Occupational autonomy and wage divergence: Evidence from European survey data

Thomas Rabensteiner Alexander Guschanski

PEGFA and University of Greenwich

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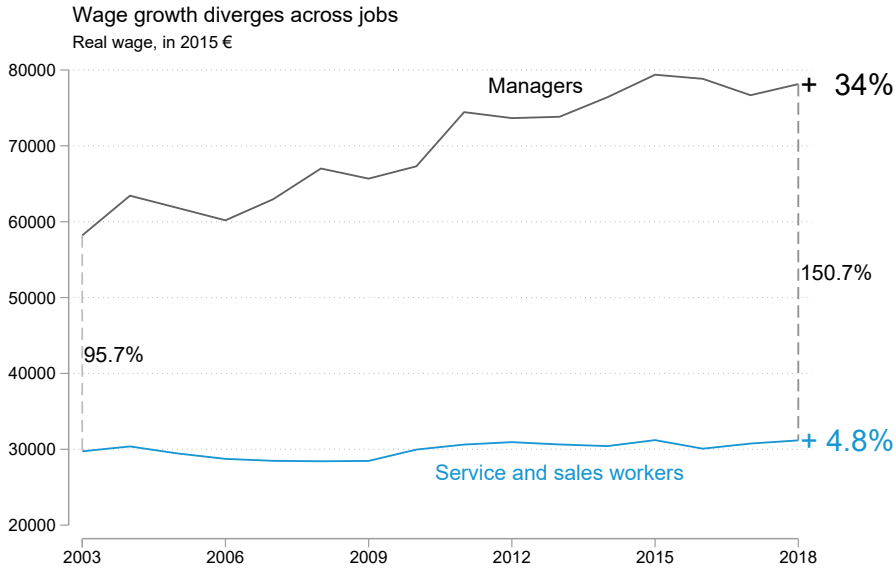
Wage growth in Western Europe



Research questions

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1. Is occupational autonomy related to wage growth differences in Western Europe?

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2. How are technology and institutions related to occupational wage growth differences?

Literature and contribution I

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- Low wage growth of cleaners, janitors, guards, customer-facing service and sales workers . . .

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→ Autonomy

Occupational autonomy

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Degree of influence and control workers in an occupation have over the work process

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Hierarchy of occupational tasks

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> **Empirically test the relationship between occupational autonomy and wage growth**

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Empirically test the relationship between occupational autonomy and wage growth
Empirically test the role of institutions and technology

Occupational autonomy index

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Key assumption: Autonomy as an inherent feature of an occupation

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Measuring autonomy

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- Making Decisions and Solving Problems

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- Making Decisions and Solving Problems
- Thinking Creatively

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O*NET (Bureau of Labour Statistics)

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Alternative measure from European Work Conditions Survey

Wage data

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European Union Survey of Income and Living Conditions (EU SILC)

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Repeated cross-section, 800k observations

Wage data

European Union Survey of Income and Living Conditions (EU SILC)

Repeated cross-section, 800k observations

2003-2018, 15 countries; full-time, full-year employees, private sector only

Empirical analysis

1. Is occupational autonomy related to wage growth differences in Western Europe?

Empirical strategy

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$$\ln\left(w_{ijkct}\right)$$

$\ln\left(w_{ijkct}\right)$, Real wage of worker i in occupation j, industry k, country c, year t

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$$\ln(w_{ijkct}) = \beta_1(A_j \times t)$$

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A_j, Autonomy index

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Main finding

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	ln wage
Autonomy	0.0027
	(0.0006)
Routinisation	0.0004
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Offshoring	0.0003
	(0.0004)
Education	*Yes*
Age	*Yes*
Gender	*Yes*
Migrant	*Yes*
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Occupation-industry-country	*Yes*
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Number of observations: 808122	
R-squared (adj.): 0.853	
Standard errors in parentheses	

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High vs. mean autonomy occupation:

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Annual wage growth difference

High vs. mean autonomy occupation: **0.27 pp**

This effect is statistically significant at the 1%-level

Economic interpretation

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Wages in a mean autonomy occupation grow by 1%

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Wages in a high autonomy occupation grow by 1.27%

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Compounded over 12 years:

Economic interpretation

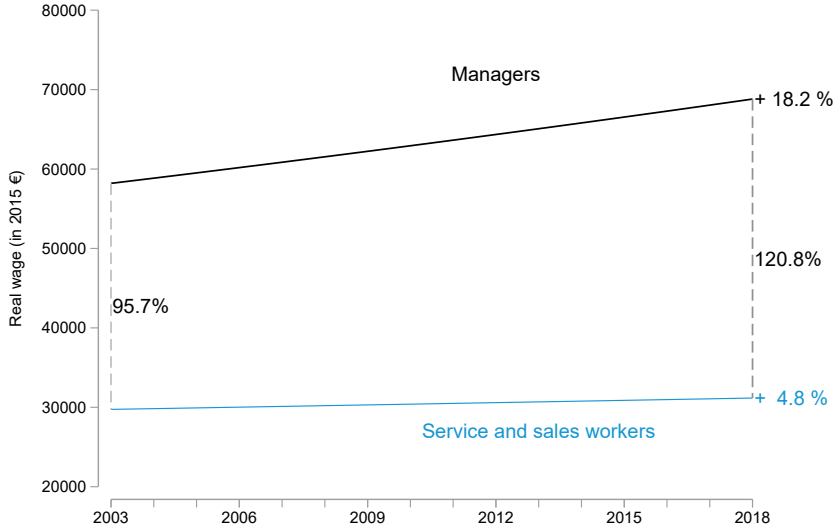
Wages in a mean autonomy occupation grow by 1%

Wages in a high autonomy occupation grow by 1.27%

Compounded over 12 years:

Wage level difference of 3.3% (if occupations have same initial wage level)

Autonomy: Wage gap between *Managers* and *Service workers* 25.1%⇑



Other occupational wage growth determinants

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~~Routineness~~

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~~Increasing returns to education (SBTC)~~

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~~Increasing return to STEM occupations (cognitive analytical)~~

Other occupational wage growth determinants

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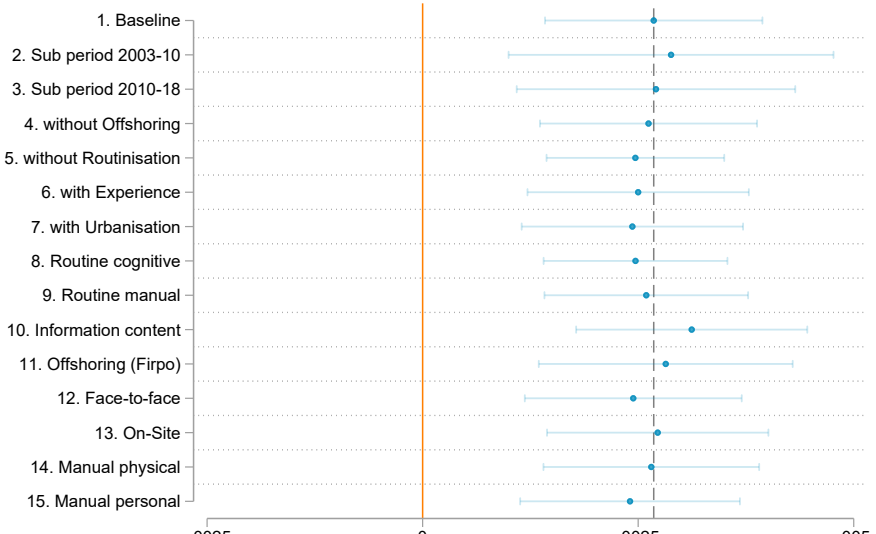
~~Increasing return to STEM occupations (cognitive analytical)~~

But we find increasing returns to autonomy

Robustness



Notes: CI = 95%. The vertical dashed grey line shows our baseline autonomy estimate.

Additional robustness checks

Different measures of autonomy

Variations of Mincer variables (experience, urbanisation, ...)

Time periods

1-digit occupation level

Alternative industry classification

Country exclusion

Industry exclusion

2. How are technology and institutions related to occupational wage growth differences?

Potential channels

Economic theory: technological change and institutions affect the relationship between autonomy and wages

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Institutions

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- Decline in collective bargaining

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Technological change A

Potential channels

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Technological change A

- ICT, computers $\rightarrow$ monitoring (Skott and Guy 2007)

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Potential channels

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Technological change B

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Data: European Social Survey, European Working Conditions Survey, European Company Survey, KLEMS database

