Do unions increase participation in further education?

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Motivation

- Skill-biased technological change
- Increasing inequality
- Race between education and technology
- Rapid technological change requires lifelong learning and continuous upgrading of workers' skills (OECD, 2021).
- What is the role of unions?

Theory - Individuals

- Simple model in which othervice identical workers choose whether to invest in training or not
- Training costs c
- Training results in an increase in the marginal product of labor from 1 to $1+\mu$
- Firms may sponsor a share λ of the training costs
- The individual's participation constraint:

$$(1) \qquad \tilde{w} \equiv w^e - w \geq (1-\lambda)c$$

Theory - Individuals

$$(1) \qquad \widetilde{w} \equiv w^e - w \geq (1-\lambda)c$$

- Most trade unions are known to compress the distribution of wages
- By reducing the returns to education, unions lower the individual incentives to invest in education (Mincer, 1981)

Theory - Firms

- Firms may choose to sponsor training
- Catch: Trained workers may quit
- Workers quit the firm at rate q
- Quitters replaced by non-trained workers
- The firm's participation constraint:

$$(2) \qquad (1-q)(1+\mu-w^e)+q(1-w)-\lambda c \geq 1-w$$

Theory - Firms

$$\lambda \leq \frac{(1-q)(\mu-\tilde{w})}{c}$$

- Perfect competition: $\mu - \tilde{w} = 0$ and $q = 1$
  - Firm's will never pay for training (Becker, 1964)
- Monopsony firms: $\mu - \tilde{w} > 0$ and $q < 1$
  - Firm's may optimally choose to pay for training (Acemoglu & Pischke, 1998)

Theory - Firms

$$(3) \qquad \lambda \leq \frac{(1-q)(\mu-\tilde{w})}{c}$$

- **Hypothesis 1:** The wage differential is lower in unionized firms
- **Hypothesis 2:** The employee turnover is lower in unionized firms

➢ **Prediction:** Unionized firms will sponsor a larger share of training costs (Acemoglu & Pischke, 1999)

Empirical approach

Estimate how variation in workplace union density influences:

a. The wage returns to further education
b. Turnover rates among participants, and, ultimately:
c. Participation in further education

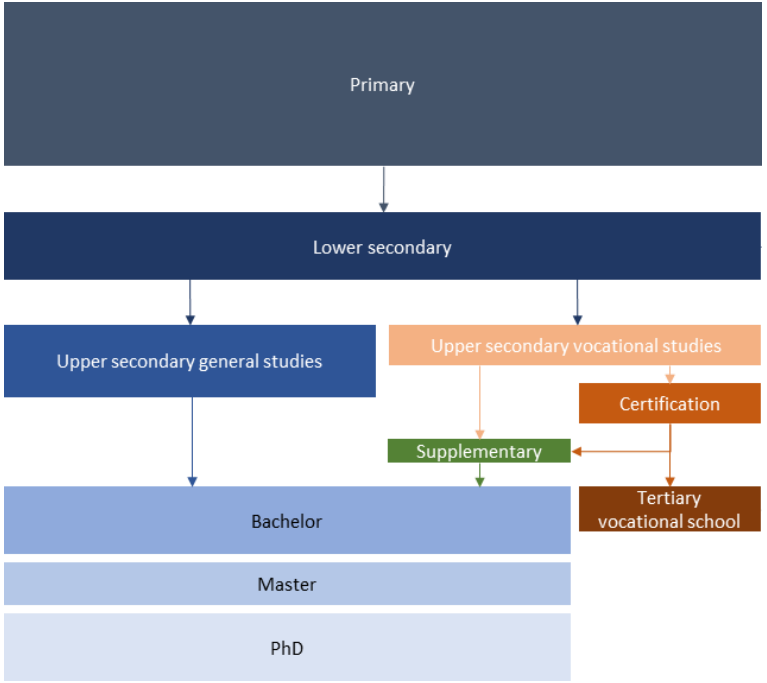
Data

- Matched employer-employee data:
  - All Norwegian workplaces
  - All Norwegian working individuals
  - Period: 2004-2019
  - Restrict population to full-time vocational workers

