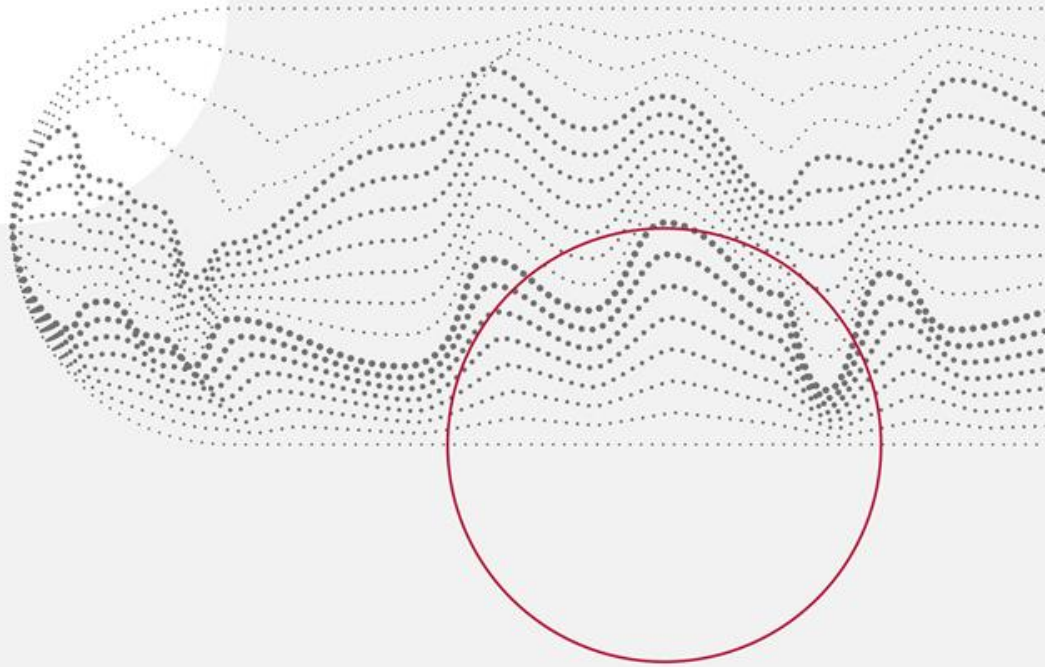
instytut badań strukturalnych

Routine and ageing? Intergenerational divide in the task composition of jobs in Europe

Piotr Lewandowski
Wojciech Hardy
Roma Keister



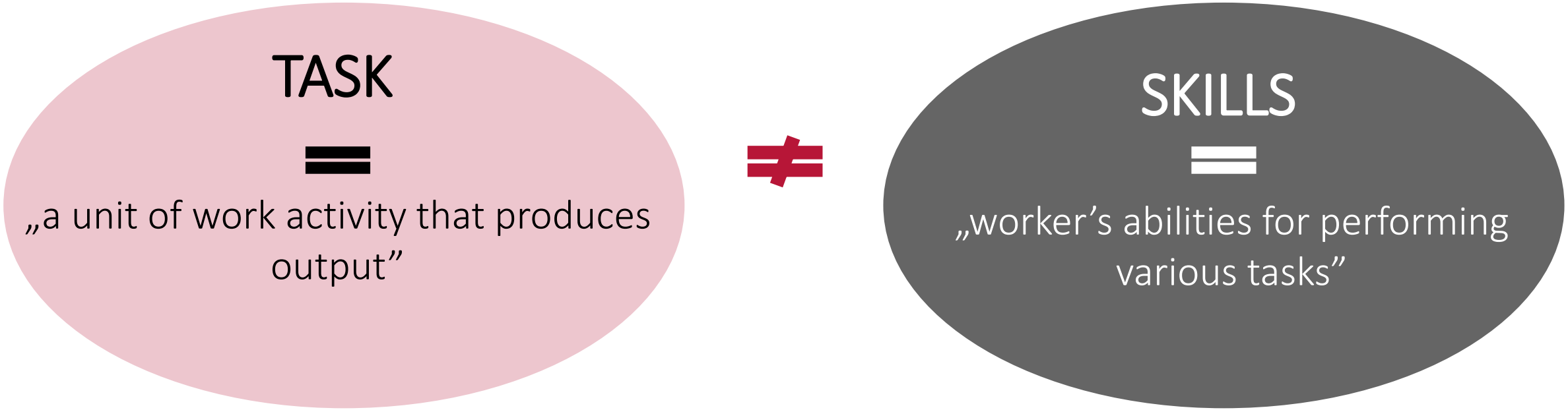
Tasks – what are they and how to categorise them?

TASK

=

„a unit of work activity that produces output”

Tasks – what are they and how to categorise them?



Particular occupations are more intensive in particular tasks

Non-routine cognitive (analytical and personal)	Routine cognitive	Manual (routine and non-routine)
• Managers • IT specialists • Architects • Engineers	• Bookkeepers • Tellers • Office clerks • Salespersons	• Assemblers • Toolmakers • Drivers • Farmers

Tasks help to understand when labour is substituted and when complemented by modern technology progress

How do we measure the task content of jobs?

EU-LFS data for 12 EU countries in 1998-2014

How do we measure the task content of jobs?

EU-LFS data for 12 EU countries in 1998-2014

O*NET data – editions 2003 and 2014

How do we measure the task content of jobs?

