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Routine and ageing? The intergenerational divide in deroutinisation of jobs in Europe

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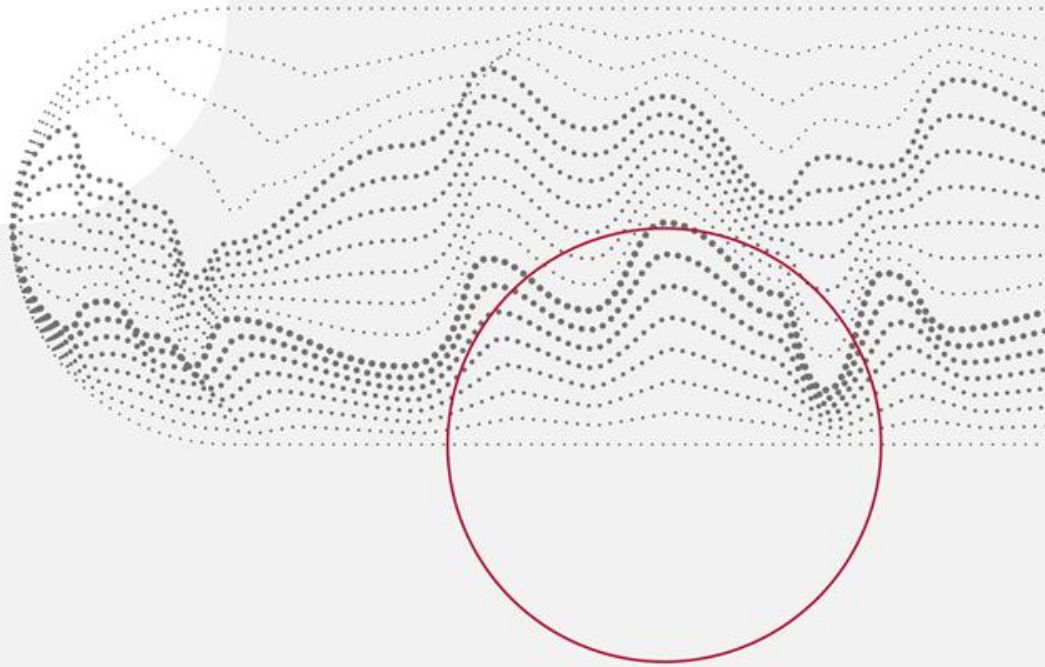

What do we know already?

- Deroutinisation = a shift away from routine and towards non-routine tasks/jobs
- Commonly found in developed countries (Autor et al. 2003, Acemoglu & Autor, 2011, Goos et al. 2010, 2014)
- Routine-replacing technical change and off-shoring are believed to be driving it
- Only few papers look at sub-groups of workers (Autor & Dorn 2009, Cortes 2016)

We focus on age

- Older workers (55-64) more likely to have low problem-solving and numeracy skills, and less likely to use information-processing skills at work than workers aged 25-54 (PIAAC)
- Older workers exhibit lower between-occupation mobility than younger workers (Tempest & Coupland, 2016)
- Automation may reduce hiring and employment of young workers (Dauth et al. 2017)

Contribution of this paper

- There is an intergenerational divide in the deroutinisation of work in Europe
- The more routine occupations are ageing faster because the shares of workers aged 45 or more are increasing more strongly in these jobs
- Routine workers face a higher unemployment risk, especially if aged 15-34 (in some countries)

How do we measure the task content of jobs?

