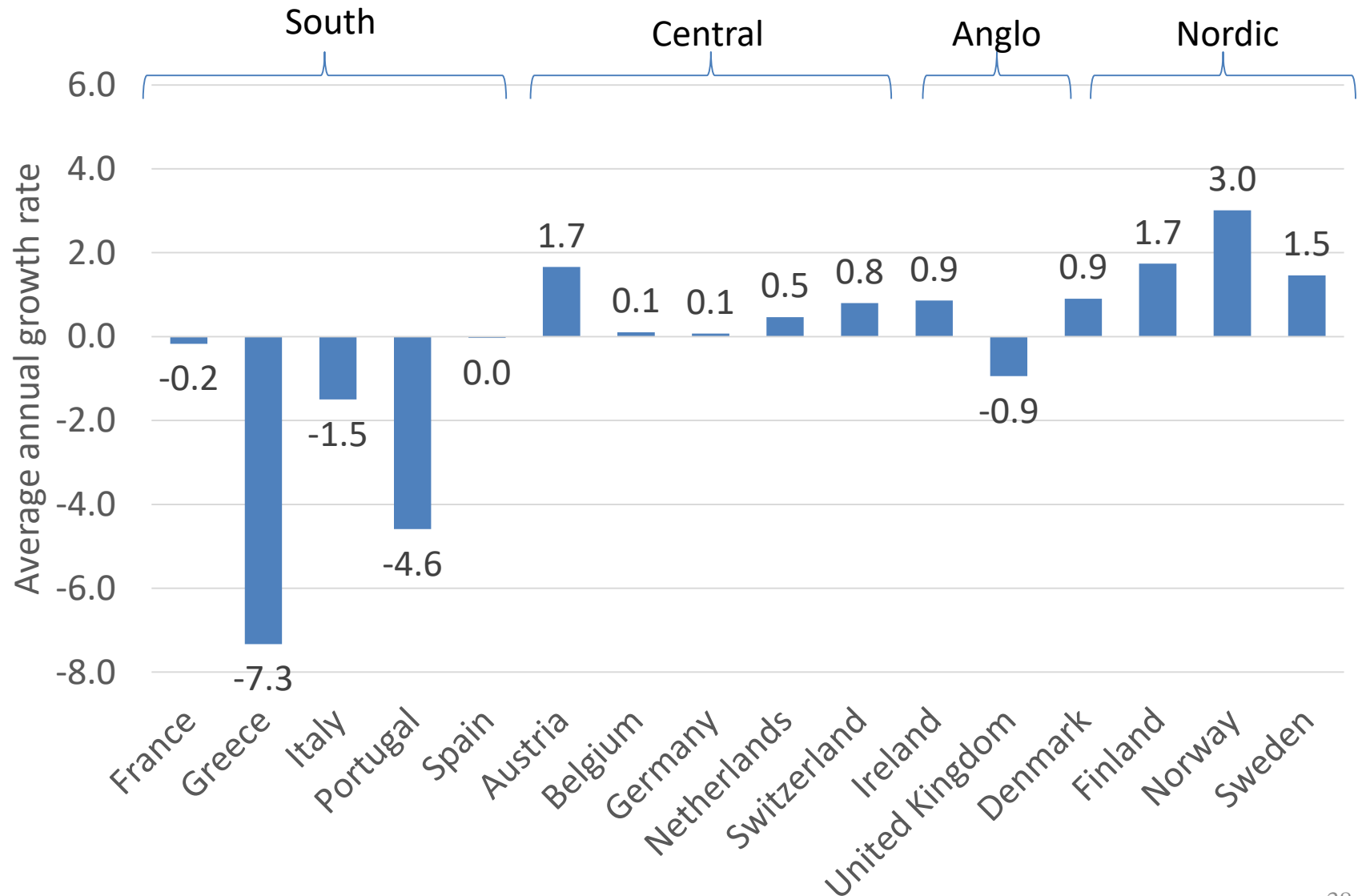
## Step 2

We compute the average GSR (predicted score) in each "minor group" (3-digit) of occupations

## Step 3

Use a statistical "cluster analysis" to determine two clusters of graduate and non-graduate jobs.

# Annual change in real gross earnings of graduates in high-skills employment, 2003-2013



# A “great reversal”?

- Earnings premium for college-only stopped growing in 2010
- Generalised reduced demand for advanced cognitive skills (even within high-skilled occupations), since ~2000 (Beaudry et al. 2016)
- robot world and chronic macro-uncertainty

## Concept of Graduate Jobs

- "where a substantial portion of the skills used are normally acquired in the course of higher education, including many of the activities surrounding it, and of its aftermath—the years after higher education when skills are acquired in work through graduates' acquired faculty for learning them"



# Wage differential between tertiary and (upper-) secondary education, 2003 and 2013

