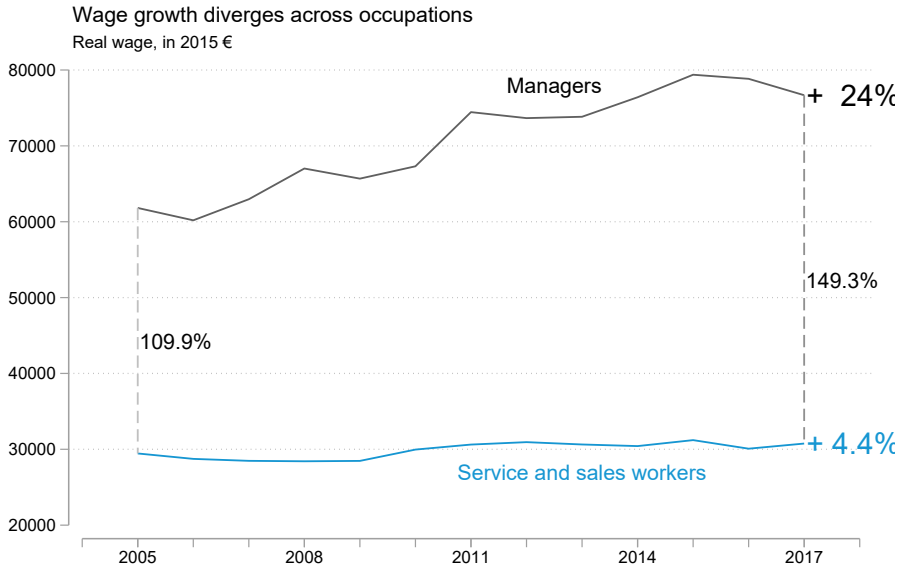
Worker autonomy and wage divergence: Evidence from European survey data

Thomas Rabensteiner Alexander Guschanski

PEGFA and University of Greenwich

May 13, 2022

Wage growth diverges across occupations



Research question

Research question

1. Does worker autonomy explain wage growth differences in Western Europe?

Research question

1. Does worker autonomy explain wage growth differences in Western Europe?

2. What are the technological and institutional determinants of changes in the autonomy wage premium?

Contribution

First cross-country analysis of the relationship between worker autonomy and occupational wage growth

Institutional determinants: Collective bargaining

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)

Worker autonomy

Worker autonomy

Control and influence a worker has over her work process

Worker autonomy

Control and influence a worker has over her work process

Decision-making, planning, strategising, supervising other workers

Worker autonomy

Control and influence a worker has over her work process

Decision-making, planning, strategising, supervising other workers

Worker autonomy and wage growth

Worker autonomy

Control and influence a worker has over her work process

Decision-making, planning, strategising, supervising other workers

Worker autonomy and wage growth

Technological change complements particular skills and tasks

Worker autonomy

Control and influence a worker has over her work process

Decision-making, planning, strategising, supervising other workers

Worker autonomy and wage growth

- Technological change complements particular skills and tasks
- Deming (2021): Increasing demand for decision-making

Worker autonomy index

Worker autonomy index

Main assumption: Autonomy as inherent feature of an occupation

Worker autonomy index

Main assumption: Autonomy as inherent feature of an occupation

O*NET (Bureau of Labour Statistics)

Worker autonomy index

Main assumption: Autonomy as inherent feature of an occupation

O*NET (Bureau of Labour Statistics)

Five index elements

Worker autonomy index

Main assumption: Autonomy as inherent feature of an occupation

O*NET (Bureau of Labour Statistics)

Five index elements

- Making Decisions and Solving Problems

Worker autonomy index

Main assumption: Autonomy as inherent feature of an occupation

O*NET (Bureau of Labour Statistics)

Five index elements

- Making Decisions and Solving Problems
- Thinking Creatively

Worker autonomy index

Main assumption: Autonomy as inherent feature of an occupation

O*NET (Bureau of Labour Statistics)

Five index elements

- Making Decisions and Solving Problems
- Thinking Creatively
- Developing Objectives and Strategies

