Hierarchy and Wage Cyclicality

Yameng Fan Jiaming Huang

Universitat Pompeu Fabra

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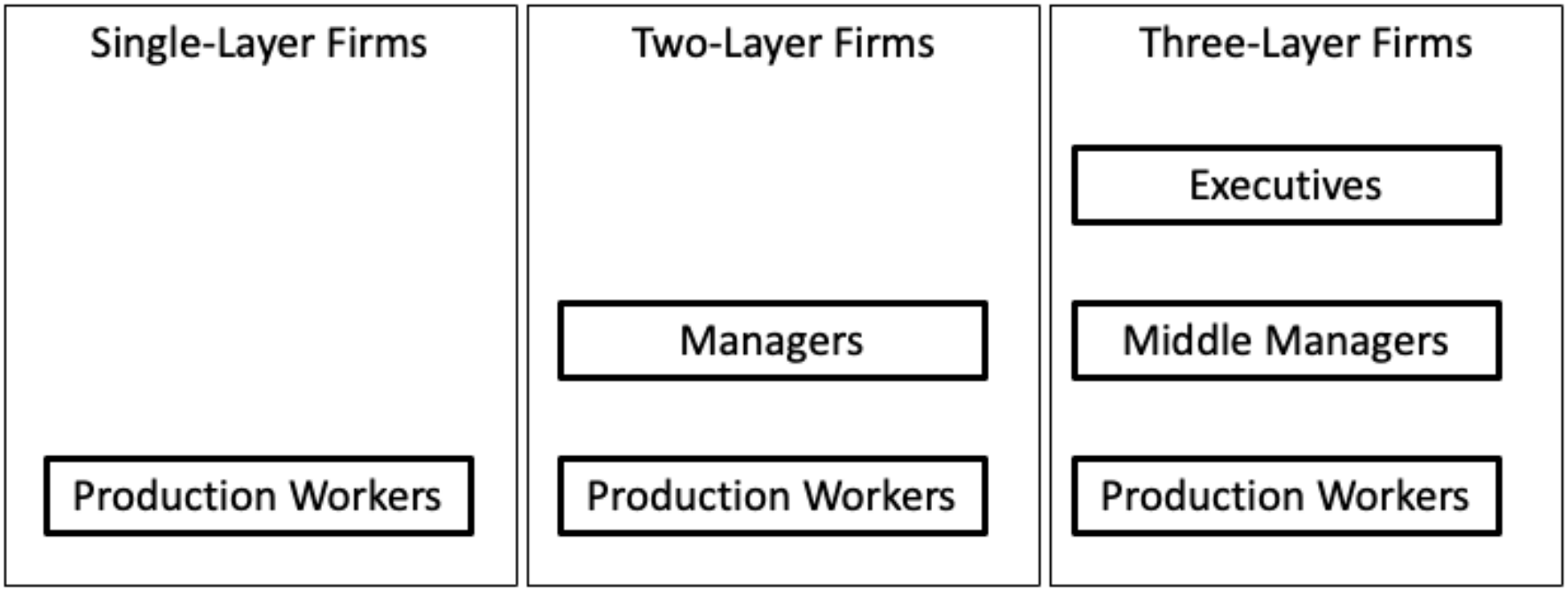
Outline

Motivation

- There is an active area of research on the macroeconomic implications of the internal organization of firms
    - Leading examples are Garicano and Rossi-Hansberg (2006), Caliendo et al. (2015), Giroud and Mueller (2019), Gumpert et al. (2022), Friedrich (2022)
- Existing work mostly focuses on the *long-run*
    - Example: How information and communication technology affects firm organizations; how wages of different hierarchies change as firms add or remove hierarchical layers
- Since internal organization speaks directly to intra-firm surplus sharing, a natural question is: How does it relate to the cyclical properties of wages?

This Paper Asks

- Are wages of managerial workers more cyclical? Are they more asymmetric?
- How does wage cyclicality of production workers respond to changes in managerial power?



