The Impact of Payroll Tax Subsidies: Theory and Evidence

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Motivation

Large component of labor tax wedges comes from payroll taxes

- Longstanding discussion how these taxes affect employment and wages

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- Apply the standard competitive framework of labor markets
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Still firms play a key role in wage determination

- Mostly theoretical discussion on the impact of public policies (e.g. UI)
- Key result: heterogeneous impact across firm and worker types

This Paper

Study impact of payroll tax subsidies in an equilibrium job search model

- Add tax subsidy to a standard search and matching model
- Analyze heterogeneous impacts on wages and hiring by productivity

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Study the impact on employment and wages

- Heterogeneity by firm productivity and worker type

Policy Relevance of Age Specific Payroll Taxes

Increasing employment of younger and older workers priority for policy

- Vulnerable groups that might be more responsive to tax changes

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Concerns about targeted payroll tax cuts

- Effectiveness: do they work?
- Incidence: do firms or workers get the money?
- Heterogenity: which workers and firms benefit from the policy?

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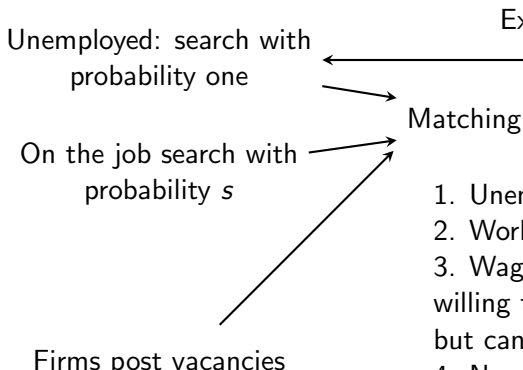
Empirical evidence is mixed, mostly focused on younger workers

- Non-negligible positive effects on employment: Egebark and Kaunitz (2018), Kramarz and Philippon (2001), Saez, Schoefer and Seim (2019), Svraka (2019)
- No clear evidence on employment effects: Boockmann, Zwick, Ammermüller and Maier (2012),Huttunen, Pirttilä and Uusitalo (2013)
- Little evidence for wage effects

Model

Main features of the model – Setup

Standard search and matching model (Bagger and Lentz, 2019; Lise, Meghir and Robin, 2016; Moscarini and Postel-Vinay, 2018; among others)



1. Unemployed finding a match: full rent extraction
2. Worker is poached if meets more productive firm
3. Wage re-negotiation if meets a firm that would be willing to offer greater value than the current contract but cannot offer more than the current firm,
4. No change if none of the above happens

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   - *Intuition: On the margin, more productive firms care less about an extra dollar of subsidy for hiring*
4. The increase in wages is larger for high productivity/high poaching firms
   - *Intuition: More poaching and wage renegotiation happens at more productive firms, leading to workers getting more of the subsidy*

Background

Job Protection Act in Hungary

Labor income is taxed heavily

- 16% (flat-rate) personal income tax;
- 18.5% social security contributions (SSC) paid by the employee;
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Job Protection Act, in effect from 2013

- Workers aged below 25 or above 55: employer SSC reduced to 14%
- Other subsidized groups: e.g. elementary occupations, long-term unemployed
  ▸ Subsidy Interaction
- For a previous policy evaluation see Svraka (2019)

Data and Sample

Administrative data

- Use employer-employee administrative data from Hungary between 2011-2017
- 50% random sample
- Links employment, tax, pension, health, labor, etc.

