Labor Market Competition and Inequality

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Labor market inequality

- Traditional (competitive) view of wage inequality $\rightarrow$ you earn what you are
  - supply side, e.g., schooling
  - demand side, e.g., biased technological change
  - institutions, e.g., minimum wage

Labor market inequality and firms

- Traditional (competitive) view of wage inequality $\rightarrow$ you earn what you are
  - supply side, e.g., schooling
  - demand side, e.g., biased technological change
  - institutions, e.g., minimum wage
- Firms $\neq$ price takers $\rightarrow$ place them at the center academic and policy debate
  - widespread wage differences across firms, regardless of the "who"
    (Card, Cardoso, Heining, and Kline, 2018)
  - firms' labor market power is a global phenomenon
    (Manning, 2021, Armangué-Jubert, Guner, and Ruggieri, 2024)
  - monopsony theory links labor market power and firm-driven wage inequality
    (Robinson, 1933; Burdett and Mortensen, 1998; Manning, 2003)

This paper in a nutshell

- *Does wage inequality and labor market competition evolve together?*
  - higher inequality in less competitive markets in the cross-section (Weber, 2015; Bassier, 2023)
  - inequality falls after crisis episodes due to increased labor market competition (Autor et al., 2024; Dustmann et al., 2024)
  - what about the (long-run) dynamics? **This paper** contribution to the literature

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  - what about the (long-run) dynamics? **This paper** contribution to the literature

- Using Lithuanian Social Security data spanning two decades
  1. the role of firm-specific wage components in wage inequality over development
     - firms explain almost entirely the dynamics of inequality along the development path
  2. the evolution of labor market competition over economic growth
     - negative gradient between firm's labor market power and economic growth
  3. do they move together?
     - if competition and inequality were not correlated, the fall in inequality would be 17% lower
  4. suggestive evidence of employment outside options from EU labor markets as the catalyst
     - EU LD expanded the most $\equiv$ LT sectors where competition (inequality) increase (decreased) more

Lithuanian context offers an interesting case to assess the joint dynamics of wage inequality and labor market competition in the long-run

- The economy more than doubled in size $\rightarrow$ from low- to high-income country growth
- Sharp decline in wage inequality, e.g., Gini halved between 2000 and 2020 Gini and co.
- Critical changes in the labor market since joining the EU in 2004 LM
  - MW flagship policy to boost income at the bottom, increased by $\sim$235% in real terms
  - the number of firms per worker as well as the labor share have risen
  - (labor) market concentration & wage markdowns has been steadily declining (Ding, Garcia-Louzao, and Jouvanceau, 2023)

Firms and workers in the variance of wages

From the AKM model (Abowd, Kramarz, and Margolis, 1999)

$$\underbrace{y_{it}}_{\text{log wages}} = \underbrace{\eta_i}_{\text{worker FE}} + \underbrace{\psi_{j(i,t)}}_{\text{firm FE}} + \underbrace{X_{it}\Omega}_{\text{age,time}} + \underbrace{\epsilon_{it}}_{\text{residuals}}$$

to the variance decomposition

$$\begin{aligned} var(y_{it}) &= var(\eta_i) + var(\psi_{j(i,t)}) + var(X_{it}\Omega) + var(\epsilon_{it}) \\ &+ 2 \times \left[\underbrace{cov(\eta_i, \psi_{j(i,t)})}_{\text{sorting}} + cov(\eta_i, X_{it}\Omega) + cov(\psi_{j(i,t)}, X_{it}\Omega) \right] \end{aligned}$$

identifying assumptions

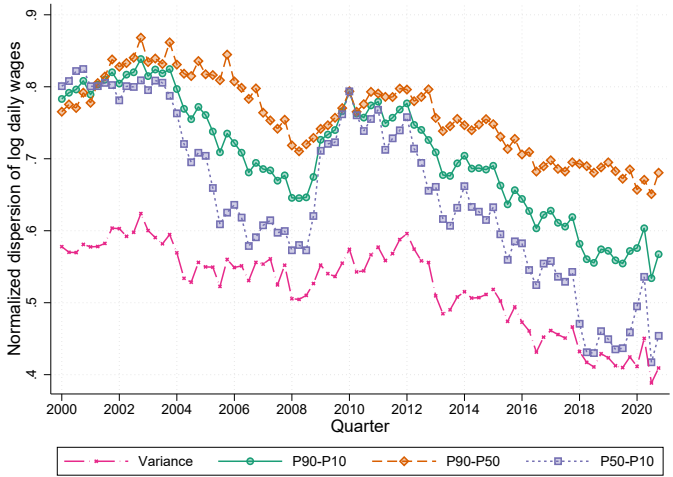
Social Security data

- Administrative data from the *State Social Insurance Fund Board (SoDra)*
  - 25% random sample of the Social Security population in 2000-2020
  - workers: identifier, gender, age, employment status, length of the employment relationship, insured labor income but no hours or education info!
  - firms: identifier, location, sector, wage bill, and firm size at the end of the year