EU-LFS data for 12 EU countries in 1998-2015, 3-digit ISCO occupations

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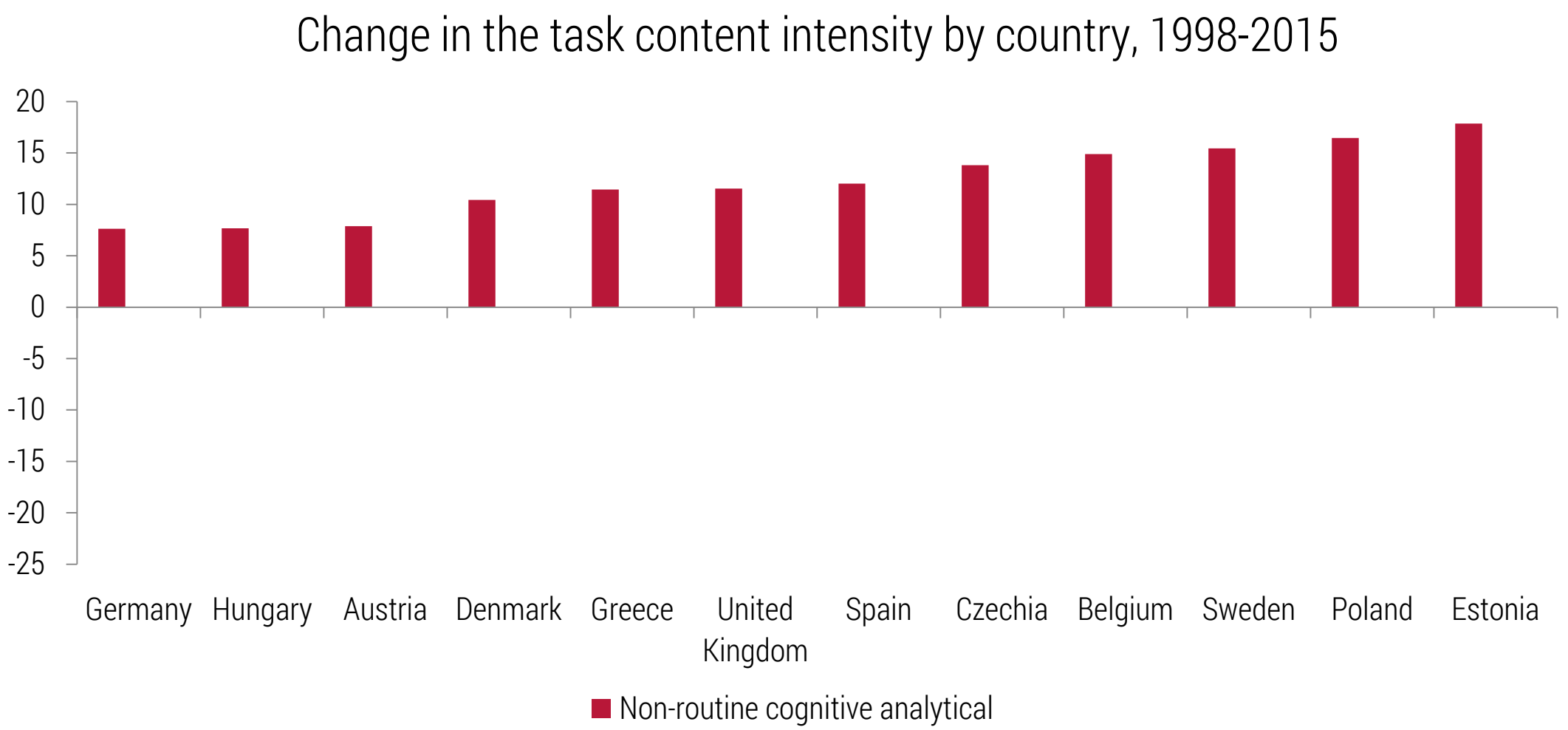
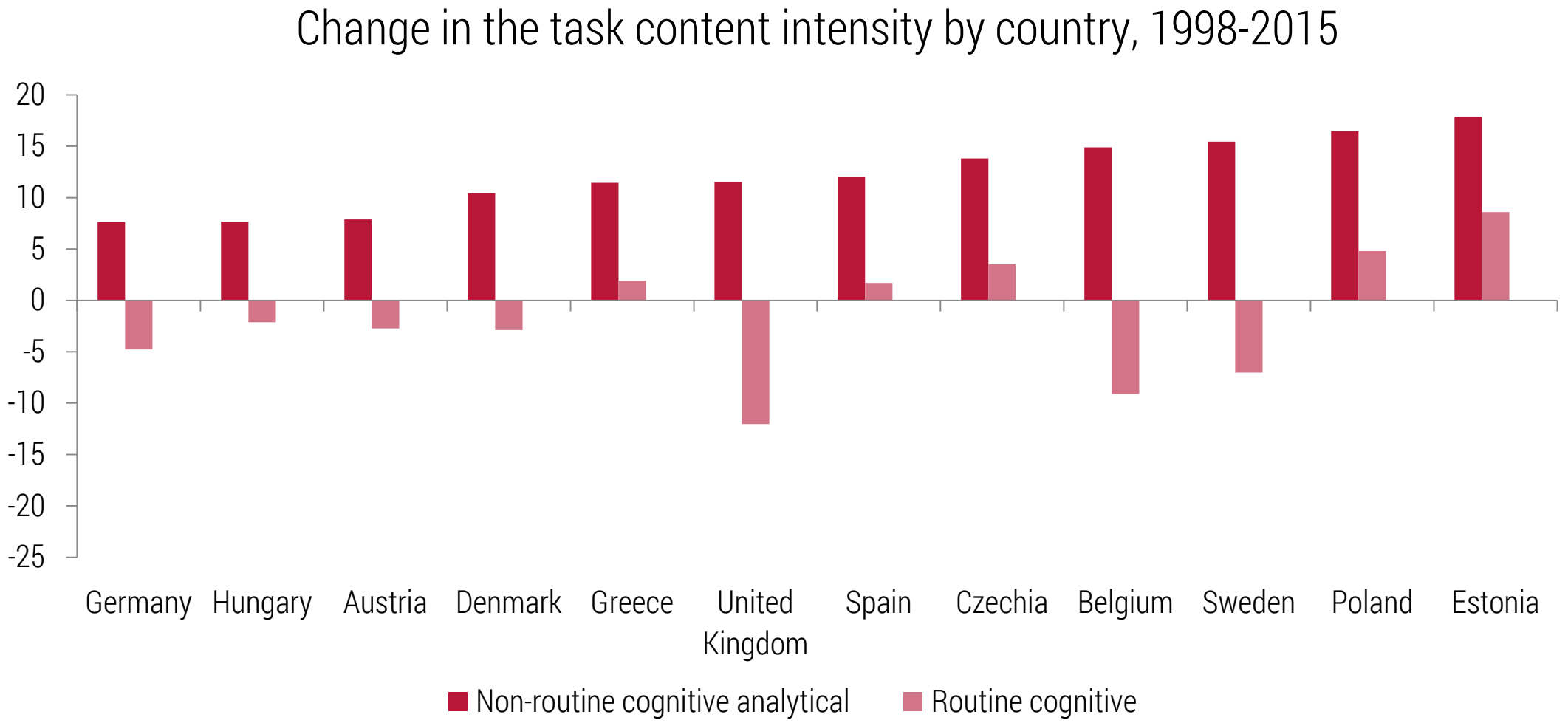
5 annual country-level task content measures (Autor & Acemoglu, 2011)