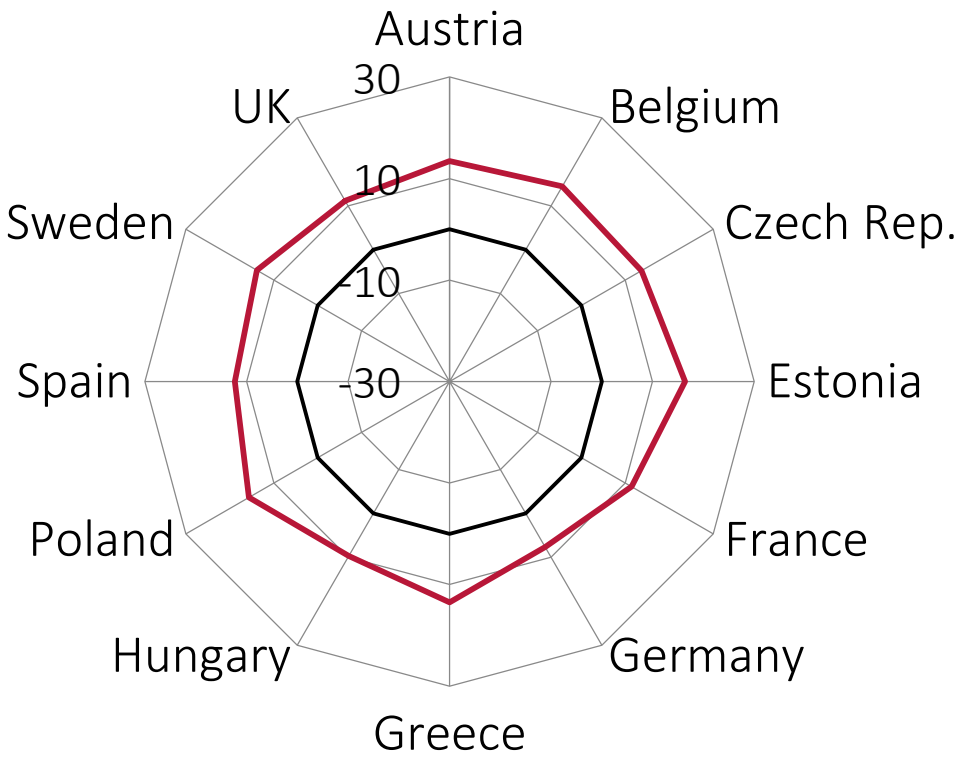
EU-LFS data for 12 EU countries in 1998-2014

O*NET data – editions 2003 and 2014

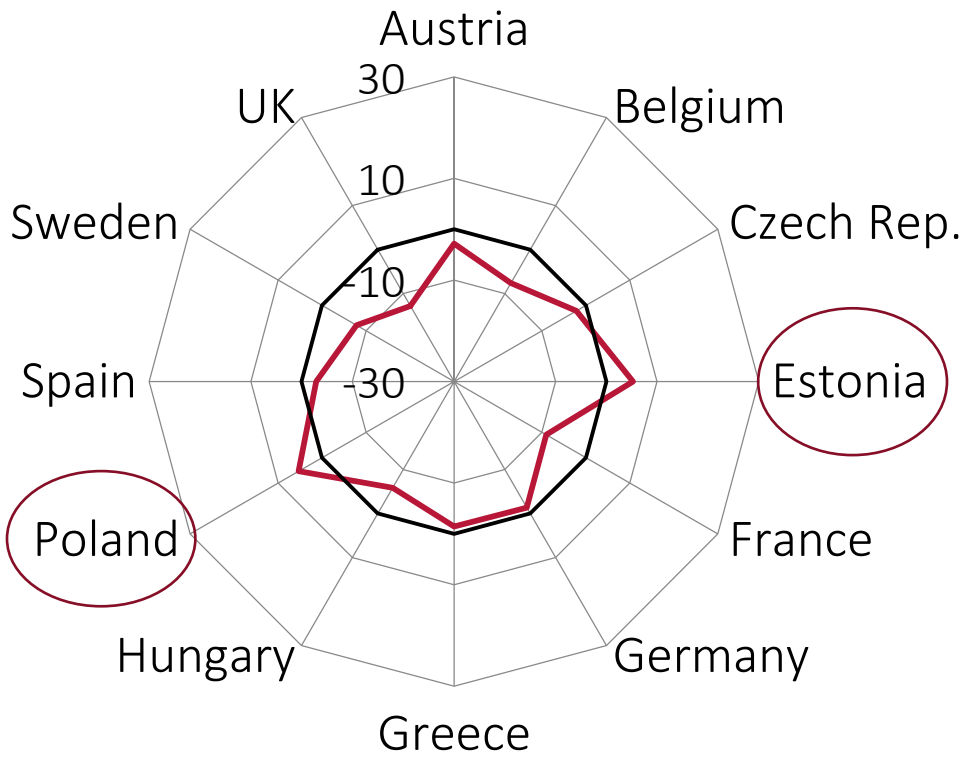
5 annual country-level task content measures Autor & Acemoglu (2011)

Non-routine ones cognitive tasks increase everywhere, but developments of routine ones vary