Literature

- Wage rigidity
  - Newhires/incumbents and unemployment: Bils (1985), Shimer (2005), Gertler et al. (2020),Bils et al. (2019), Schoefer (2021)
  - Heterogeneity across occupations: Avouyi-Dovi et al. (2013), Barattieri et al. (2014), Sigurdsson (2016), Hazell and Taska (2020)

- Surplus sharing
  - Intra-firm bargaining: Stole and Zwiebel (1996a), Stole and Zwiebel (1996b), Cahuc et al. (2008), Brügemann et al. (2019)

- This project:
  - empirics indicating surplus sharing among workers within the same firms
  - develop a framework to disentangle the effect of marginal productivity and extra bargaining power(future)

Outline

Sampling Process

Sample of Integrated Employer-Employee Data (SIEED)

- Establishments:
  - 1.5% random sample in West Germany, 1975-2010
  - Continuous hierarchies (Caliendo et al. 2015)
  - $\geq$ 20 employees (Song et al. (2015))
- Workers:
  - Full-time, 25 -60 years old
- Wages:
  - Annual real wage deflated by CPI (100 in 2015).
  - Include bonus, no stock.

Hierarchy Definitions following Caliendo et al. (2015)

- **Layer-0: Clerks, operators, production workers**, e.g. Cement, stone and other building material producers (011), Tyre vulcanisers (144), Film, stage and related directors, actors, singers and dancers (835), Judges, lawyers, legal professionals and executory officers (081)
- **Layer-1: Supervisors, engineers, technicians, professionals**, e.g. Architects, civil and structural engineers (603), Mechanical engineering technicians (621), Judges and prosecutors (811), Economists, psychologists, sociologists, political scientists, statisticians (881)
- **Layer-1': Senior experts, middle managers**, e.g. Forepersons and other operations managers (629), Navigators, nautical ships' officers and pilots (721), Management, personnel and other business consultants (752), Senior and administrative state officials (762)
- **Layer-2: Entrepreneurs, managing directors and division managers (751)**

Summary Stats: worker characteristics

Def: hier2

Number of Layers

- Following Caliendo et al. (2015), we use number of layers as a measure of firm hierarchy.
  - Select full-time, regular workers (>13 weeks in establishment e in a given year, as in Song et al. (2015))
  - Consider a firm have H layers in year t as long as $emp_{h,t} > 0$ $\forall h \in \{0, 1, ...H-1\}$
  - Firms without consecutive layers are excluded(non-CMR firms). Summary Stats: firm selection
  - $H = \{0, 1, 2\}$: consider layer 1 and layer 2 as the same layer.
- Multi-layer firms generally have higher average wages, more educated workers, and less female workers; the firms are also older and larger Summary Stats by Firm Organization

Span of Control

- For each hierarchy we measure the span of control as the relative size of employees "under control":

$$S_{h,t} = \frac{\sum_{l=0}^{h-1} NumWorkers_{l,t}}{NumWorkers_{h,t}}, \quad S_{0,t} = 0 \tag{1}$$

where $NumWorkers_{h,t}$ is the number of workers at hierarchy h.

- The span of control serves as a proxy for the power of a hierarchy.

	Firm 1	Firm 2
Executive	0	1
Manager	1	2
Production Worker	10	5
S_2	/	7
S_1	10	2.5
S_0	0	0

Table: Example: Span of Control

Outline

Baseline Model

$$\ln w_{ift} = y_t\beta + y_t \cdot S_{h_i,f,t-1}\theta + x'_{ift}\gamma + \lambda_{if} + \epsilon_{ift}$$

- Following Carneiro et al. (2012)
- y_t is the cyclical indicator
  - Real GDP (per capita) change
- $S_{h_i,f,t}$ is the span of control of worker i of hierarchy h_i at firm f in year t.
- x_{ift} includes worker age, age squared, tenure (in establishment f), education, firm age, log firm size, the share of workers with university degree, linear and quadratic time trend
- λ_{if} includes worker and firm FE
- **Parameter of interest: θ represents the excess cyclicality of worker i when his span of control is larger.**