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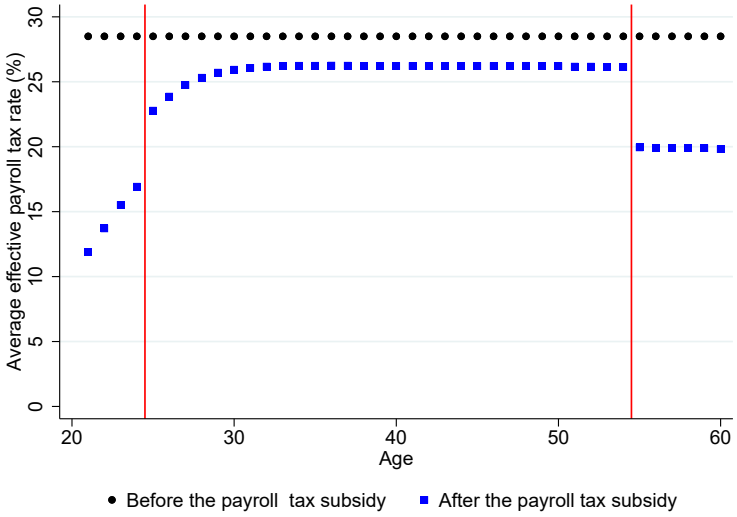
Sample

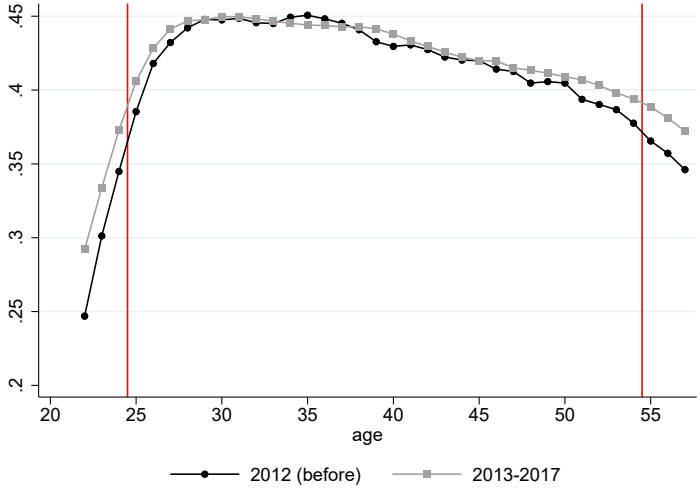
- Focus on men in main analyses (women retire early at high rates)
- Focus on ages 22-27 and 52-57
- Private sector employees

Results

Average Payroll Tax Rate by Age

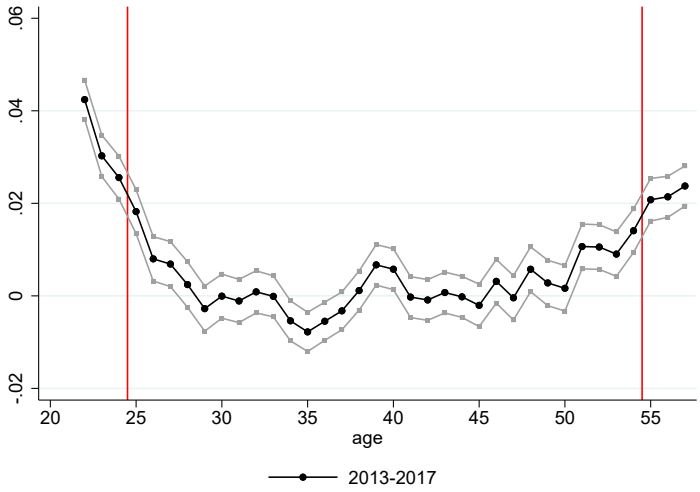


Employment in Private Sector Companies By Age (Males)



▸ Figure: All Years

Change in Employment in Private Sector Companies By Age (Males)



▸ Figure: All Years ▸ Placebo: Elementary Occupations ▸ Placebo: Public Sector

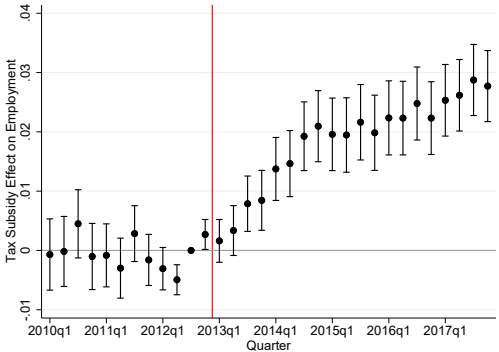
Estimation: Employment

$$y_{it} = \alpha_a + \beta_q + \sum_q \delta_q \mathit{Treated}_{it} + \varepsilon_{it}$$