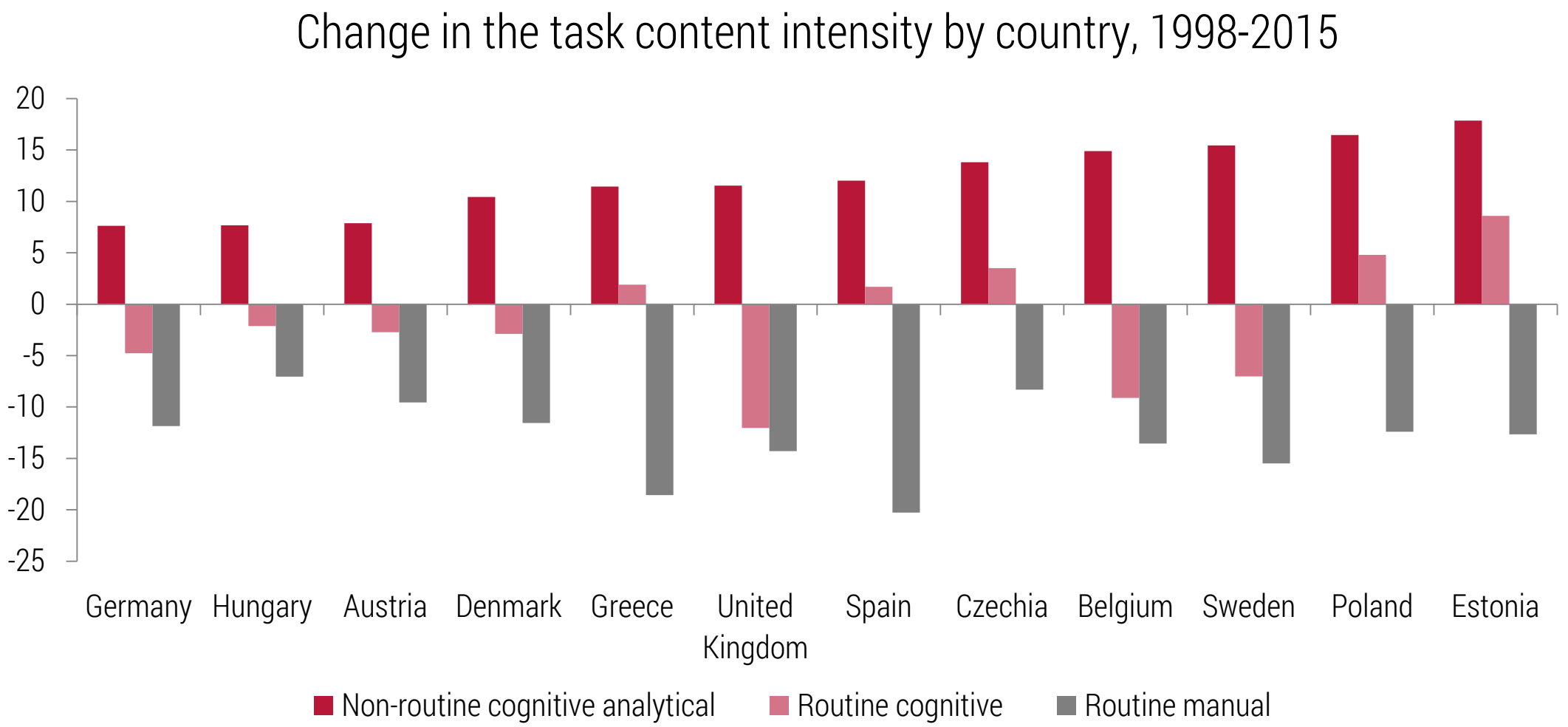
Non-routine cognitive tasks increased in all European countries



Routine cognitive tasks declined in the Western European countries but increased in several CEE countries