Non-routine cognitive analytical

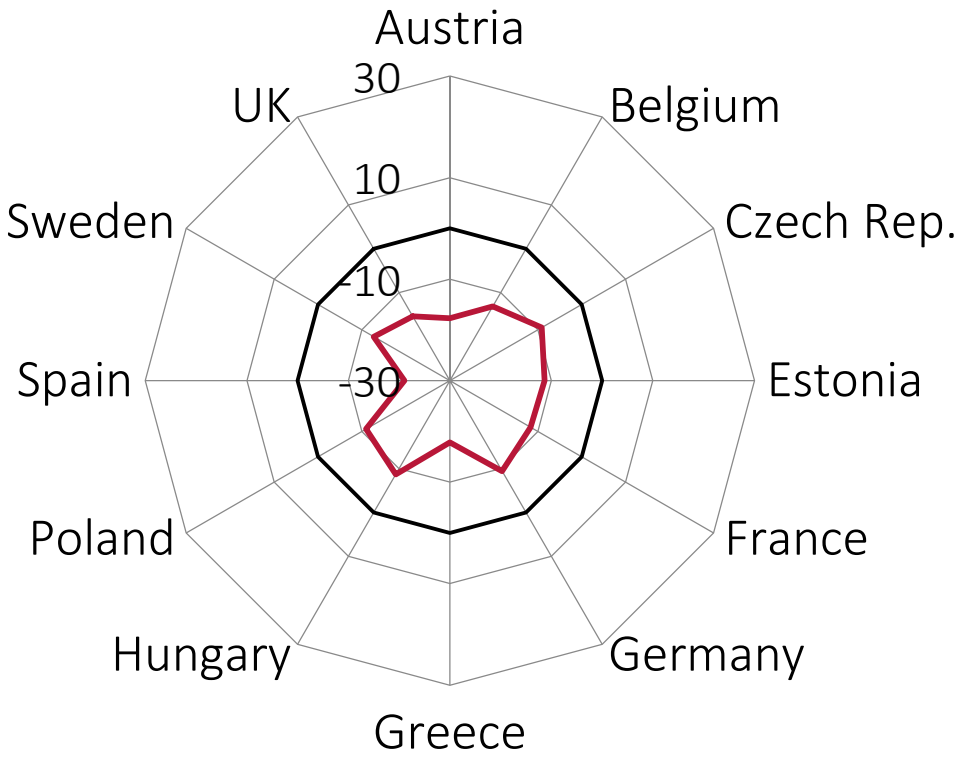


Routine cognitive

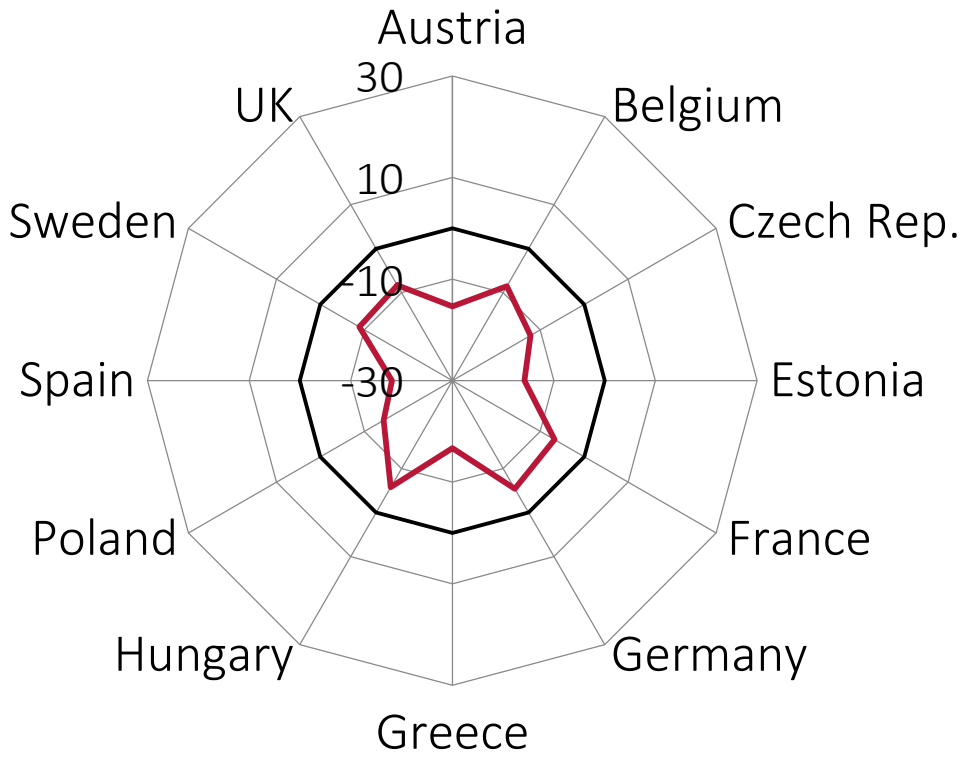


Manual tasks, especially routine, shrink

Routine manual

