Minimum Wages and Employment Composition

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How do minimum wages affect low-pay labor markets?

Aggregate effects

- Employment effects ≈ 0. Summary
- Reduced worker flows (Dube et al. 2016, Portugal and Cardoso 2006).

Distributional effects?

- Who works how much: Increased relative hours of experienced workers (case studies: Jardim et al. 2022, Gopalan et al. 2021).
- This project: Who is retained, how does allocation of hours change? (Heterogeneity: worker experience)

How do minimum wages affect low-pay labor markets?

- Setting: US nursing home industry.
  - Administrative shift-level data for universe of employees.
  - High precision in individual-level hours worked.
- Policy changes: 190 state, local min wage increases 2019-23.

Preview of results

Shift to more experienced workers:

1. Changes in retention: Increased retention, especially among the most experienced workers. *Most important.*
2. Changes in individual worker schedules: *Less important.*
    - Less overtime, full-time work ($\approx$ 1-2% / \$1 MW).
    - Some increase in weekend work.

Welfare implications:

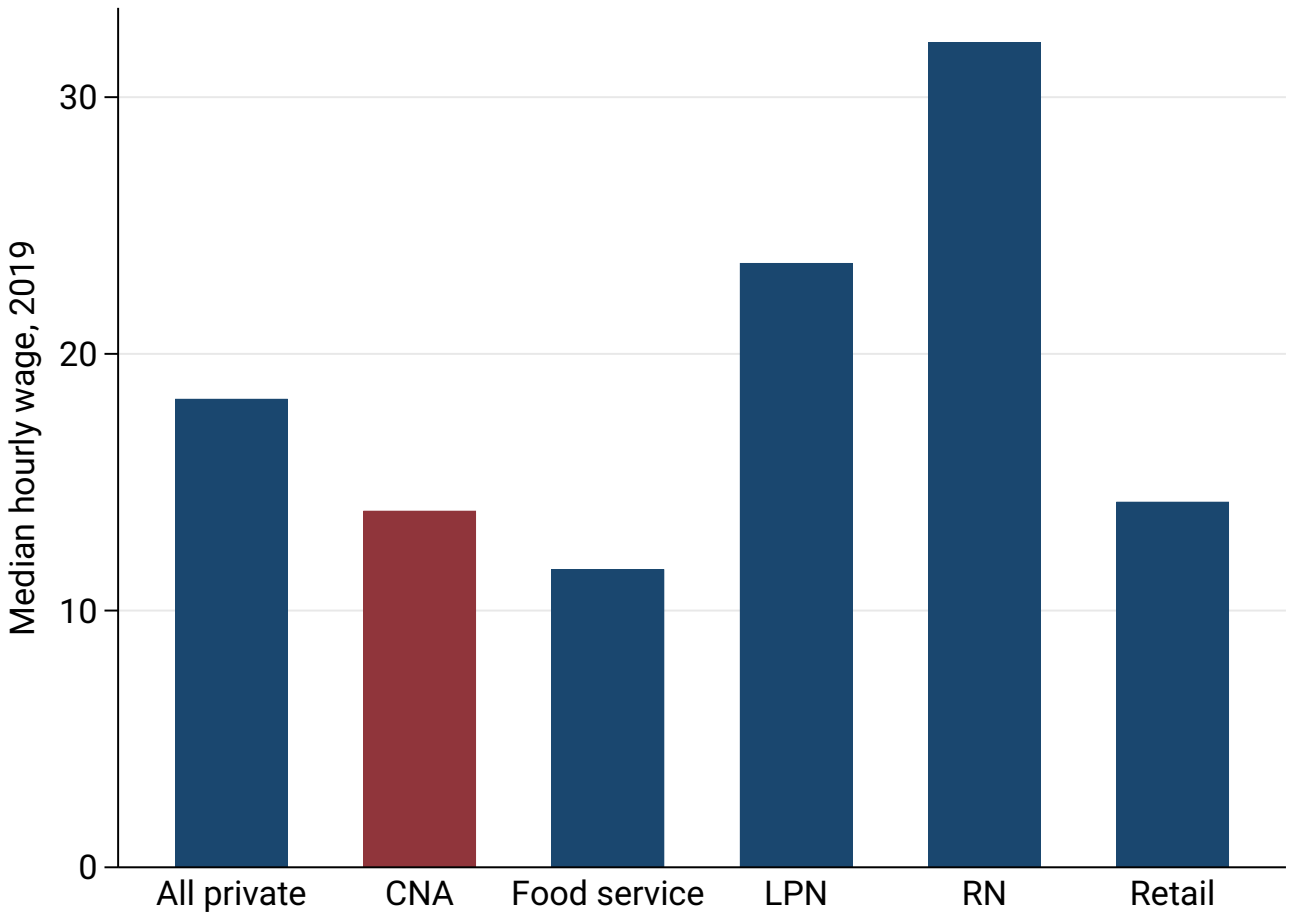
- Consumers benefit from more experienced workforce.
- Lower hours (and non-wage benefits?) reduce some wage gains.

Institutional setting

Setting: US nursing home industry

- Mix of rehab/therapy and long-term care for the elderly.
- $\approx$ 15k facilities, employ 1.6m workers.
- Care is labor-intensive. A median patient-day:
  - 24 minutes registered nurse (RN)
  - 49 minutes licensed practical nurse (LPN)
  - 136 minutes certified nursing assistant (CNA)
- CNAs are the primary caregivers.
  - Pay is low: typically $\approx$ \$14/hour (2019).
  - Difficult work: assisting with ADLs (mobility, cleaning, toileting, eating, etc.).
  - Limited career advancement.
  - Annual turnover $>$ 100% (Gandhi et al. 2021).

Setting: Nursing home pay



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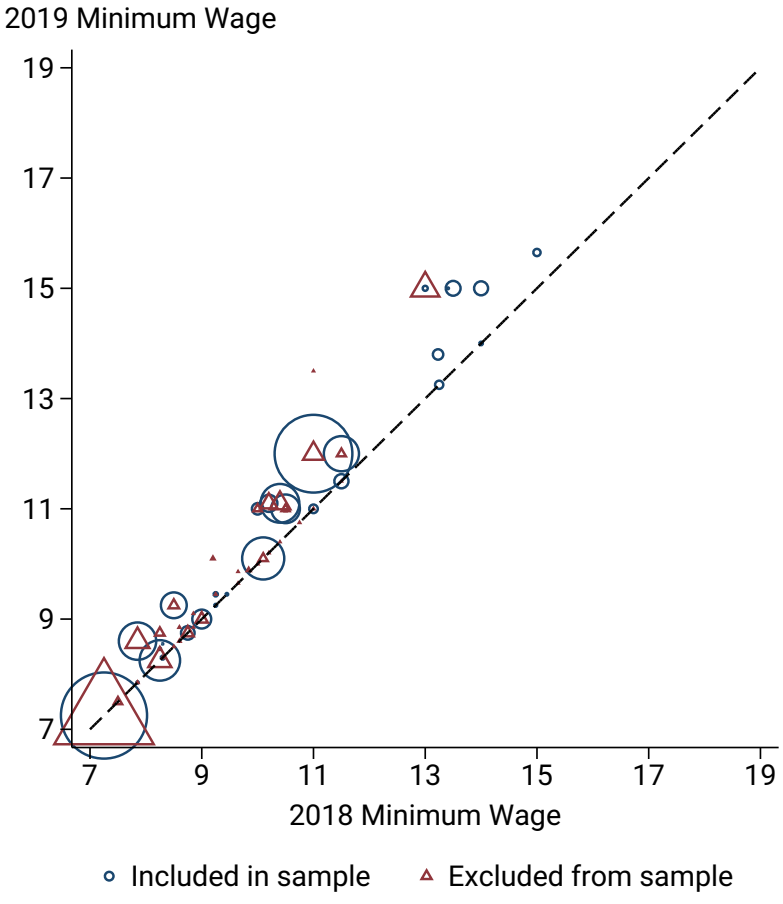
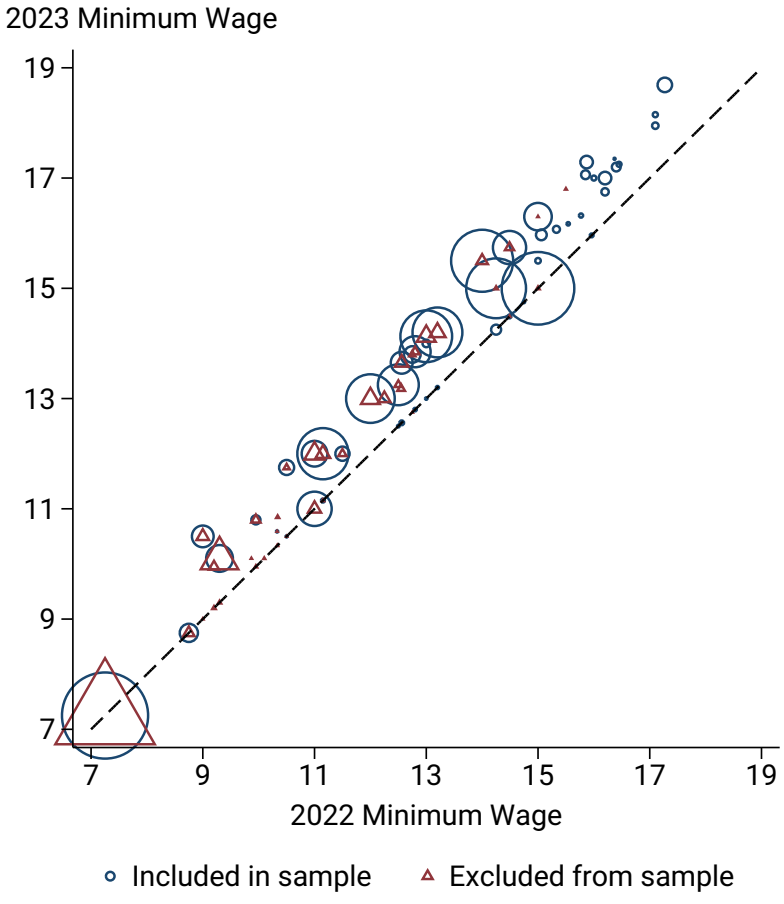
Setting: 2019-2023 minimum wage changes