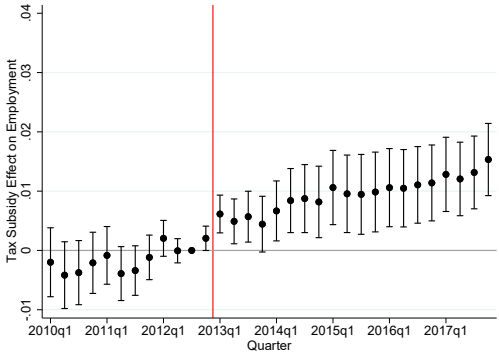
where

- y_{it} indicator of private sector employment of individual i in month t
- α_a are age fixed effects
- q quarterly date index runs between $2010 - 2017$
- *Treated* is one for ages under 25 (younger treated) or for ages at and above 55 (older treated)
- Restrict the sample to 22-27 for the younger workers and 52-57 for the older workers
- δ_q terms are quarter-specific dummies

Results: Employment

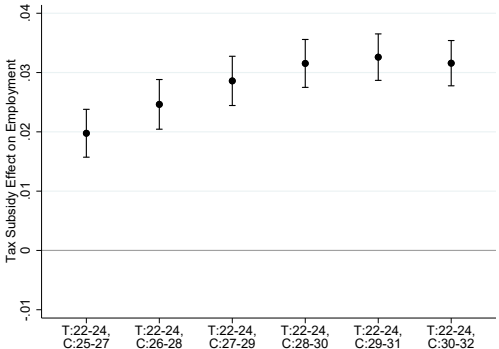


Young, age 22-27

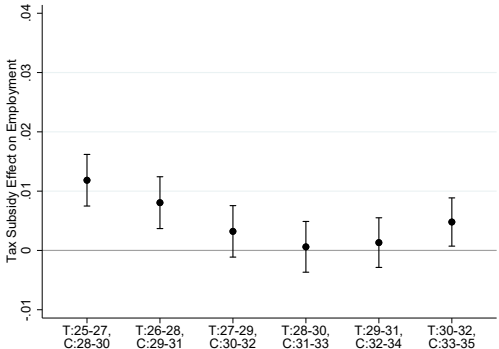


Old, age 52-57

Alternative Control Ages and Placebo Analyses: Employment



Controls: Young



Placebos: Young

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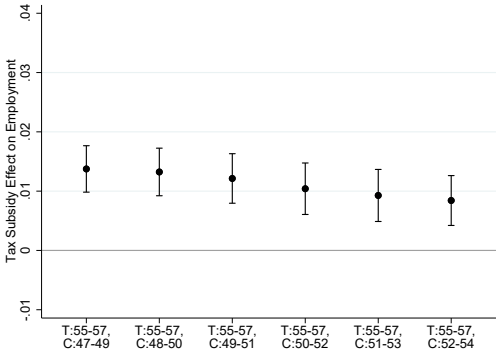
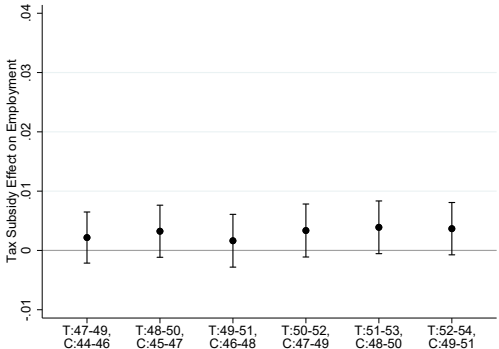
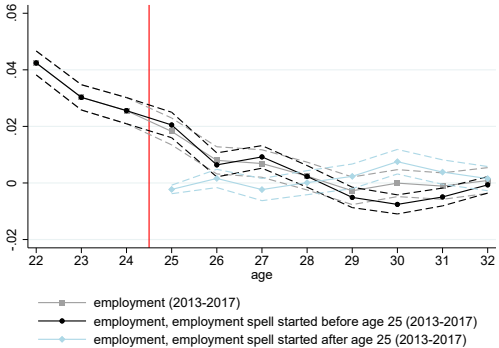