The autonomy wage premium and labour unions

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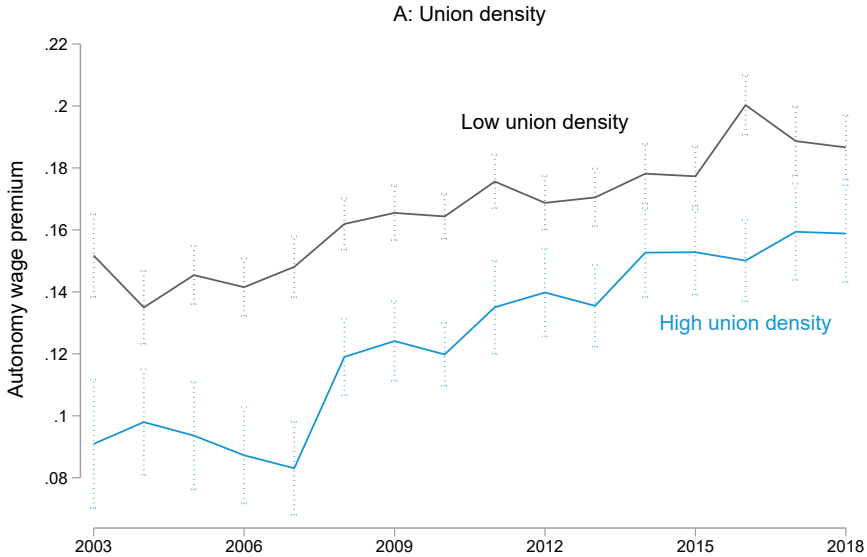

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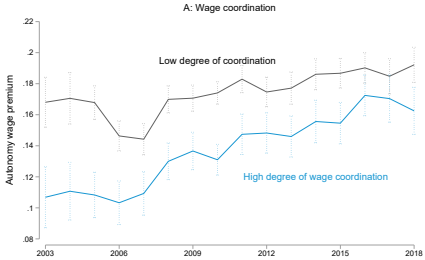

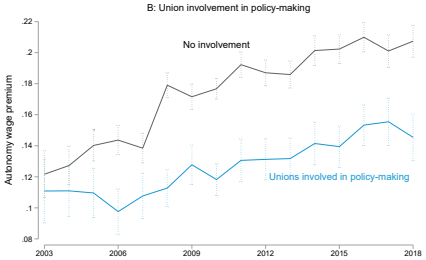

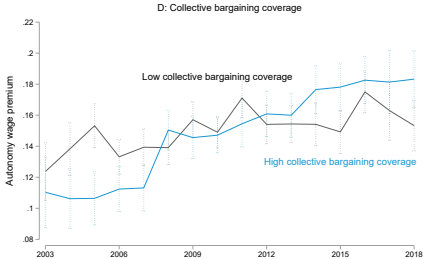

Source: EU SILC, own calculations

The autonomy premium and technological change

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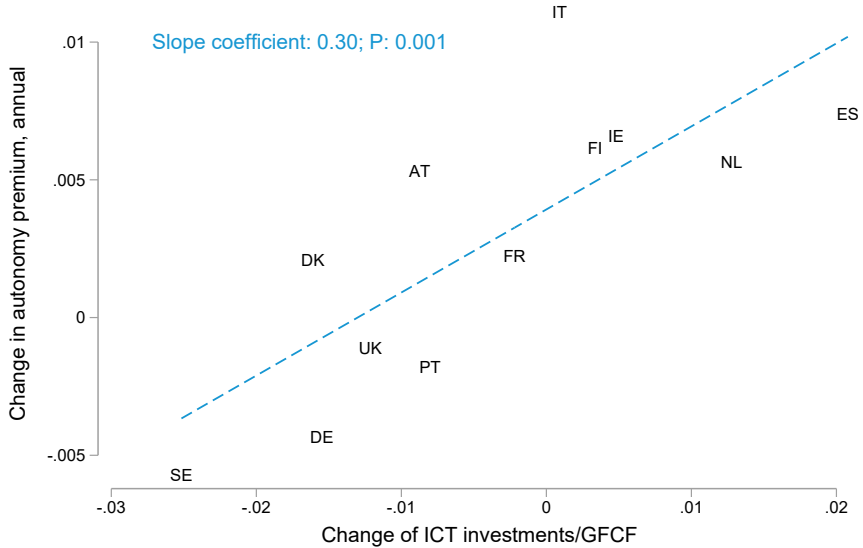

The autonomy premium and computer use

Table: Computer use and the autonomy wage premium

	(1) Δ Autonomy wage premium
Δ Computer use	0.0265**
	(0.0131)
Observations	90
r2	0.2911
Country FE	Yes

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Bottom line

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Higher occupational autonomy is related to higher wage growth

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Higher occupational autonomy is related to higher wage growth

$\rightarrow$ Wage inequality increases

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Collective bargaining: *lower* autonomy premium

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Collective bargaining: *lower* autonomy premium

Technological change: *rising* autonomy premium

Implications

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Policy

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Collective bargaining: Strengthen worker coordination across occupations

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Technology: re- and upskilling
(but can everyone have a high-autonomy occupation?) $\rightarrow$ direct tech change towards creating *good* jobs

Implications

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Collective bargaining: Strengthen worker coordination across occupations

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Why do firms adopt digital technologies?