Baseline Model: Asymmetric Wage Adjustment

$$\begin{aligned}\ln w_{ift} =& y_t^+ \beta^+ + y_t^+ \cdot S_{h_i,f,t-1}\theta^+ + y_t^- \beta^- + y_t^- \cdot S_{h_i,f,t-1}\theta^- \\ &+ x'_{ift}\gamma + \lambda_{if} + \epsilon_{ift}\end{aligned}$$

- y_t^+ (y_t^-) equals y_t if y_t is positive (negative), and zero otherwise
- Parameter of interest:
  - In the presence of asymmetric wage adjustment, we should expect β^+ to be different from β^-
  - θ^+ (θ^-) represents the excess cyclicality during boom (bust)

Results

Table: Wage Cyclicality and Span of Control (all firms)

	ΔGDPpp		ΔGDP	
y_t	0.1920***		0.1995***	
	(0.0047)		(0.0050)	
$S_{h_i,f,t-1}$	0.0119***	0.0055*	0.0120***	0.0048*
	(0.0022)	(0.0022)	(0.0022)	(0.0022)
$y_t \cdot S_{h_i,f,t-1}$	-0.0003		-0.0007	
	(0.0005)		(0.0006)	
y_t^+		0.1879***		0.1775***
		(0.0090)		(0.0114)
$y_t^+ \cdot S_{h_i,f,t-1}$		0.0027**		0.0046***
		(0.0009)		(0.0011)
y_t^-		0.2003***		0.2243***
		(0.0118)		(0.0125)
$y_t^- \cdot S_{h_i,f,t-1}$		-0.0061***		-0.0069***
		(0.0014)		(0.0014)
# obs	2,316,934	2,316,934	2,316,934	2,316,934
W + F FEs	✓	✓	✓	✓

strongly procyclical

$+\ p < 0.1$, $*\ p < 0.05$, $**\ p < 0.01$, $***\ p < 0.001$. The span of control of executives have mean 58.4 and standard deviation 123.5.

Results

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	(0.0022)	(0.0022)	(0.0022)	(0.0022)
$y_t \cdot S_{h_i,f,t-1}$	-0.0003		-0.0007	
	(0.0005)		(0.0006)	
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		(0.0090)		(0.0114)
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		(0.0009)		(0.0011)
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# obs	2,316,934	2,316,934	2,316,934	2,316,934
W + F FEs	✓	✓	✓	✓

managers enjoy pay rise in boom

managers avoid pay cut in recession

$+\ p < 0.1$, $*\ p < 0.05$, $**\ p < 0.01$, $***\ p < 0.001$. The span of control of executives have mean 58.4 and standard deviation 123.5.

PW Wage Cyclicality Across Organizations

$$\ln w_{ift} = y_t\beta + \sum_{h=1}^{2} \mathbf{1}\{O_{f,t-1} = h\} \cdot [\rho_h + y_t \cdot \theta_h] + x'_{ift}\gamma + \lambda_{if} + \epsilon_{ift}$$

$$\ln w_{ift} = y_t^+\beta^+ + \sum_{h=1}^{2} \mathbf{1}\{O_{f,t-1} = h\} \cdot [\rho_h + y_t^+ \cdot \theta_h^+]$$

$$+ y_t^-\beta^- + \sum_{h=1}^{2} \mathbf{1}\{O_{f,t-1} = h\} \cdot [\rho_h + y_t^- \cdot \theta_h^-] + x'_{ift}\gamma + \lambda_{if} + \epsilon_{ift}$$

- Similar to the baseline specifications
- $O_{f,t}$ is categorical variable that equals h for a firm with h layers

