

# The Impact of Minimum Wages: International Evidence

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Umass Amherst, and NBER

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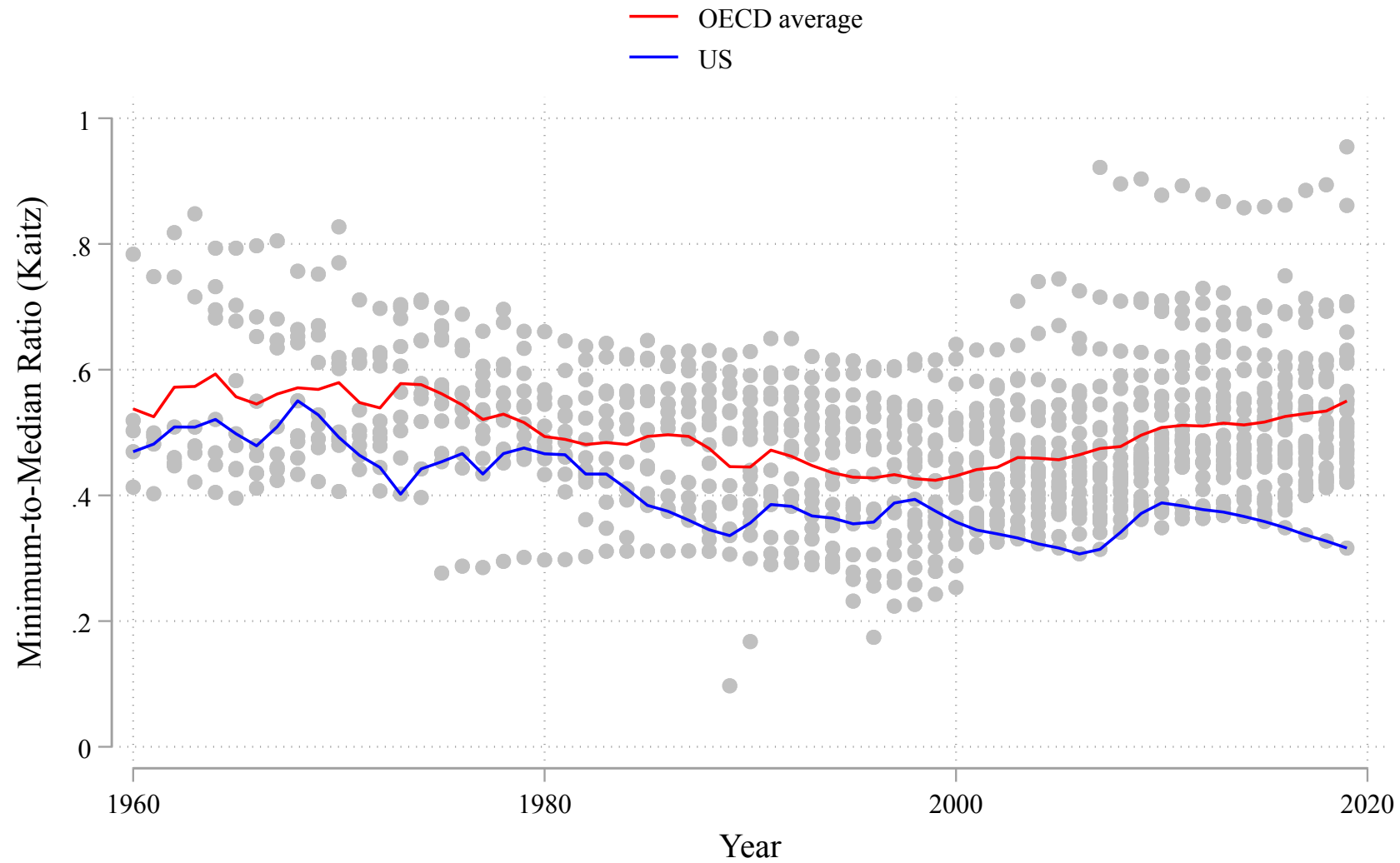
# An outline for the talk

- International Context
  - What's happening with minimum wages?
- Conceptual Framework for Understanding Minimum Wage Impacts
  - Absorption of minimum wages in imperfectly competitive labor markets
  - Role of re-allocation
- Key evidence on overall effects of minimum wages on employment
  - Evidence from US states
  - National minimum wage and living wage in UK
  - Germany's national minimum wage
  - Overall meta-analysis using the Own-Wage-Elasticity of employment
- Recent evidence from “high minimum wages”
  - Recent increases in US states, cities
  - Recent increases in National Living Wage in UK
- Parting Thoughts
  - Turning point by what?
  - Covid crisis

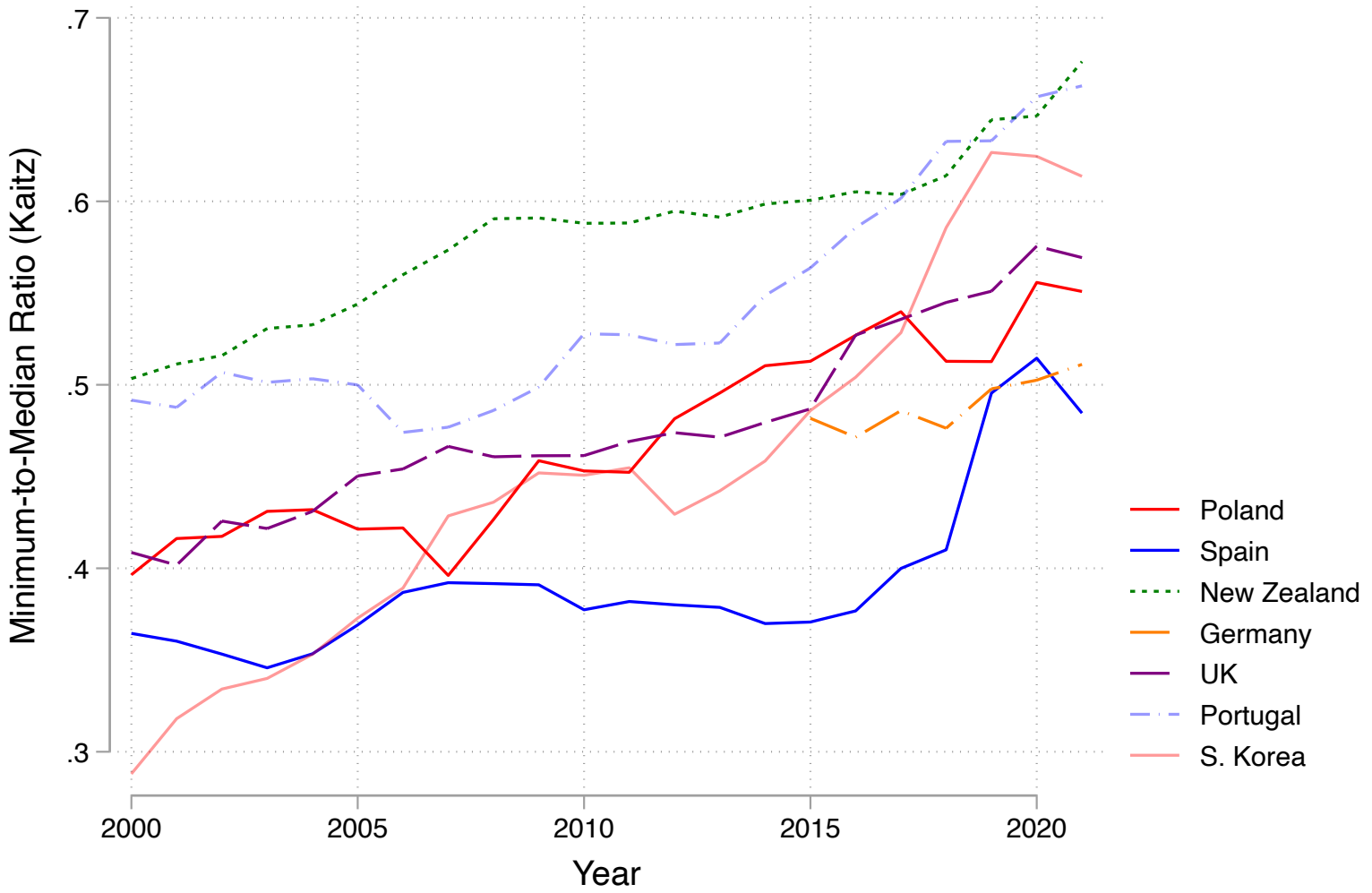
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# Minimum Wages Are Rising Internationally