State/local Size

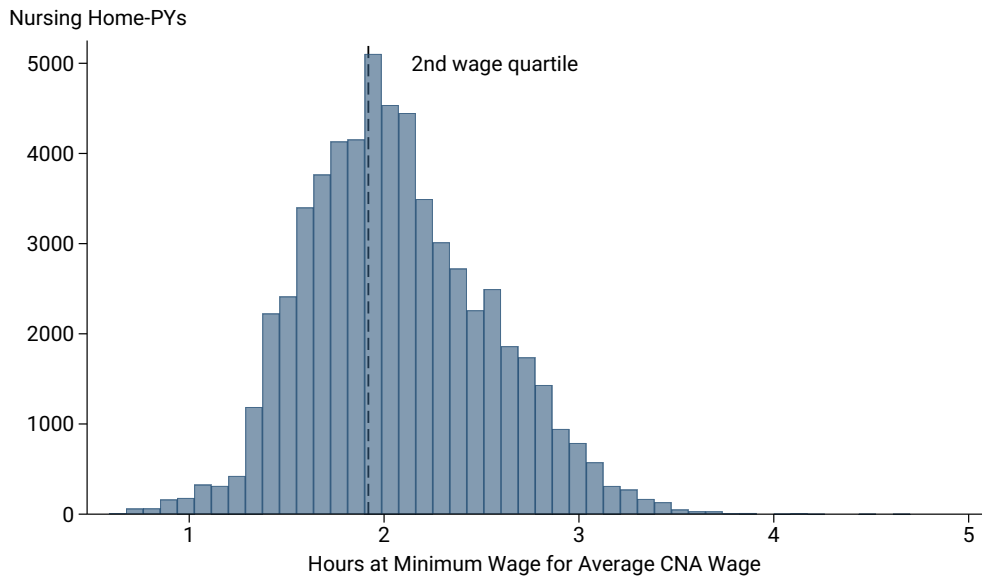
190 state, local changes, median $\approx$ 90c, largest \$3.

Data and empirical framework

Focus: Low-pay labor markets

Areas where CNA pay is low relative to MW.

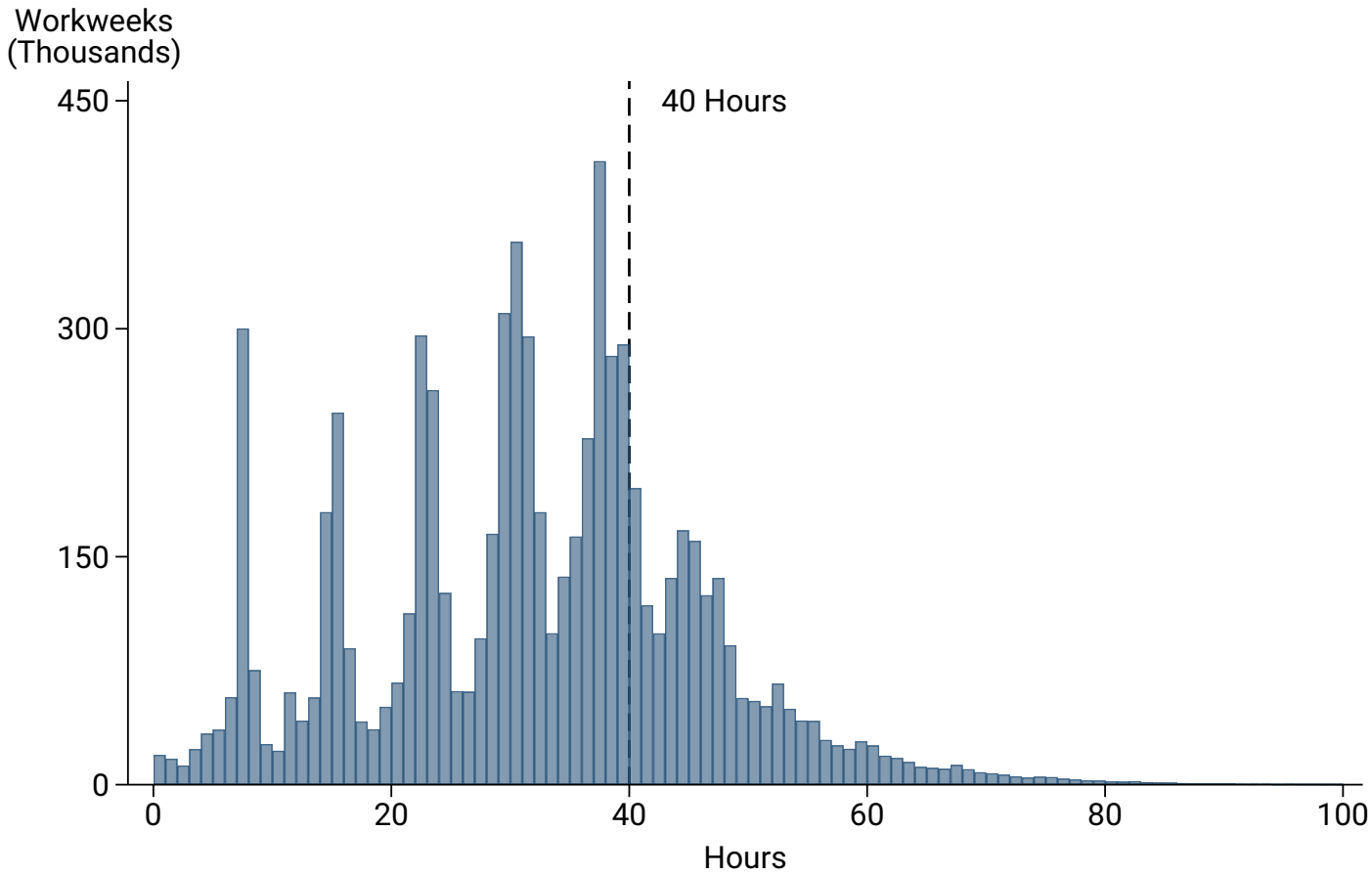
$$payratio_{ct} = \frac{\overline{CNAwage_{ct}}}{MW_{ct}}$$



Staffing data: Payroll Based Journal (PBJ) microdata

- Daily, shift-level data for all nursing home workers.
  - $>$ 2 mil employee-employer relationships, 200 mil shifts/year.
  - 2016Q4-2023Q4 (exclude pandemic).
  - Auditable, payroll-based data.
- Who worked? How many hours? What role? Direct employee or a contract worker?
- Focus on wage-CNAs by employee tenure (experience).
  - Terciles of previous hours as of FY start, based on national distribution. FY2019

CNA workweek hours



Approach: Matched stacked difference-in-differences

Estimator proposed by Cengiz et al. (2019)

- Minimum wage increases not randomly assigned.
- TWFE problematic when units treated at different times and treatment effect changes over time.
- Stacked DD restricts attention between "treated" to similar "never-treated" facilities for each "policy year" (PY).
    - 8 policy years: Jan/Jul 2019, 2021, 2022, 2023.