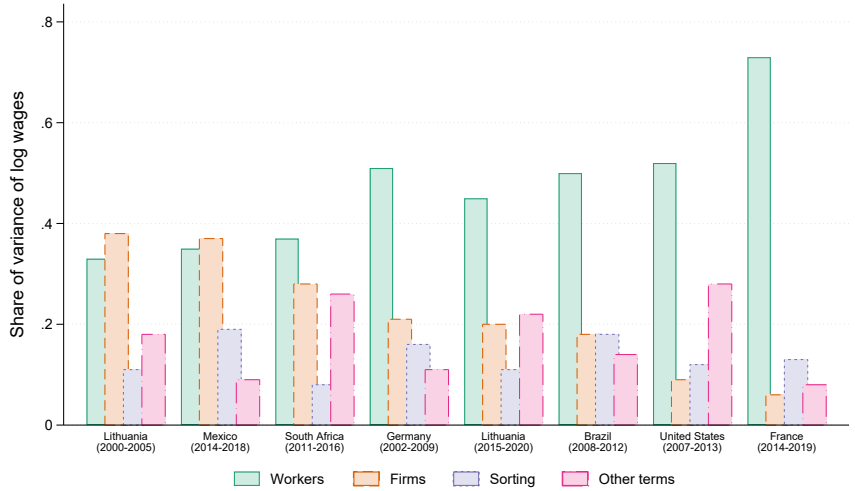
- Estimation sample
  - quarterly panel of private sector workers, 2000Q1 to 2020Q4
  - main job workers employed for $\geq$15days & earning $\geq 0.5 \times$monthly MW in a quarter
  - wage metric: real daily wages $=$ quarterly labor earnings / days worked in the quarter
  - cleaned data: 532,500 workers in 143,177 firms over 16,735,075 observations
  - connected set: 526,549 workers in 137,514 firms over 16,637,948 observations

summary statistics

Wage inequality significantly fell between 2000 and 2020



Contribution of firms and workers to declining inequality resembles development



cross-section | validation twfe | time-varying effects | estimation sample | leave-one-out estimator | firm clusters

Compression of firm-specific wage components behind the fall in inequality

	2000-05 to 2015-20		
	AKM	KSS	BLM
Change in $Var(y)$	-0.131	-0.136	-0.123
Contribution			
$Var(\eta)$	-0.088	-0.043	-0.233
$Var(\psi)$	0.898	0.930	0.639
$Var(X\Omega)$	-0.067	-0.068	-0.148
$Var(\epsilon)$	0.058	0.059	0.096
$2 \times Cov(\eta, \psi)$	0.184	0.109	0.504
$2 \times Cov(\eta, X\Omega)$	0.036	0.038	0.121
$2 \times Cov(\psi, X\Omega)$	-0.021	-0.024	0.022
Counterfactual change in $Var(y)$			
1. Fixed variance of firm effects	-0.013	-0.017	-0.045
2. Fixed corr. of firm and worker effects	-0.117	-0.150	-0.109
3. Both 1 and 2	0.012	-0.024	0.024

What can be behind this decline?

- Structural transformation: reallocation of labor towards sectors with lower dispersion of pay policies
  - FHK decomposition suggests is a within-sector phenomenon FHK

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- Policy: truncated pay distribution due to cumulative increase of the minimum wage $\sim$x3 in nominal terms
  - no correlation btw more affected sectors and larger declines in firm-driven inequality MW

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- Policy: truncated pay distribution due to cumulative increase of the minimum wage $\sim$x3 in nominal terms
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- Labor market competition?
  - monopsony theory: employer market power and firm-driven inequality are closely linked

Monopsony power and firm-driven wage inequality

- Dynamic monopsony model a la Manning (2003, 2021)
  - firms are heterogeneous in their productivity, z_{jt}
  - production function w/ decreasing returns to (homogeneous) labor, L_{jt}
  - firms face an upward-sloping labor supply curve labor that depends on recruitment, $R(w_{jt})$, and separation, $s(w_{jt})$ rates
- Optimal labor demand condition can be rearranged to show that

$$var[\log w_{jt}] \approx \left(\frac{1}{1+\varepsilon_t}\right)^2 \text{var}\left[\log z_{jt}\right] \quad with \quad \varepsilon_t = \varepsilon_{Rt} - \varepsilon_{sept}$$

- ε is elasticity of labor supply to wages of firm j
  - competitive model: $\varepsilon = \infty \Rightarrow$ the law of one price
  - imperfect competition: $\varepsilon < \infty \Rightarrow$ firm-specific wages result in firm-driven wage inequality
  - higher competition $\implies$ lower firm-driven inequality
- Does labor market competition increased?

Estimating the firm labor supply elasticity $\equiv$ labor market competition

$$P(s_{ijt} = 1) = \alpha + \beta \log w_{ijt} + X_{ijt}\Lambda + \xi_{ijt}$$

separation semi-elasticity

- s_{ijt} stands for the separation of worker i from employer j at quarter t
  - all separations and EE transitions at a quarterly frequency
- w_{ijt} is the corresponding wage measure
  - worker's daily wage
  - AKM firm-specific wage component [IV'ed $\sim$ Bassier et al., 2022]
- X_{ijt} is a vector of controls
  - *estimated* AKM worker fixed effect + age, gender, industry, and time effects
- ξ_{ijt} is the error term
- Firm labor supply elasticity: FLSE $\equiv -2 \times \frac{\hat{\beta}}{\bar{s}_{ijt}}$ (Manning, 2003)

The firm's labor supply elasticity has increased over the last two decades

All separations

Job to job transitions

table w/ estimates

FLSE increasing likely to reflect competition rather than LM segmentation or concentration

- Changes in the sensitivity of worker mobility to wages might reflect other structural forces taking place in the economy rather than changes in labor market competition
  - FLSE from Social Security data negatively correlated with wage markdowns from balance sheet data, as predicted by theory
    flse vs md

- Worker heterogeneity can lead to market segmentation, affecting FLSE without real changes in competition
  - FLSE increased for both workers below and above the median of AKM worker FEs
    skill-specific flse

- With strategic interaction between employers as in Berger et al., 2022, FLSE can increase due to MW-induced changes in concentration
  - no correlation between ↑ FLSE and Δwage bill-HHI or MW incidence
    firm granularity MW incidence

Did labor market competition and firm-drive inequality move together?