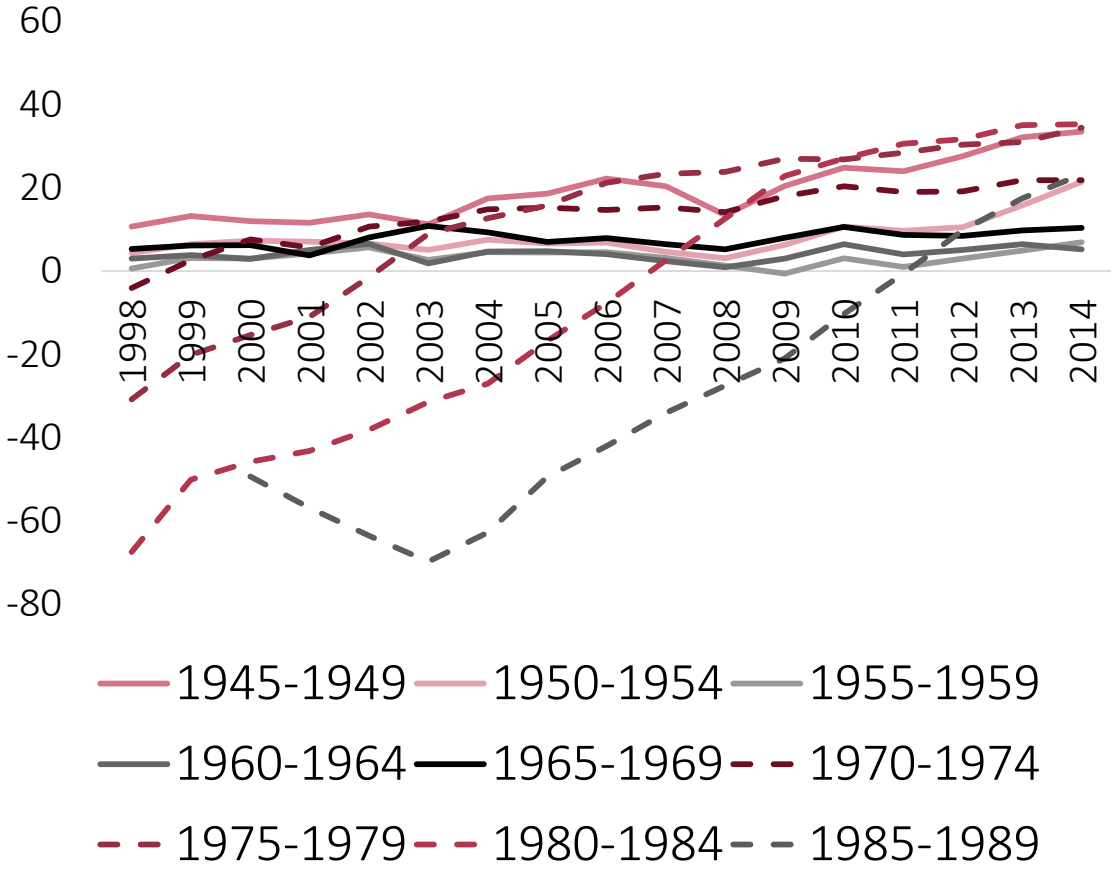


Non-routine manual physical

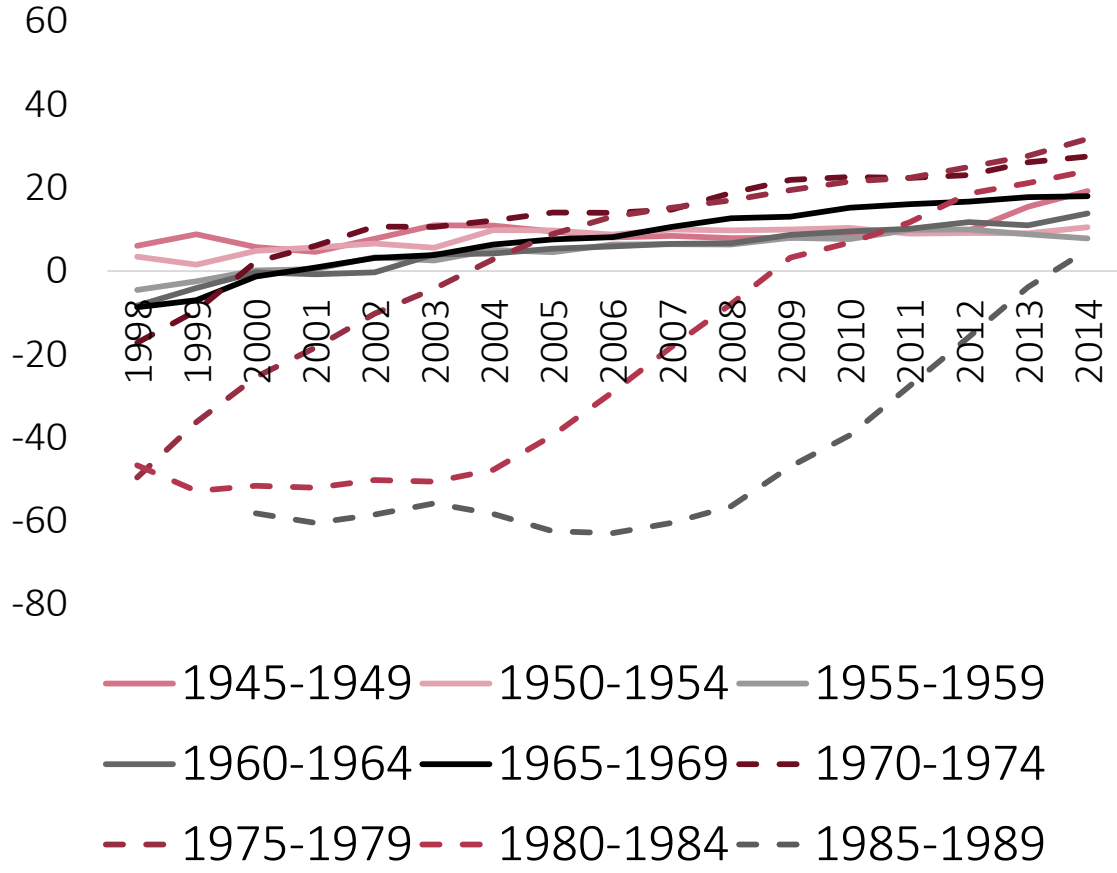


Non-routine cognitive tasks (pictured analytical): Younger cohorts are leapfrogging older cohorts

