Cohort size and youth labour-market outcomes: the role of measurement error

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Outlook

- Effect that the supply of youth labour has on employment and unemployment among the young

- Empirical analysis based on EU-SILC data from 49 European NUTS1 regions covering 2005-2012

- Instrumental variables identification strategy to account for regional self-selection

- Estimated effects very sensitive to the age range of the sample

- Measurement error due to high rates on non-participation among the young a potential explanation

Key concepts

- **Imperfect substitutability hypothesis:**
  - Individuals of different age groups are only imperfectly substitutable
  - Differences in work experience and human capital
  - Separate labour markets for different age groups

- **The cohort-size variable:**
  - Share of a single-year age group in the working-age population

- **The youth-share variable:**
  - Share of an age range in the working-age population

- **Measurement:**
  - Outcomes determined by the supply of labour within an age group
  - Population-based variables may not provide an ideal measure

Literature review
Wages

- **Increase in the size of an age group:**
  - Outward shift in the labour supply curve
  - Reduction in marginal productivity (movement along a downward-sloping labour demand curve)

- **Wage adjustment in perfectly competitive labour markets:**
  - Lower marginal productivity fully reflected in lower wages
  - Empirical evidence: Freeman (1979), Welch (1979), Wright (1991), Brunello (2010), Moffat and Roth (2016), Garloff and Roth (2016)

- **But if wages do not fully adjust?**
  - Institutional constraints (minimum wage legislation, collective wage bargaining)
  - Adjustments in employment and unemployment rates possible

- **Cohort-crowding hypothesis:**
  - Members of larger cohorts face depressed labour-market outcomes
  - Higher risk of unemployment due to increased competition
  - Lower wages can lead to lower participation rates

- **Search and matching model with on-the-job search:**
  - Young individuals are more likely to be unemployed or mismatched
  - As a result, they are more willing to search for or switch jobs
  - Trading externality: A larger number of trading partners makes it more likely to realise a match
  - Incentives for firms to create jobs in areas with large youth shares
  - This reduces the overall and youth unemployment rate

- **Conflicting empirical evidence:**

  - Higher (lower) overall and/or youth unemployment (employment) rates (Korenman and Neumark, 2000; Biagi and Lucifora, 2008; Garloff et al., 2013)

  - Lower (higher) overall and/or youth unemployment (employment) rates (Shimer, 2001; Skans, 2005)

Contributions

- **A further piece of empirical research on the relationship between age-group size and youth (un)employment**

- **Young age groups may be ill-suited to assess this relationship:**
  - Effect on (un)employment outcomes is conditional on first choosing to participate in the labour market
  - Due to high rates of non-participation the size of an age group may provide a poor measure of labour supply

- **Data from different longitudinal EU-SILC releases**

- **Generate a unique person identifier:**
  - Combination of country, rotational group and person ID
  - Assess robustness in terms of sex and age

- **Combine data from different EU-SILC releases:**
  - Starting with the 2012 release
  - Adds observations from other years
  - Adds observations from other rotational groups within a given year

- **Adjustment of personal weights:**
  - Adjust for change in the number of rotational groups
  - Re-scale to match official statistics on region-year-age-sex cells

Data
Combining different EU-SILC releases

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
A									
B	B								
C	C	C							
D	D	D	D						
	E	E	E	E					
		F	F	F	F				
			G	G	G	G			
				H	H	H	H		
					I	I	I	I	
						J	J	J	J
							K	K	K
								L	L
									M

Data
Individual-level and aggregate datasets

- **Individual-level dataset:**

  - 2.76m observations on approximately 1m individuals

- **Aggregate dataset:**

  - Aggregate individual observations to the region-year level

  - 49 NUTS1 regions covering 2005-2012 (balanced panel)

    - Austria (3), Belgium (3), Czech Republic (1), Denmark (1), Estonia (1), Greece (4), Spain (7), France (8), Hungary (3), Italy (5), Lithuania (1), Luxemburg (1), Latvia (1), Poland (6), Sweden (3), Slovakia (1)