Worker autonomy index

Main assumption: Autonomy as inherent feature of an occupation

O*NET (Bureau of Labour Statistics)

Five index elements

- Making Decisions and Solving Problems
- Thinking Creatively
- Developing Objectives and Strategies
- Responsibility for Outcomes and Results

Worker autonomy index

Main assumption: Autonomy as inherent feature of an occupation

O*NET (Bureau of Labour Statistics)

Five index elements

- Making Decisions and Solving Problems
- Thinking Creatively
- Developing Objectives and Strategies
- Responsibility for Outcomes and Results
- Frequency of Decision Making

Worker autonomy index

Main assumption: Autonomy as inherent feature of an occupation

O*NET (Bureau of Labour Statistics)

Five index elements

- Making Decisions and Solving Problems
- Thinking Creatively
- Developing Objectives and Strategies
- Responsibility for Outcomes and Results
- Frequency of Decision Making

Firpo et al. (2011) use index to measure decision-making

Wage data

Wage data

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

Wage data

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

Repeated cross-section, 800k observations

Wage data

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

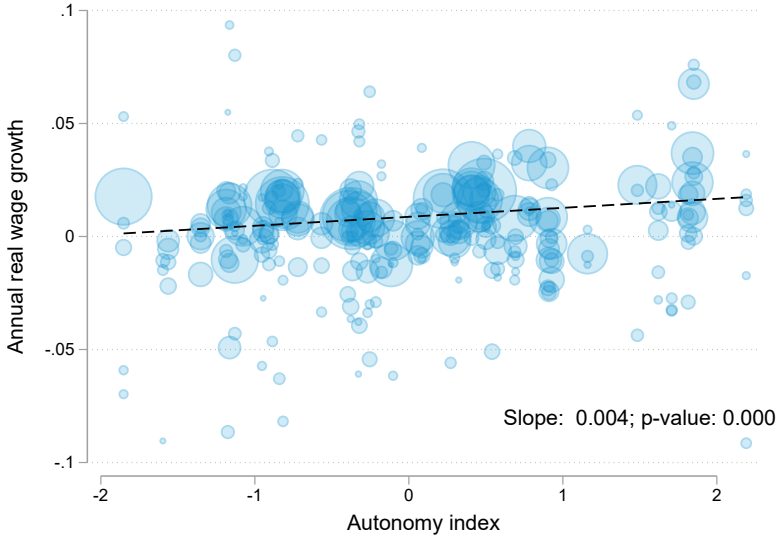
Repeated cross-section, 800k observations

2003-2018, 15 countries; full-time, full-year employees

Empirical analysis

Worker autonomy and wage growth, 2003-2018

Worker autonomy and wage growth, 2003-2018



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

Empirical strategy

Empirical strategy

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

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

Empirical strategy

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

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

A_j, Worker autonomy index

Empirical strategy

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

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

A_j, Worker autonomy index

t, Linear time trend

Empirical strategy

$$\ln(w_{ijkct}) = \beta_1(A_j \times t) + \beta_2(X_j \times t)$$

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

A_j, Worker autonomy index

t, Linear time trend

X_j, Other task-based measures (routinisation, offshoring)

Empirical strategy

$$\ln(w_{ijkct}) = \beta_1(A_j \times t) + \beta_2(X_j \times t) + \mathrm{B}M_{ijkct}$$

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

A_j, Worker autonomy index

t, Linear time trend

X_j, Other task-based measures (routinisation, offshoring)

M_{ijkct}, Demographic control variables (Mincer)

Empirical strategy

$$\ln(w_{ijkct}) = \beta_1(A_j \times t) + \beta_2(X_j \times t) + \mathrm{B}M_{ijkct} + \lambda_{jkc}$$

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

A_j, Worker autonomy index

t, Linear time trend

X_j, Other task-based measures (routinisation, offshoring)

M_{ijkct}, Demographic control variables (Mincer)

λ_{jkc}, Occupation-industry-country dummy

Empirical strategy

$$\ln(w_{ijkct}) = \beta_1(A_j \times t) + \beta_2(X_j \times t) + \mathrm{B}M_{ijkct} + \lambda_{jkc} + \theta_{kct}$$