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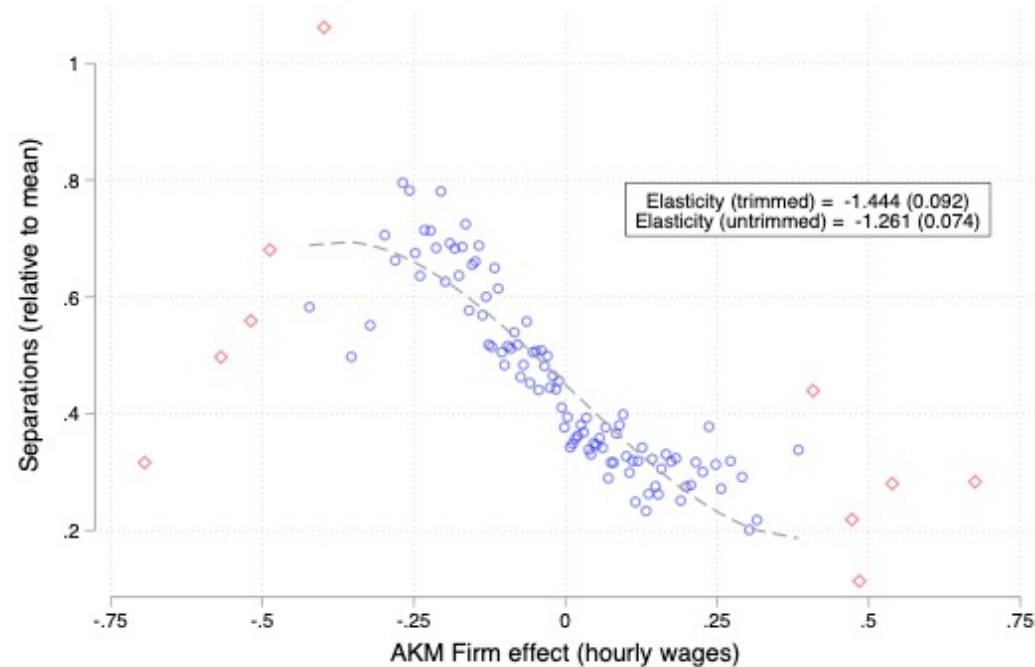
# Key aspects of how low wage labor markets

- Low wage labor markets have substantial monopsony power
  - Shown in contexts of US, UK, Germany, and more
  - Evidence from matched employer employee data in US (Bassier, Dube Naidu 2021)

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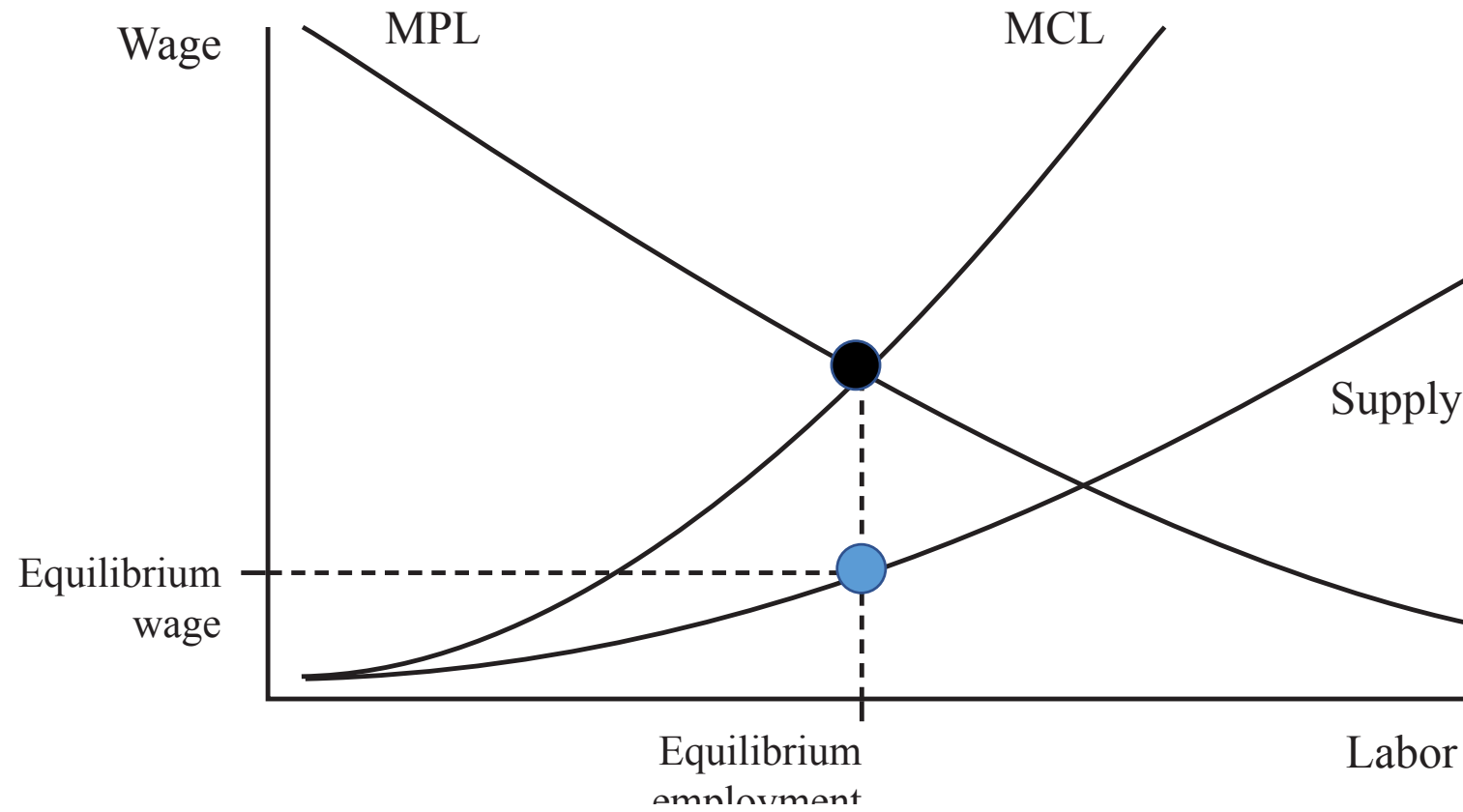
Figure 2: Separations and firm wage effects