Controls: Old

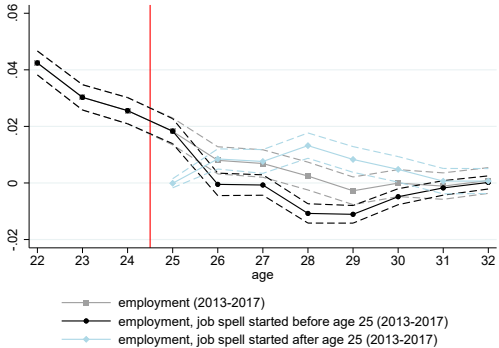


Placebos: Old

Spillover — Young

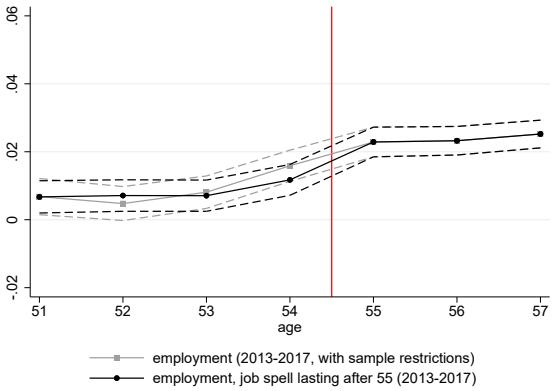


Employment spells starting before 25



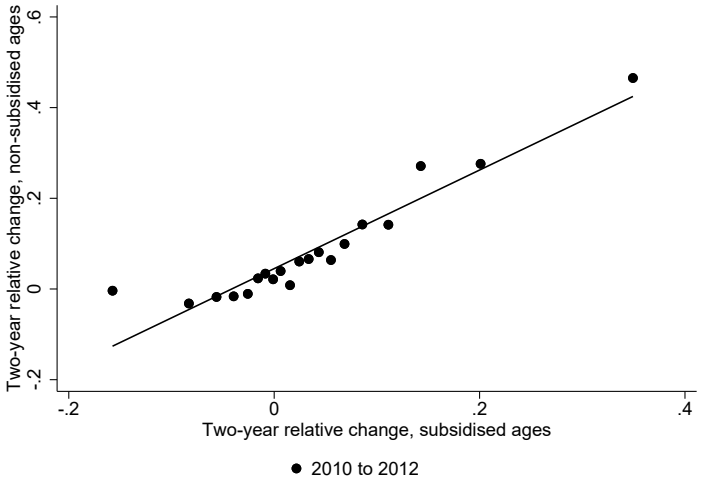
Job spells starting before 25

Spillover — Old



Employment spells lasting after 55

No Evidence of Substitution



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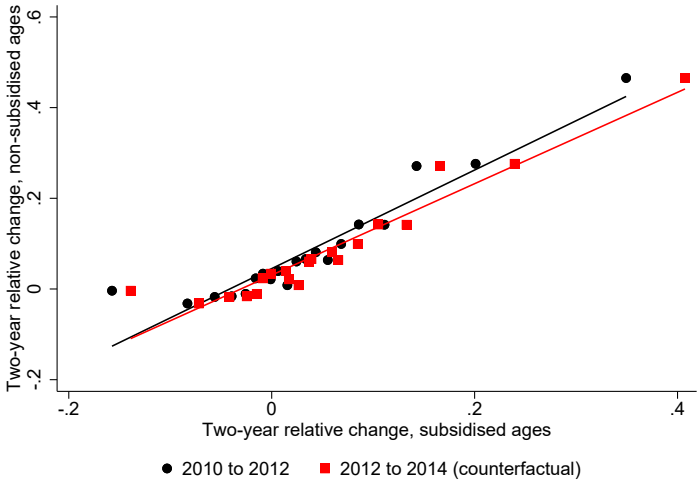