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

A_j, Worker autonomy index

t, Linear time trend

X_j, Other task-based measures (routinisation, offshoring)

M_{ijkct}, Demographic control variables (Mincer)

λ_{jkc}, Occupation-industry-country dummy

θ_{kct}, Industry-country-year dummy

Empirical strategy

$$\ln(w_{ijkct}) = \beta_1(A_j \times t) + \beta_2(X_j \times t) + \mathrm{B}M_{ijkct} + \lambda_{jkc} + \theta_{kct} + \varepsilon_{ijkct}$$

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

A_j, Worker autonomy index

t, Linear time trend

X_j, Other task-based measures (routinisation, offshoring)

M_{ijkct}, Demographic control variables (Mincer)

λ_{jkc}, Occupation-industry-country dummy

θ_{kct}, Industry-country-year dummy

Main finding

Main finding

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

Main finding

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

Annual wage growth difference

Main finding

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

Annual wage growth difference

High vs. mean autonomy occupation:

Main finding

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

Annual wage growth difference

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

Main finding

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

Annual wage growth difference

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

This effect is statistically significant at the 1%-level

Economic interpretation

Economic interpretation

Wages in mean autonomy occupation grow by 1%

Economic interpretation

Wages in mean autonomy occupation grow by 1%
Wages in a high autonomy occupation grow by 1.27%

Economic interpretation

Wages in mean autonomy occupation grow by 1%
Wages in a high autonomy occupation grow by 1.27%

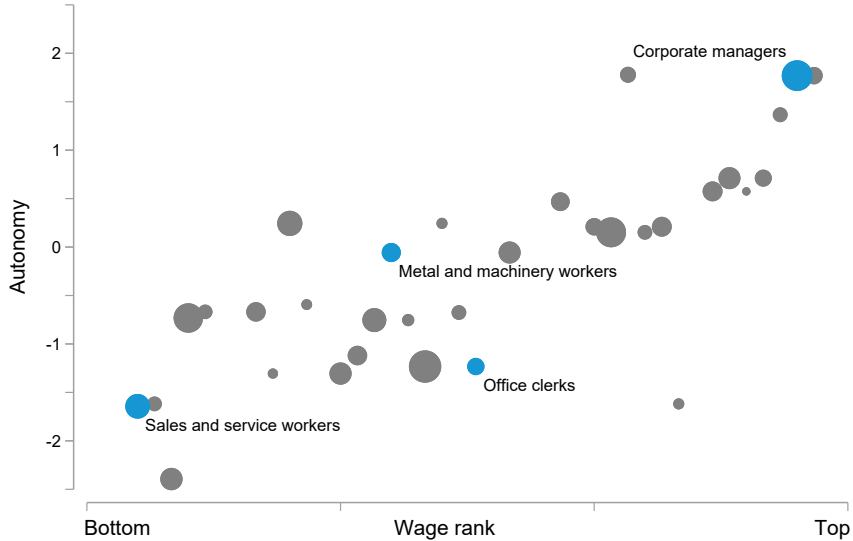
Compounded over 12 years:

Economic interpretation

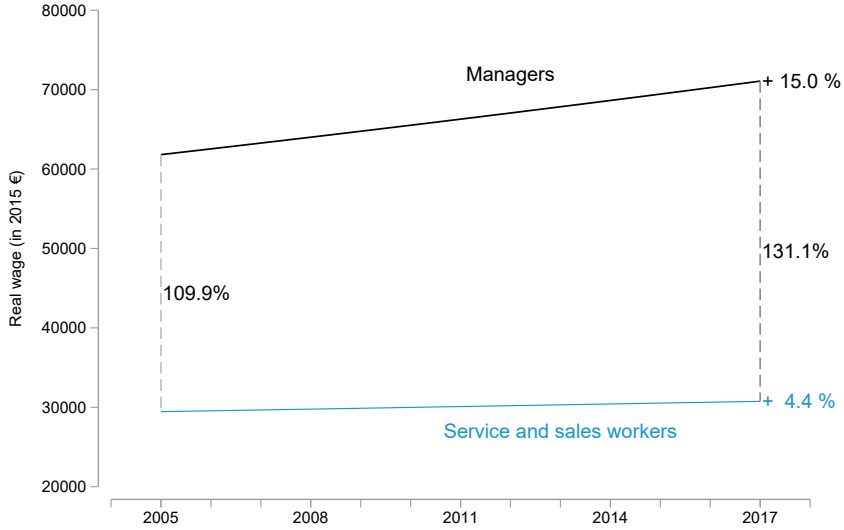
Wages in mean autonomy occupation grow by 1%
Wages in a high autonomy occupation grow by 1.27%