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Research

Why do firms adopt digital technologies?

Employee monitoring or productivity improvements?

Why does the autonomy premium increase in high-bargaining countries?

Why do firms adapt digital technologies?

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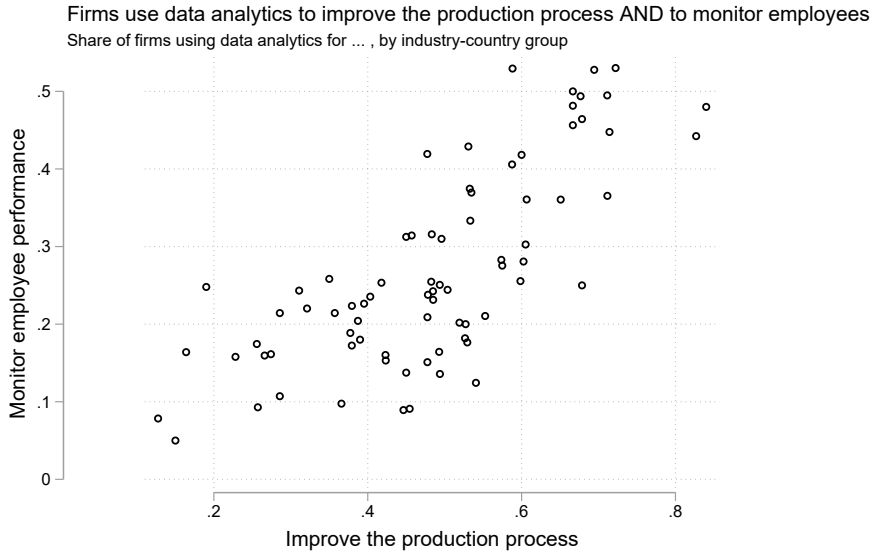


Get in touch

Thomas Rabensteiner

Website: www.thomasrabensteiner.com
Email: thomas.rabensteiner@greenwich.ac.uk
Twitter: @thomsiaae

Alexander Guschanski

Email: alexander.guschanski@greenwich.ac.uk
Twitter: @AGuschanski

Appendix

Related literature

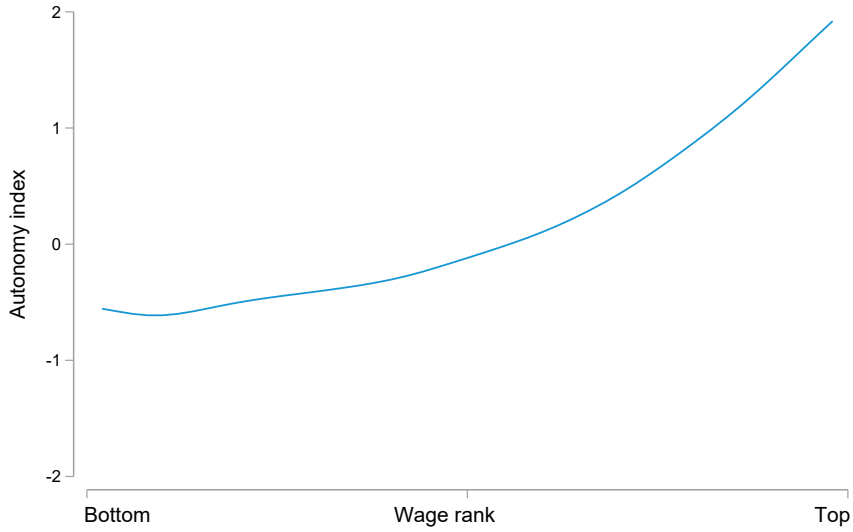
Occupations matter (Autor et al. 2003)

Focus on routinisation and offshoring (Acemoglu and Autor 2011, Firpo et al. 2011)

Increasing importance of worker autonomy for labour market outcomes (Blundell et al., 2022; Deming, 2021)