Model and identification

- **Regression model:**
  - $share_{rt} = \beta_0 + \beta_1 YS_{rt} + \eta_r + \varphi_t + \varepsilon_{rt}$
  - Outcome variable: (un-)employment share
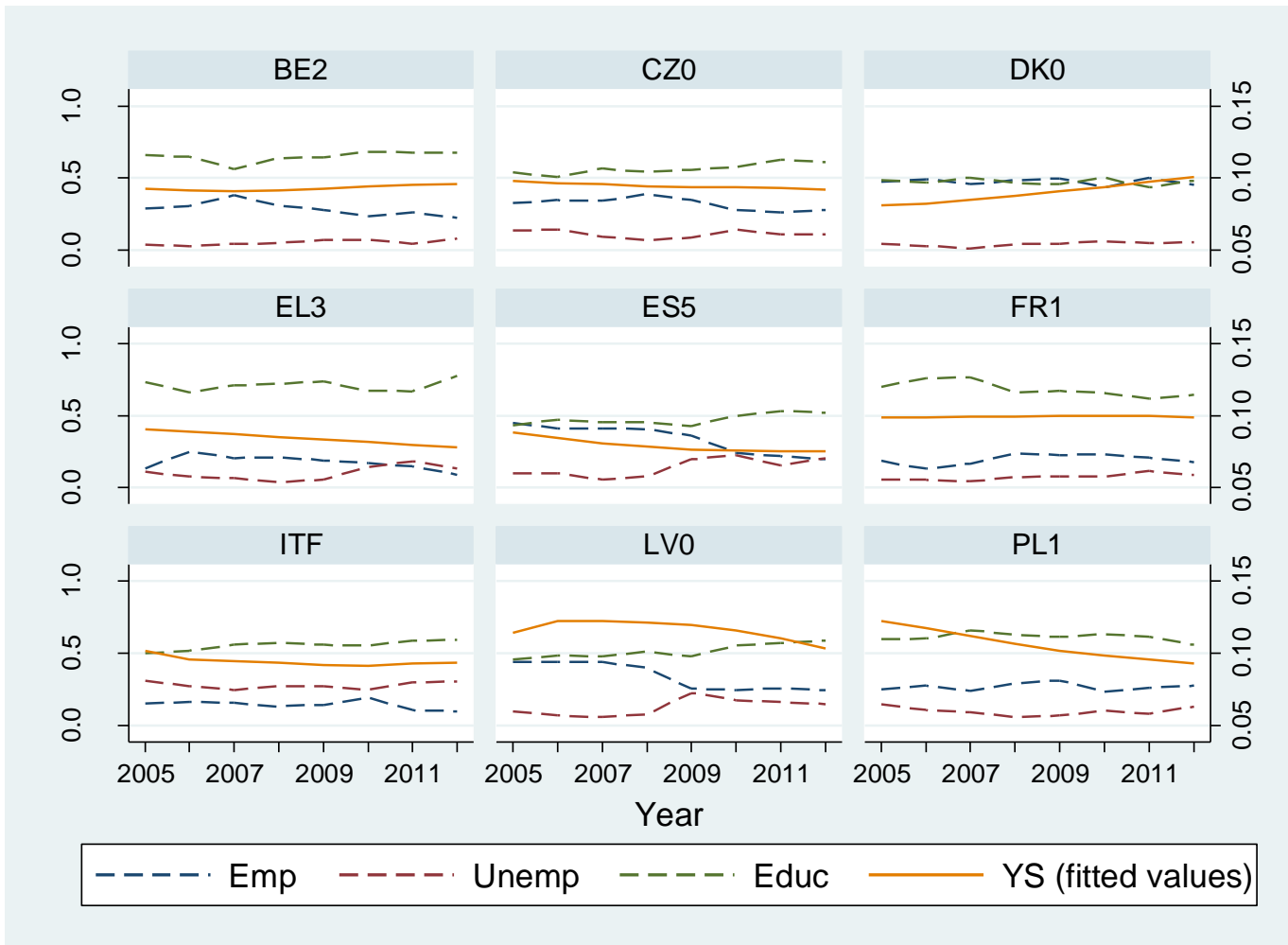 - Key regressor: Share of youth population in working-age population

- **Sample:**
  - Model estimated separately for age groups 18-22, 19-23, …, 25-29