Compounded over 12 years:
Wage level difference of 3.3% (if occupations have same initial wage level)

High autonomy workers are at the top of the wage distribution



Autonomy: Wage gap between *Managers* and *Service workers* 21.2%⇑



Worker autonomy explains wage growth patterns in Western Europe from 2003-2018

Worker autonomy explains wage growth patterns in Western Europe from 2003-2018

~~Routinisation~~

Worker autonomy explains wage growth patterns in Western Europe from 2003-2018

~~Routinisation~~

~~Offshoring~~

Worker autonomy explains wage growth patterns in Western Europe from 2003-2018

~~Routinisation~~

~~Offshoring~~

~~Increasing returns to education~~

Worker autonomy explains wage growth patterns in Western Europe from 2003-2018

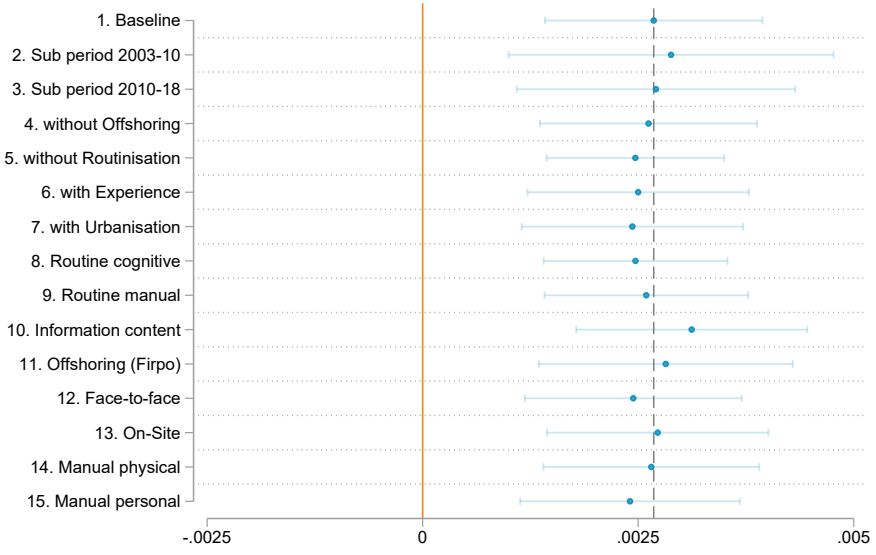
~~Routinisation~~

~~Offshoring~~

~~Increasing returns to education~~

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

Robustness checks



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

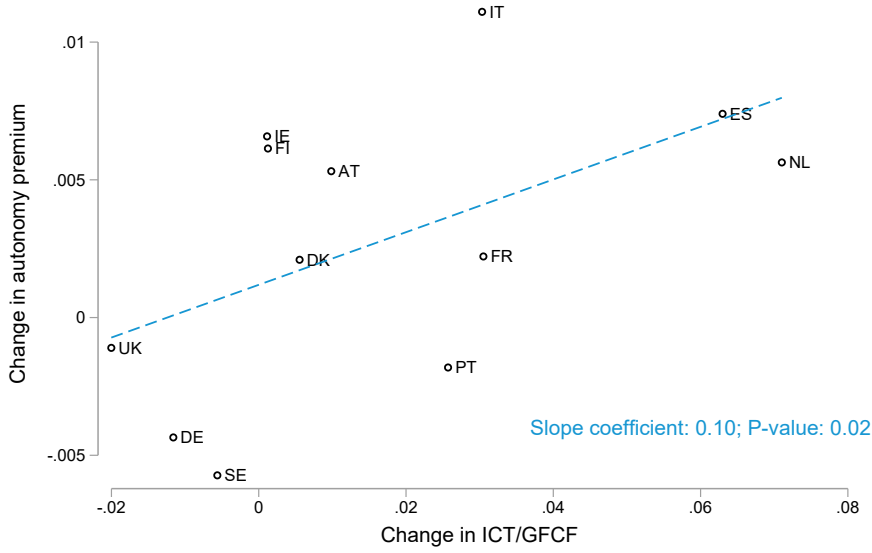
Alternative industry classification

Country exclusion

Industry exclusion

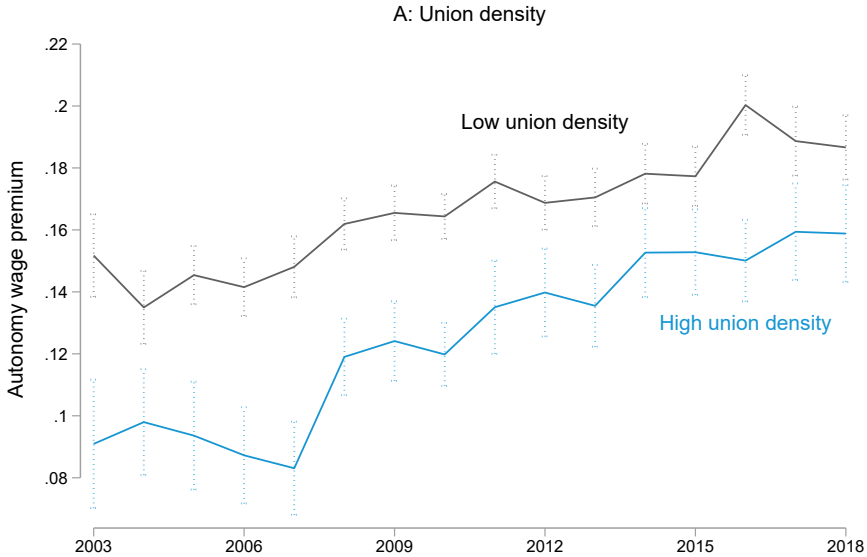
The autonomy premium and technological change

The autonomy premium and technological change



The autonomy wage premium and labour unions

The autonomy wage premium and labour unions



Bottom line

Bottom line

Worker autonomy explains wage growth divergence

Bottom line

Worker autonomy explains wage growth divergence

$\rightarrow$ Increase in wage inequality

Bottom line

Worker autonomy explains wage growth divergence

$\rightarrow$ Increase in wage inequality