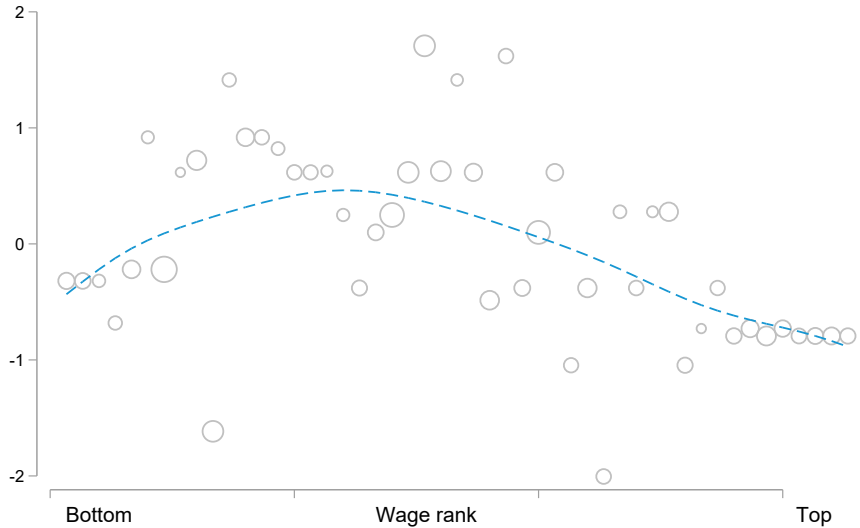
Collective bargaining as important determinant of the wage distribution (Farber et al., 2021)

High autonomy occupations are at the top of the wage distribution



EU SILC, own calculation. Wage ranking is based on average occupation-industry wages across countries.

Routinisation index vs wage rank, lowess smooth

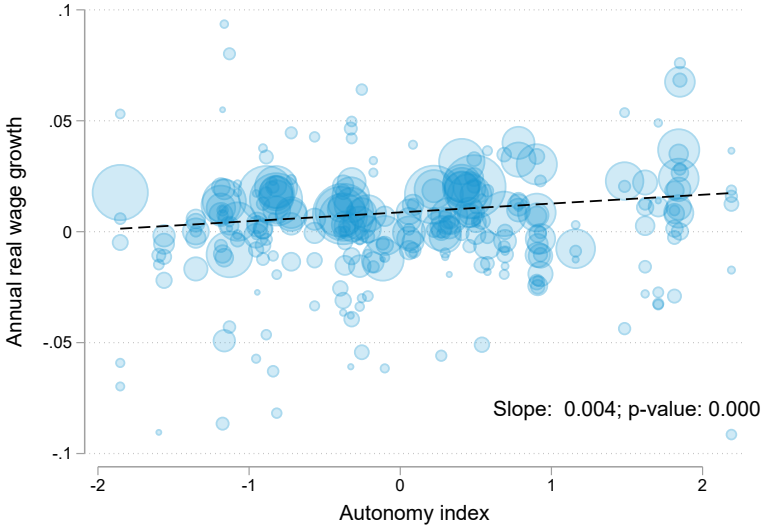


EU SILC, own calculation. Wage ranking is based on average occupation-industry wages across countries. Circle sizes reflect employment shares.

Offshoring index vs wage rank, lowess smooth

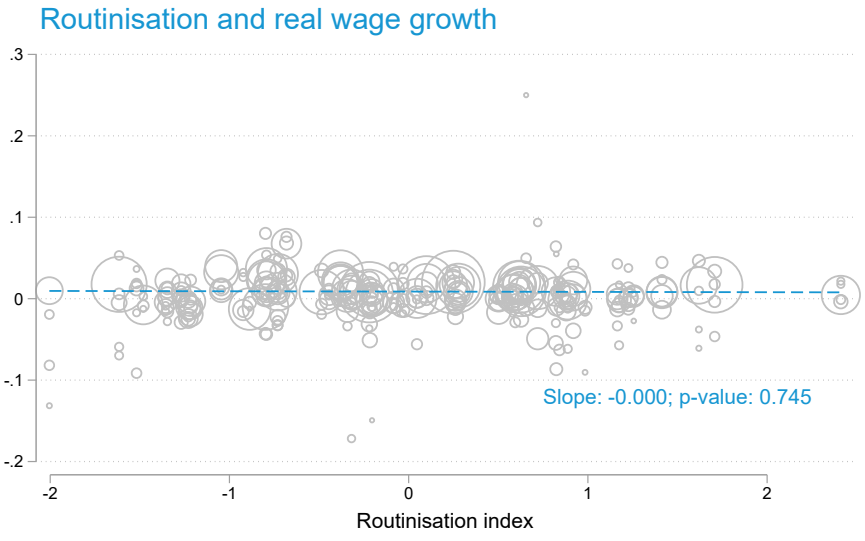
EU SILC, own calculation. Wage ranking is based on average occupation-industry wages across countries.