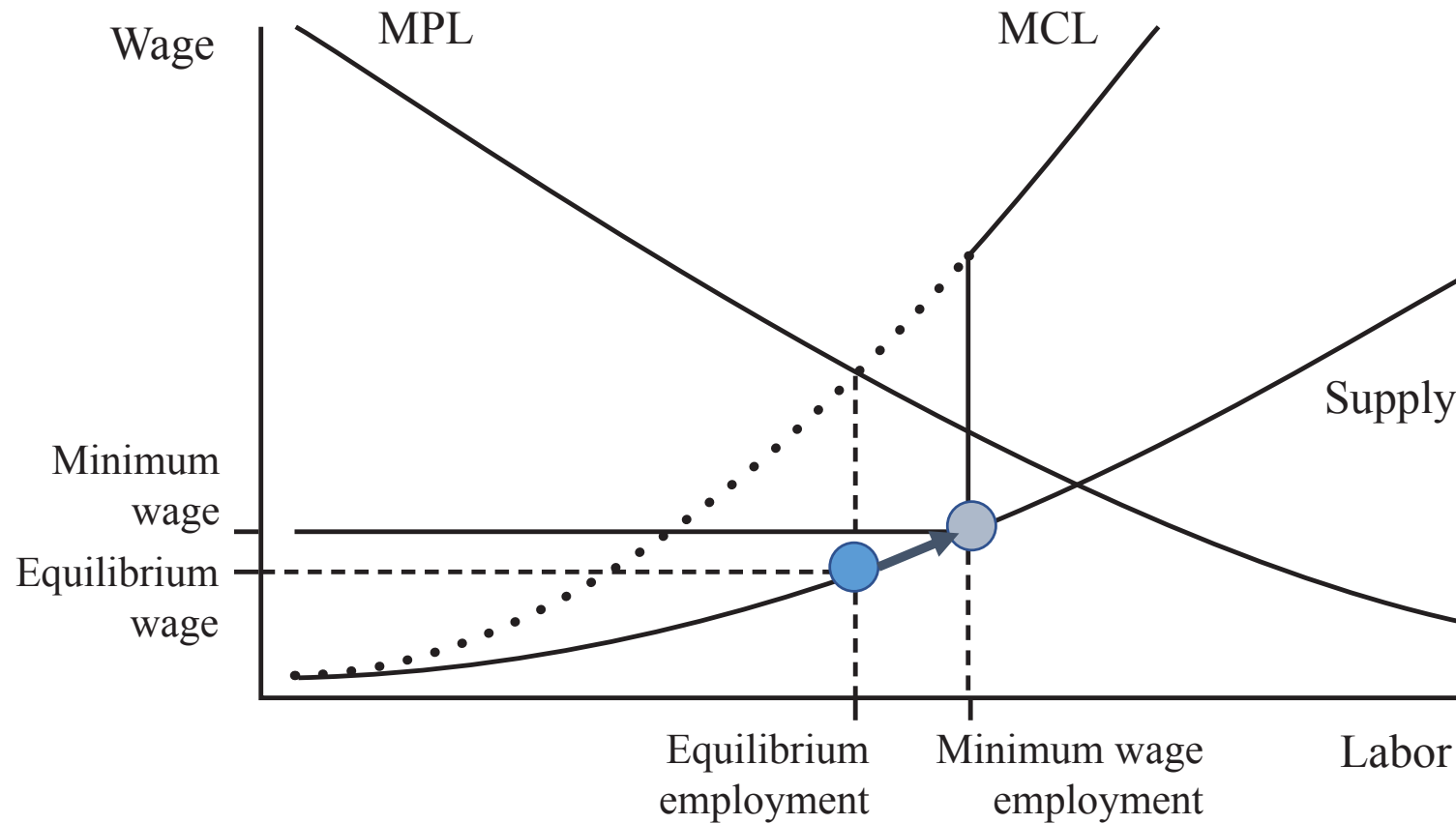
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- Minimum wage effects in monopsonistic labor markets are nuanced
  1. Labor supply versus demand constrained firms
  2. Reallocation effects
  3. Heterogeneity by local labor market characteristics (wage level, concentration)

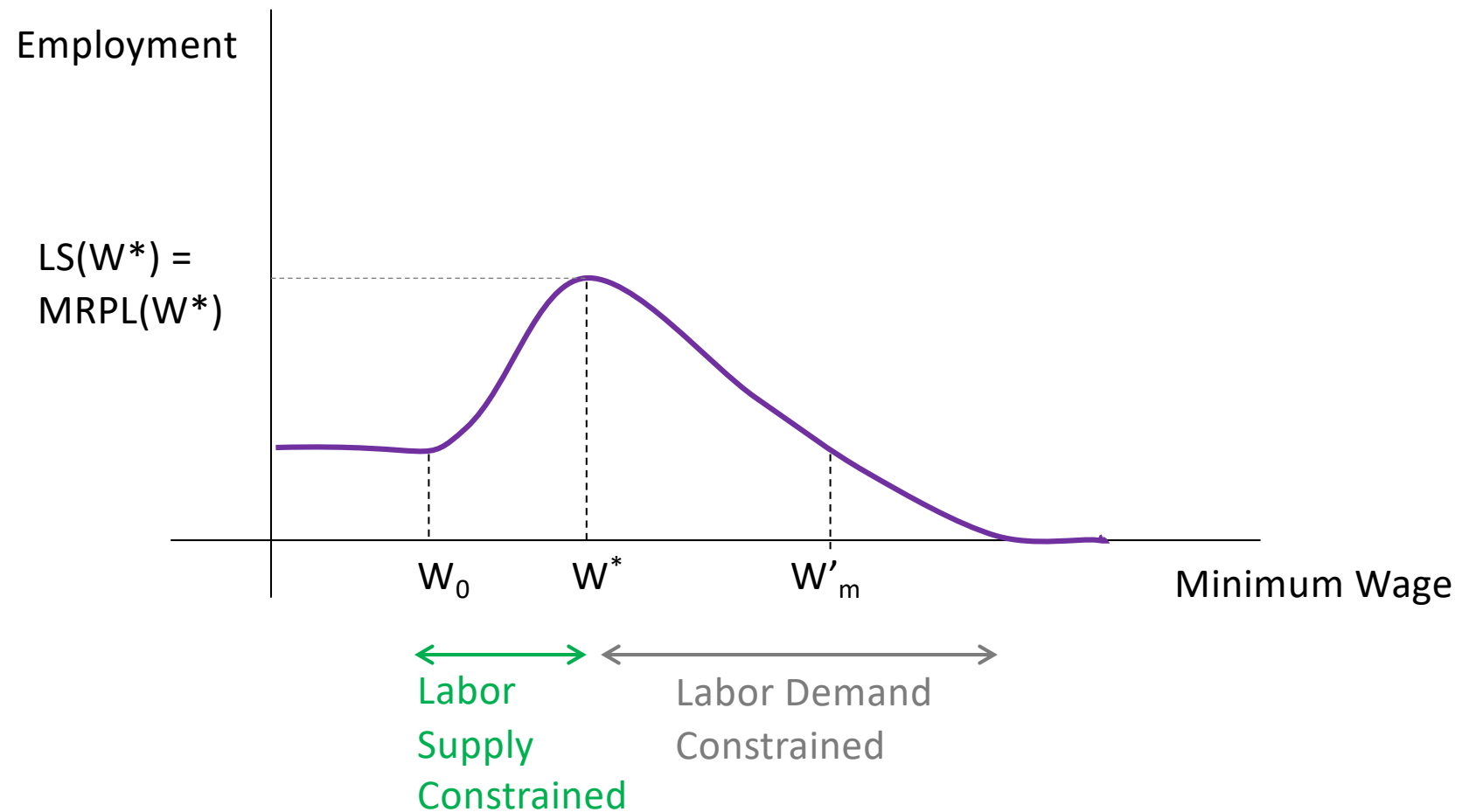
# Minimum wage in monopsonistic labor market