Results

Table: Wage Cyclicality Across Organizations

	ΔGDP pp$_t$		ΔGDP$_t$	
y_t	0.0915***		0.104***	
	(0.0133)		(0.0135)	
$\mathbf{1}\{O_{f,t-1}=1\}$	-0.6169***	-0.9666**	-0.6274***	-1.1730***
	(0.1020)	(0.1096)	(0.1020)	(0.1114)
$\mathbf{1}\{O_{f,t-1}=2\}$	-0.7227***	-0.8744**	-0.7240***	-1.0929***
	(0.1147)	(0.1207)	(0.1147)	(0.1222)
$y_t \times 1\{O_{f,t-1}=1\}$	-0.0194		-0.0096	
	(0.0162)		(0.0006)	
$y_t \times 1\{O_{f,t-1}=2\}$	0.1524***		0.1667***	
	(0.0146)		(0.0151)	
y_t^+		-0.0300		-0.1193***
		(0.0259)		(0.0308)
$y_t^+ \times \mathbf{1}\{O_{f,t-1}=1\}$		0.1790***		0.3514***
		(0.0297)		(0.0354)
$y_t^+ \times \mathbf{1}\{O_{f,t-1}=2\}$		0.2393***		0.4114***
		(0.0279)		(0.0332)
y_t^-		0.2638***		0.3431***
		(0.0314)		(0.0327)
$y_t^- \times \mathbf{1}\{O_{f,t-1}=1\}$		-0.2997***		-0.3959***
		(0.0372)		(0.0382)
$y_t^- \times \mathbf{1}\{O_{f,t-1}=2\}$		0.0315		-0.0971**
		(0.0348)		(0.0359)
# obs	1,782,898	1,782,898	1,782,898	1,782,898
W + F FEs	✓	✓	✓	✓

strongly procyclical

more so for multi-layer firms

Results

Table: Wage Cyclicality Across Organizations

	ΔGDP pp$_t$		ΔGDP$_t$	
y_t	0.0915***		0.104***	
	(0.0133)		(0.0135)	
$\mathbf{1}\{O_{f,t-1}=1\}$	-0.6169***	-0.9666**	-0.6274***	-1.1730***
	(0.1020)	(0.1096)	(0.1020)	(0.1114)
$\mathbf{1}\{O_{f,t-1}=2\}$	-0.7227***	-0.8744**	-0.7240***	-1.0929***
	(0.1147)	(0.1207)	(0.1147)	(0.1222)
$y_t \times 1\{O_{f,t-1}=1\}$	-0.0194		-0.0096	
	(0.0162)		(0.0006)	
$y_t \times 1\{O_{f,t-1}=2\}$	0.1524***		0.1667***	
	(0.0146)		(0.0151)	
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y_t^-		0.2638***		0.3431***
		(0.0314)		(0.0327)
$y_t^- \times \mathbf{1}\{O_{f,t-1}=1\}$		-0.2997***		-0.3959***
		(0.0372)		(0.0382)
$y_t^- \times \mathbf{1}\{O_{f,t-1}=2\}$		0.0315		-0.0971**
		(0.0348)		(0.0359)
# obs	1,782,898	1,782,898	1,782,898	1,782,898
W + F FEs	✓	✓	✓	✓