- **Endogeneity of the youth-share variable:**

  - Regional self-selection into attractive regions
  - Relative size of the age group 14 years younger and measured 14 years earlier used as an instrument
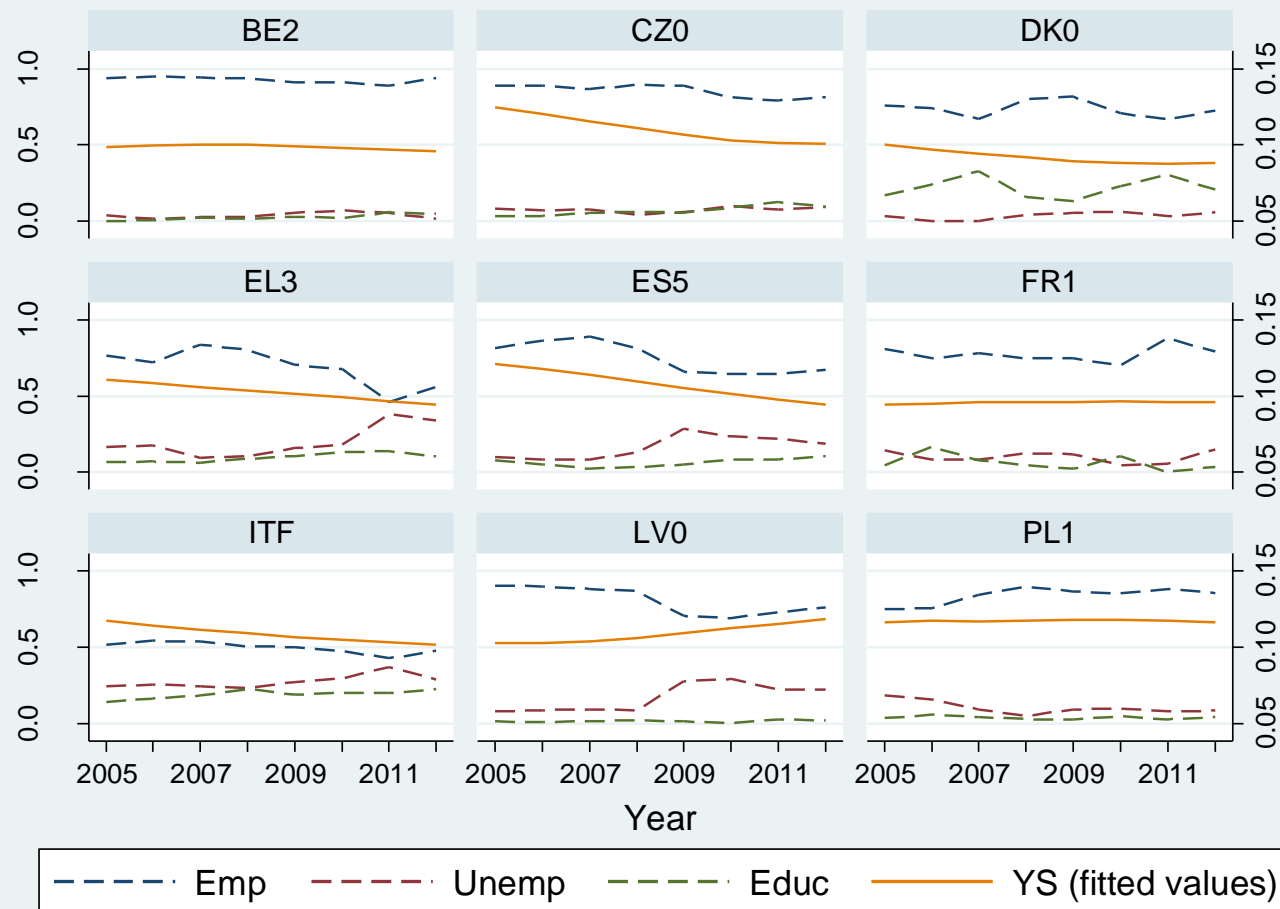
Variables (age group 18-22)

Variables (age group 25-29)

Measurement error

- **Measurement error in youth-share variable:**
  - $YS_{rt} = YS_{rt}^* + u_{rt}$
  - The observed youth share (YS) contains measurement error due to non-participation, especially among young age groups
 - Inconsistent estimation

- **Non-classical measurement error:**
  - Measurement error correlated with youth share available to the labour market
  - Use of 2SLS does not ensure consistent estimation

- **Motivation:**
  - Members of larger age groups less likely to acquire education (Fertig et al., 2009)
  - Carries over to latent youth share if the former is larger in larger age groups