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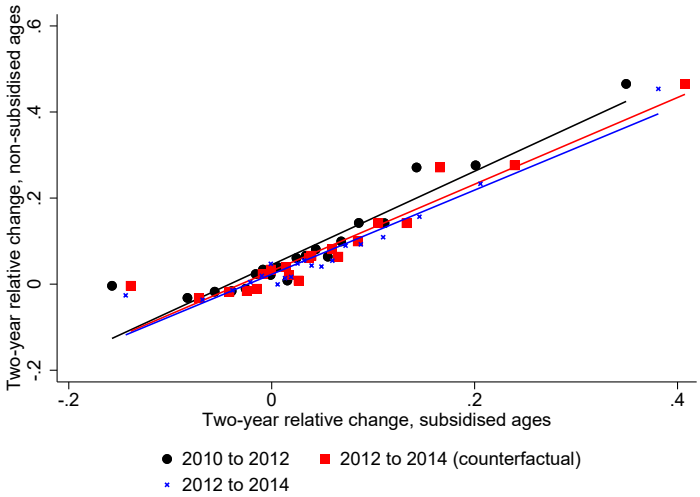


Heterogeneity: Employment

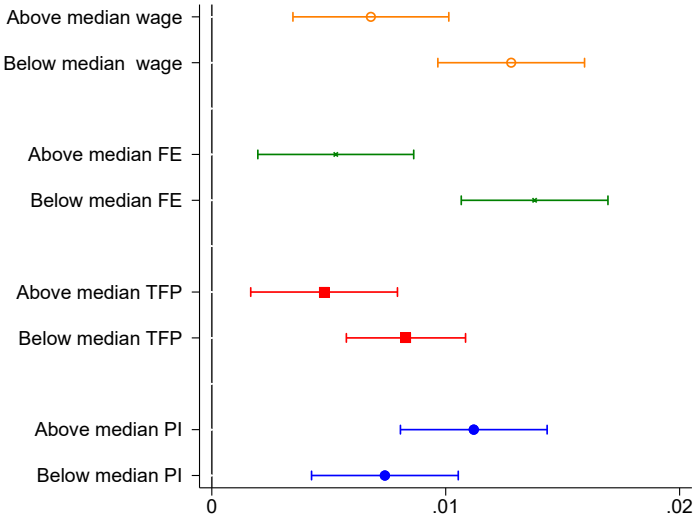
Estimate pooled version of difference-in-differences equation:

$$y_{it} = \alpha_a + \beta_q + \delta \mathit{After}_t \mathit{Treated}_{it} + \varepsilon_{it}.$$

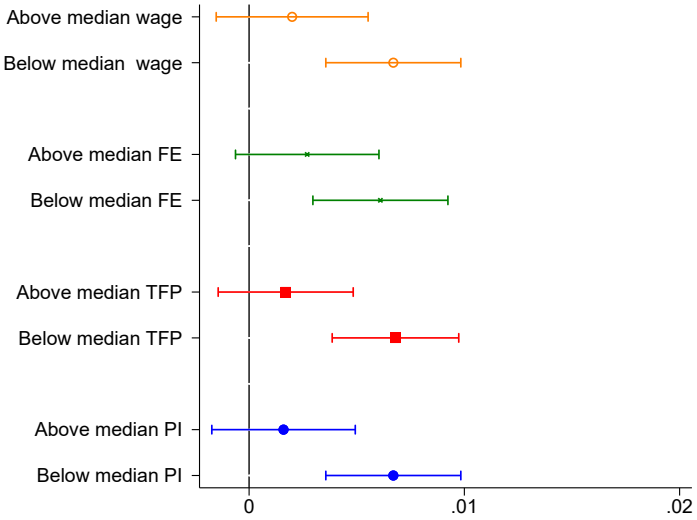
To assess heterogeneity: replace outcome variable y_{it} with binary indicator for employment in given type of job