# Minimum wage in monopsonistic labor market



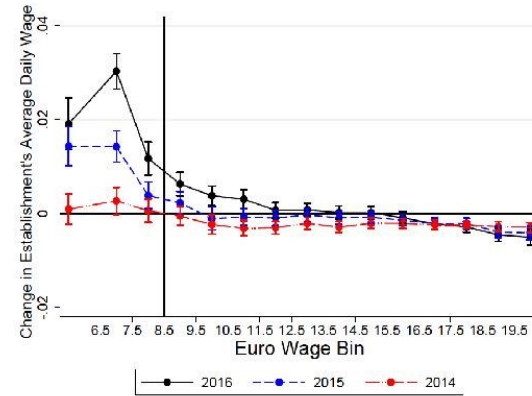
# MW effect on employment in monopsony model



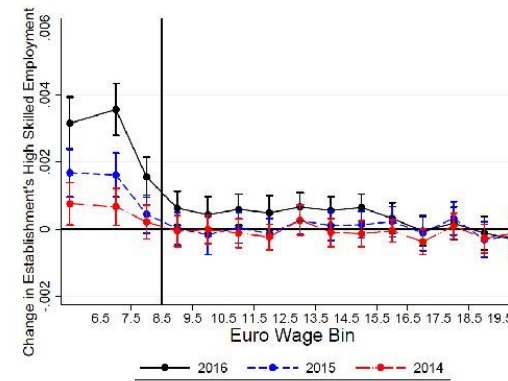
# Reallocation effects in monopsonistic markets

- Firms have different productivity and wage policies
  - Low-productivity firm types are bound by labor demand: shrink in size from having to raise wages
  - Medium-productivity types bound by labor supply: some expand in size as they raise wages
  - Highest-productivity types whose wages were already substantially above the minimum may expand or shrink

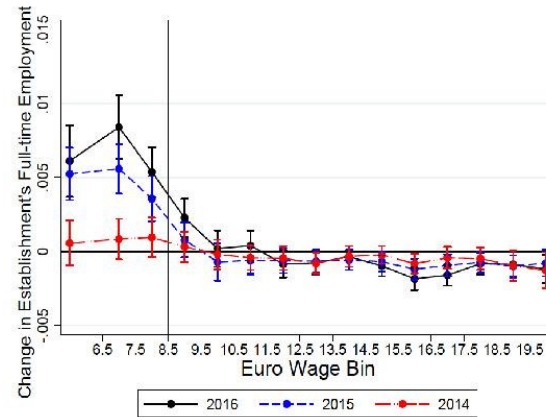
# Reallocation Effects from Germany's National Minimum Wage (Dustmann et al. 2022)



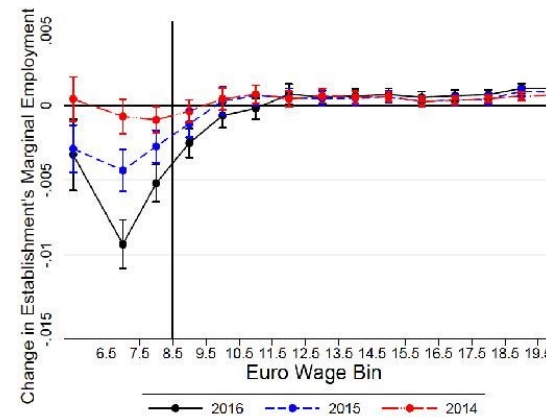
(A) Establishment's Average Daily Wage



(B) Establishment's High-Skilled Employment Share



(C) Establishment's Full-Time Employment Share



(D) Establishment's Marginal Employment Share

# Concentration, monopsony power, and minimum wage effects

- Should we expect to detect larger job losses in less urban areas where minimum wage more binding?
  - Unclear since rural markets tend to *also* be more concentrated and are typically less tight.
  - Evidence from Azar et al. (2019) suggests that employment effects are more positive in more concentrated markets.
  - Suggests “turning points” may be tricky to detect using “bite” of the policy

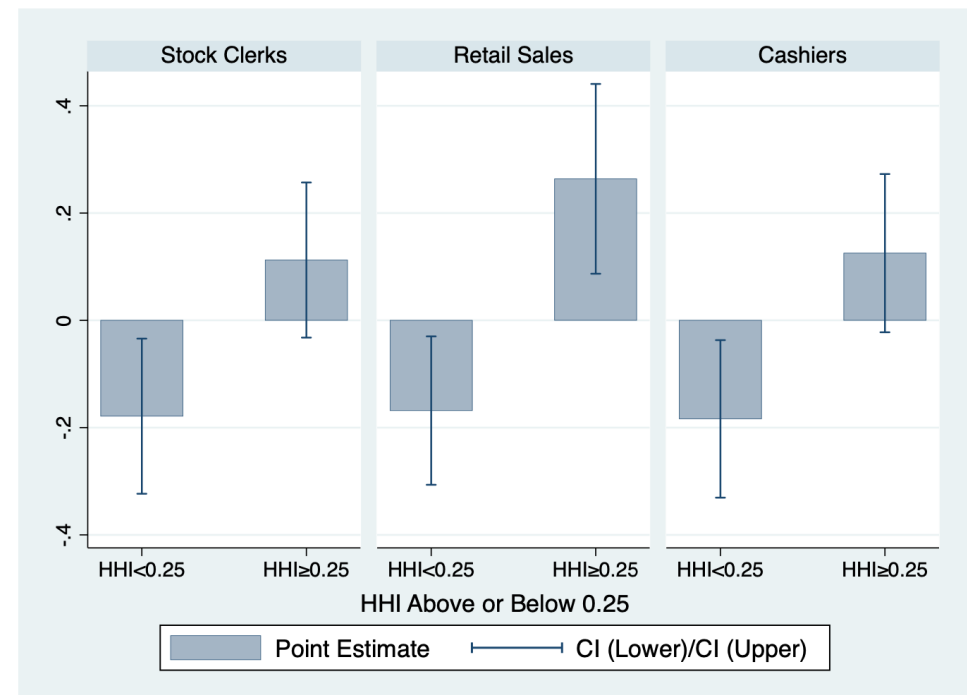


Figure 4. Employment Elasticities by High/Low Occupational Labor Market Concentration

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# Measuring the size of minimum wage employment effects

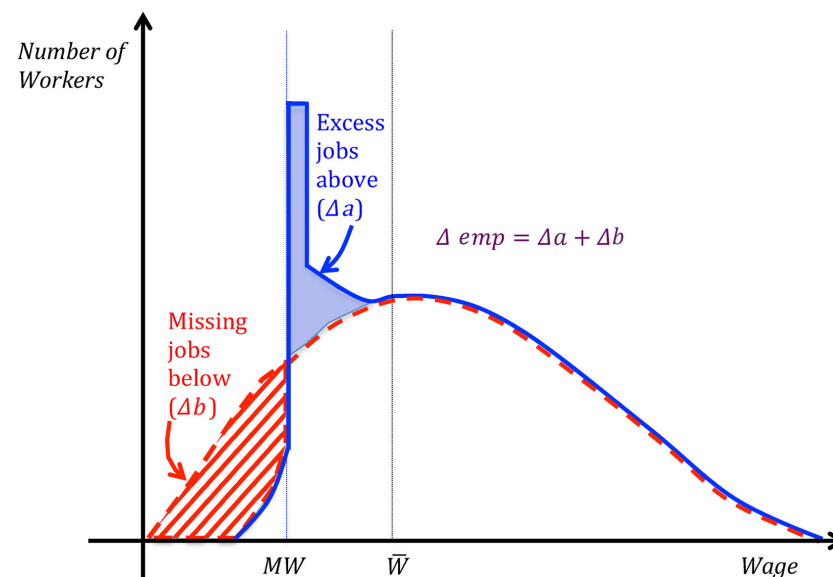
- Need a way to quantify the size of employment effect
- Own wage elasticity (OWE) of employment:

$$\frac{\% \Delta \textit{Employment}}{\% \Delta \textit{Wage}}$$

- Until recently, the minimum wage literature typically used narrow “low-wage” groups like teens, young high-school dropouts, and restaurant workers
- Ideally want to know more comprehensive impact on low-wage jobs/workers