$$\Delta \text{var}_{st}[\psi_j] = \alpha + \beta \Delta \varepsilon_{st} + X_{st}\Omega + \upsilon_{st}$$

- $\Delta \text{var}_{st}[\psi_j]$ sector-specific changes in the variance of firm FE, 2000-05 to 2015-20
- $\Delta \varepsilon_{st}$ sector-specific changes in firm's labor supply elasticity, 2000-05 to 2015-20
- X sector-specific vector of controls
  - "model-based" $\equiv$ firm's labor supply elasticity in 2015-20 + changes in firm's size dispersion
  - minimum wage workers in 2000-05, account for sustained MW hikes and potential reallocation effects (Dustmann et al., 2021)
  - changes in LM concentration, account for market structure dynamics and its impact on wage inequality (Deb et al., 2024)

Dispersion of firm pay policies negatively correlated with LM competition

	Δ var$_{st+1}[\psi]$			ΔP90P10	ΔP50P10	ΔP90P50
	OLS	OLS	ORIV	ORIV	ORIV	ORIV
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta\ \varepsilon_{st+1}$	-0.0128	-0.0137	-0.0379	-0.1714	-0.1371	-0.0343
	(0.0047)	(0.0047)	(0.0175)	(0.0047)	(0.0741)	(0.0577)
Implied %Δ var[y]	5.7	6.1	16.9	-	-	-
Model-based controls	✓					
Full set of controls		✓	✓	✓	✓	✓
No. sectors	74	74	74	74	74	74

no correlation w/ WFE or sorting

EU accession potential trigger for increased competition and fall in inequality

- Free mobility of labor after EU enlargement in 2004 triggered mass emigration, as LT workers got access to more and better-paid labor markets, affecting domestic wages
  - Lithuanians working in pre-2004 EU countries amounted to more than 10% of Lithuania's population in 2020
  - 1% increase in the emigration rate of Lithuanians towards Ireland was associated with a 0.66% increase in the wages of those who stayed in Lithuania (Elsner, 2013)
- More job opportunities can foster job shopping and reduce job stickiness $\rightarrow$ wage compression among domestic firms in monopsonistic labor markets (Autor et al., 2024)

Employment outside options for Lithuanian workers in pre-2004 EU countries

- Employment outside options for LT workers as sector-specific labor demand changes across EU countries between 2000 and 2020 (Caldwell and Harmon, 2019)

$$\Delta x_s = \sum_{c \in \mathcal{C}} \mu_{c2000} \Delta x_{cs}$$

  - Δx_{cs} refers to changes in total hours worked (Δh) or labor compensation (Δw) in sector s and country c between 2000 and 2020
  - μ_{c2000} Lithuanians residing in pre-2004 EU countries in 2000

- Δx_s sector-level developments in the EU labor markets, giving more weight to the EU countries with a large presence of Lithuanian workers before 2004

EU sectors with the largest labor demand expansions are also the ones with the greatest competition and wage inequality

	Competition		Inequality	
	$\Delta\, \varepsilon_{st+1}$		$\Delta \text{var}_{st+1}[\psi_j]$	
	(1)	(2)	(3)	(4)
Δw_{st+1}	0.913		-0.053	
	(0.405)		(0.024)	
Δh_{st+1}		0.763		-0.051
		(0.449)		(0.024)
No. sectors	74	74	74	74

Taking stock

- Three main findings
  - firms played a critical role in declining inequality over Lithuania's development
  - labor market competition increased with economic growth and reduced barriers to mobility
  - fall in wage inequality if it was uncorrelated with labor market competition $\approx$ 17% lower
- Suggestive evidence that more and better outside options for LT workers after gaining access to EU labor markets spurred labor market competition among LT firms
- Wage inequality can be consequence of market failures $\rightarrow$ room for labor market and competition policies to tackle inequality and increase welfare

THANK YOU

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APPENDIX

Contribution to the state of knowledge

- Firms explain around 20% of wage dispersion in developed economies and even more in developing countries (Card et al., 2013; Card et al. 2018; Alvarez et al., 2018; Song et al., 2019; Perez Perez and Nuno-Ledesma, 2022; Bassier, 2023)
  - + dynamics of firm-driven wage dispersion over the course of a country's development
- Measuring labor market power and its dynamics (Hirsch et al., 2018; Azar et al., 2022; Bassier et al., 2022; Lamadon et al., 2022; Diez et al., 2022; Webber, 2022; Armangue-Jubert et al., 2023)
  - + labor market competition in a context of economic growth
- Labor market power and wages (Webber 2015; Bassier, 2023; Autor et al., 2023; Deb et al., 2024)
  - + labor market competition and firm-driven inequality over time
- Minimum wage policy main explanation behind declining inequality in CEE (Magda et al., 2021, Garcia-Louzao and Tarasonis, 2023)
  - + complementary explanation coming from market forces: competition

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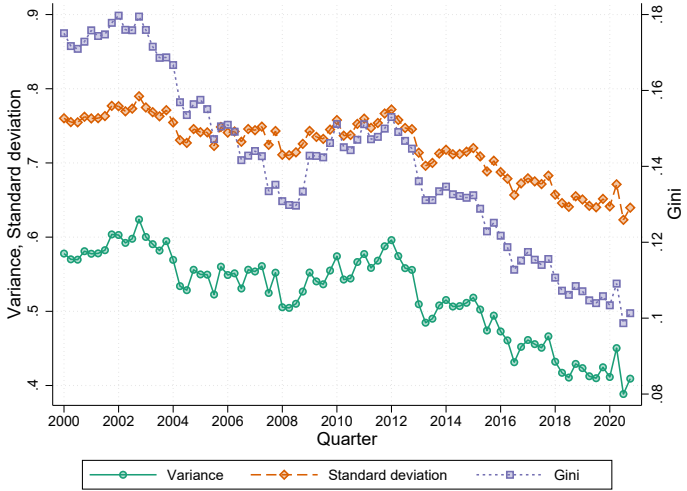
The fall of inequality under alternative indices