wage do not increase in boom in 1-layer firm

wage do increase in boom in multi-layer firm

Results

Table: Wage Cyclicality Across Organizations

	ΔGDP pp$_t$		ΔGDP$_t$	
y_t	0.0915***		0.104***	
	(0.0133)		(0.0135)	
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	(0.1020)	(0.1096)	(0.1020)	(0.1114)
$\mathbf{1}\{O_{f,t-1}=2\}$	-0.7227***	-0.8744**	-0.7240***	-1.0929***
	(0.1147)	(0.1207)	(0.1147)	(0.1222)
$y_t \times 1\{O_{f,t-1}=1\}$	-0.0194		-0.0096	
	(0.0162)		(0.0006)	
$y_t \times 1\{O_{f,t-1}=2\}$	0.1524***		0.1667***	
	(0.0146)		(0.0151)	
y_t^+		-0.0300		-0.1193***
		(0.0259)		(0.0308)
$y_t^+ \times \mathbf{1}\{O_{f,t-1}=1\}$		0.1790***		0.3514***
		(0.0297)		(0.0354)
$y_t^+ \times \mathbf{1}\{O_{f,t-1}=2\}$		0.2393***		0.4114***
		(0.0279)		(0.0332)
y_t^-		0.2638***		0.3431***
		(0.0314)		(0.0327)
$y_t^- \times \mathbf{1}\{O_{f,t-1}=1\}$		-0.2997***		-0.3959***
		(0.0372)		(0.0382)
$y_t^- \times \mathbf{1}\{O_{f,t-1}=2\}$		0.0315		-0.0971**
		(0.0348)		(0.0359)
# obs	1,782,898	1,782,898	1,782,898	1,782,898
W + F FEs	✓	✓	✓	✓

wage decrease in recession in 1-layer firm

mixed effects in recession in multi-layer firm

PW Wage Cyclicality and Managerial Power

$$\ln w_{ift} = y_t\beta + y_t \cdot S_{2,f,t-1}\theta + x'_{ift}\gamma + \lambda_{if} + \epsilon_{ift}$$

$$\begin{aligned}\ln w_{ift} =& y_t^+\beta^+ + y_t^+ \cdot S_{2,f,t-1}\theta^+ + y_t^-\beta^- + y_t^- \cdot S_{2,f,t-1}\theta^- \\ &+ x'_{ift}\gamma + \lambda_{if} + \epsilon_{ift}\end{aligned}$$

- Only include production workers and multi-layer firms
- $S_{2,f,t-1}$ the span of control of executives
  - θ now measures the excess cyclicality associated with higher power of executives

Results

Table: Wage Cyclicality and Executive Span of Control

	ΔGDPpp		ΔGDP	
y_t	0.2564***		0.2772***	
	(0.0070)		(0.0001)	
$S_{2,f,t-1}$	0.0013***	0.0015***	0.0012***	0.0013***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
$y_t \cdot S_{2,f,t-1}$	-0.0001		0.0000	
	(0.0000)		(0.0000)	
y_t^+		0.1656***		0.2088***
		(0.0124)		(0.0166)
$y_t^+ \cdot S_{2,f,t-1}$		-0.0001***		-0.0000
		(0.0000)		(0.0000)
y_t^-		0.3685***		0.3477***
		(0.0187)		(0.0195)
$y_t^- \cdot S_{2,f,t-1}$		0.0002***		0.0001*
		(0.0000)		(0.0000)
# obs	1,106,151	1,106,151	1,106,151	1,106,151
W + F FEs	✓	✓	✓	✓

higher wage **level**

$+$ $p < 0.1$, $*$ $p < 0.05$, $**$ $p < 0.01$, $***$ $p < 0.001$. The span of control of executives have mean 58.4 and standard deviation 123.5.

Results

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	(0.0001)	(0.0001)	(0.0001)	(0.0001)
$y_t \cdot S_{2,f,t-1}$	-0.0001		0.0000	
	(0.0000)		(0.0000)	
y_t^+		0.1656***		0.2088***
		(0.0124)		(0.0166)
$y_t^+ \cdot S_{2,f,t-1}$		-0.0001***		-0.0000
		(0.0000)		(0.0000)
y_t^-		0.3685***		0.3477***
		(0.0187)		(0.0195)
$y_t^- \cdot S_{2,f,t-1}$		0.0002***		0.0001*
		(0.0000)		(0.0000)
# obs	1,106,151	1,106,151	1,106,151	1,106,151
W + F FEs	✓	✓	✓	✓

smaller pay rise when managers have power

$+ \; p < 0.1, \quad * \; p < 0.05, \quad * * \; p < 0.01, \quad * * * \; p < 0.001$. The span of control of executives have mean 58.4 and standard deviation 123.5.