# Approaches to Estimating the Overall Effect of Minimum Wages on Jobs

1. “Bunching approach” in Cengiz, Dube, Lindner Zipperer (2019, QJE)
  - Estimate impact of policy on frequency distribution of wages
  - Compare “missing jobs” below the minimum to “excess jobs” at or just above the minimum



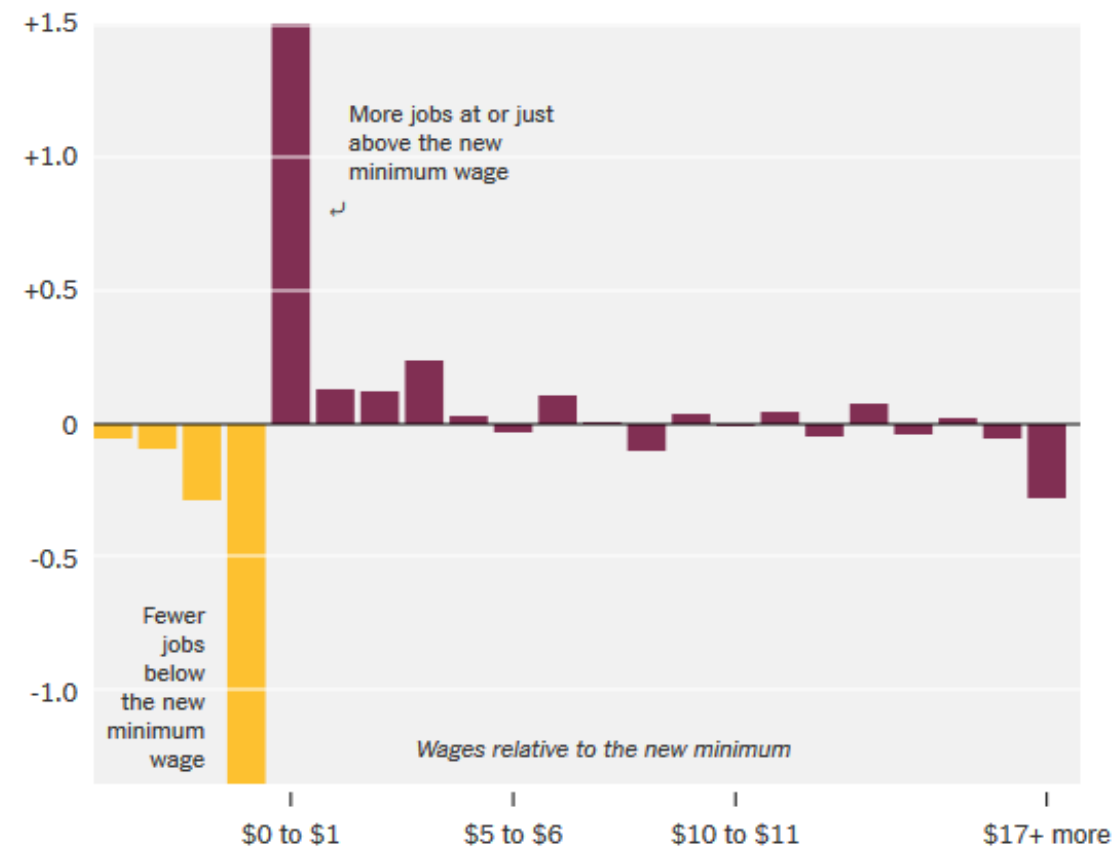
- Implement using 138 prominent changes in US 1979-2016. Up to 7 years following policy change

# Evidence from “bunching approach”

- OWE of 0.41 (s.e. 0.43)
  - FTE (with hours) OWE of 0.60 (s.e. 0.42)
- Evidence on wage spillovers
- Little heterogeneity by demographic or “skill” groups
- More negative impact in tradable sector, but small share of min wage workers
- Overall, event by event analysis can’t rule out sharp null of zero effects

## What Research Showed Across the United States

Estimates of the change in jobs five years after a change in the minimum wage, as a share of total employment before the increase