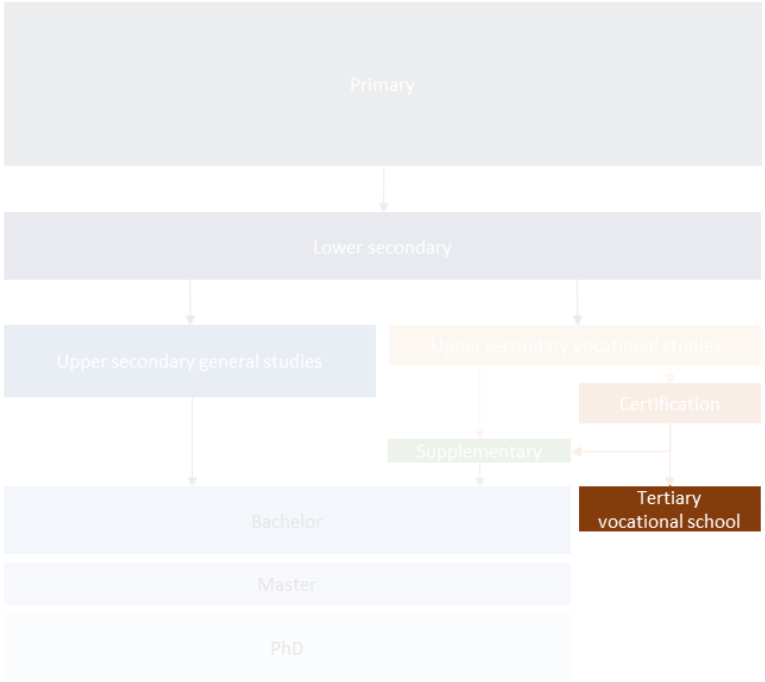
- Key variables:
  - Further education: Participation in education at the tertiary vocational level
  - Unionization: Individual memberships and workplace union density

- All data is provided by Statistics Norway through the application *microdata.no*