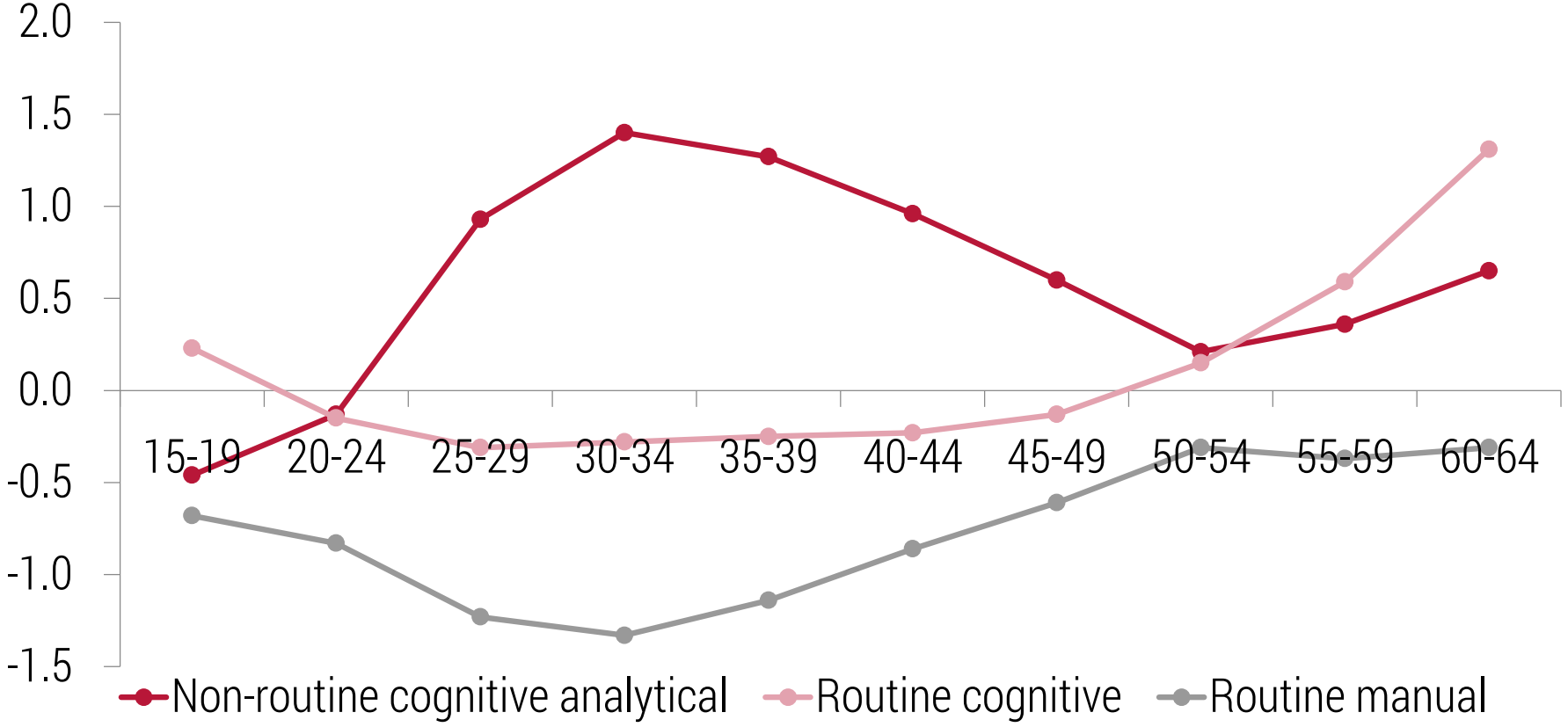


Manual tasks, especially the routine ones, shrank in all European countries



Deroutinisation occurred much faster among prime-age workers than among older/younger workers

Task intensity changes by age groups - panel estimates of linear time-trend coefficients, 12 EU countries in 1998-2015



From here on I will use the routine task intensity (RTI, Autor & Dorn, 2009)

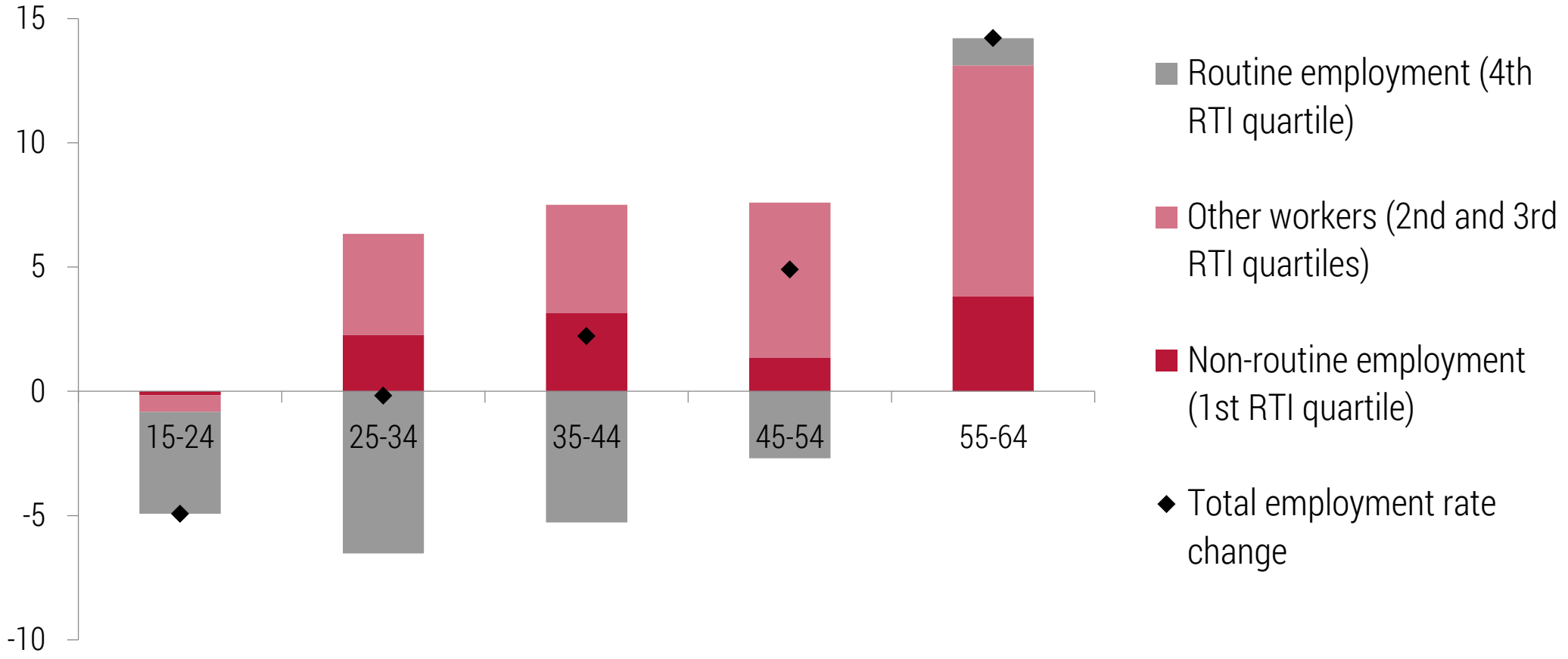
- RTI ↗ with relative importance of routine tasks,
  ↘ with relative importance of non-routine tasks

$$\forall_{i \in occupations} RTI_i = \ln(RC + RM) - \ln(NRCA + NRCP)$$

- For each country, the pooled (1998-2015) distribution of RTI defines:
  - Non-routine workers – 25% of individuals with the lowest RTI
  - Routine workers – 25% of individuals with the highest RTI