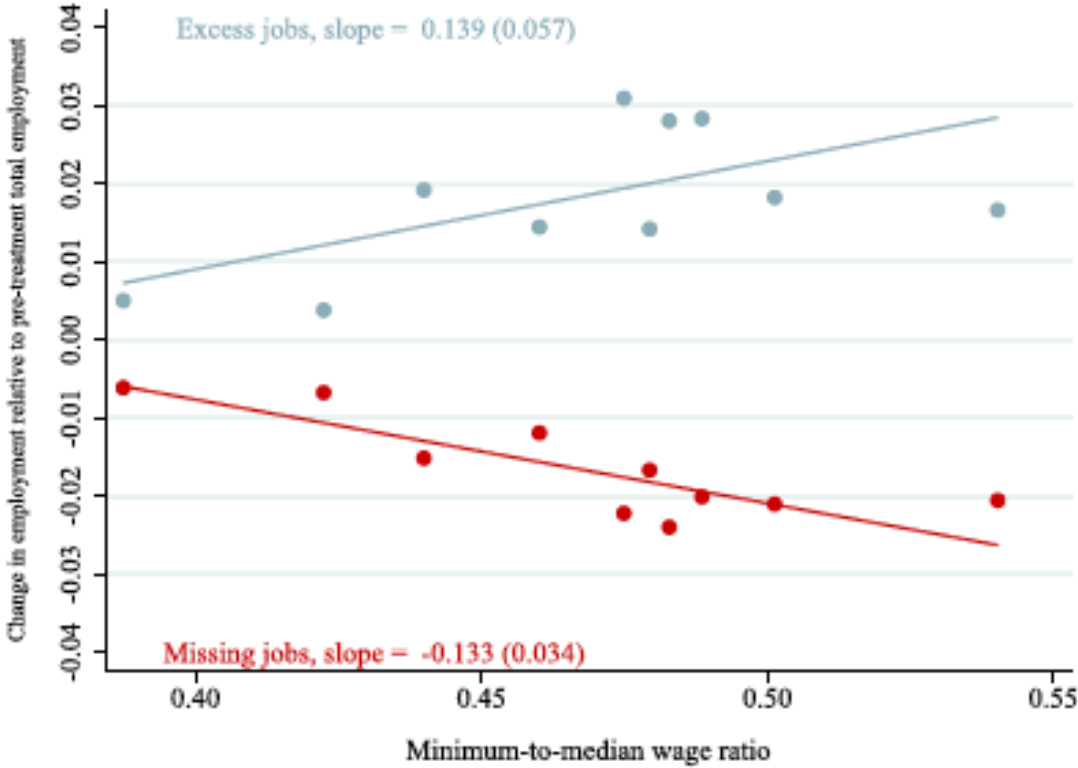


Based on 137 state-level minimum wage increases between 1979 and 2016

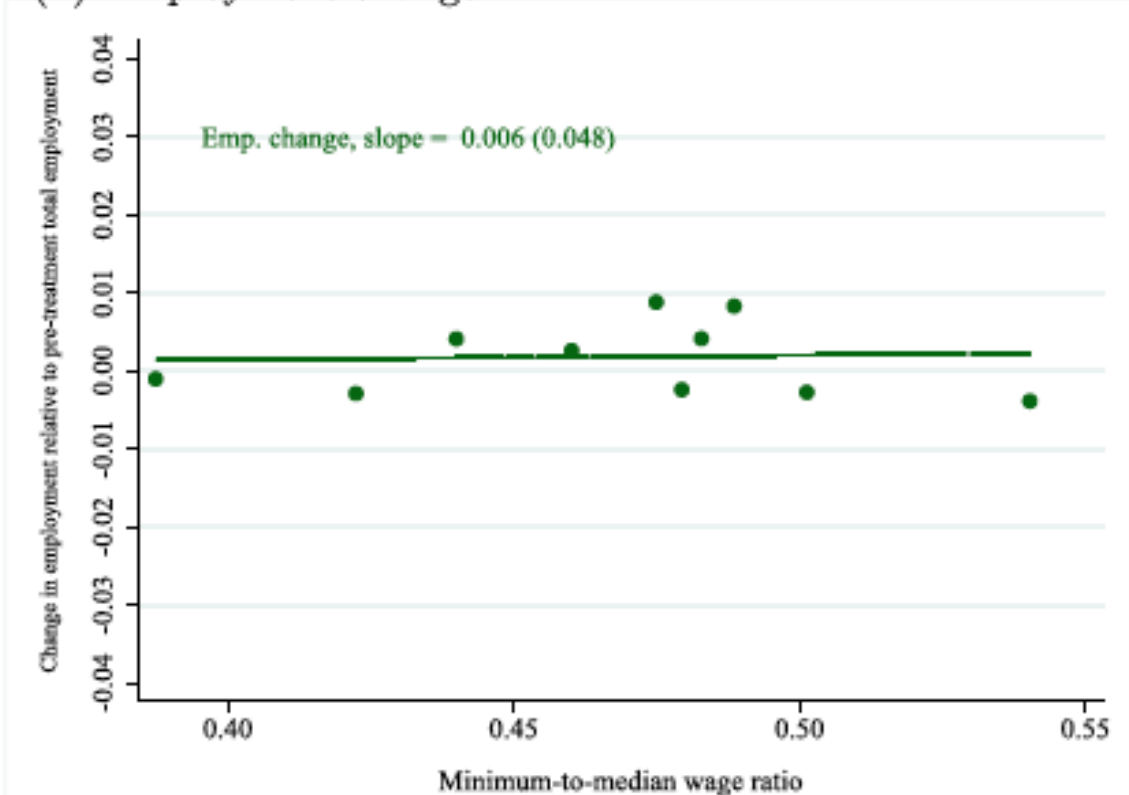
Source: “The Effect of Minimum Wages on the Total Number of Jobs: Evidence from the United States Using a Bunching Estimator”

# Heterogeneity in impact by Kaitz Index

(A) Missing and excess jobs



(B) Employment change

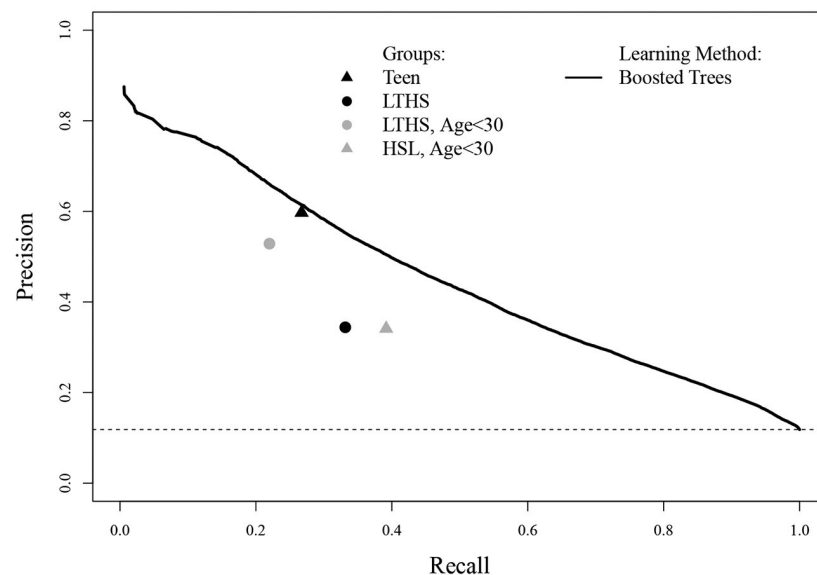


Source: Cengiz, Dube, Lindner, Zipperer (2019)

# Approaches to Estimating the Overall Effect of Minimum Wages on Jobs

## 2. “Prediction approach” in Cengiz, Dube, Lindner Zentler-Munro (2022, *JoLE*)

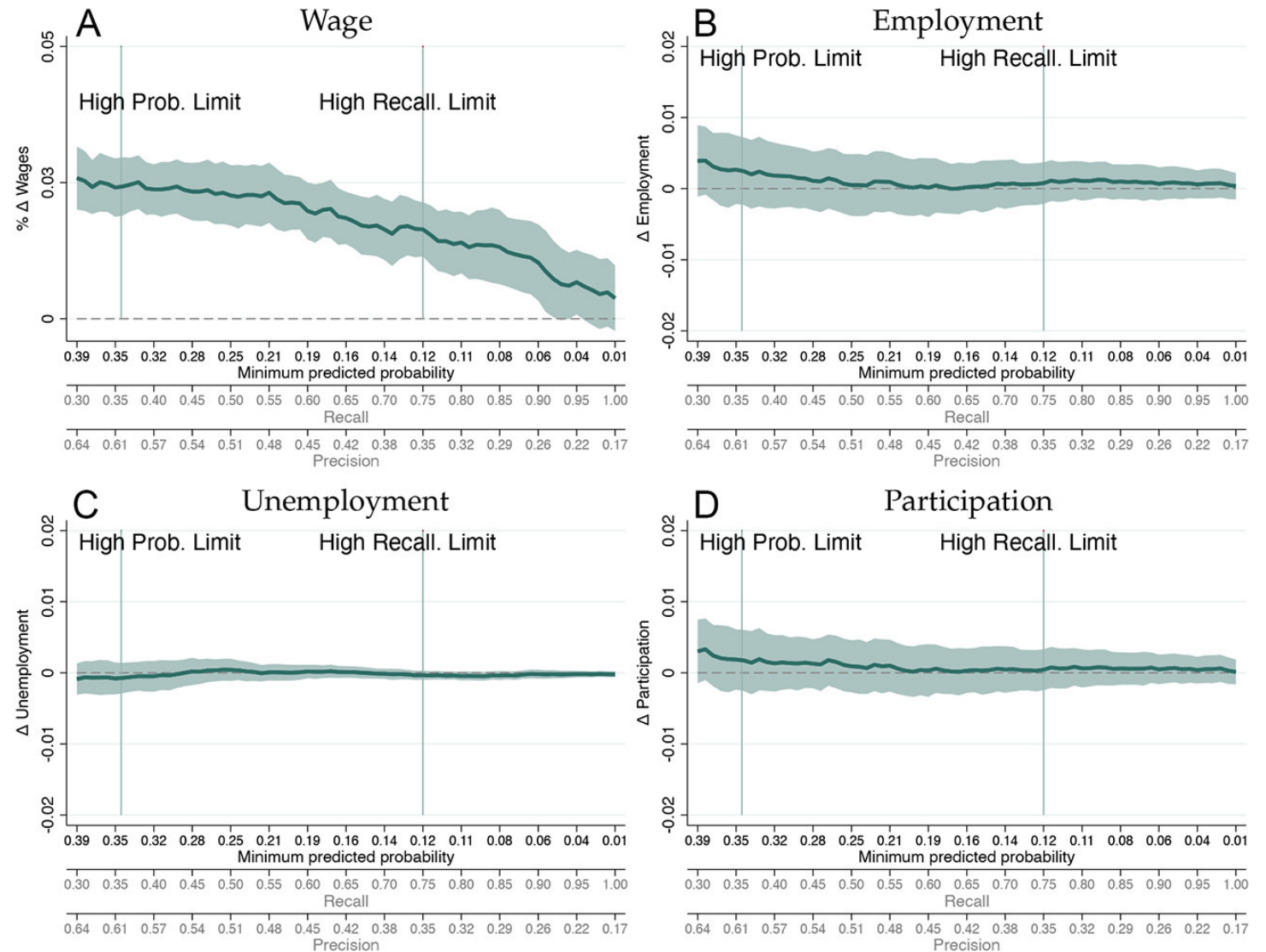
- Use a ML-based model and demographic features to predict a “high probability” or “high recall” group; high recall group captures around  $\frac{3}{4}$  of minimum wage workers but still gets a strong 1<sup>st</sup> stage wage effect