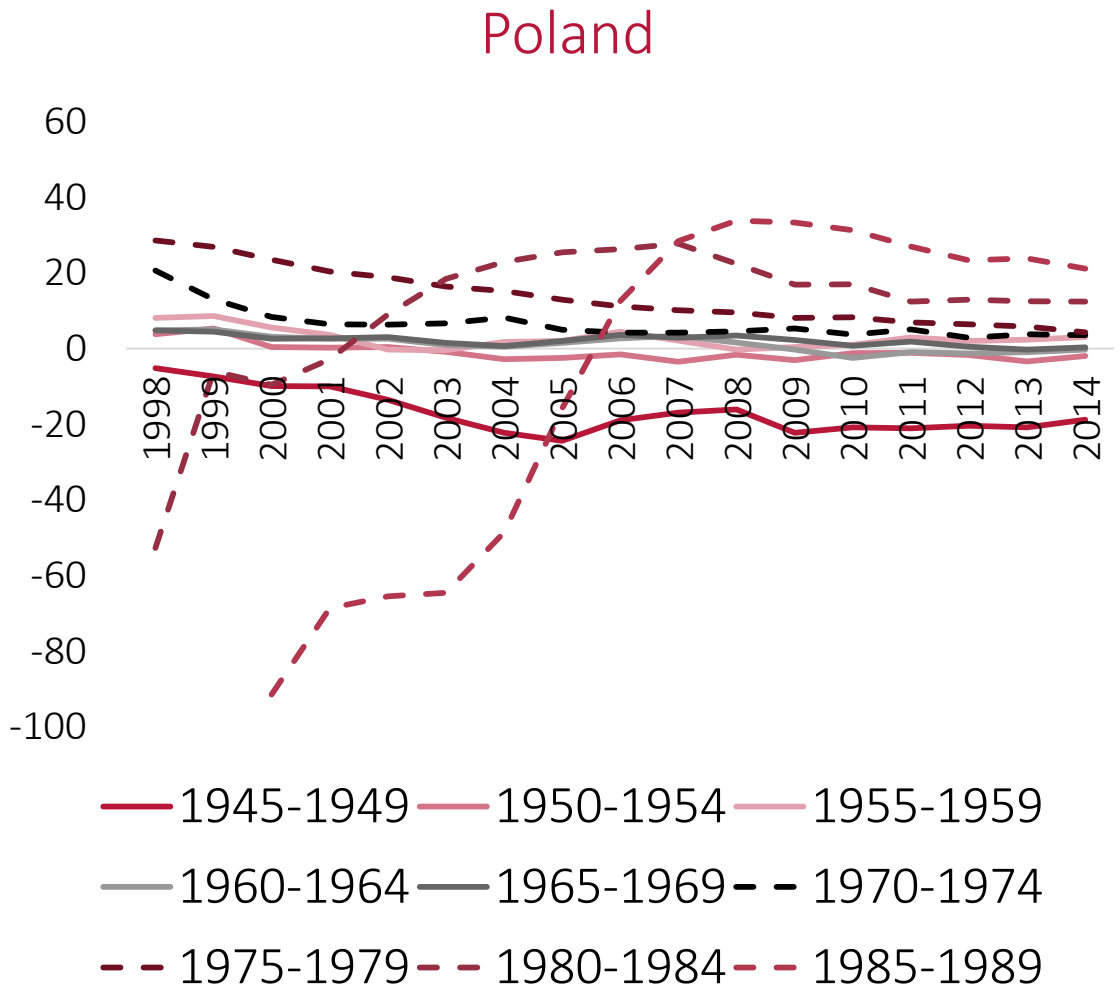
Poland

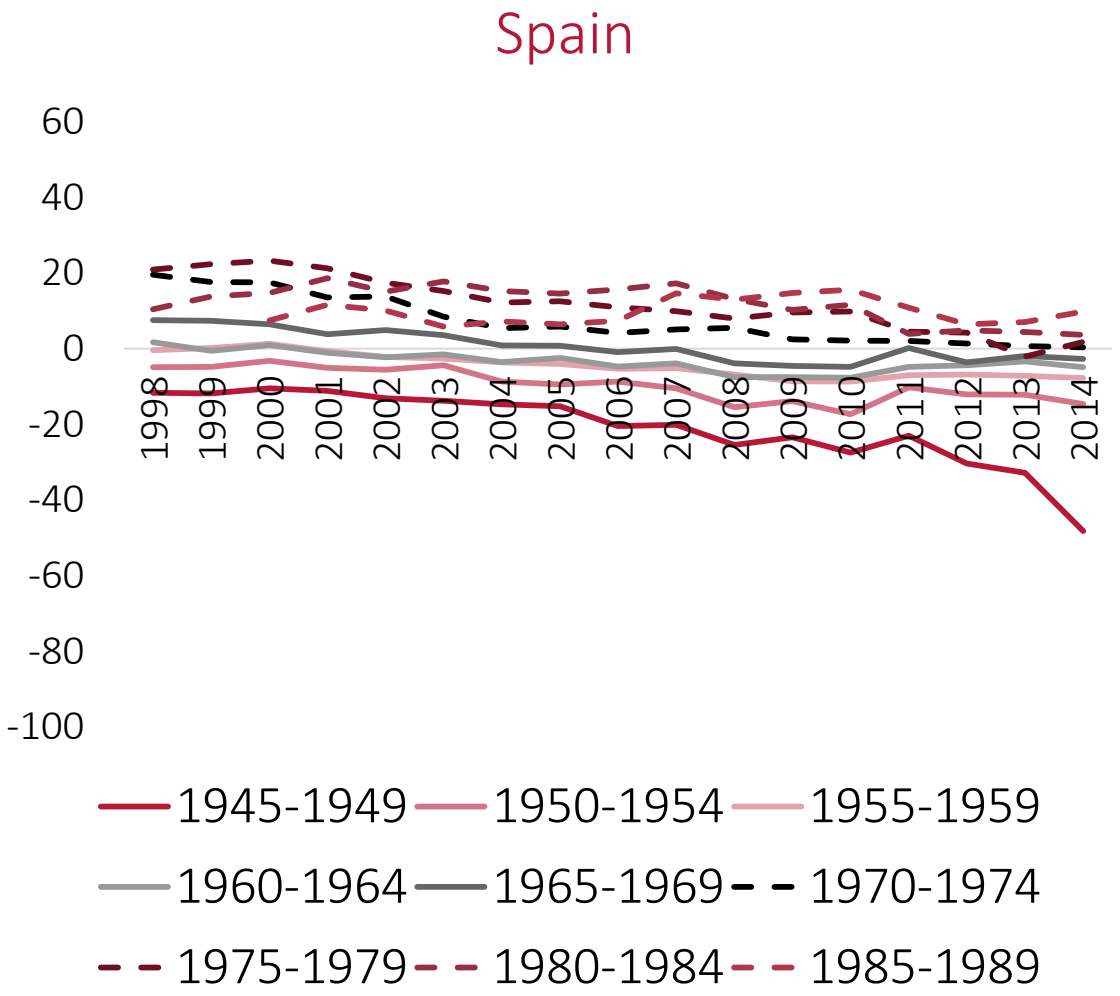


Sweden



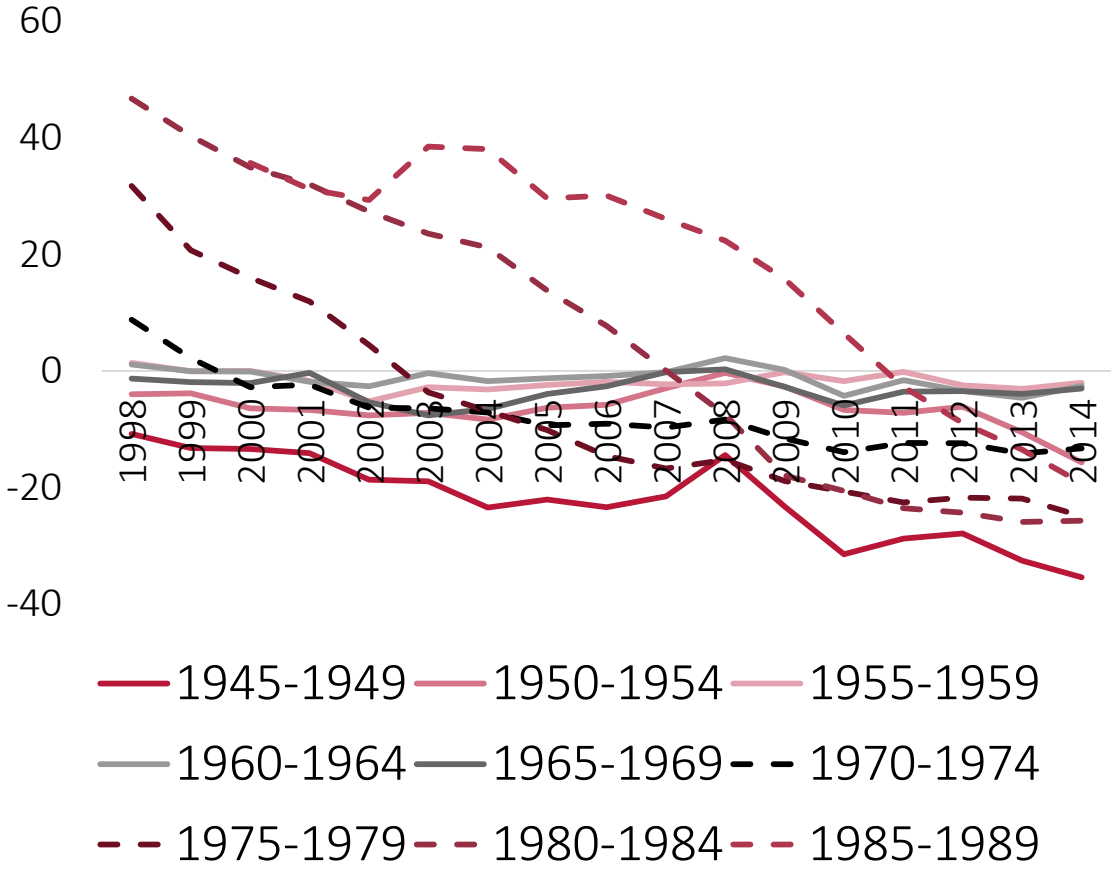
Routine cognitive tasks:
Reshuffling of cohorts in some countries, parallel declines in others