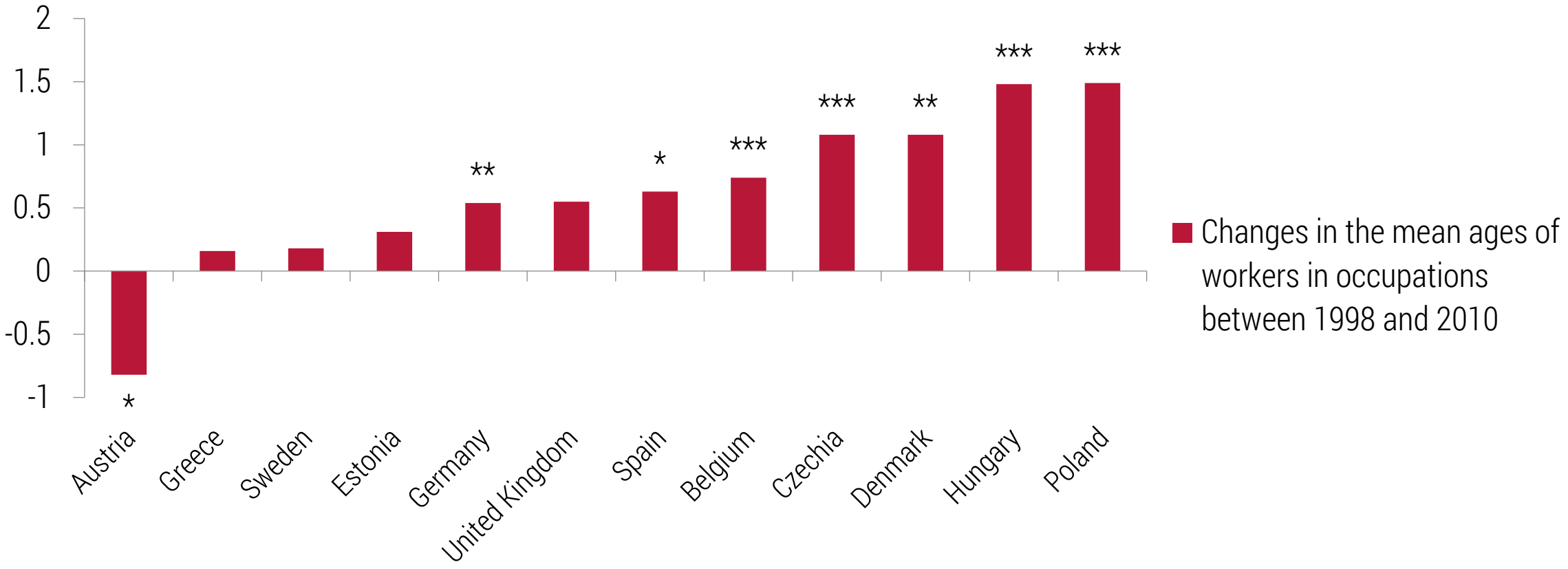
Older workers (aged 55-64) were the only group that recorded an increasing employment rate (and supply) of routine workers

Changes in employment rates of routine and non-routine workers, between 1998-2000 and 2013-2015, average for 12 EU countries (in pp.)



European workforce was ageing more quickly in occupations that were initially more routine-intensive

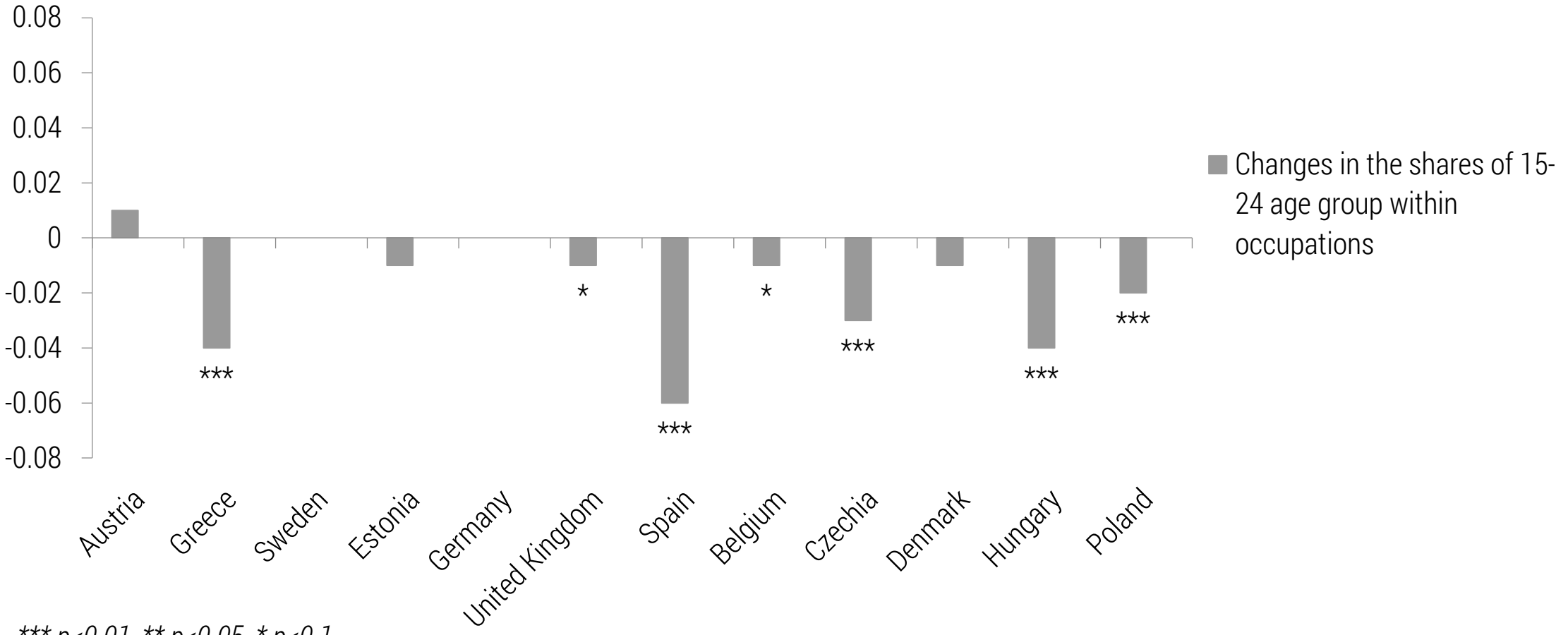
The estimated effect of the initial (1998 RTI) routine task intensity of occupations on changes in age structures by 2010