- Use 172 prominent changes in US 1979-2019.

# Evidence from “prediction approach”

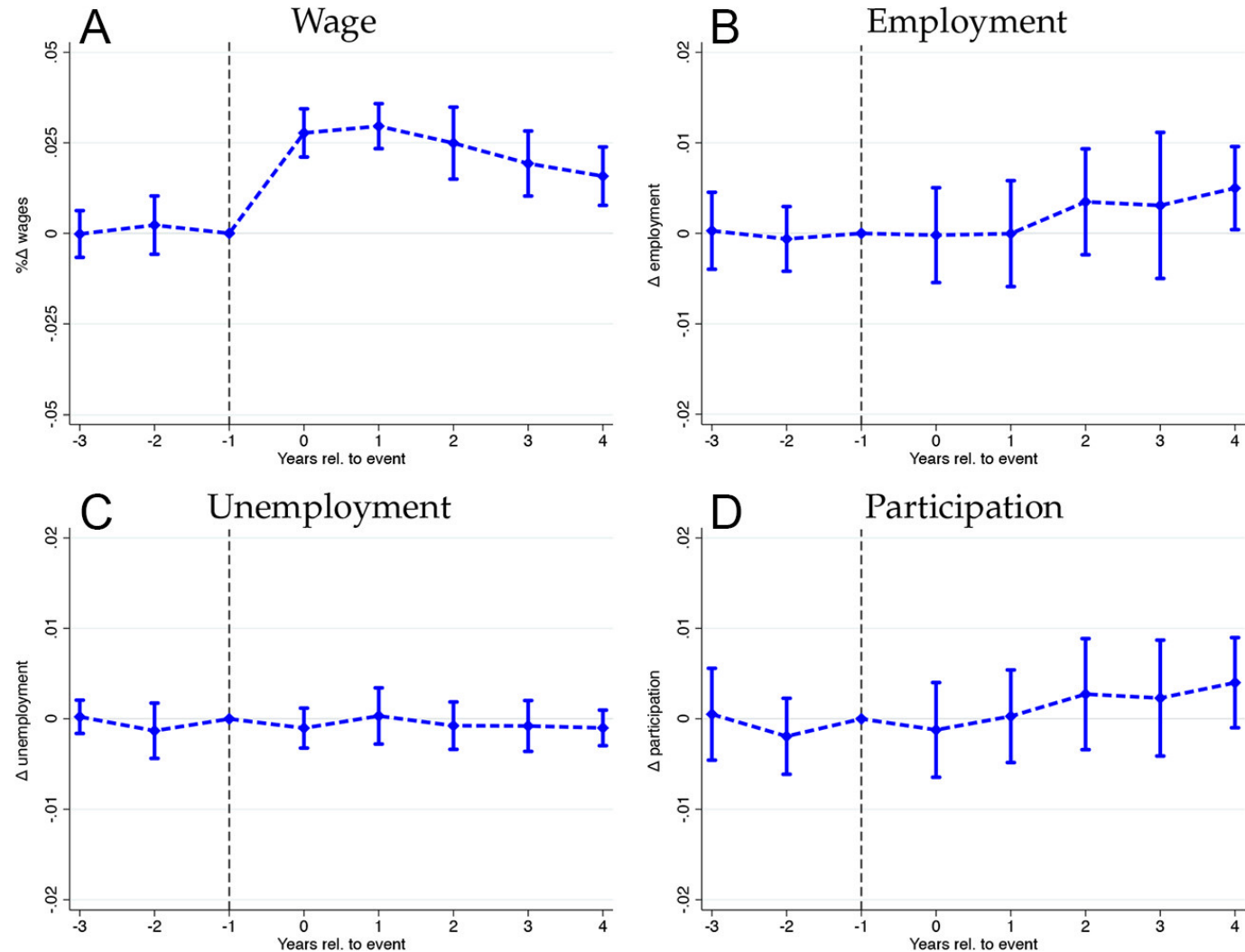
- OWE of 0.11 (s.e. 0.22) for “high recall” group; OWE of 0.29 (s.e. 0.32) for “high probability” group
- Little evidence of labor-labor substitution
- Some evidence of *increased* hours for “high probability” group, and zero effect on hours for “high recall” group.



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- Little evidence of labor-labor substitution



# Review of Evidence on Wages and Employment from 77 Studies

Own-wage elasticity:

$$\left( \frac{\% \Delta Emp}{\% \Delta MW} \right) / \left( \frac{\% \Delta Ave Wage}{\% \Delta MW} \right)$$

Size:

> -0.4	“Small”	(74%)
-0.4 to -0.8	“Medium”	(10%)
< -0.8	“Large”	(16%)

Source: updated from Dube 2019 review through 2022.



# Evidence from UK, Germany

- UK

- Most NMW evidence (Stewart 2004, Manning 2016), early NLW evidence (Dube 2019, Aitken Dolton Riley 2019) point to little effect. (Exception for specific subgroup: part time women)
- Median OWE from UK (N=9) of -0.15