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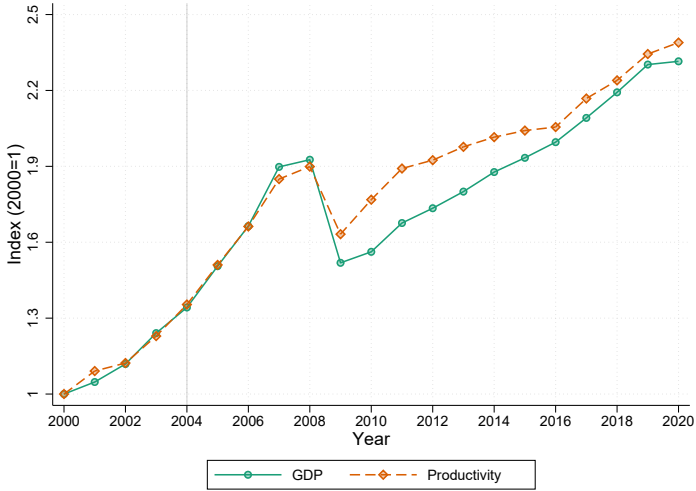
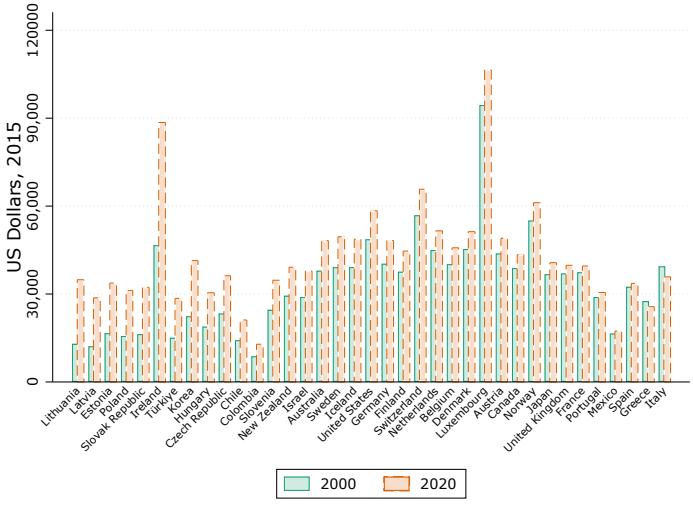
The Lithuanian economy experienced extraordinary economic growth



back cross-country

Among OECD countries, Lithuania experienced the largest growth in GDPpc



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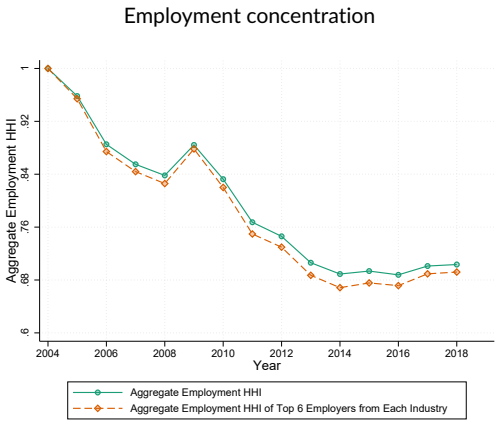
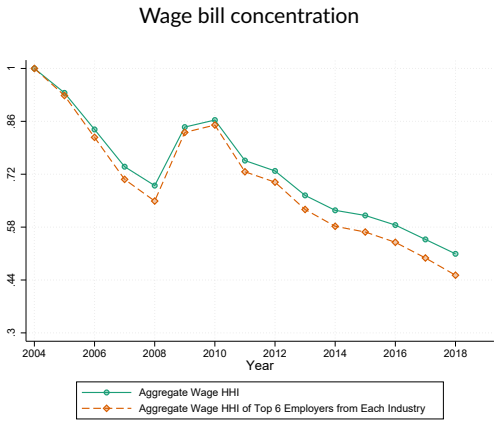
Labor market concentration computed from balance sheet data has been steadily decreasing





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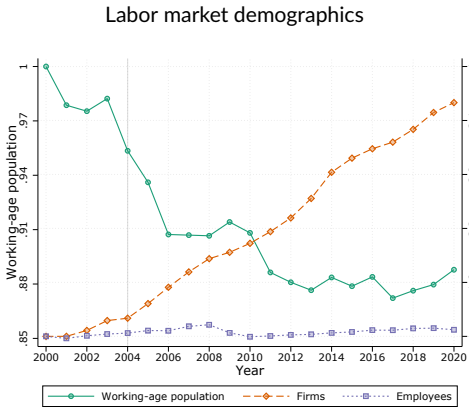
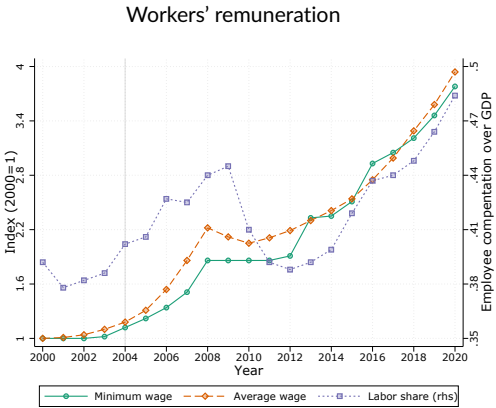
EU accession unleashed in-house potential for new firms and created opportunities abroad for workers: LS ↓ & LD ↑