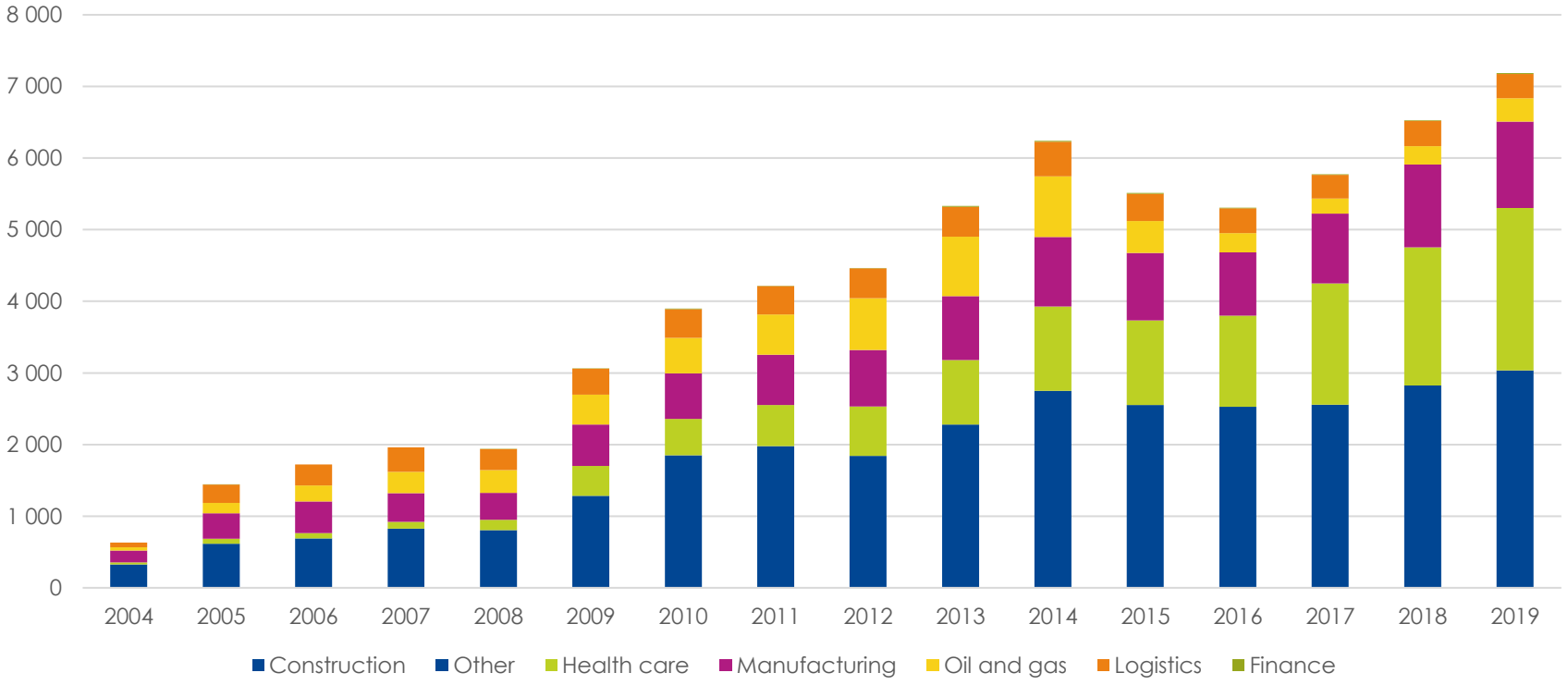
The Norwegian education system



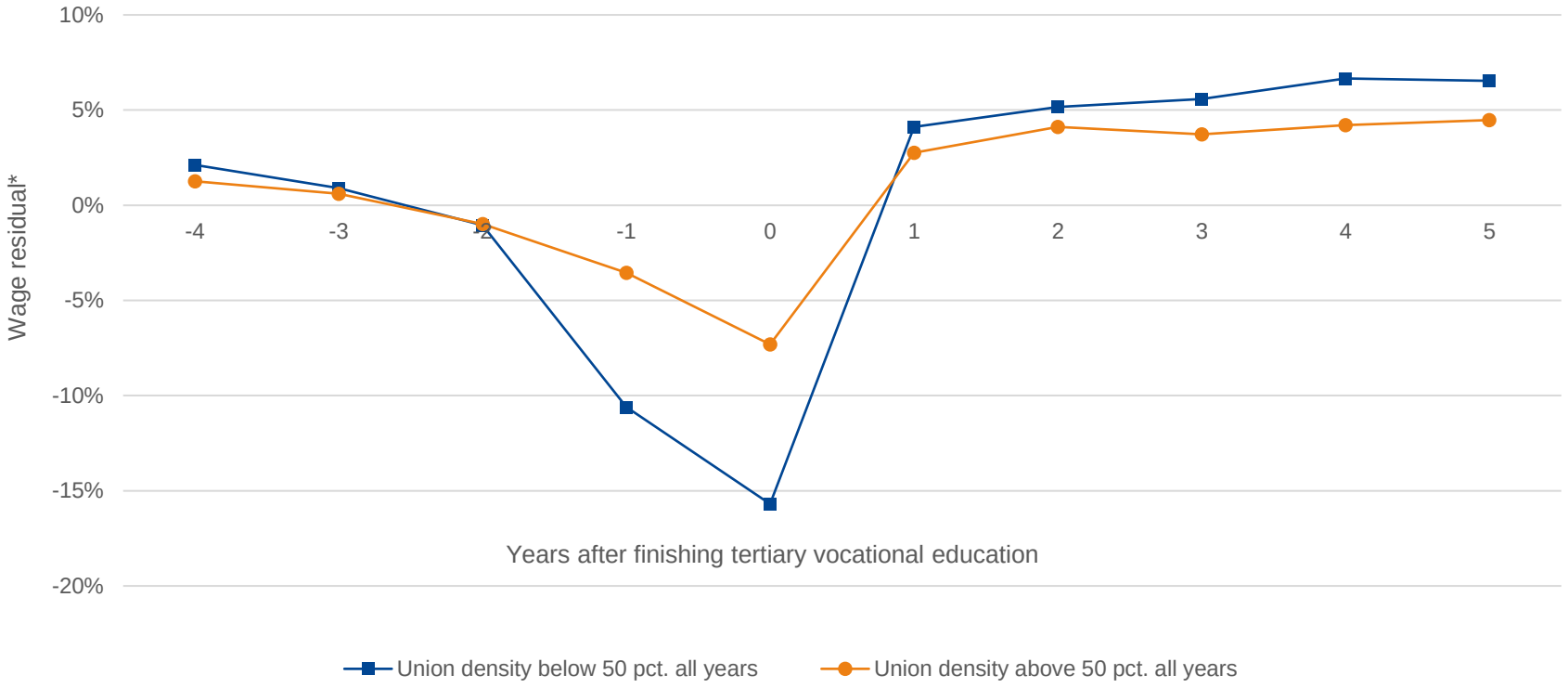
The Norwegian education system