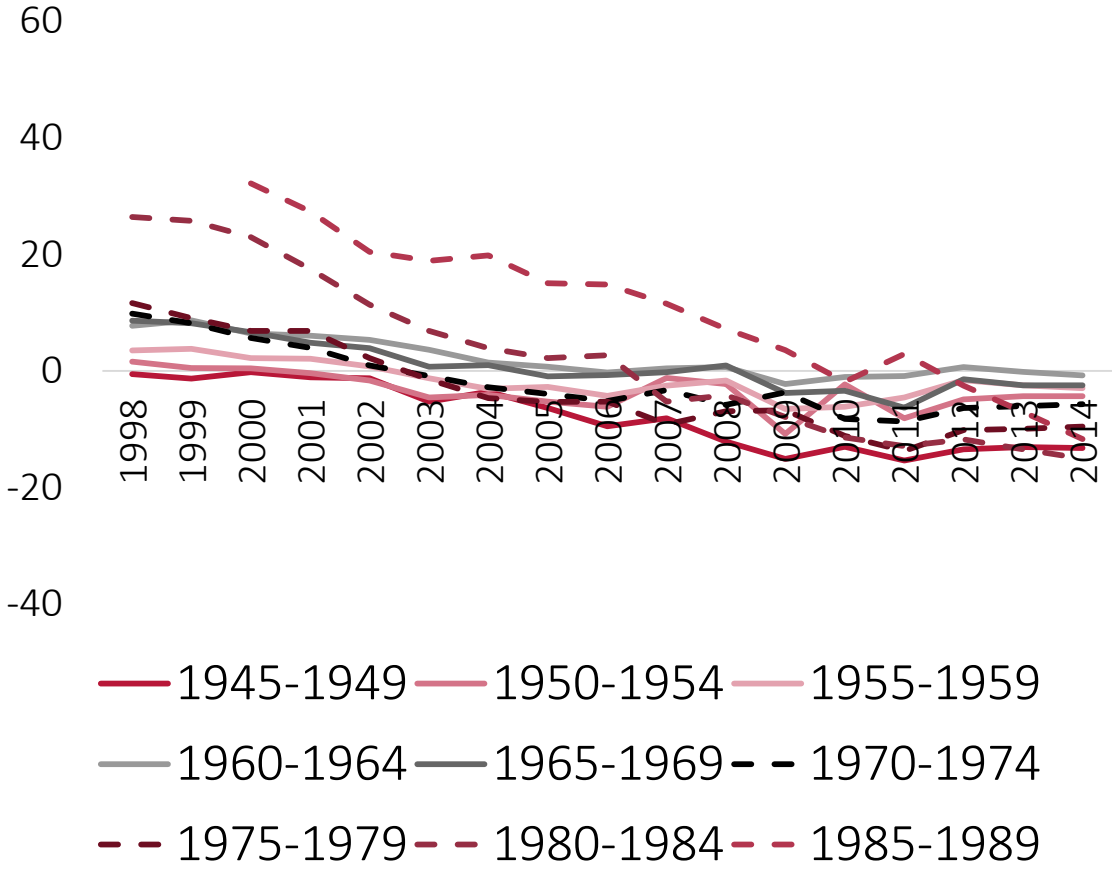


Routine manual tasks:
Steepest decline among younger cohorts

Poland



Germany



Tasks of various cohorts evolved differently in 1998-2014

- Differences in task structures between cohorts decreased, except for routine cognitive tasks – no clear pattern

- In comparison to the older cohorts, younger cohorts perform
  - increasingly more non-routine cognitive tasks
  - gradually less manual tasks

Not all highly routine jobs are prone to automation

- Jobs rich in routine tasks are often rich in non-routine ones too
- Autor & Dorn (2009) – index of routine-task intensity
- RTI increases with relative importance of routine tasks,
  falls with relative importance of non-routine ones

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

- RTI based on 1998 country-specific task structures, ≈100 occupations per country

Routine intensive occupations are ageing faster

Panel fixed effects estimation	Δ mean age of occupation *i*, 1998-2010			
	Germany	Spain	Sweden	Poland
RTI in occupation *i* in 1998	0.54**	0.79**	0.17	0.87***
Δ share of occupation *i*, 1998-2010	-0.49	0.07	0.14	0.22**