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Identification of worker and firm effects

- Connected set
  - only connected firms and their workers contribute to the identification
  - connected firms $\equiv$ firms through which workers move
- Identifying assumptions
  - a1 exogenous mobility $\rightarrow$ no correlation between mobility and the time-varying component of the residual
  - a2 additive separability $\rightarrow$ no interaction of worker and firm heterogeneity
- Limited mobility bias
  - sufficient mobility to quantify the dispersion of firm-specific wage components
    - s1 KSS leave-one-out estimator to correct the bias (Kline et al., 2020)
    - s2 BLM firm-clusters to reduce dimensionality (Bonhomme et al., 2019, 2022)

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Summary statistics: Cleaned sample and connected set

	2000-2020		2000-2005		2015-2020	
	Cleaned data	Connected set	Cleaned data	Connected set	Cleaned data	Connected set
Wages						
Mean	2.905	2.909	2.525	2.539	3.252	3.278
Std.Dev.	0.779	0.777	0.764	0.759	0.679	0.667
Firms	143,461	137,783	64,509	56,698	78,103	62,387
Direct movers	296,159	295,942	124,873	124,425	124,595	123,530
Movers	391,670	391,229	173,540	172,827	165,418	163,837
Workers	532,495	526,536	330,161	320,625	333,238	314,337
Direct moves	815,911	815,539	218,456	217,821	233,805	232,016
Job changes	1,399,550	1,398,910	341,133	340,191	349,526	347,079
Worker-quarters	16,735,572	16,638,459	4,510,485	4,409,926	4,957,606	4,696,179

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Firm and worker heterogeneity explain two-thirds of cross-sectional inequality

	AKM		KSS		BLM	
	Component	Share	Component	Share	Component	Share
$Var(y)$	0.604	-	0.595	-	0.606	-
$Var(\eta)$	0.165	0.274	0.156	0.263	0.203	0.335
$Var(\psi)$	0.189	0.312	0.171	0.287	0.092	0.153
$Var(X\Omega)$	0.089	0.147	0.089	0.149	0.066	0.110
$Var(\epsilon)$	0.121	0.200	0.121	0.204	0.148	0.245
$2 \times Cov(\eta, \psi)$	0.041	0.068	0.053	0.088	0.078	0.129
$2 \times Cov(\eta, X\Omega)$	-0.002	-0.004	-0.003	-0.005	-0.007	-0.012
$2 \times Cov(\psi, X\Omega)$	0.002	0.003	0.003	0.004	0.024	0.040

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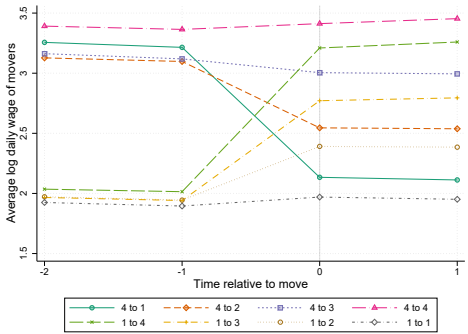
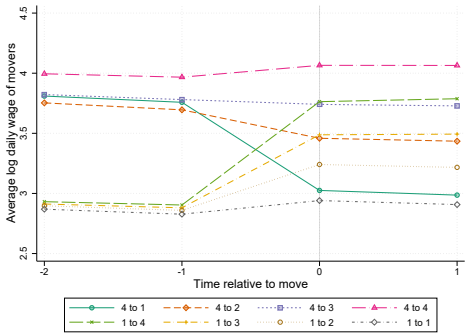
Wage changes after a switch by quarterly of firm fixed effects are near symmetric

(a) 2000-2005

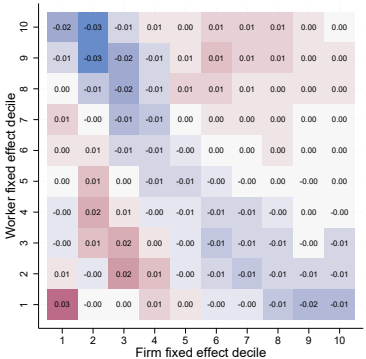


(b) 2015-2020

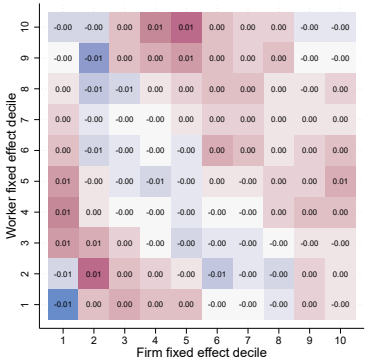


Average residuals by deciles of worker and firm fixed effects suggest that match effects are not critical

(a) 2000-2005



(b) 2015-2020



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Contribution of workers and firms under alternative specifications of time-varying effects