Results

Table: Wage Cyclicality and Executive Span of Control

	ΔGDPpp		ΔGDP	
y_t	0.2564***		0.2772***	
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$S_{2,f,t-1}$	0.0013***	0.0015***	0.0012***	0.0013***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
$y_t \cdot S_{2,f,t-1}$	-0.0001		0.0000	
	(0.0000)		(0.0000)	
y_t^+		0.1656***		0.2088***
		(0.0124)		(0.0166)
$y_t^+ \cdot S_{2,f,t-1}$		-0.0001***		-0.0000
		(0.0000)		(0.0000)
y_t^-		0.3685***		0.3477***
		(0.0187)		(0.0195)
$y_t^- \cdot S_{2,f,t-1}$		0.0002***		0.0001*
		(0.0000)		(0.0000)
# obs	1,106,151	1,106,151	1,106,151	1,106,151
W + F FEs	✓	✓	✓	✓

larger pay cut when managers have power

$+ \; p < 0.1, \quad * \; p < 0.05, \quad * * \; p < 0.01, \quad * * * \; p < 0.001$. The span of control of executives have mean 58.4 and standard deviation 123.5.

Production Worker versus Managers

$$\ln w_{ift} = y_t\beta + y_t \cdot S_{h_i,f,t-1}\theta + x'_{ift}\gamma + \lambda_{if} + \epsilon_{ift}$$

$$\begin{aligned}\ln w_{ift} =& y_t^+\beta^+ + y_t^+ \cdot S_{h_i,f,t-1}\theta^+ + y_t^-\beta^- + y_t^- \cdot S_{h_i,f,t-1}\theta^- \\ &+ x'_{ift}\gamma + \lambda_{if} + \epsilon_{ift}\end{aligned}$$

- Same as in the baseline specification, but only include multi-layer firms

Results

Table: Wage Cyclicality and Span of Control (firms with CEOs)

	ΔGDPpp		ΔGDP	
y_t	0.2485***		0.2630***	
	(0.0062)		(0.0068)	
$S_{h_i,f,t-1}$	0.0102***	0.0043+	0.0102***	0.0040+
	(0.0023)	(0.0024)	(0.0023)	(0.0023)
$y_t \cdot S_{h_i,f,t-1}$	-0.0007		-0.0011$^+$	
	(0.0005)		(0.0006)	
y_t^+		0.1577***		0.1219***
		(0.0117)		(0.0151)
$y_t^+ \cdot S_{h_i,f,t-1}$		0.0021*		0.0035**
		(0.0008)		(0.0010)
y_t^-		0.3890***		0.4209***
		(0.0158)		(0.0166)
$y_t^- \cdot S_{h_i,f,t-1}$		-0.0061***		-0.0066***
		(0.0016)		(0.0015)
# obs	1,486,742	1,486,742	1,486,742	1,486,742
W + F FEs	✓	✓	✓	✓

within the same firm type, wage growth gets more positively skewed as span of control increases

$+$ $p < 0.1$, $*$ $p < 0.05$, $**$ $p < 0.01$, $***$ $p < 0.001$. The span of control of executives have mean 58.4 and standard deviation 123.5.