Tertiary Vocational Education

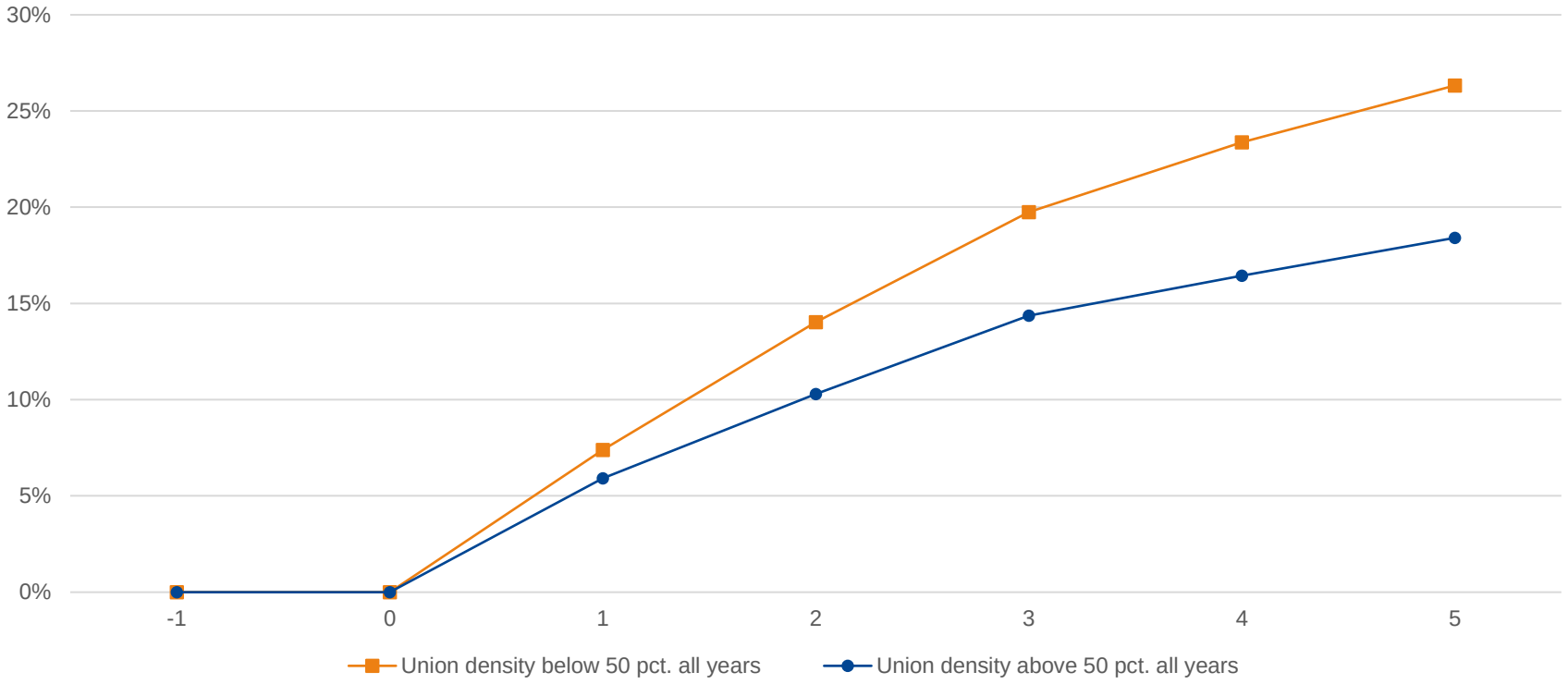


Wage development



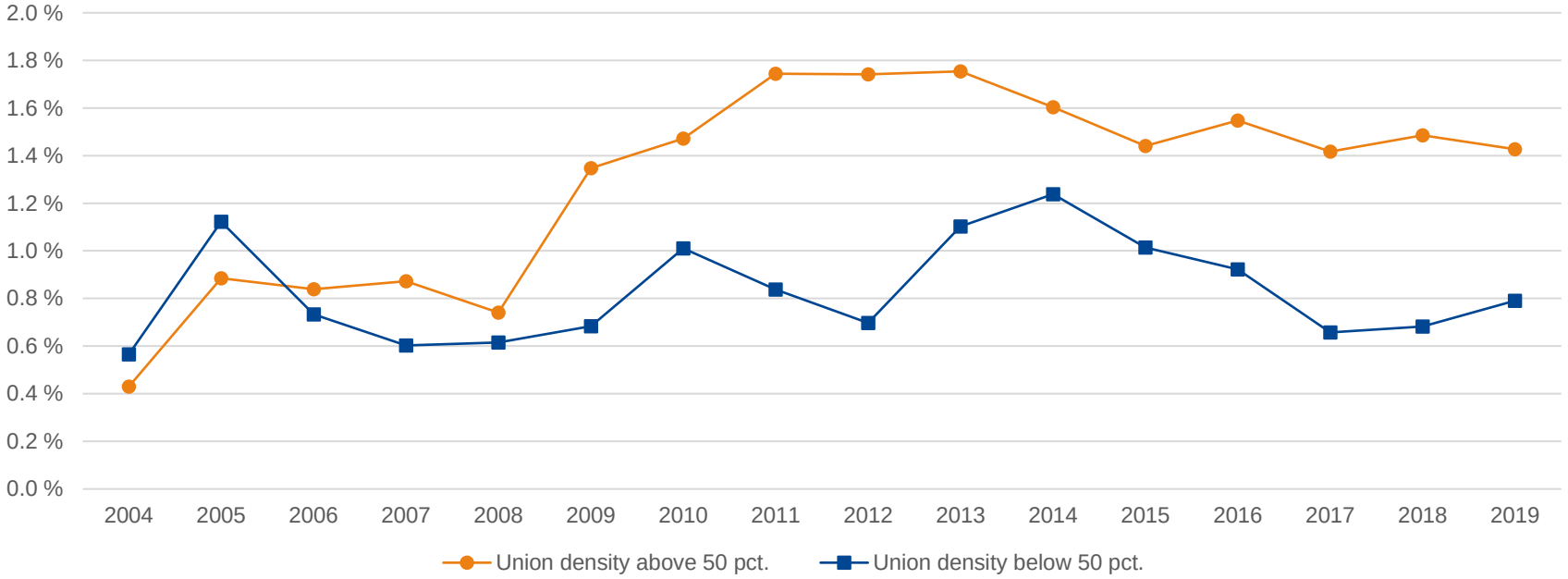
* Residuals from a mincer wage equation

Employee turnover



Participation rates

Full-time workers who finished upper secondary vocational education in the year 2000