Technological change is related to rising autonomy wage premium

Bottom line

Worker autonomy explains wage growth divergence

$\rightarrow$ Increase in wage inequality

Technological change is related to rising autonomy wage premium

Collective bargaining is related to lower autonomy wage premium

Conclusion

Conclusion

Policy

Conclusion

Policy

Technology: Educational measures to re- and upskill workers

Conclusion

Policy

Technology: Educational measures to re- and upskill workers

Collective bargaining: Strengthen bargaining institutions that span across occupations

Conclusion

Policy

Technology: Educational measures to re- and upskill workers

Collective bargaining: Strengthen bargaining institutions that span across occupations

Research

Conclusion

Policy

Technology: Educational measures to re- and upskill workers

Collective bargaining: Strengthen bargaining institutions that span across occupations

Research

Other dimensions of autonomy

Conclusion

Policy

Technology: Educational measures to re- and upskill workers

Collective bargaining: Strengthen bargaining institutions that span across occupations

Research

Other dimensions of autonomy

Employment patterns

Conclusion

Policy

Technology: Educational measures to re- and upskill workers

Collective bargaining: Strengthen bargaining institutions that span across occupations

Research

Other dimensions of autonomy

Employment patterns

Gender dimension

Get in touch

Thomas Rabensteiner

Email: thomas.rabensteiner@greenwich.ac.uk
Twitter: @thomsiaae

Alexander Guschanski

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