- e.g., in above median poaching index firm, in above median TFP firm

Heterogeneity: Employment — Young



Heterogeneity: Employment — Old



Estimation: Wages

$$ln(w_{it}) = \xi_a + \eta_t + (\phi_a + \zeta_t) ln(w_{it-1}) + \psi X_{it} + \theta_t Treated_{it} + \nu_{it},$$

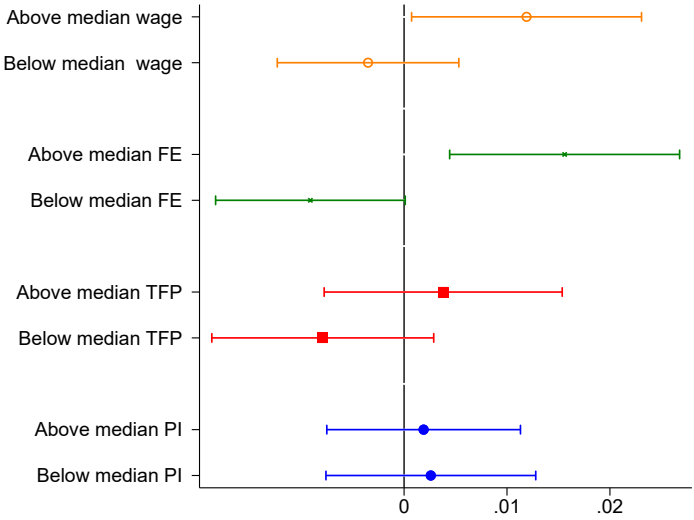
where

- w_{it}: annual average monthly wage adjusted for working hours of individual i at time t (May of years 2012-2013)
- ξ_a: age effects
- η_t: calendar year effects
- ϕ_a, ζ_t: age-specific and year-specific effects of lagged wage
- X_{it}: vector of controls, including occupation, log firm size, poaching index, ownership
- Focus on years 2012-2013

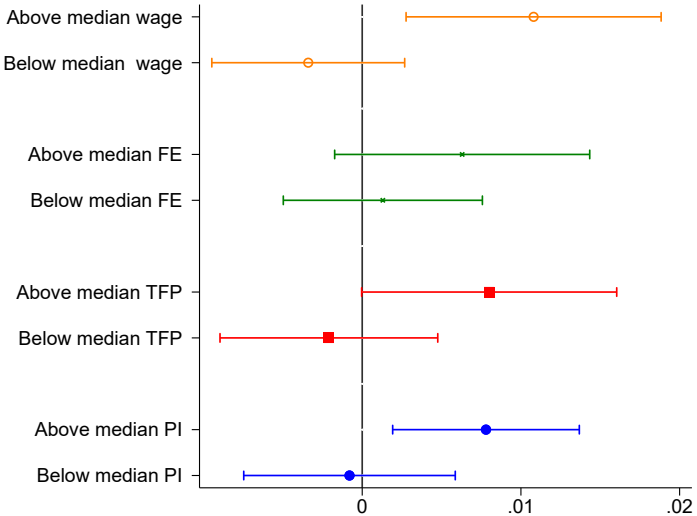
Results: Wages

	Log Wage of Young Age 22-27	Log Wage of Old Age 52-57
Average treatment effect	0.0023	0.0038
	[0.0043]	[0.0028]