Outline

Summary

- Workers face different levels of wage risks depending on their position and firm structure
- Production workers in single-layer firms have the highest wage risks, which are negatively skewed
  - Their wages do not increase in good times, but decrease in bad times
- Executives in multi-layer firms have the lowest wage risks, which are positively skewed
  - Their wages increase significantly in good times, but remain stable in bad times
- Production workers in multi-layer firms have moderate wage risks, depending on the managerial power of the top
  - Their wages increase in good times, but also decrease in bad times
  - Higher managerial power shifts the distribution of wage risks to the left

Appendix

Summary Statistics: Worker Characteristics by Hierarchy (FIRM SIZE≥20)

hierarchy	variable	N	mean	sd	p25	p50	p75	p95
0	age	5,196,334	40.80	9.72	32	40	49	57
	tenure	5,196,334	6.47	5.98	1.98	4.54	9.35	19.01
	gender	5,196,334	0.31	0.46	0	0	1	1
	education	5,118,513	1.86	0.48	2	2	2	3
	complexity	5,052,961	2.07	0.49	2	2	2	3
	(log) wage	5,152,850	4.59	0.39	4.39	4.59	4.80	5.21
1	age	954,608	40.19	9.33	32	39	47	57
	tenure	954,608	6.16	5.87	1.75	4.00	9.01	18.68
	gender	954,608	0.26	0.44	0	0	1	1
	education	950,981	2.43	0.53	2	2	3	3
	complexity	954,608	3.31	0.73	3	3	4	4
	(log) wage	948,651	4.98	0.45	4.70	4.95	5.25	5.76
1'	age	161,128	41.40	9.49	33	41	49	57
	tenure	161,128	6.67	6.19	2	4.58	9.76	19.90
	gender	161,128	0.18	0.39	0	0	0	1
	education	159,916	2.35	0.54	2	2	3	3
	complexity	161,128	3.39	0.58	3	3	4	4
	(log) wage	160,326	5.05	0.47	4.78	5.03	5.33	5.83
2	age	148,479	45.64	8.82	38	45	52	58
	tenure	148,479	6.59	6.11	2	4.51	9.65	19.35
	gender	148,479	0.16	0.37	0	0	0	1
	education	146,660	2.30	0.50	2	2	3	3
	complexity	148,479	3	0	3	3	3	3
	(log) wage	148,043	5.07	0.52	4.83	5.13	5.37	5.79

back

Definition of Layer-2 Workers

According to Caliendo et al. (2015), Layer-1' includes the following occupations:

629	Industriemeister, Werkmeister	foreman, foreman
721	Nautiker	navigators
722	Technische Schiffsoffiziere, Schiffsmaschinisten	ship's engineering officers, ship's machinists
724	Binnenschiffer	barges
752	Unternehmensberater, Organisatoren	business consultants, organizers
753	Wirtschaftsprüfer, Steuerberater	auditors, tax consultants
761	Abgeordnete, Minister, Wahlbeamte	deputies, ministers, electoral officials
762	Leitende, administrativ entscheidende Verwaltungsfachleute	Senior, administratively decisive administrators
763	Verbandsleiter, Funktionäre	association leaders, officials

So in the remaining analysis we merge layer-1 and layer-2 and refer to the merged laryer as "middle managers" back

Firm Selection

Table: Firm Characteristics by Firm Organizations (Firm Size≥20)

	variable	N	mean	sd	p25	p50	p75	p95
CMR firms	firm size	53,734	114.41	382.14	26	41	87	364
	firm age	53,734	15.79	11.38	6	14	24	38
	(log) wage	53,734	4.59	0.31	4.43	4.60	4.77	5.09
	worker age	53,734	41.22	3.74	38.75	41.36	43.78	47.24
	high skill share	53,734	0.12	0.18	0	0.05	0.14	0.55
Non-CMR firms	firm size	23,659	60.89	105.47	26	38	66	163
	firm age	23,659	14.11	10.88	5.00	12.00	21.00	36.00
	(log) wage	23,659	4.57	0.30	4.40	4.57	4.75	5.08
	worker age	23,659	40.70	3.63	38.20	40.75	43.13	46.74
	high skill share	23,659	0.11	0.18	0.00	0.04	0.11	0.57

back

Firm Selection

Table: Worker Characteristics by Firm Organization (FirmSize≥20)