*** p<0.01, ** p<0.05, * p<0.1.

As the share of young workers in the more routine-intensive occupations was declining

The estimated effect of the initial routine task intensity of occupations in 1998 on changes in age structures by 2010



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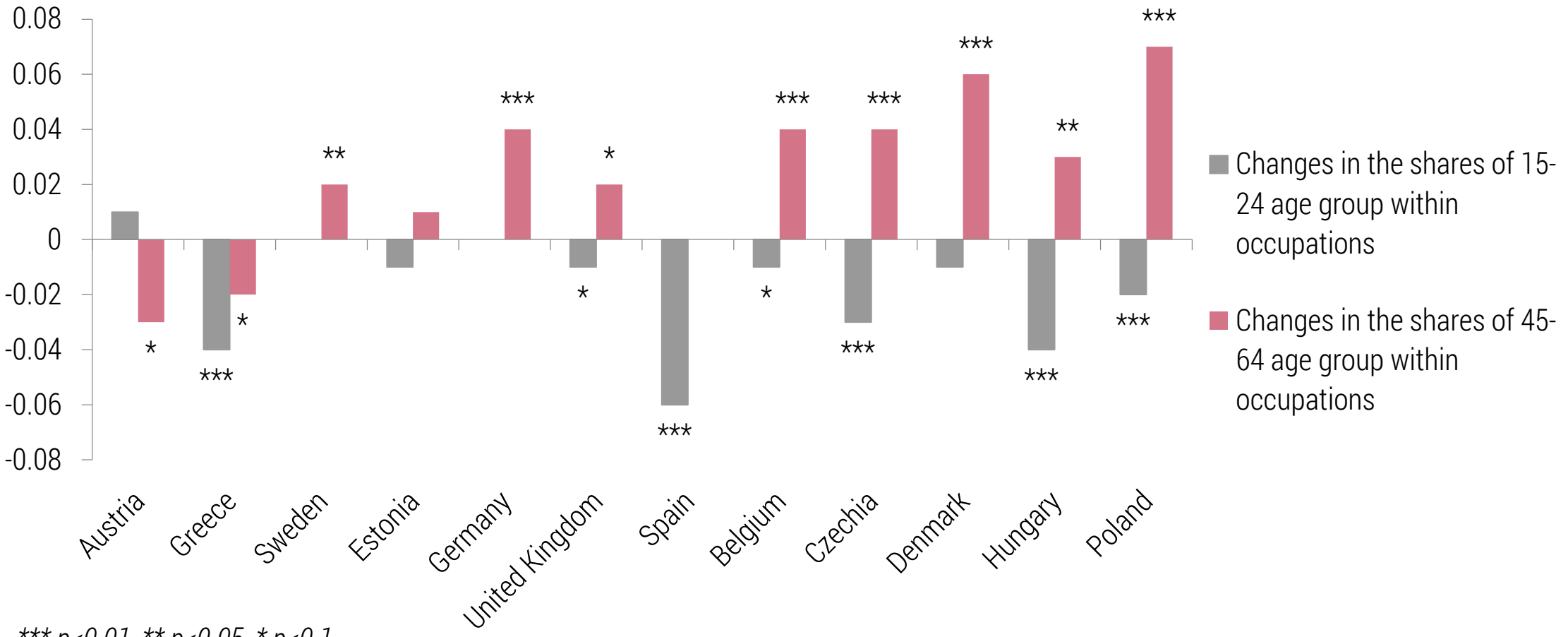
And the share of the oldest workers was increasing

The estimated effect of the initial routine task intensity of occupations in 1998 on changes in age structures by 2010