Approach: Matching

For each facility i experiencing a MW change in policy year p and state s,

- Retention at time t: $\frac{numworker_{t=0} - (numworker | \text{employed t} = 0)_{t=t}}{numworker_{t=0}}$
- Select ≤ 5 facilities in state $-s$ with no MW change in PY p to form group g,
  - Exact match on payratio quartiles.
  - NNM on pre-PY retention.
- Weigh each matched facility by $\frac{1}{nummatch_{ig}}$

Approach: Matched stacked difference-in-differences

$$y_{igt} = \sum_{k \neq -1} \beta_k (t - MW = k)_{igt} * (\Delta MW > 0)_{it} + \gamma_{ig} + \phi_{tg} + \varepsilon_{igt}$$

- $(t - MW = k)_{igt} * (\Delta MW > 0)_{it}$: Event-time indicator for treated facilities.
- γ_{ig} Facility-by-group FE.
- ϕ_{tg} Time-by-group FE (time pattern for "control" facilities).

Results

Total hours worked and workers

	CNA Positions		Other Nursing Staff		Occupancy Rate
	Employee	Contract	LPN	RN	
Panel a: Weekly Hours Per Bed					
Minimum Wage	0.055	-0.033	0.134	-0.065	0.000
	(0.021)	(0.014)	(0.010)	(0.008)	(0.001)
Mean	12.03	0.66	4.95	3.52	0.78
Std. Dev.	4.42	1.48	2.65	2.68	0.17
Implied Representative Elasticity	0.060	-0.646	0.354	-0.240	0.004
Panel b: Weekly Number of Workers Per Bed					
Minimum Wage	0.004	-0.000	0.003	-0.002	
	(0.001)	(0.001)	(0.000)	(0.000)	
Mean	0.41	0.04	0.16	0.12	
Std. Dev.	0.17	0.10	0.09	0.11	
Implied Representative Elasticity	0.143	-0.078	0.244	-0.258	
County Clusters	38,444	38,444	38,444	38,444	38,414
Facilities	5,820	5,820	5,820	5,820	5,813
Facility-Weeks	374,954	374,954	374,954	374,954	373,865

Changes in retention

	New Hires (% of initial payroll)	Separations (% of initial payroll)			
		All	Tercile 1	Tercile 2	Tercile 3
Minimum Wage	3.877	-0.663	-0.546	-0.493	-1.174
	(0.708)	(0.121)	(0.115)	(0.128)	(0.174)
Mean	232.98	63.43	79.79	64.20	47.37
Std. Dev.	180.11	19.47	18.07	22.41	25.79
Implied Representative Elasticity	0.359	-0.164	-0.102	-0.124	-0.478
County Clusters	38,448	38,448	37,680	42,489	40,938
Facilities	5,821	5,821	5,736	5,750	5,577
Facility-Weeks	375,232	375,232	360,345	375,489	365,307

Decomposing allocation of hours across groups

Two potential channels:

1. Extensive margin: Changes in retention (more workers).
2. Intensive margin: Changes in hours per worker.

Changes in hours per worker, with and without retention, T1

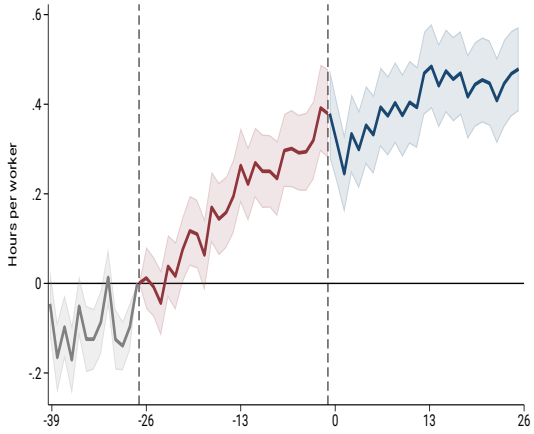


Figure 1: Combined

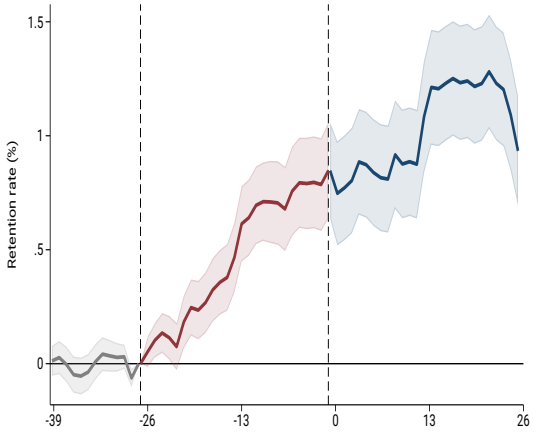


Figure 2: Retention

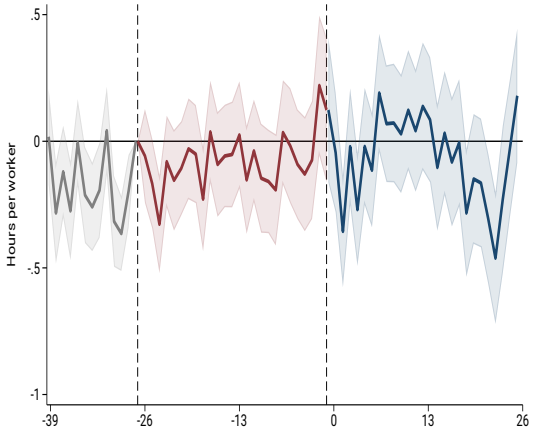


Figure 3: Hrs/worker

Changes in hours per worker, with and without retention, T2

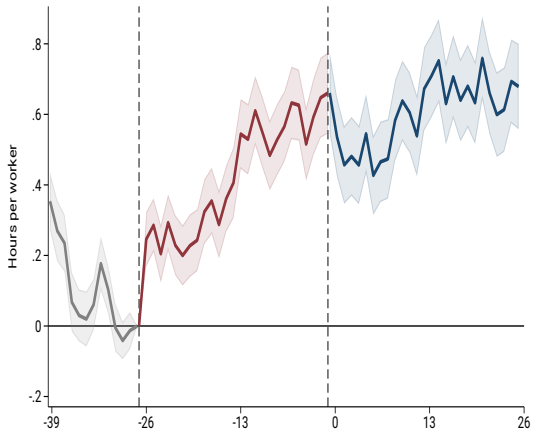


Figure 4: Combined

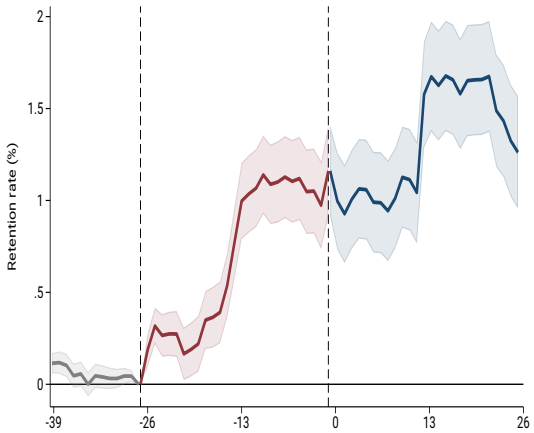


Figure 5: Retention

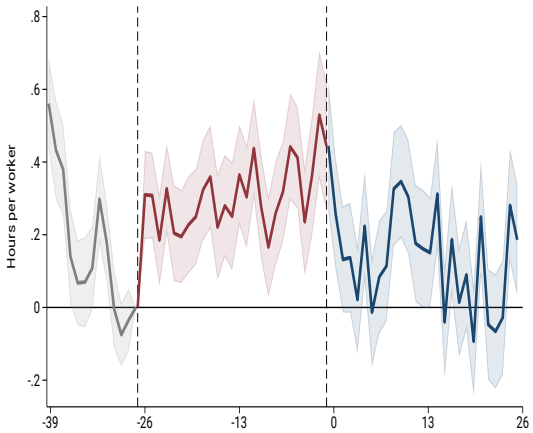


Figure 6: Hrs/worker

Changes in hours per worker, with and without retention, T3

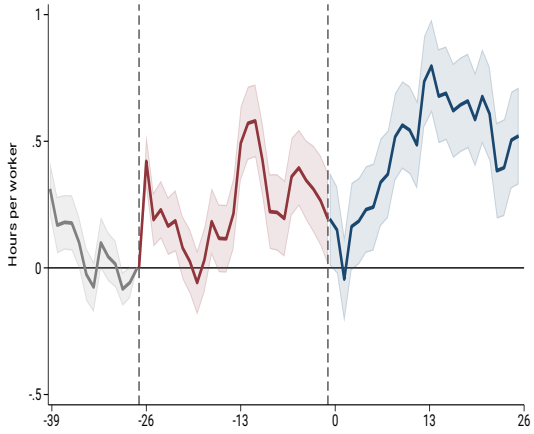


Figure 7: Combined

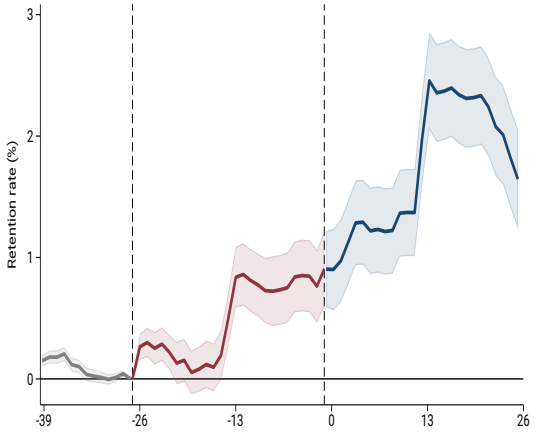


Figure 8: Retention

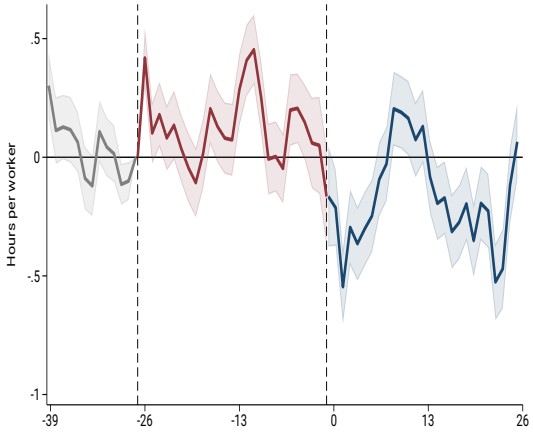
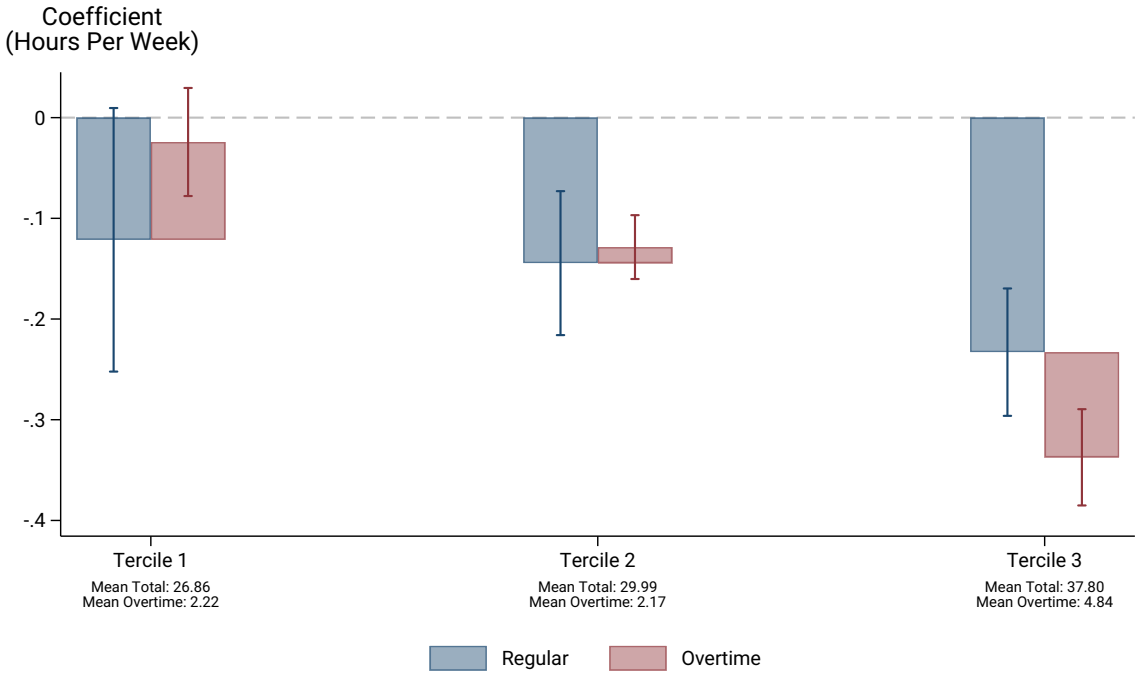


Figure 9: Hrs/worker

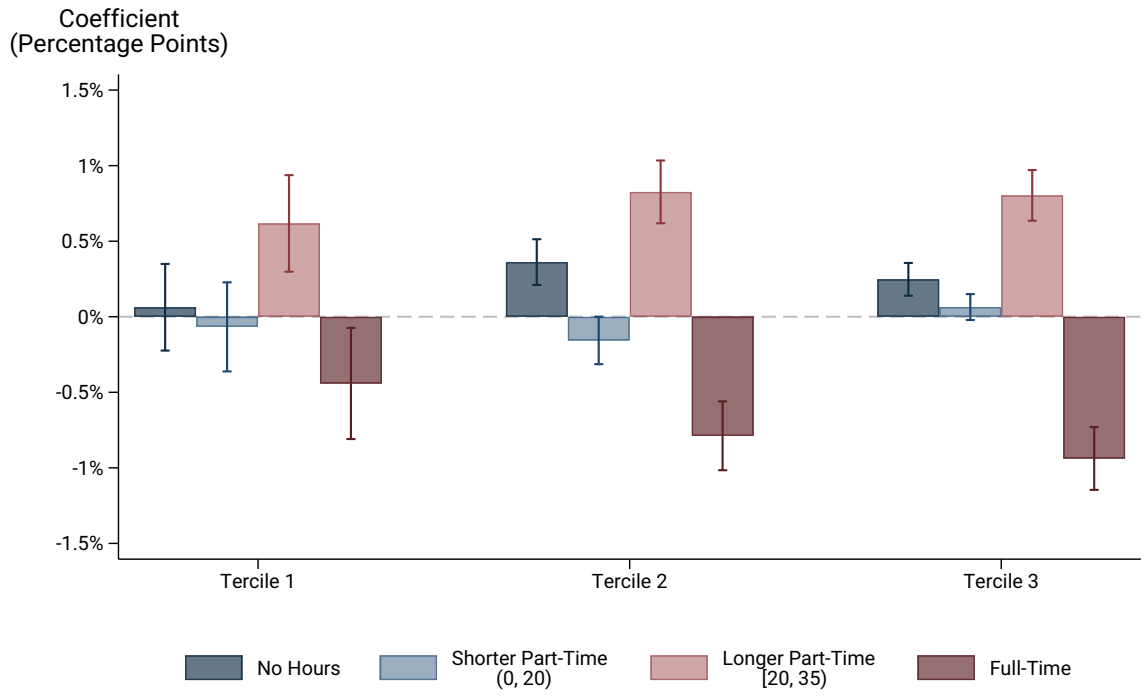
Hours worked, regular and overtime



Takeaways:

- All changes small: < 14 min/wk $\rightarrow$ 12 hrs/year.
- Larger $\downarrow$ OT work for most-experienced (2% OT vs. 0.7% regular).

Hours worked, part- and full-time status



Takeaways:

- 1-2% ($<$ 1pp) reduction in full-time work.
- Shift to (longer) part-time.

Initial dist

Simulating long-term effects

Simulating long-term effects

1. Reduced-form estimates show how employment composition changes within a given FY.

2. Effects can be larger in the long-run:
    - Persistence: Higher retention is likely to stay high past 6 mo.
    - Snowballing: High retention increases the tenure of employees, and higher tenure employees have higher retention.