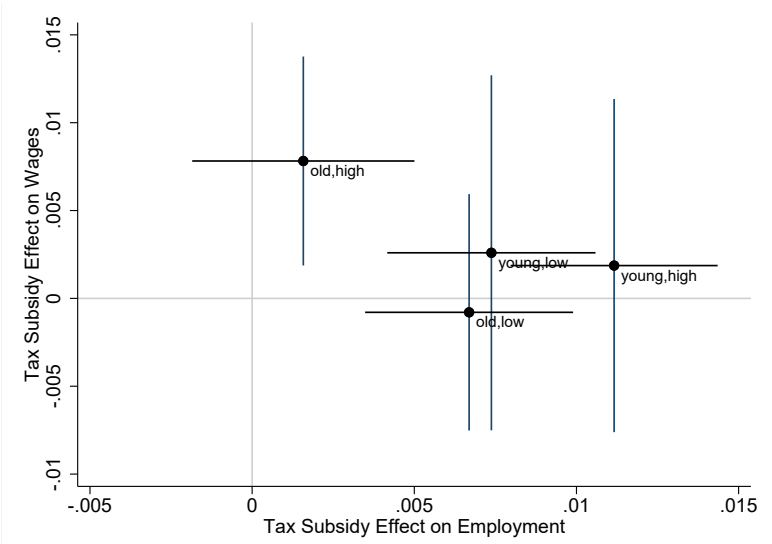
Heterogeneity: Wages — Young



Heterogeneity: Wages — Old



Employment vs Wage Effects — Age Groups + Quality



Discussion

Model + empirical evidence on heterogeneities in the impact of payroll tax subsidies on employment and wages

- Model adds tax subsidy to canonical search and matching framework
- Empirical evidence based on policy experiment in Hungary allowing for diff-in-diff estimation

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Empirically, we find positive employment effects on both younger and older workers

- Driven by entry with some exit reduction for older workers
- No evidence of substitution
- Among older workers, employment effects are much larger in lower-quality firms and jobs

Discussion

Small positive wage effects

- Larger effect in higher-quality firms – more so for older workers

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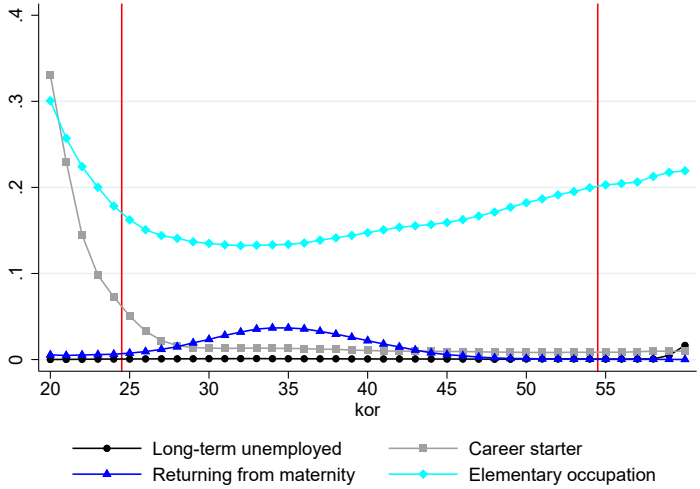
Suggests that in lower-quality firms and jobs, incidence is on firms, in higher-quality firms and jobs, incidence is on workers

- Wage and employment effects are negatively related
- Highlights importance of heterogeneity in the impacts of payroll tax subsidies
- Broadly consistent with model

Age-dependent vs Other Subsidies



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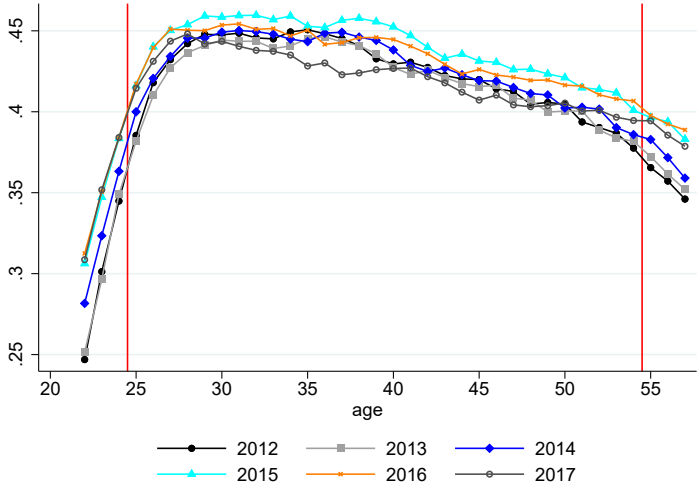
Private Sector Employment Rate By Age