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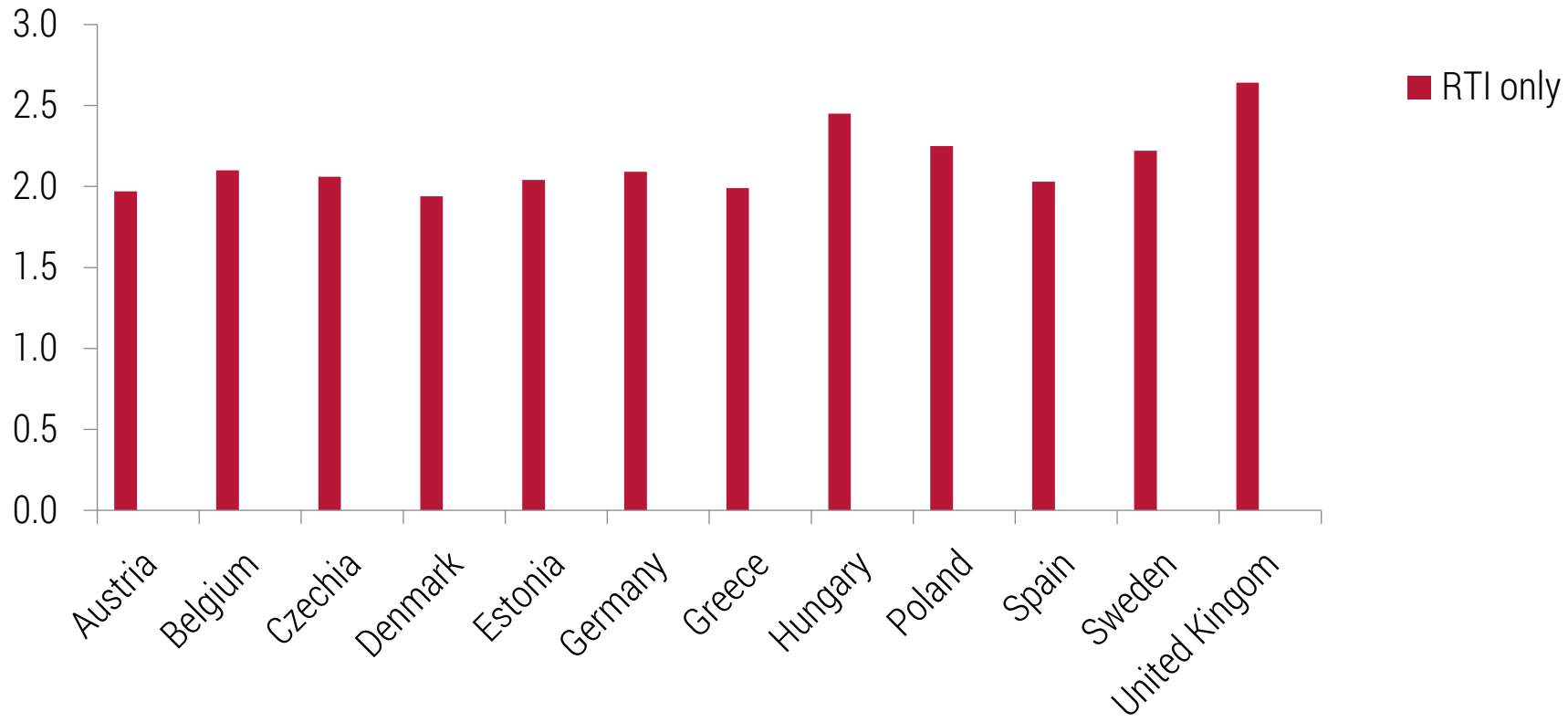
Deroutinisation may increase the risk of unemployment among routine workers

- Are the routine workers more likely to be unemployed?
- Are there differences by age and over time?
- Country-specific logit models for the probability of being unemployed (accounting for changes over time, individual, workplace and regional variables)

Higher routine intensity was associated with higher risk of unemployment

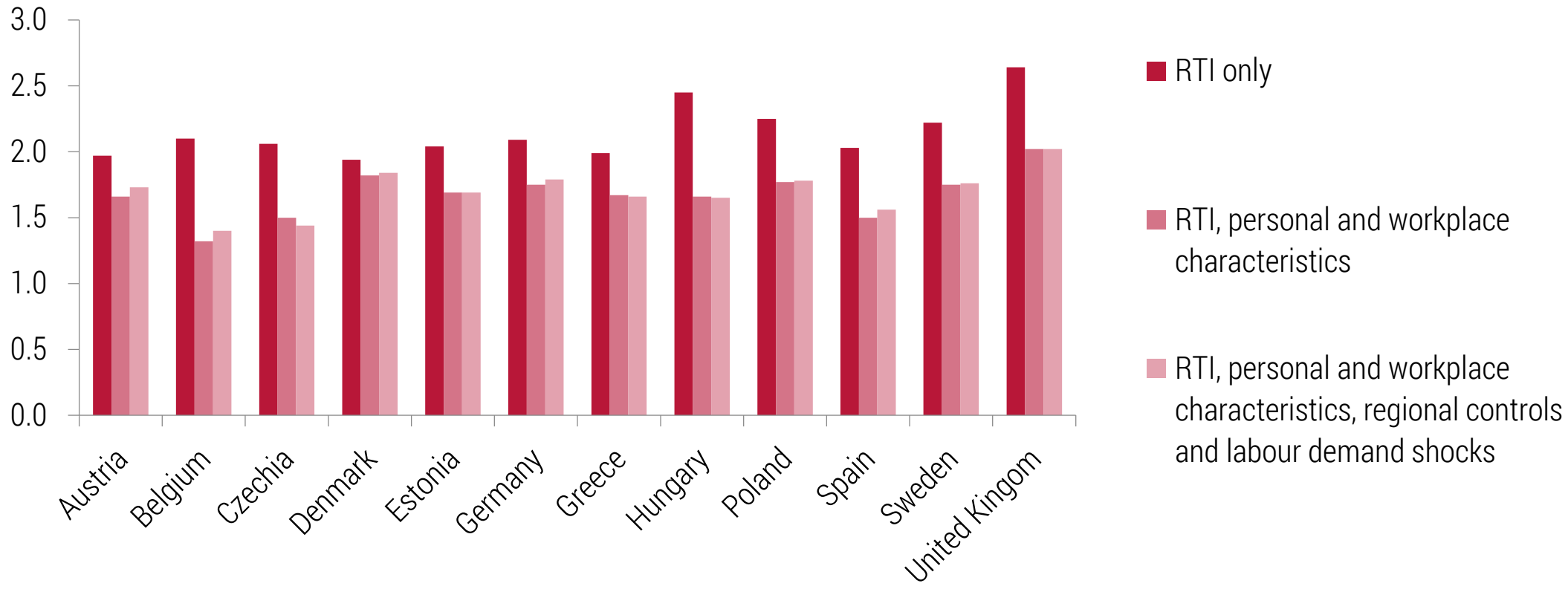
The estimated effect of the routine task intensity on unemployment risk – odds ratios from country-specific models



Logit regressions at individual level. Standard errors clustered at occupation level. All effects significant at 0.01.