Results – Returns to education

End: log(wage)	Model 3a	Model 3b	Model 3c	Model 3d	Model 3e	Model 3f
$UD_{it} \geq 0.5$	0.0780 ***	0.0190 ***	0.0150 ***	0.0000	0.0000	0.0001
$E_{it} = 1$	- 0.1794 ***	- 0.1755 ***	- 0.1409 ***	- 0.0592 ***	- 0.0592 ***	- 0.0598 ***
$E_{it} = 2$	0.1551 ***	0.1361 ***	0.0932 ***	0.0820 ***	0.0819 ***	0.0798 ***
$E_{it} = 1 \times UD_{it} \geq 0.5$	0.0875 ***	0.0696 ***	0.0669 ***	0.0285 ***	0.0286 ***	0.0264 ***
$E_{it} = 2 \times UD_{it} \geq 0.5$	- 0.0080 *	- 0.0048	- 0.0197 ***	- 0.0148 ***	- 0.0146 ***	- 0.0139 ***
Sick absenteeism					✓	✓
Industry trends						✓
Min. 10 employees		✓	✓	✓	✓	✓
Certified pre-2000			✓			
Stayers				✓	✓	✓
No. of individuals	838,656	740,191	408,470	584,536	584,536	584,536
Avg. obs. per ind.	8.7	7.8	9.5	6.2	6.2	6.2
Total observations	7,309,459	5,747,001	3,887,782	3,598,622	3,598,622	3,598,622

All models are estimated using the within estimator, controlling for individual fixed effects, industry fixed effects and year dummies

Results – Turnover

End: Turnover rate	Model 4a	Model 4b	Model 4c	Model 4d	Model 4e
Union density	-0.0905***	-0.1408***	-0.1455***	-0.1412***	-0.1334***
	(0.0168)	(0.0223)	(0.0408)	(0.0223)	(0.0223)
Sick absenteeism				✓	✓
Industry trends					✓
Min. 10 empl.		✓	✓	✓	✓
Certified pre-2000			✓		
No. of individuals	19,663	17,979	5,157	17,979	17,979
Avg. obs. per ind.	4.2	3.9	4.6	3.9	3.9
Total observations	81,852	70,792	23,559	70,792	70,792

All models are estimated using the within estimator, controlling for individual fixed effects, industry fixed effects and year dummies

Results - Participation

End: Participation rate	Model 2a	Model 2b	Model 2c	Model 2d	Model 2e	Model 2f	Model 2g	Model 2h	Model 2i
Union density	0.0026***	0.0030***	0.0022***	0.0024***	0.0023**	0.0025***	0.0030***	0.0031***	0.0042***
Sick absenteeism								✓	
Industry trends									✓
Min. 10 empl.		✓	✓	✓	✓	✓	✓	✓	✓
Present all years			✓						
Male workers				✓					
Private sector					✓				
Certified pre-2000						✓			
Stayers							✓	✓	✓
Avg. part. Rate	1.2 %	1.3 %	0.5 %	1.3 %	1.3 %	0.5 %	1.0 %	1.0 %	1.0 %
Partial effect at avg.	2.2 %	2.4 %	4.2 %	1.8 %	1.8 %	5.4 %	3.1 %	3.1 %	4.3 %
No. of individuals	827,592	740,928	121,796	448,591	506,641	358,078	499,733	499,733	499,733
Avg. obs. per ind.	8.6	7.8	16	9.3	8.9	10.9	7.2	7.2	7.2
Total observations	7,129,995	5,751,520	1,948,731	4,162,764	4,521,542	3,889,178	3,596,081	3,596,081	3,596,081

All models are estimated using the within estimator, controlling for individual fixed effects, industry fixed effects and year dummies

Takeaways

- Returns to education are lower in more unionized establishments
- Workers face lower wage cuts during education in more unionized establishments
- Turnover among graduated participants in further education is lower in more unionized establishments
- Positive correlation between workplace union density and participation in further education

Causation?

- Do unions make firms optimally sponsor training by lowering returns to education and employee turnover?
- Or do unions *force* firms to sponsor training through clauses in collective agreements?
- Or could it be that firms with lower turnover rates (e.g. due to monopsony power) are more willing to invest in the skills of their workers, whereas the workers face larger incentives to unionize in order to capture a share of the monopsony rent?

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