Simulation approach

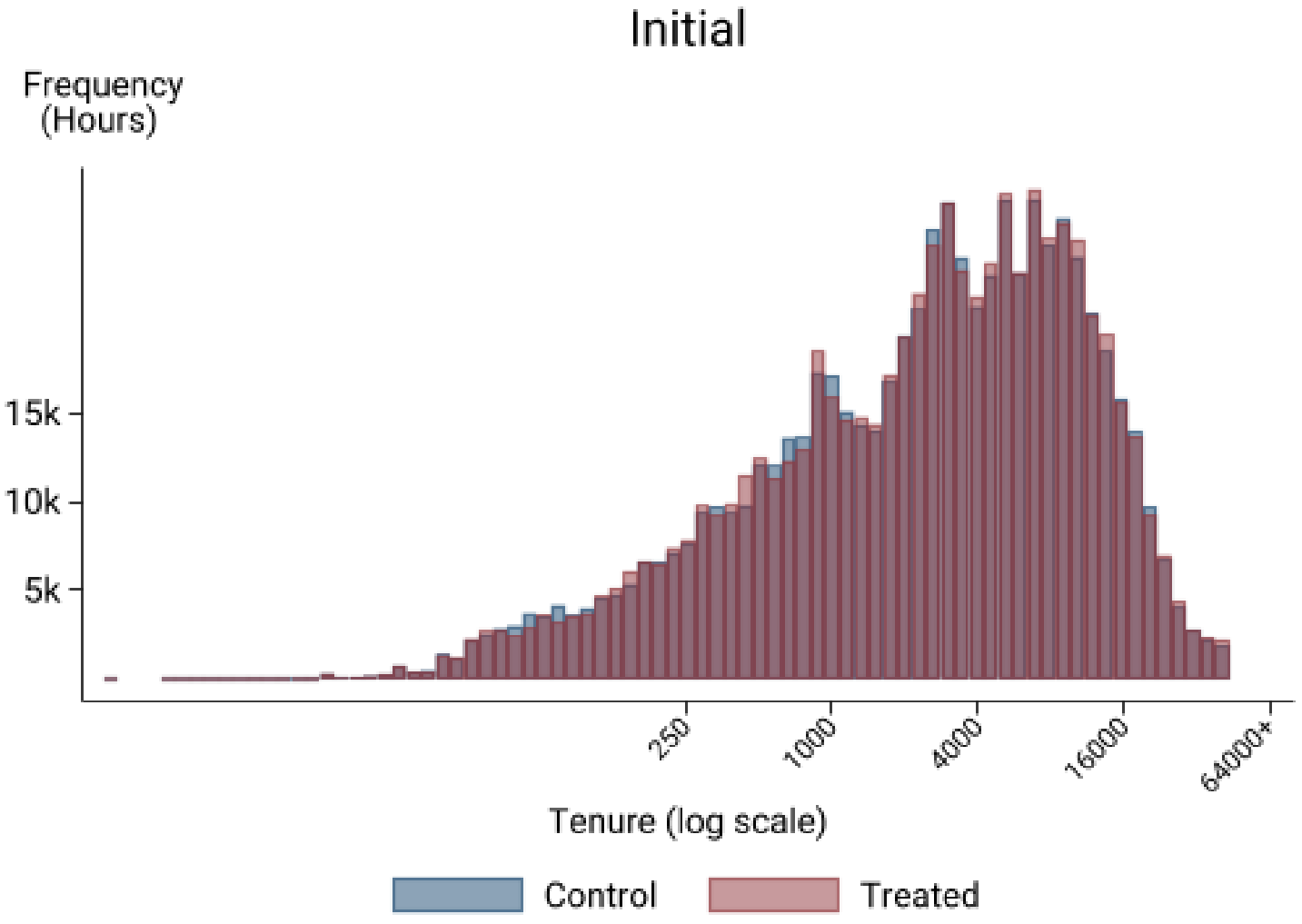
Starting with reduced-form estimates, iteratively simulate (weekly) for a $1 MW increase:

1. What workers are retained based on fiscal week and tenure.
2. Whether new staff (and how many) are hired.
3. How many hours each employee works from empirical shift distribution and event study estimates.

Update tenure at end of each PY, repeat.

Today: Just Jan 2019

Simulation: Long Run



Simulation takeaways

- 9 months post: Average (median) hr of care $\uparrow$ 303 (401) tenure hours.
- Long-term post:
  - Average hr of care $\uparrow$ 1139 (23%) tenure hours.
  - Median hr of care $\uparrow$ 786 (33%) tenure hours.
  - % of care hours received from workers with $>$ 2,000 hours of firm-specific experience $\uparrow$ 6 pp (baseline $=$ 55%).

Policy implications

Conclusion

- Higher minimum wages increase retention, especially for most-experienced workers.
- Small changes in hours, mostly reduction in OT, full-time work.
- Anticipation effects (vary over time non-systematically): Standard DD approaches may understate effects.
- More experienced workforce $\rightarrow$ better patient outcomes (Antwi and Bowblis 2018, Gandhi 2021).

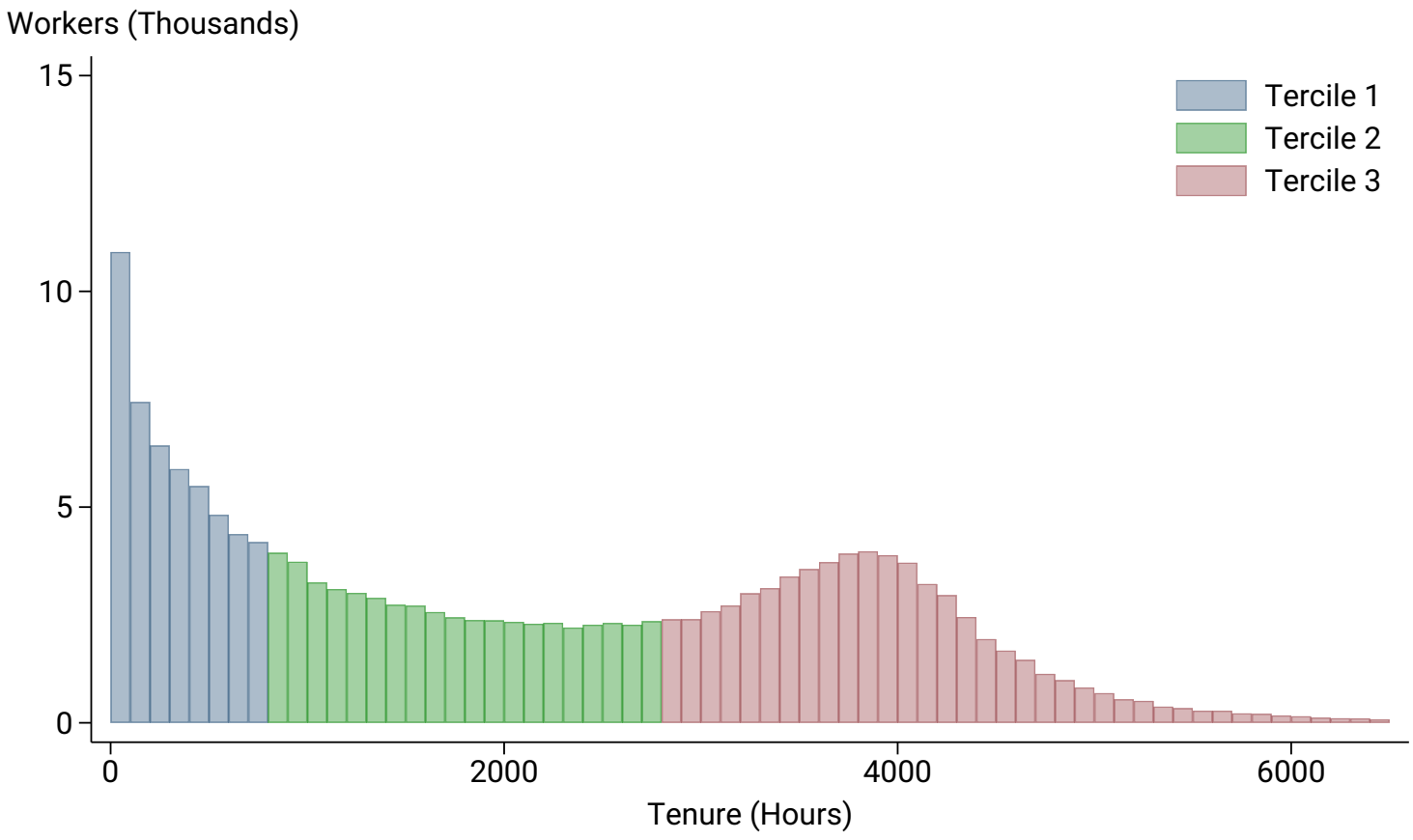
Thank you!