Also when we control for personal and workplace characteristics, regional controls and labour demand shocks

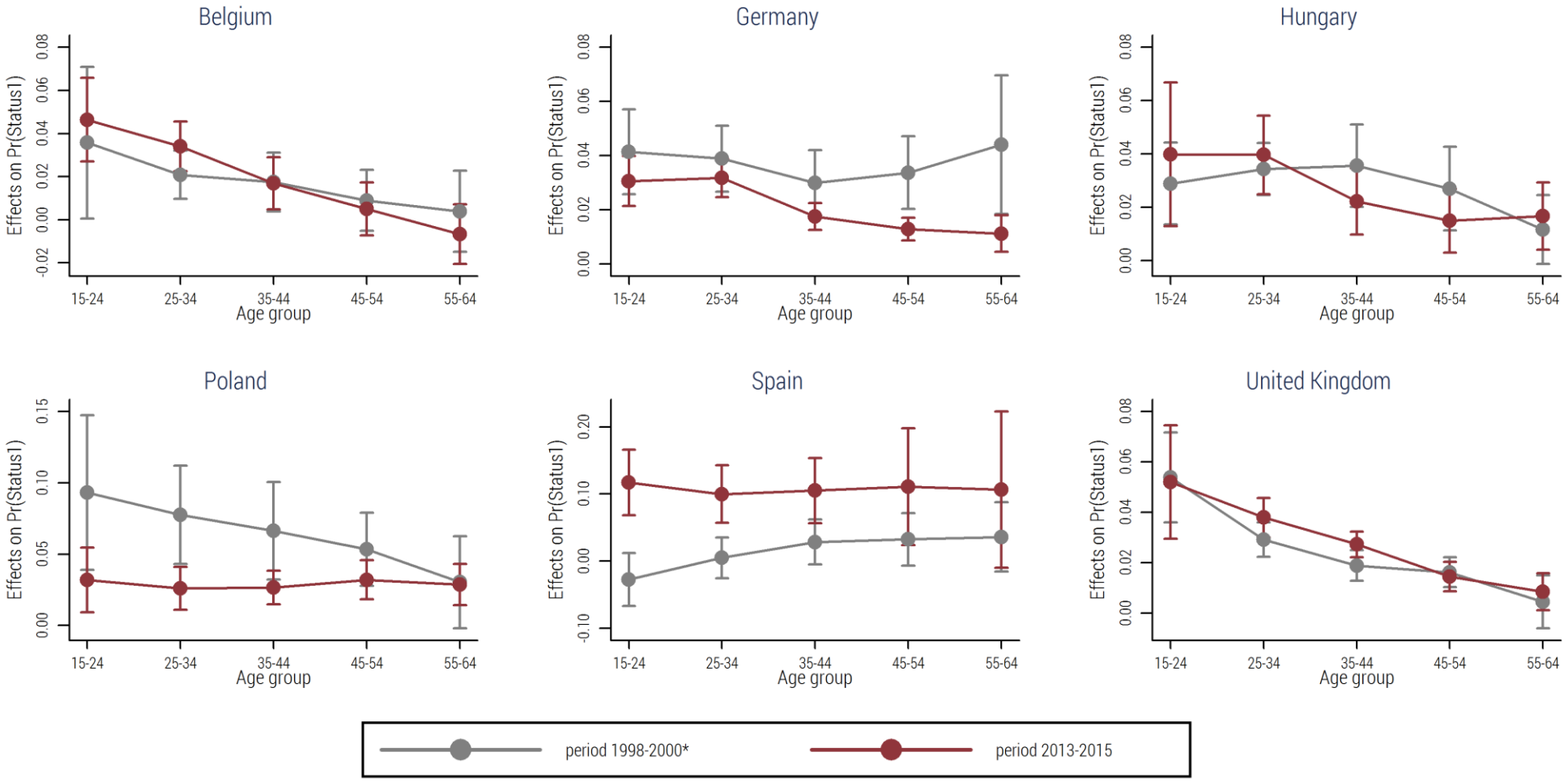
The estimated effect of the routine task intensity on unemployment risk – odds ratios from country-specific models



Logit regressions at individual level. Standard errors clustered at occupation level. All effects significant at 0.01.

In several countries, the relationship between routine task intensity and unemployment probability is declining with age

The marginal effects of the routine task intensity (RTI) on the unemployment risk, by age



Logit regressions at individual level. Standard errors clustered at occupation level.

What do tasks tell about intergenerational differences in jobs in Europe

- Widespread shift from manual to cognitive work
  and routine cognitive tasks decline in richer (EU15) countries

- Prime-aged groups experience this change more strongly than older groups

- Routine-intensive occupations:
  - Age faster because of declining share of young workers
  - Create higher unemployment risk for the young and prime-aged

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Thanks for listening

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