	Sex-specific time effects		Wages centered		Residual wages	
	Component	Share	Component	Share	Component	Share
$Var(y)$	0.604	-	0.518	-	0.511	-
$Var(\eta)$	0.170	0.281	0.164	0.317	0.163	0.319
$Var(\psi)$	0.189	0.313	0.190	0.367	0.188	0.368
$Var(X\Omega)$	0.090	0.149	0.007	0.013	-	-
$Var(\epsilon)$	0.120	0.199	0.121	0.234	0.121	0.238
$2 \times Cov(\eta, \psi)$	0.042	0.069	0.041	0.080	0.039	0.077
$2 \times Cov(\eta, X\Omega)$	-0.007	-0.011	-0.004	-0.007	-	-
$2 \times Cov(\psi, X\Omega)$	0.001	0.001	-0.001	-0.002	-	-

back

Contribution of workers and firms under alternative sample selection

	LM attachment		MW		Public sector		No welfare benefits	
	Component	Share	Component	Share	Component	Share	Component	Share
$Var(y)$	0.618	-	0.395	-	0.564	-	0.608	-
$Var(\eta)$	0.178	0.289	0.146	0.369	0.183	0.325	0.169	0.300
$Var(\psi)$	0.205	0.332	0.102	0.259	0.148	0.263	0.205	0.364
$Var(X\Omega)$	0.088	0.143	0.077	0.194	0.088	0.156	0.100	0.177
$Var(\epsilon)$	0.117	0.189	0.067	0.171	0.115	0.203	0.099	0.175
$2 \times Cov(\eta, \psi)$	0.031	0.050	0.018	0.045	0.034	0.060	0.041	0.072
$2 \times Cov(\eta, X\Omega)$	-0.003	-0.004	-0.005	-0.014	-0.007	-0.012	-0.004	-0.007
$2 \times Cov(\psi, X\Omega)$	0.000	0.001	-0.009	-0.023	0.002	0.004	-0.002	-0.003

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Contribution of workers and firms under alternative wage definitions to classify firms

	BLM w/ worker variables		BLM w/ firm variables	
	Component	Share	Component	Share
$Var(y)$	0.607	-	0.607	-
$Var(\eta)$	0.195	0.322	0.251	0.415
$Var(\psi)$	0.103	0.170	0.074	0.122
$Var(X\Omega)$	0.082	0.136	0.083	0.137
$Var(\epsilon)$	0.145	0.238	0.153	0.252
$2 \times Cov(\eta, \psi)$	0.078	0.128	0.044	0.072
$2 \times Cov(\eta, X\Omega)$	-0.004	-0.007	-0.007	-0.011
$2 \times Cov(\psi, X\Omega)$	0.008	0.013	0.009	0.015

Contribution of workers and firms under alternative number of firm clusters

	BLM 150		BLM 500		BLM 2500	
	Component	Share	Component	Share	Component	Share
$Var(y)$	0.606	-	0.606	-	0.606	-
$Var(\eta)$	0.212	0.349	0.204	0.337	0.204	0.336
$Var(\psi)$	0.088	0.145	0.091	0.151	0.094	0.154
$Var(X\Omega)$	0.068	0.112	0.067	0.110	0.067	0.111
$Var(\epsilon)$	0.150	0.247	0.149	0.245	0.148	0.244
$2 \times Cov(\eta, \psi)$	0.074	0.121	0.078	0.129	0.077	0.127
$2 \times Cov(\eta, X\Omega)$	-0.007	-0.012	-0.007	-0.012	-0.007	-0.012
$2 \times Cov(\psi, X\Omega)$	0.023	0.038	0.024	0.040	0.024	0.040

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Contribution of workers and firms under alternative leave-one-out units

	Leave-out-observations		Leave-out-workers	
	Component	Share	Component	Share
$Var(y)$	0.599	-	0.595	-
$Var(\eta)$	0.157	0.263	0.156	0.263
$Var(\psi)$	0.177	0.295	0.171	0.287
$Var(X\Omega)$	0.088	0.148	0.089	0.149
$Var(\epsilon)$	0.121	0.202	0.121	0.204
$2 \times Cov(\eta, \psi)$	0.050	0.084	0.053	0.089
$2 \times Cov(\eta, X\Omega)$	-0.003	-0.004	-0.003	-0.005
$2 \times Cov(\psi, X\Omega)$	0.002	0.004	0.003	0.004

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Within vs between sector changes

Sectoral decomposition

	AKM		BLM	
	Estimate (1)	Contribution (%) (2)	Estimate (3)	Contribution (%) (4)
Change in $Var(y)$	-0.131	-	-0.136	-
Change in $Var(\psi)$	-0.118	89.8	-0.127	93.0
Between-sector	0.016	-12.1	0.006	-4.5
Within-sector	-0.134	112.1	-0.133	104.5

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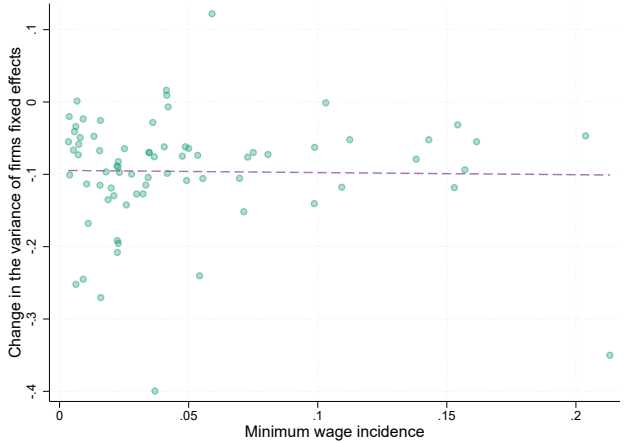
Variance of firm fixed effects vs MW



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The firm's labor supply elasticity has increased over the last two decades

A. 2000-2005	Worker wage		Firm fixed effect		IV-Firm fixed effect	
	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep
	(1)	(2)	(3)	(4)	(5)	(6)
β	-0.0601	-0.0250	-0.0485	-0.0220	-0.0800	-0.0433
	(0.0004)	(0.0003)	(0.0019)	(0.0010)	(0.0024)	(0.0014)
ε_{LS}	1.0329	0.9747	0.8327	0.8561	1.3746	1.6861
	(0.0068)	(0.0104)	(0.0083)	(0.0125)	(0.0417)	(0.0556)
First stage F-statistic					3,062.27	
Observations	4,149,923	4,149,923	4,149,923	4,149,923	4,149,923	4,149,923