Annual wage growth vs autonomy index, 2003 - 2018



The linear fit is weighted by employment shares. Circle sizes represent employment shares.

Annual wage growth vs routinisation index, 2003 - 2018



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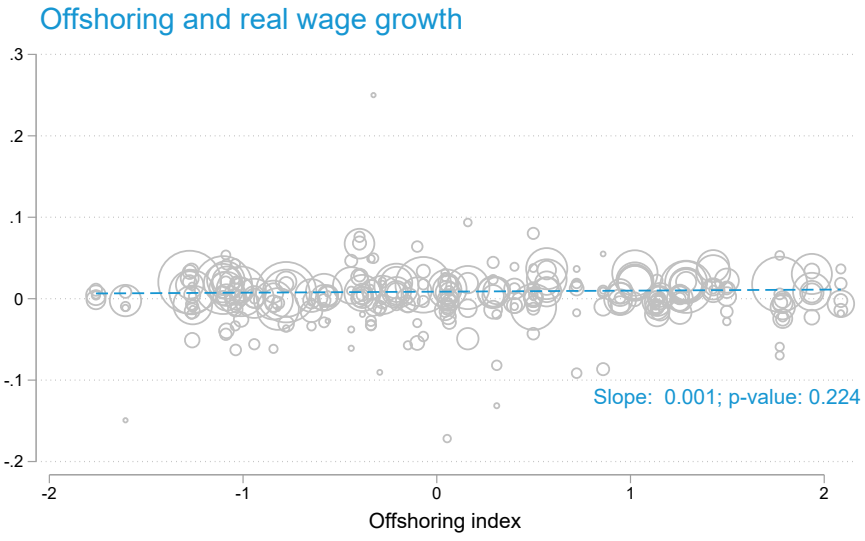
Annual wage growth vs offshoring index, 2003 - 2018



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Alternative autonomy index I

The decision-making index from Deming (2021) includes the following elements:

- 4.A.2.b.1 Making Decisions and Solving Problems
- 4.A.2.b.4 Developing Objectives and Strategies
- 4.A.2.b.6 (Organizing), Planning and Prioritizing Work

Alternative autonomy index II

The extended autonomy index includes the following nine elements:

- 4.A.2.b.1 Making Decisions and Solving Problems
- 4.A.2.b.2 Thinking Creatively
- 4.A.2.b.4 Developing Objectives and Strategies
- 4.C.3.a.2.b Frequency of Decision Making
- 4.A.2.b.6 Organizing, Planning and Prioritizing Work
- 2.A.2.a Critical Thinking
- 2.A.2.d Monitoring
- 4.C.3.d.3 Pace determined by Speed of Equipment (reversed)
- 4.C.3.a.4 Freedom to make decisions

The autonomy wage premium and gender inequality

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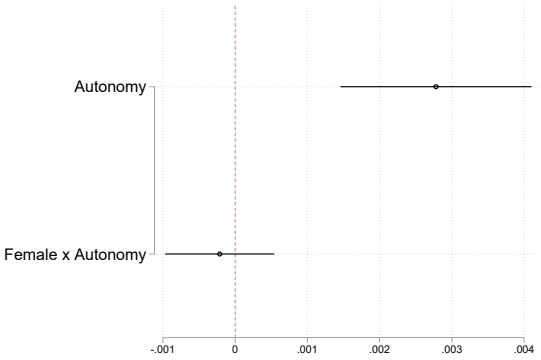
The autonomy wage premium does not affect women and men differently

The autonomy wage premium and gender inequality

The autonomy wage premium does not affect women and men differently



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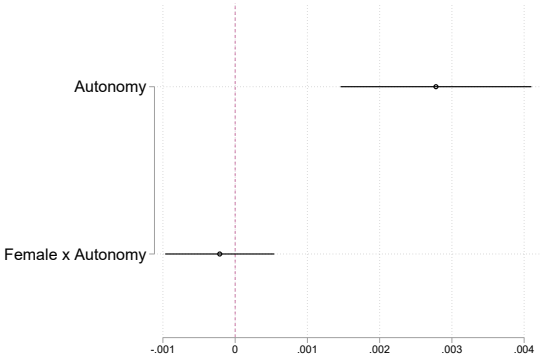