As the share of young workers declines more in routine occupations

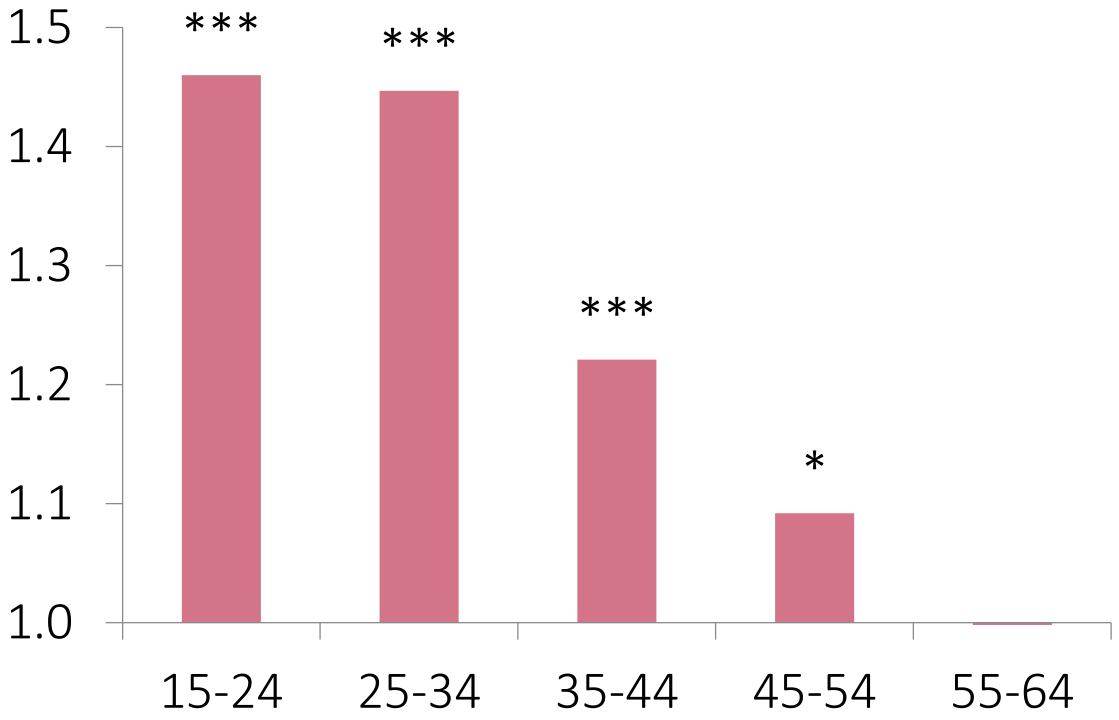
Panel fixed effects estimation	Germany			Spain		
	Δ 15-29	Δ 30-54	Δ 55-64	Δ 15-29	Δ 30-54	Δ 55-64
RTI in occupation i in 1998	-0.023**	0.025**	0.002	-0.053***	0.063***	-0.008
Δ share of occupation i, 1998-2010	0.023**	-0.019	-0.005	0.005	-0.007	0.001

Plus in Eastern Europe the share of older workers rises

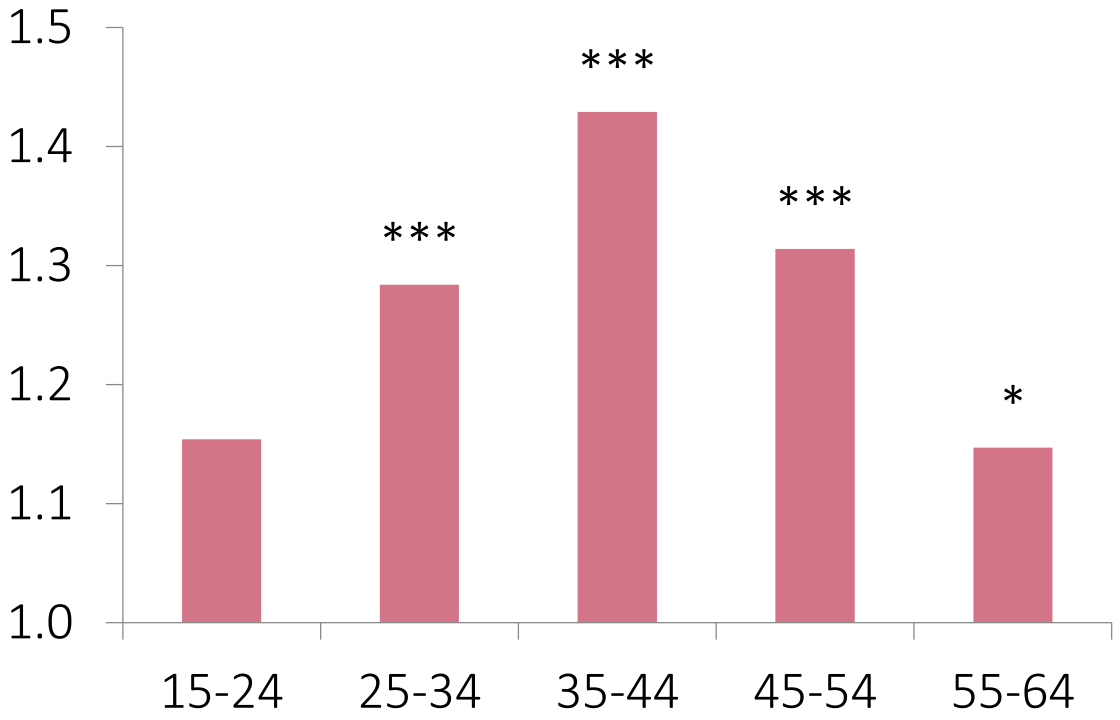
Panel fixed effects estimation	Poland			Sweden		
	Δ 15-29	Δ 30-54	Δ 55-64	Δ 15-29	Δ 30-54	Δ 55-64
RTI in occupation *i* in 1998	-0.023**	0.010	0.012***	0.010	-0.000	-0.011
Δ share of occupation *i*, 1998-2010	0.002	-0.024***	0.005***	-0.001	0.001	-0.005