MaxLayer	variable	N	mean	sd	p25	p50	p75	p95
CMR firms	age	6,147,832	41.47	9.70	33	41	49	57
	gender	6,147,832	0.28	0.45	0	0	1	1
	education	6,069,068	2.01	0.56	2	2	2	3
	complexity	5,999,027	2.35	0.78	2	2	3	4
	(log) wage	6,103,047	4.74	0.44	4.49	4.70	4.98	5.52
Non-CMR firms	age	1,440,563	40.64	9.78	32	40	49	57
	gender	1,440,563	0.32	0.46	0	0	1	1
	education	1,419,612	1.97	0.50	2	2	2	3
	complexity	1,407,104	2.24	0.68	2	2	2	4
	(log) wage	1,428,478	4.59	0.45	4.34	4.58	4.84	5.35

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Worker Characteristics by Firm Organization

Table: Worker Characteristics by Firm Organization (FirmSize≥20)

MaxLayer	variable	N	mean	sd	p25	p50	p75	p95
0	age	618,475	40.66	9.83	32	40	49	57
	gender	618,475	0.30	0.46	0	0	1	1
	education	606,124	1.88	0.43	2	2	2	2
	complexity	599,103	1.98	0.36	2	2	2	2
	(log) wage	612,532	4.45	0.44	4.22	4.48	4.69	5.12
1	age	940,120	41.26	9.88	33	41	49	57
	gender	940,120	0.36	0.48	0	0	1	1
	education	930,064	2.01	0.50	2	2	2	3
	complexity	923,861	2.25	0.79	2	2	2	4
	(log) wage	931,139	4.59	0.40	4.40	4.59	4.79	5.23
1'	age	893,489	41.84	9.86	33	42	50	58
	gender	893,389	0.30	0.46	0	0	1	1
	education	887,162	2.00	0.54	2	2	2	3
	complexity	875,078	2.31	0.76	2	2	2	4
	(log) wage	886,975	4.67	0.37	4.47	4.64	4.85	5.32
2	age	3,695,748	41.57	9.59	33	41	49	57
	gender	3,695,748	0.25	0.43	0	0	1	1
	education	3,645,718	2.04	0.59	2	2	2	3
	complexity	3,600,985	2.44	0.81	2	2	3	4
	(log) wage	3,672,401	4.84	0.43	4.57	4.80	5.09	5.63

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Firm Characteristics by Firm Organization

Table: Firm Characteristics by Firm Organization (Firm Size≥20)

MaxLayer	variable	N	mean	sd	p25	p50	p75	p95
0	firm size	15,600	39.65	32.58	23	29	42	96
	firm age	15,600	14.03	10.64	5	12	21	34
	(log) wage	15,600	4.43	0.31	4.25	4.47	4.62	4.91
	worker age	15,600	40.56	3.93	38	41	43	47
	high skill share	15,600	0.03	0.08	0.00	0.00	0.04	0.14
1	firm size	16,873	55.72	84.84	25	35	56	155
	firm age	16,873	15.49	10.90	6	14	23	36
	(log) wage	16,873	4.56	0.26	4.43	4.58	4.71	4.98
	worker age	16,873	41.26	3.75	39	41	44	47
	high skill share	16,873	0.12	0.19	0.00	0.05	0.14	0.58
1'	firm size	7,292	122.53	256.22	32	57	120	397
	firm age	7,292	17.58	11.86	8	16	27	39
	(log) wage	7,292	4.66	0.24	4.52	4.66	4.79	5.05
	worker age	7,292	41.84	3.72	39	42	44	48
	high skill share	7,292	0.15	0.19	0.03	0.08	0.19	0.58
2	firm size	13,969	264.57	696.15	52	101	226	820
	firm age	13,969	17.17	12.15	7	15	26	40
	(log) wage	13,969	4.77	0.28	4.59	4.76	4.94	5.25
	worker age	13,969	41.59	3.41	40	42	44	47
	high skill share	13,969	0.19	0.21	0.04	0.11	0.27	0.65

back

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