But women are more often employed in low-autonomy occupations

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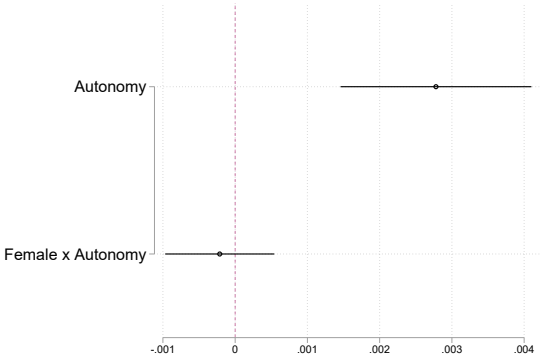

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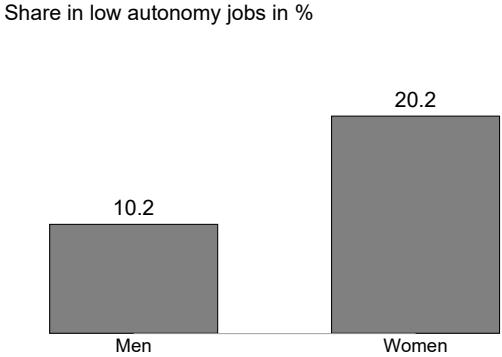
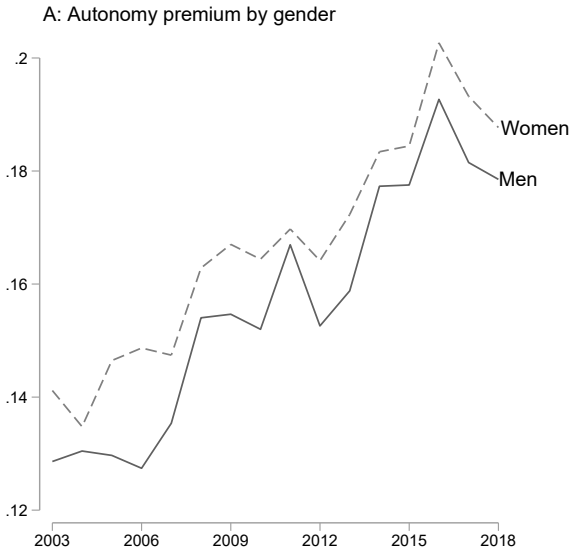
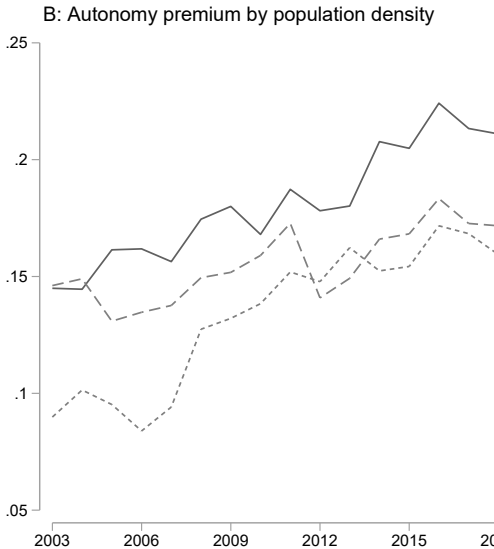
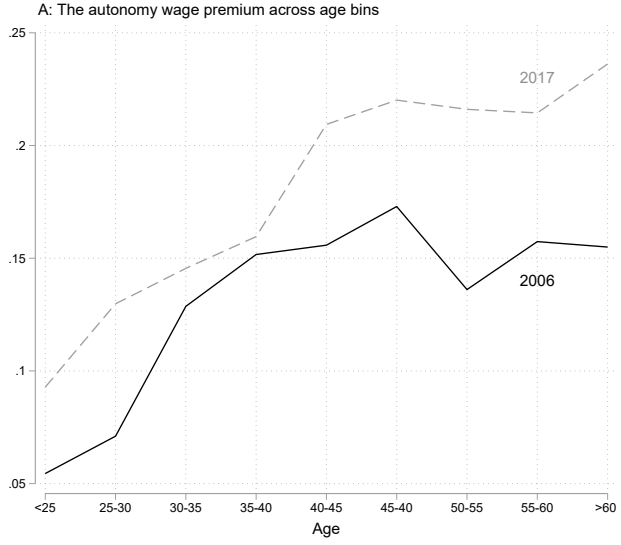