Higher routine intensity correlates with higher risk of unemployment

Germany

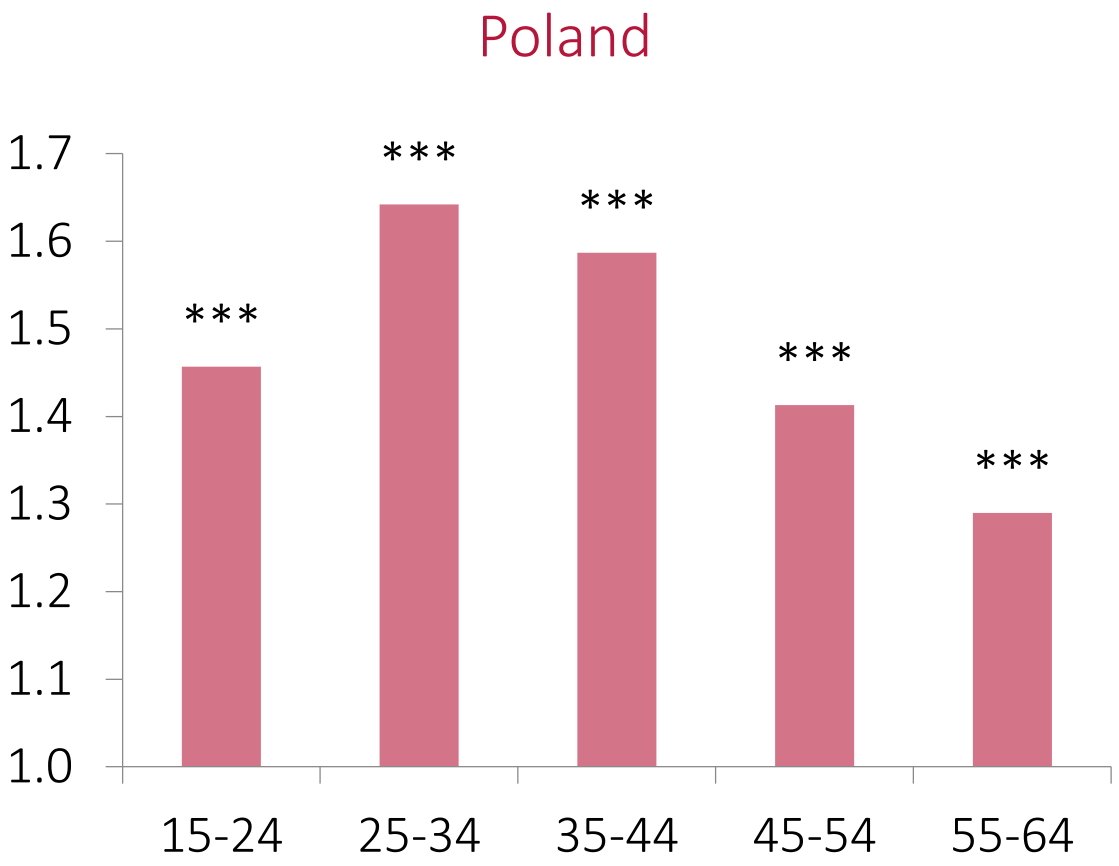


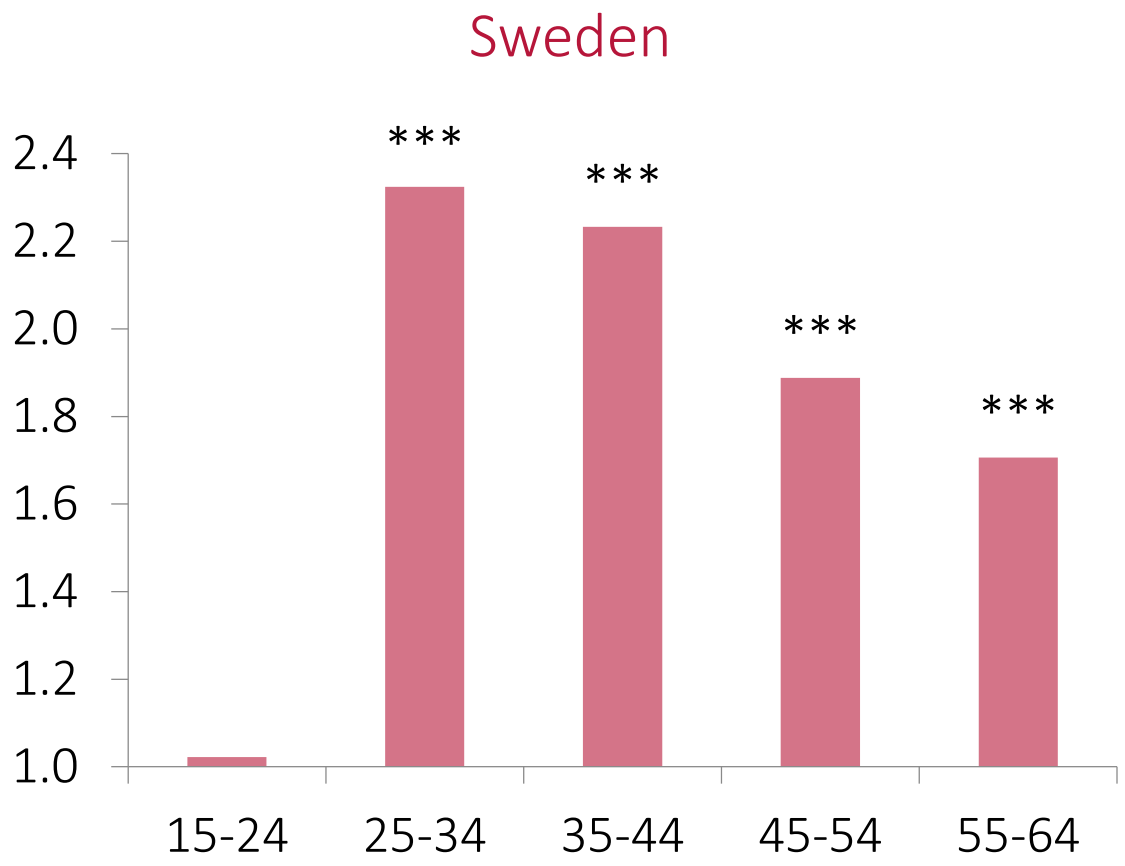
Spain



Odds-ratios from country-specific logit regressions

Mainly among young and prime-aged workers





Odds-ratios from country-specific logit regressions

What tasks say about intergenerational differences in jobs

- Widespread shift from manual to cognitive work, with routine cognitive tasks shrinking in richer (EU15) countries
- Younger cohorts experience this change stronger than older cohorts
- Routine-intensive occupations:
  - Age faster because of declining share of young workers
  - Create higher unemployment risk for the young and prime-aged
- Routine cognitive tasks likely to ↘ as ICT stock ↗ and technology prices ↘

instytut
badań
strukturalnych

Piotr Lewandowski

piotr.lewandowski@ibs.org.pl

www.ibs.org.pl

@ibs_warsaw