Setting: Nursing home pay gap within occupation

	Wage New hires	Wage Tercile 3	Wage gap ($)	Wage gap (%)
$10 MW	12.24	13.57	1.33	10.9%
Earnings elasticity WRT MW	0.342	0		
After $1 MW increase	12.66	13.57	0.91	7.2%

Back

CNA turnover is high



Description

Minimum Wages and Employment Levels

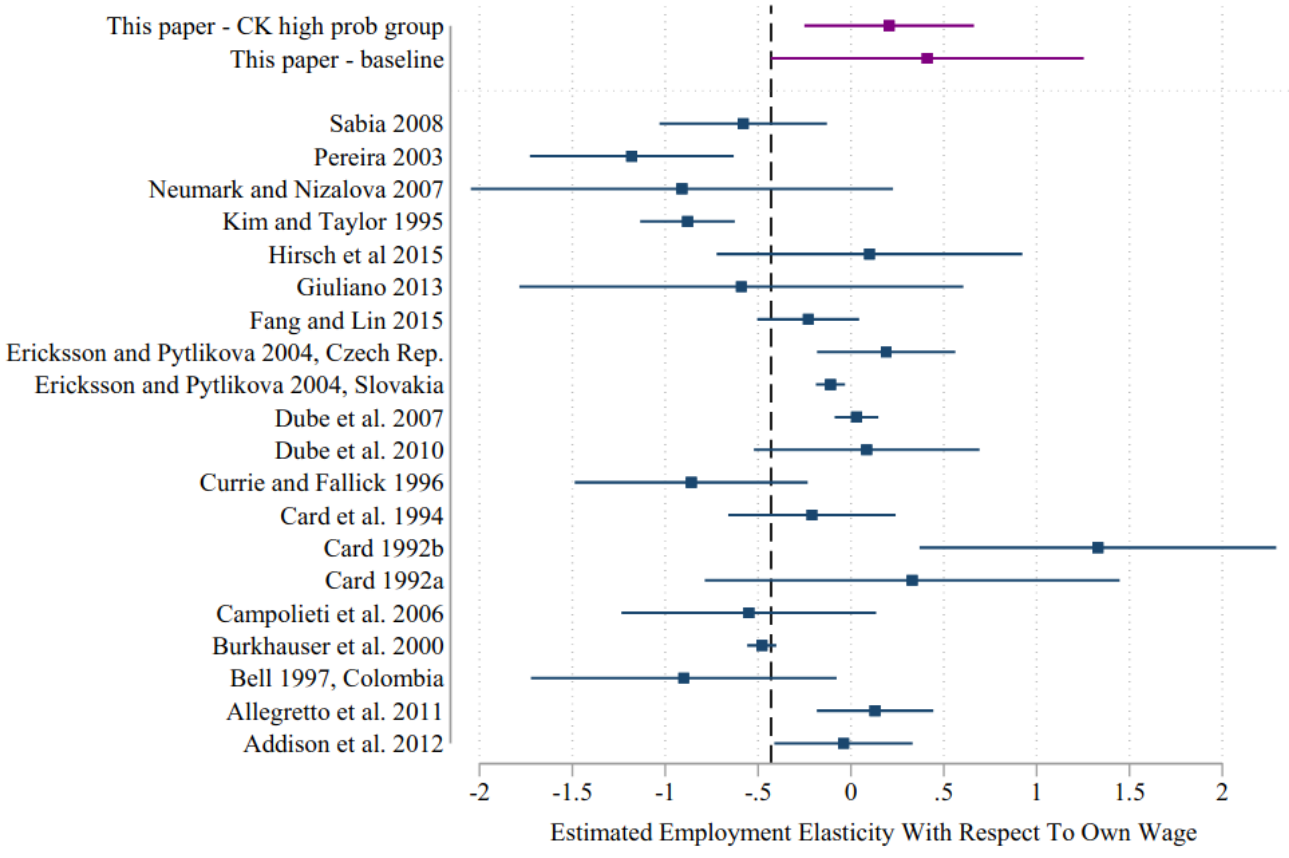
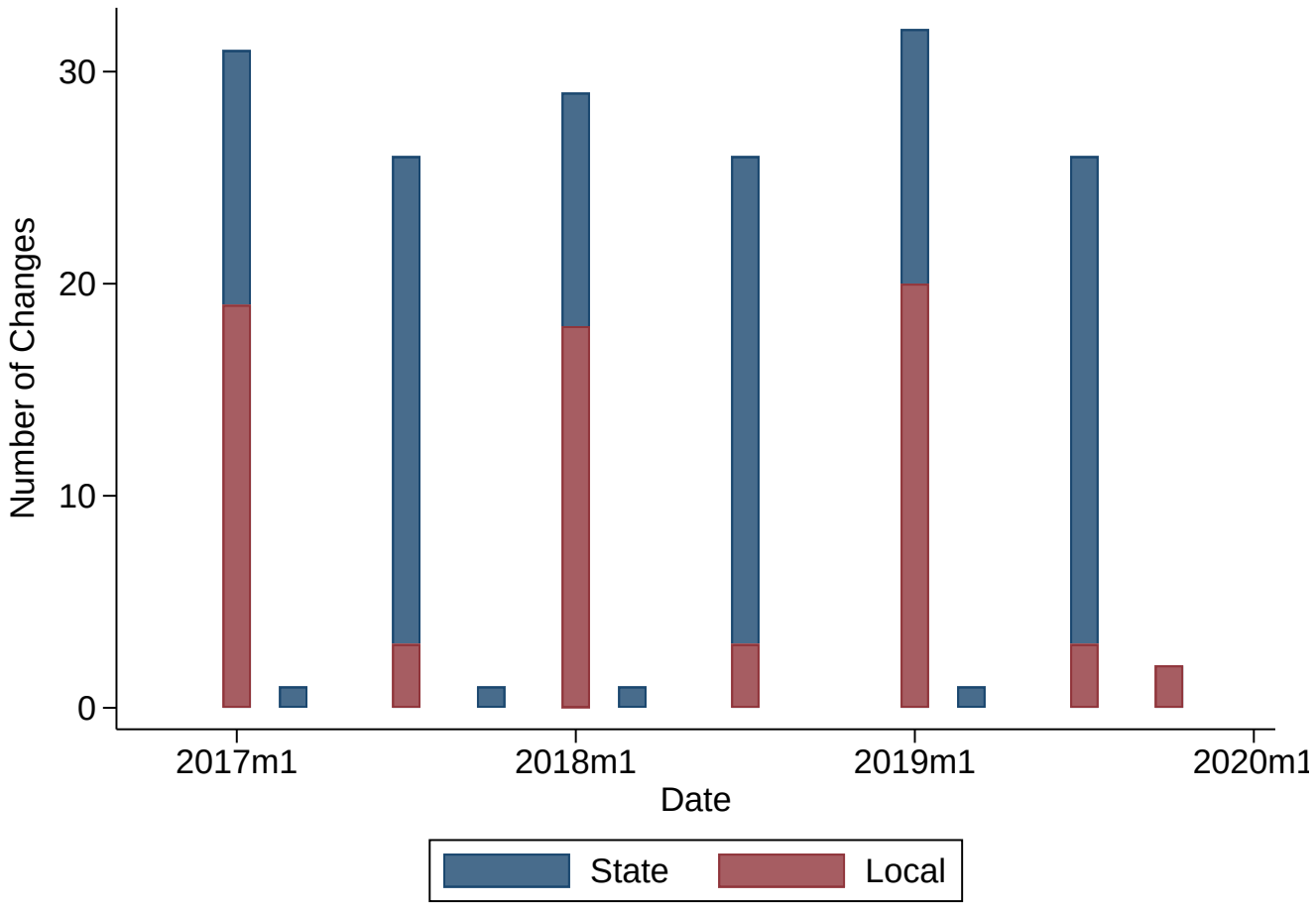


Figure 10: Cengiz et al. (2019)