B. 2015-2020	Worker wage		Firm fixed effect		IV-Firm fixed effect	
	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep
	(1)	(2)	(3)	(4)	(5)	(6)
β	-0.0773	-0.0289	-0.0565	-0.0246	-0.0979	-0.0507
	(0.0005)	(0.0003)	(0.0015)	(0.0009)	(0.0023)	(0.0013)
ε_{LS}	1.3693	1.1145	1.0007	0.9478	1.7340	1.9514
	(0.0216)	(0.0220)	(0.0265)	(0.0125)	(0.0415)	(0.0519)
First stage F-statistic					13,757.87	
Observations	4,404,064	4,404,064	4,404,064	4,404,064	4,404,064	4,404,064

back complementary log-log alternative set of controls

Separation elasticity using a complementary log-log model

A. 2000-2005	Worker wage		IV-Firm fixed effect	
	Sep	EE Sep	Sep	EE Sep
ε_{sep}	-0.5550	-0.4747	-0.6712	-0.7611
	(0.0034)	(0.0046)	(0.0366)	(0.0481)
Observations	4,149,923	4,149,923	4,149,923	4,149,923

B. 2015-2020	Worker wage		IV-Firm fixed effect	
	Sep	EE Sep	Sep	EE Sep
ε_{sep}	-0.6692	-0.5086	-0.8459	-0.8666
	(0.0037)	(0.0050)	(0.0203)	(0.0224)
Observations	4,404,064	4,404,064	4,404,064	4,404,064

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Separation elasticity using alternative controls

A. 2000-2005	Worker wage								IV-Firm fixed effect							
	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep
ϵ_{sep}	-0.0475	-0.0209	-0.0622	-0.0269	-0.0598	-0.0249	-0.0647	-0.0191	-0.0627	-0.0379	-0.0815	-0.0472	-0.0794	-0.0431	-0.0989	-0.0460
	(0.0004)	(0.0003)	(0.0004)	(0.0003)	(0.0004)	(0.0003)	(0.0003)	(0.0002)	(0.0022)	(0.0014)	(0.0023)	(0.0015)	(0.0024)	(0.0014)	(0.0024)	(0.0014)
Observations	4,149,923	4,149,923	4,149,923	4,149,923	4,149,923	4,149,923	4,149,923	4,149,923	4,149,923	4,149,923	4,149,876	4,149,876	4,149,923	4,149,923	4,149,923	4,149,923
A. 2015-2020	Worker wage								IV-Firm fixed effect							
	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep
ϵ_{sep}	-0.0684	-0.0254	-0.0795	-0.0298	-0.0766	-0.0288	-0.0750	-0.0222	-0.0851	-0.0457	-0.1062	-0.0666	-0.0969	-0.0503	-0.1394	-0.0601
	(0.0004)	(0.0003)	(0.0005)	(0.0003)	(0.0005)	(0.0003)	(0.0004)	(0.0002)	(0.0021)	(0.0013)	(0.0025)	(0.0015)	(0.0023)	(0.0013)	(0.0026)	(0.0015)
Observations	4,404,064	4,404,064	4,404,064	4,404,064	4,404,064	4,404,064	4,404,064	4,404,064	4,404,064	4,404,064	4,404,024	4,404,024	4,404,064	4,404,064	4,404,064	4,404,064
Tenure FE	Y	Y	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N
Sector×Municipality FE	N	N	Y	Y	N	N	N	N	N	N	Y	Y	N	N	N	N
Family controls	N	N	N	N	Y	Y	N	N	N	N	N	N	Y	Y	N	N
AKM worker type	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	N

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Elasticity for workers with FE below median

A. 2000-2005	Worker wage		Firm fixed effect		IV-Firm fixed effect	
	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep
	(1)	(2)	(3)	(4)	(5)	(6)
β	-0.0674	-0.0235	-0.0552	-0.0241	-0.0856	-0.0451
	(0.0007)	(0.0004)	(0.0029)	(0.0013)	(0.0036)	(0.0018)
ϵ_{LS}	0.9520	0.8651	0.7798	0.8872	1.2093	1.6626
	(0.0092)	(0.0148)	(0.0413)	(0.0462)	(0.0514)	(0.0665)
First stage F-statistic					2,328.86	
Observations	2,074,976	2,074,976	2,074,976	2,074,976	2,074,976	2,074,976

B. 2015-2020	Worker wage		Firm fixed effect		IV-Firm fixed effect	
	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep
	(1)	(2)	(3)	(4)	(5)	(6)
β	-0.0875	-0.0271	-0.0730	-0.0299	-0.1036	-0.0538
	(0.0007)	(0.0005)	(0.0021)	(0.0011)	(0.0036)	(0.0019)
ϵ_{LS}	1.3317	1.0121	1.1122	1.1173	1.5776	2.0090
	(0.0112)	(0.0178)	(0.0317)	(0.0428)	(0.0550)	(0.0695)
First stage F-statistic					9,975.29	
Observations	2,202,037	2,202,037	2,202,037	2,202,037	2,202,037	2,202,037

Elasticity for workers with FE above median

A. 2000-2005	Worker wage		Firm fixed effect		IV-Firm fixed effect	
	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep
	(1)	(2)	(3)	(4)	(5)	(6)
β	-0.0526	-0.0249	-0.0403	-0.0185	-0.0742	-0.0405
	(0.0005)	(0.0004)	(0.0015)	(0.0010)	(0.0020)	(0.0014)
ϵ_{LS}	1.1529	1.0236	0.8842	0.7613	1.6261	1.6690
	(0.0108)	(0.0148)	(0.0332)	(0.0425)	(0.0430)	(0.0570)
First stage F-statistic					3,576.39	
Observations	2,074,947	2,074,947	2,074,947	2,074,947	2,074,947	2,074,947