Employment share
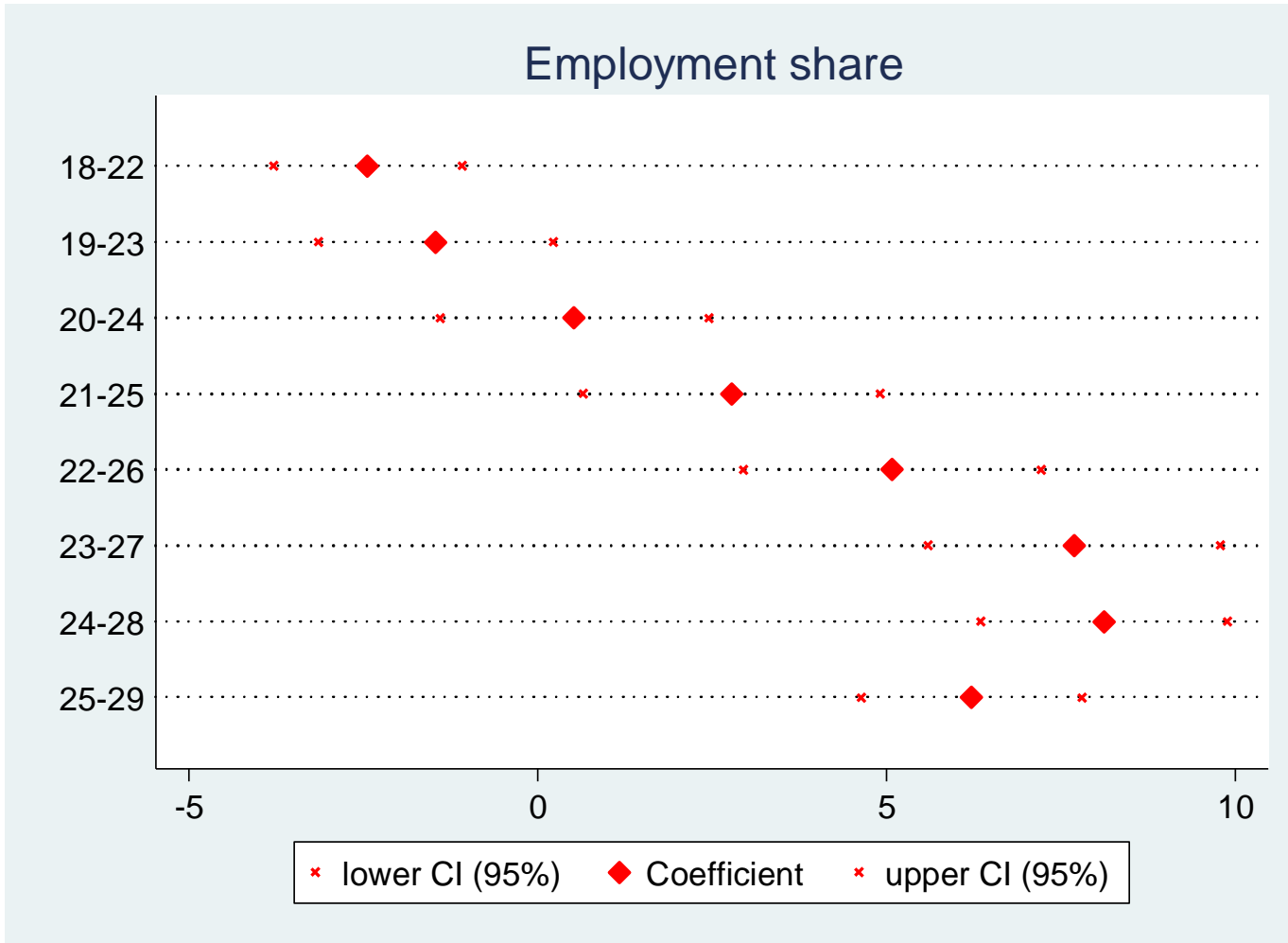
Unemployment share

Conclusion

- Conflicting empirical evidence on the relationship between size of young age groups and their (un)employment outcomes

- Empirical analysis based on EU-SILC data from 49 NUTS1 regions covering 2005-2012

- Estimated coefficients are sensitive to the chosen age range

- (Non-classical) Measurement error as a possible explanation

- Youth share a poor measure of labour supply among young age groups due to high rates of non-participation

- For older age groups an increase in the youth share increases (decreases) the employment (unemployment) rate

Thank you for your attention.

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