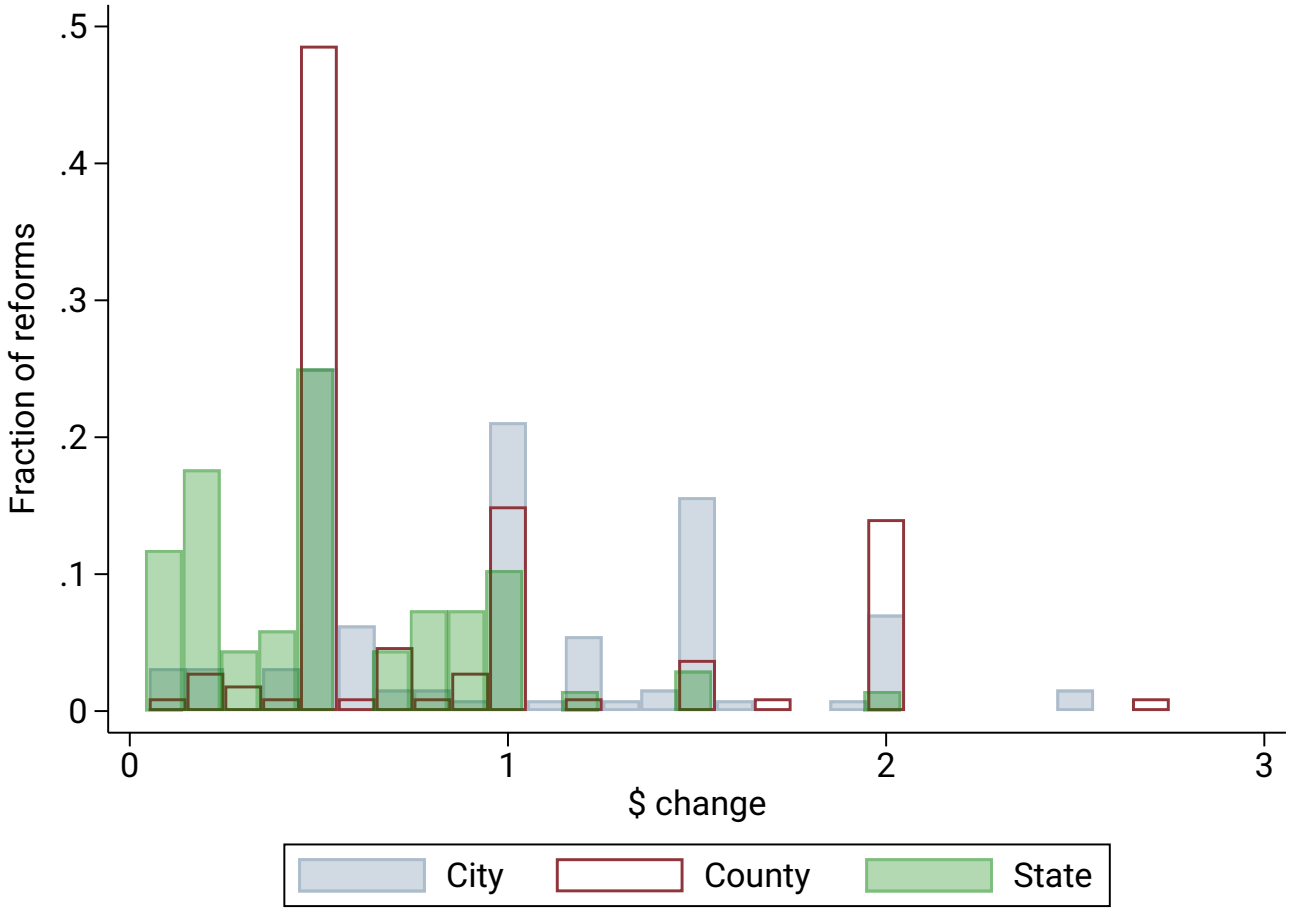
Back

Minimum wage changes: 2016-2019



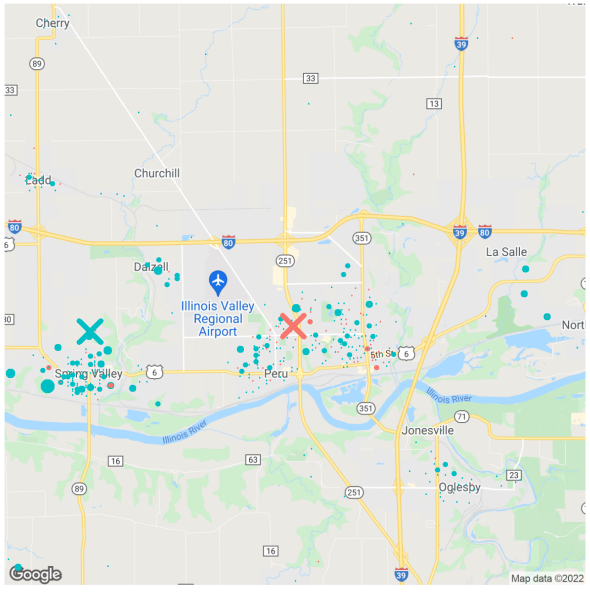
Back

Minimum wage changes: 2016-2019



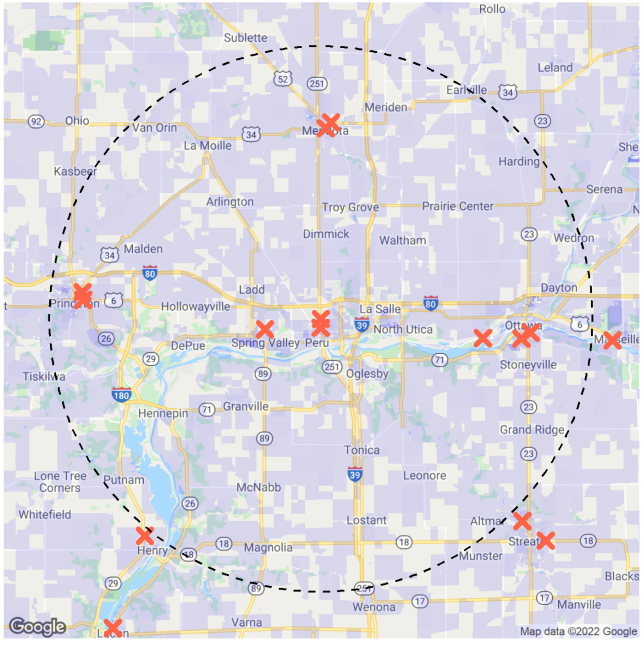
Back

Determining nursing home labor markets



Number of workers

- 2.5
- 5.0
- 7.5
- 10.0

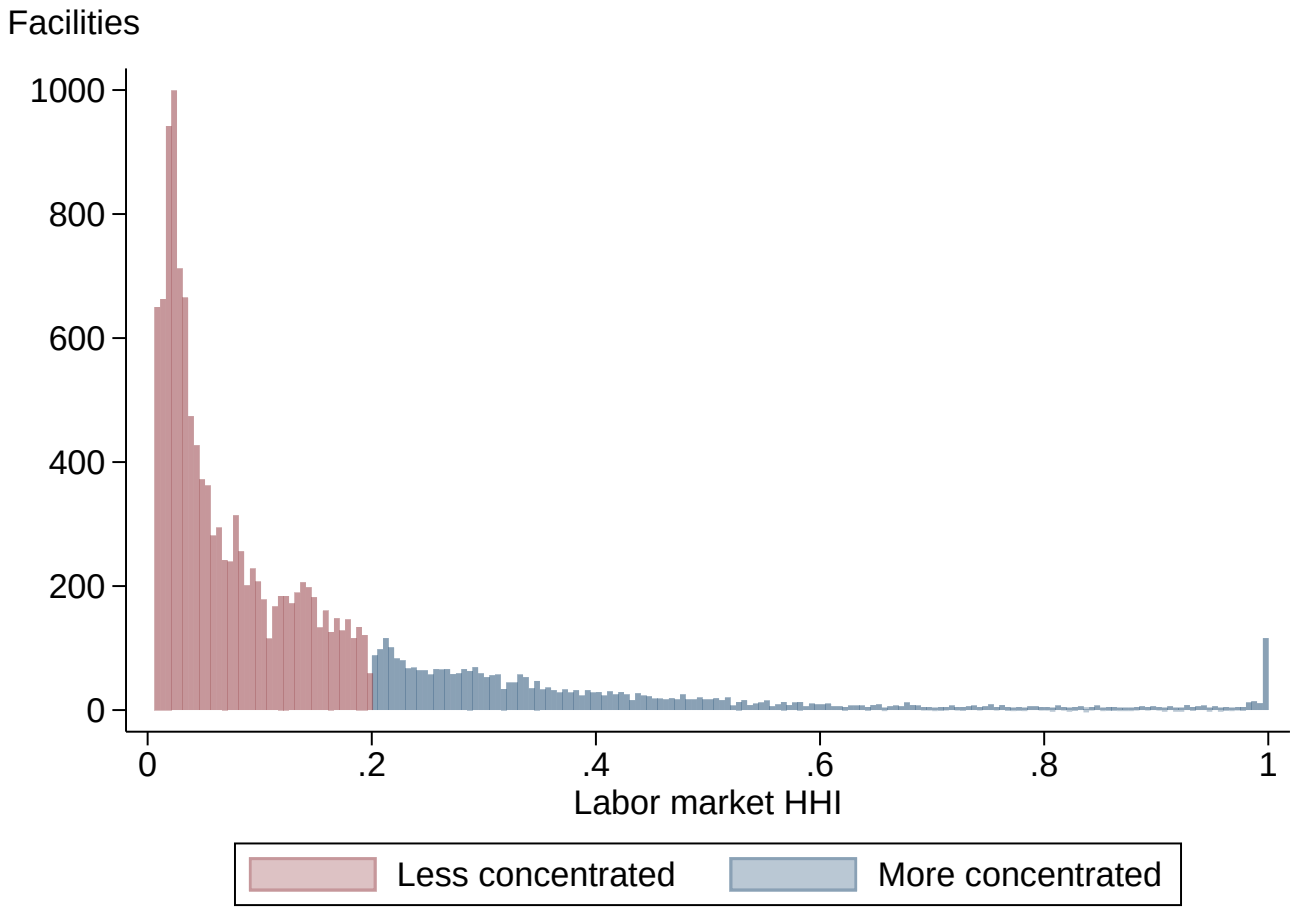


CNS16

- 0
- 40
- 80
- 120

Back

HHI distribution



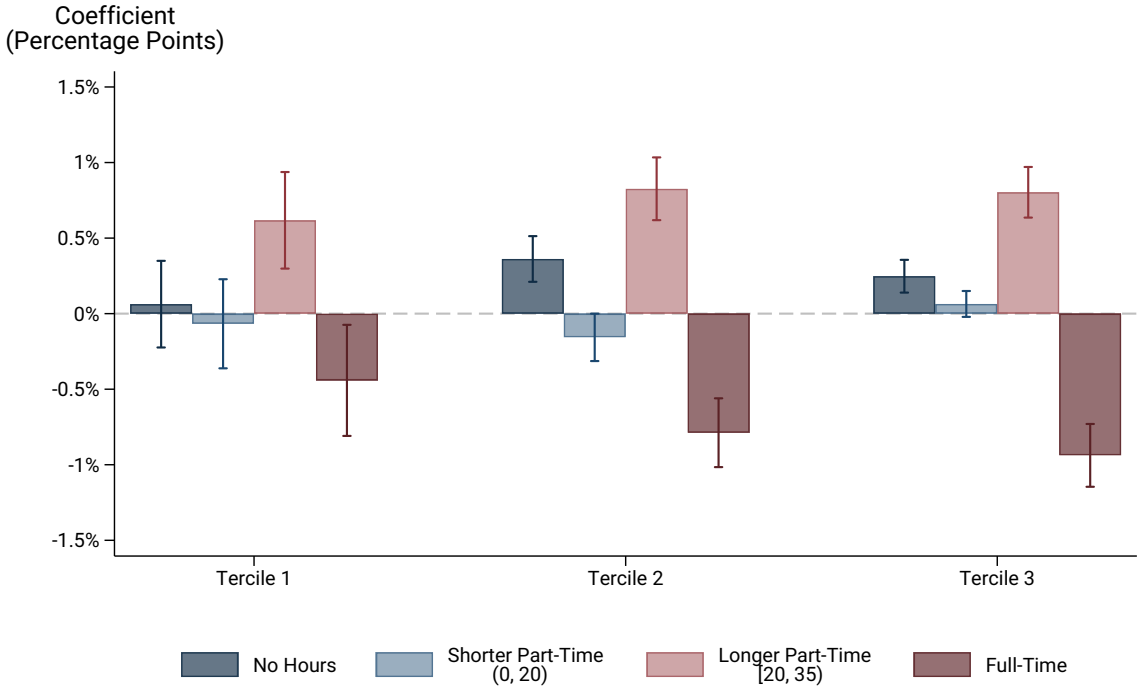
Back

Hours worked: By worker tenure

	New Hires		Tercile 1		Tercile 2		Tercile 3	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Panel A: Fiscal Year 2018 (Facilities)								
Hours Per Bed	3.08	2.69	1.98	1.62	3.32	2.35	4.95	3.13
Number of Workers Per Bed	0.10	0.09	0.08	0.06	0.11	0.08	0.13	0.08
Overtime Hours Per Bed	0.19	0.31	0.10	0.17	0.17	0.25	0.45	0.45
Share of Full-Time Weeks	0.33	0.22	0.20	0.17	0.30	0.18	0.56	0.19