B. 2015-2020	Worker wage		Firm fixed effect		IV-Firm fixed effect	
	Sep	EE Sep	Sep	EE Sep	Sep	EE Sep
	(1)	(2)	(3)	(4)	(5)	(6)
β	-0.0668	-0.0293	-0.0417	-0.0193	-0.0910	-0.0474
	(0.0006)	(0.0004)	(0.0014)	(0.0010)	(0.0021)	(0.0014)
ϵ_{LS}	1.4158	1.1625	0.8840	0.7665	1.9285	1.8814
	(0.0134)	(0.0175)	(0.0301)	(0.0394)	(0.0449)	(0.0562)
First stage F-statistic					10,122.45	
Observations	2,202,027	2,202,027	2,202,027	2,202,027	2,202,027	2,202,027

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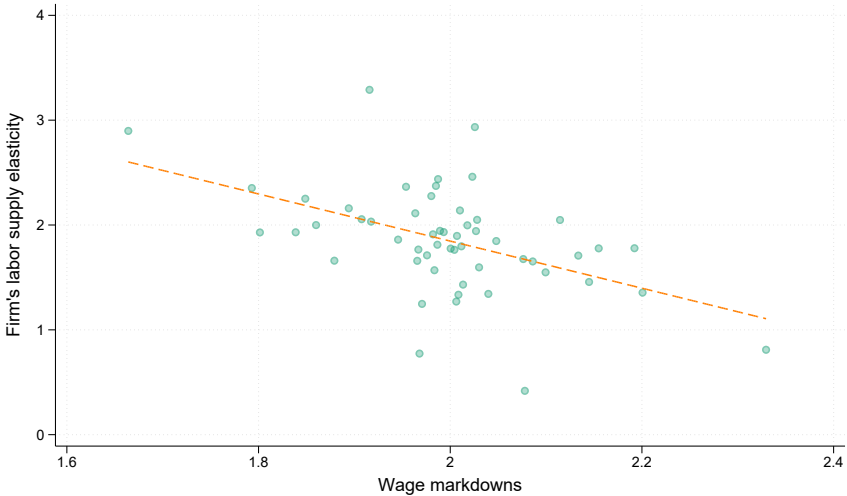
Sector-level elasticities resemble markdowns from producers data → labor market competition increased



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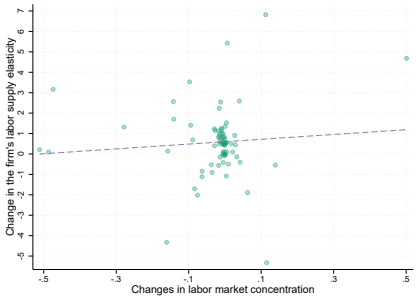
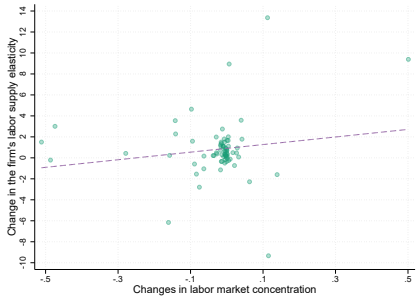
Firm granularity: Elasticity vs concentration

(a) All separations



(b) Job-to-job



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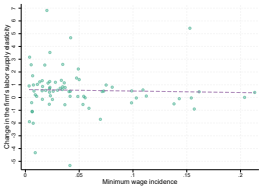
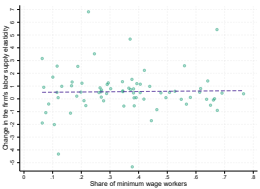
Firm granularity: Elasticity vs MW

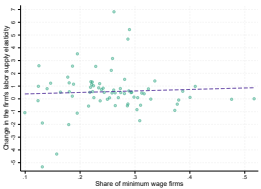
(a) MW incidence



(b) MW workers



(c) MW firms



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Contribution of changes in competition to changes in overall wage inequality

The contribution of competition to overall inequality can be calculated as

$$\sum_{s=1}^{S} \frac{L_{st}}{L_t} \hat{\beta}_1 \Delta\varepsilon_{st+1}$$

- L is the number of workers
- $\hat{\beta}_1$ is the effect of competition on the variance of firm fixed effects
- ε_s sector-specific firm labor supply elasticity

Changes in labor market competition can explain a reduction in wage inequality through firm-specific wage components equal to

$$0.9 \times \left(\frac{\sum_{s=1}^{S} \frac{L_{st}}{L_t} \hat{\beta}_1 \Delta\varepsilon_{st+1}}{\sum_{s=1}^{S} \frac{L_{st}}{L_t} \Delta \text{var}_{st+1}[\psi_{jt+1}]} \right) \times 100\%$$

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Increased competition in the labor market does not affect the dispersion of worker fixed effects or sorting

A. $\Delta \text{var}_{st+1}[\eta]$	Worker wage		Iv-Firm fixed effect	
	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
Δ Firm LSE	-0.0248	0.0848	-0.0174	-0.0218
	(0.0352)	(0.1108)	(0.0090)	(0.0189)

B. $\Delta \text{cov}_{st+1}[\psi, \eta]$	Worker wage		IV-Firm fixed effect	
	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
Δ Firm LSE	0.0121	0.0098	-0.0090	0.0293
	(0.0339)	(0.0997)	(0.0116)	(0.0261)
Full set of controls	✓	✓	✓	✓
No. sectors	74	74	74	74

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