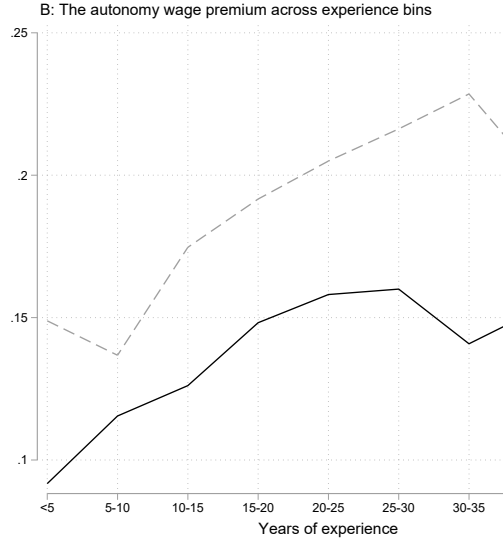
The autonomy premium over time for gender and population density





The autonomy premium along age and experience





High autonomy occupations are at the top of the wage distribution

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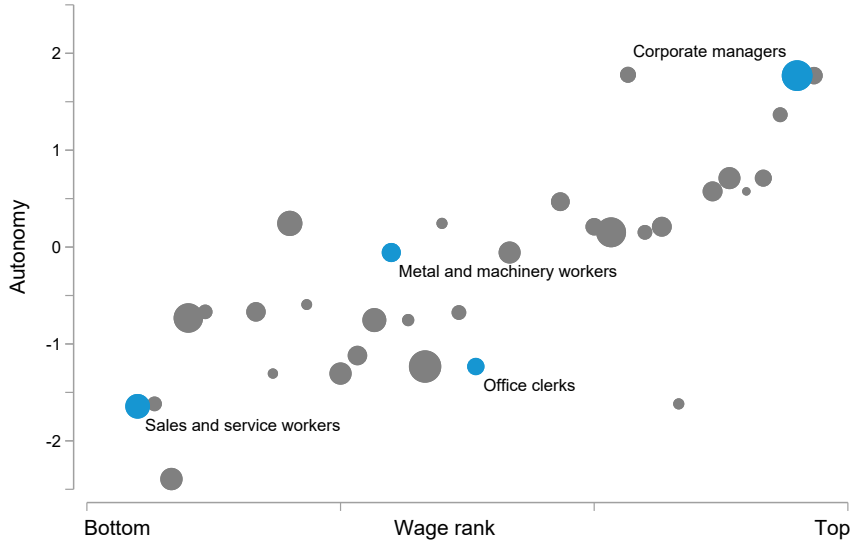

Robustness

Robustness

Table: Robustness 1

	(1) excl. Rou and Off	(2) Return to education	(3) Cognitive anal.
Autonomy	0.0025***	0.0029***	0.0042***
	(0.0005)	(0.0007)	(0.0010)
Routinisation		0.0003	
		(0.0006)	
Offshoring		0.0004	
		(0.0004)	
College return		−0.0006*	
		(0.0003)	
Cognitive analytical (AA)			−0.0019**
			(0.0009)
Women	−0.1919***	−0.1918***	−0.1919***
	(0.0035)	(0.0035)	(0.0035)
Lower sec. educ.	0.0720***	0.0764***	0.0719***
	(0.0071)	(0.0074)	(0.0071)
Upper sec. educ.	0.1704***	0.1796***	0.1702***

Robustness

Robustness

Table: Robustness 2: Alternative measures

	(1) Autonomy (EWCS)	(2) Decision (Deming)	(3) Autonomy alternative	(4) Supervisory ta
Autonomy (EWCS)	0.0047***			
	(0.0010)			
Decision-making (Deming)		0.0027***		
		(0.0006)		
Autonomy altern. index			0.0032***	
			(0.0008)	
Supervisory tasks				0.0025***
				(0.0006)
Routinisation	0.0001	0.0004	0.0010	-0.0004
	(0.0006)	(0.0006)	(0.0007)	(0.0005)
Offshoring	-0.0010**	0.0003	-0.0003	0.0003
	(0.0005)	(0.0004)	(0.0004)	(0.0004)