Share of Weeks with Overtime	0.22	0.21	0.14	0.17	0.20	0.19	0.39	0.22
Tenure Range (Hours at Start of Fiscal Year)	[0, 0]		(0,]		(,]		(,]	
Panel B: Fiscal Year 2019 (Facilities)								
Hours Per Bed	2.91	3.04	2.10	1.92	3.12	2.04	4.96	3.05
Number of Workers Per Bed	0.10	0.10	0.08	0.07	0.10	0.07	0.14	0.08
Overtime Hours Per Bed	0.18	0.28	0.13	0.20	0.21	0.27	0.45	0.46
Share of Full-Time Weeks	0.33	0.22	0.25	0.19	0.31	0.18	0.53	0.19
Share of Weeks with Overtime	0.23	0.22	0.19	0.20	0.23	0.20	0.38	0.22
Tenure Range (Hours at Start of Fiscal Year)	[0, 0]		(0,]		(,]		(,]	

Back

Hours worked, part- and full-time status



Takeaway: New hires work more,
high-tenure work more (longer-)part-time.

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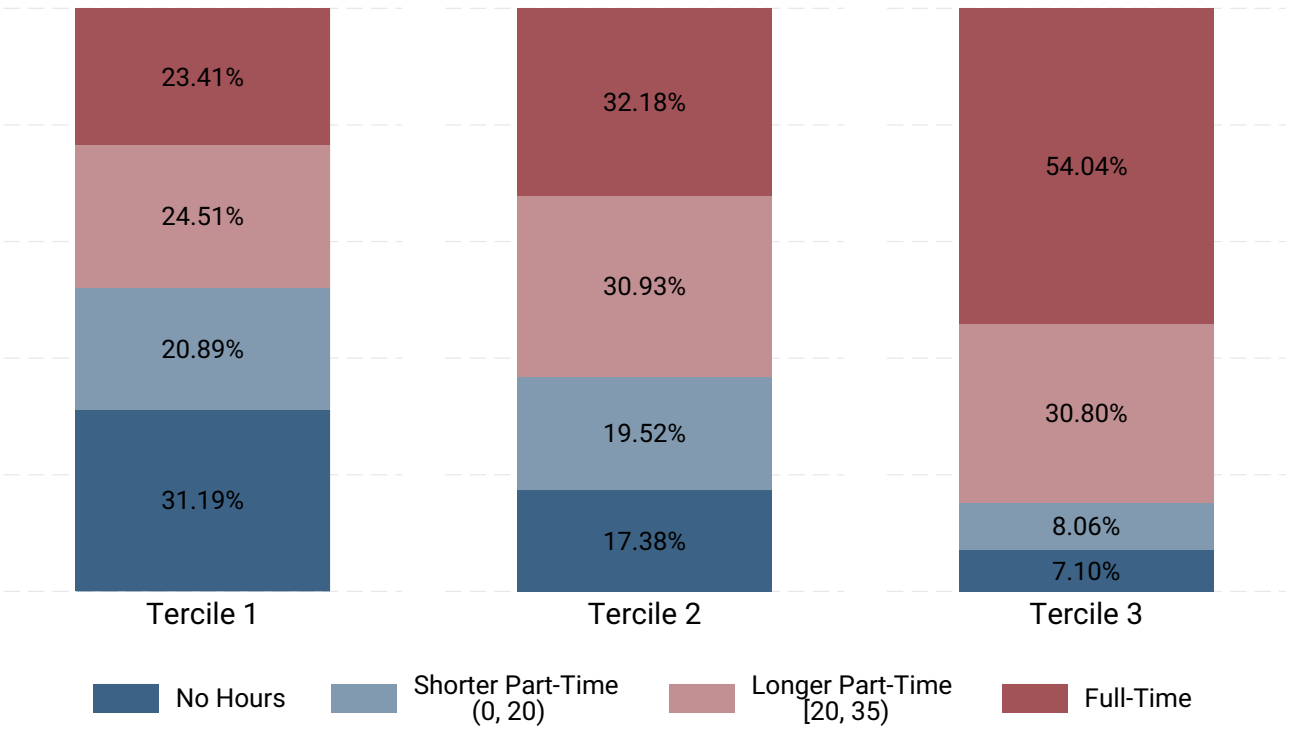
Part- and full-time work: Initial distribution



Back