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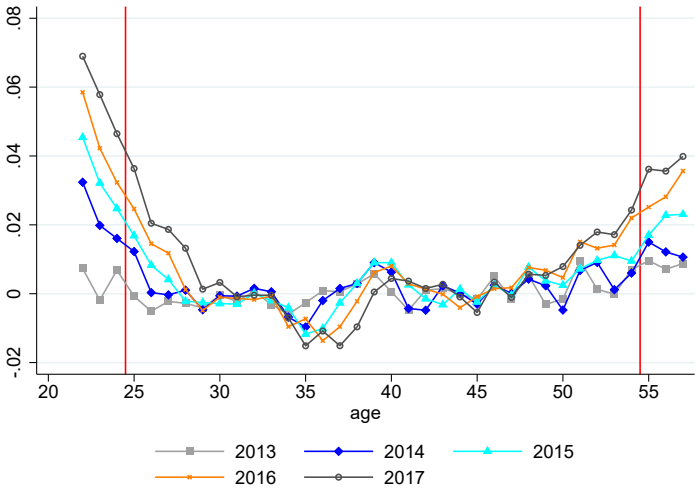

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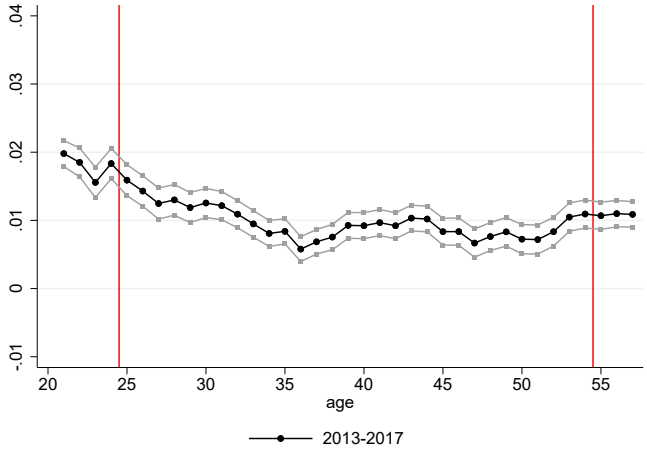
Private Sector Employment Rate By Age—Placebo: Elementary Occupations



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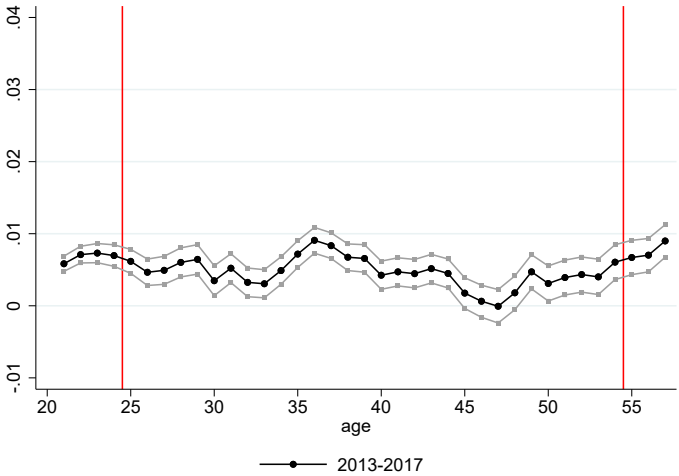
Private Sector Employment Rate By Age—Placebo: Public Sector



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