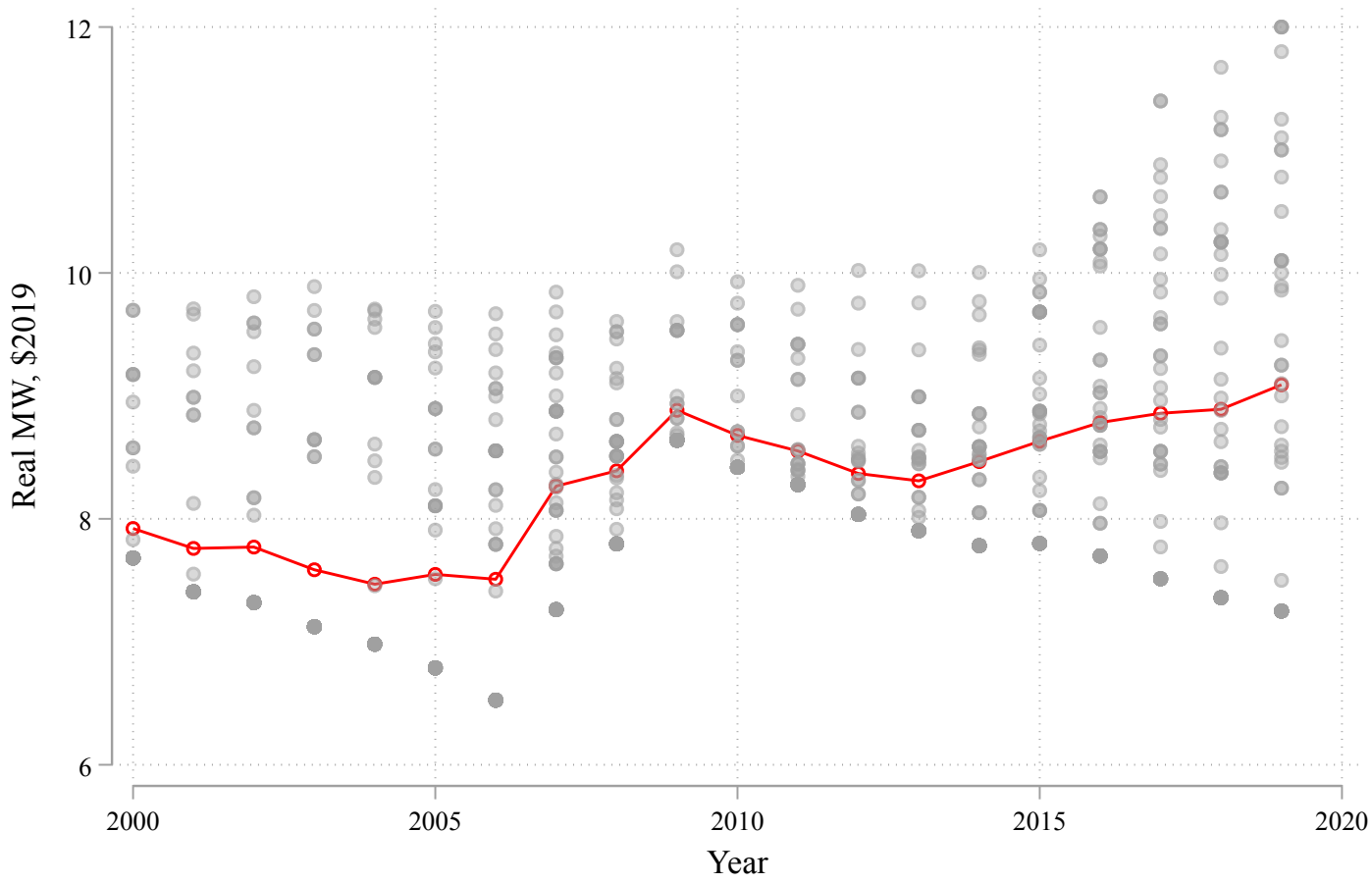
- Germany

- Ashfeldt Roth Steidel 2019; Bossler and Gerner 2019; Dustmann et al 2022 all point to small effects (OWE between -0.27 and 0.17)

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# Minimum wages Across US States

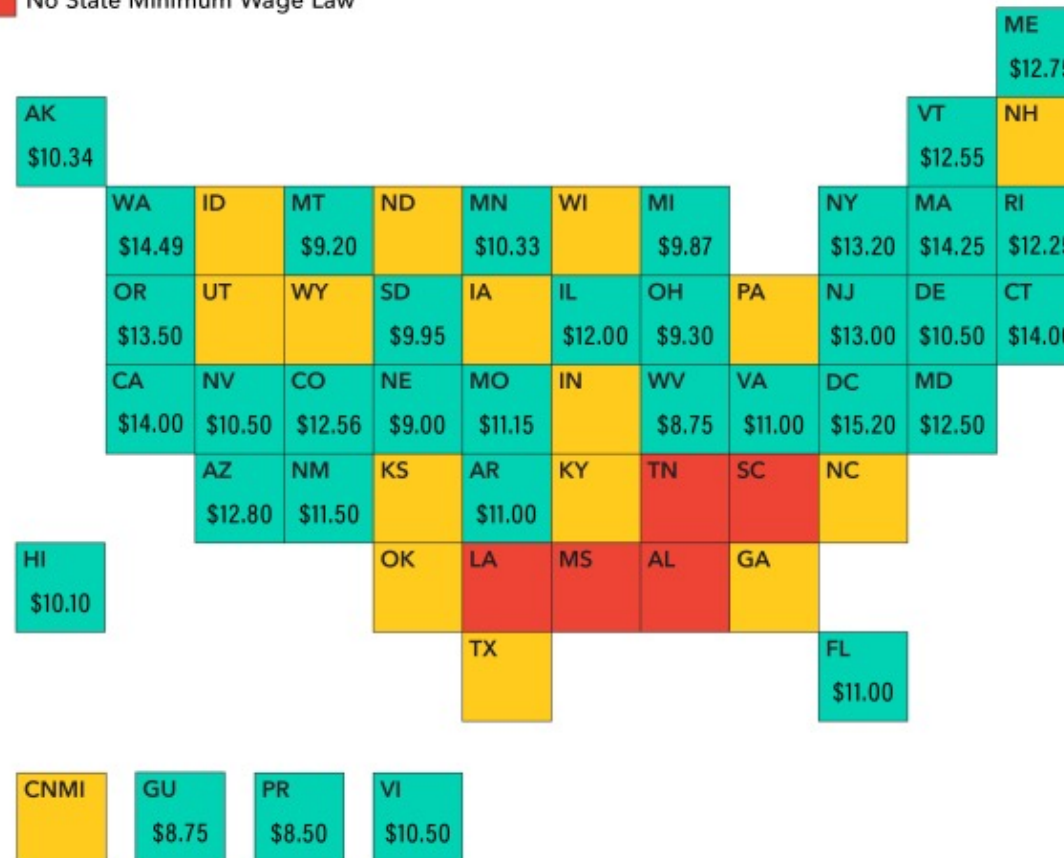


- 30 states have minimums > federal minimum wage in 2022
- 2019 population-weighted minimum wage was \$9.09

# Planned Minimum Wages Set to Rise to \$15/ 2024 in 8 states

## Minimum Wages as of 2022

■ Greater Than Federal Minimum Wage   
 ■ Equals Federal Minimum Wage of \$7.25   
 ■ No State Minimum Wage Law



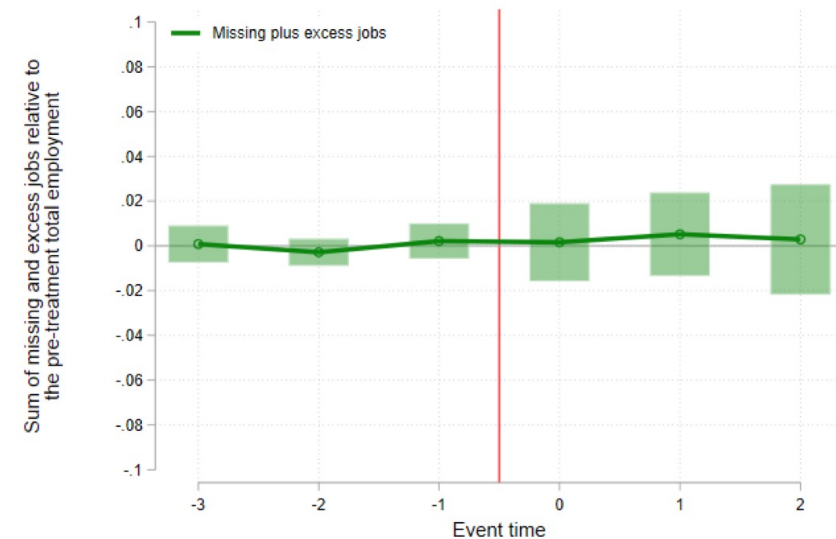
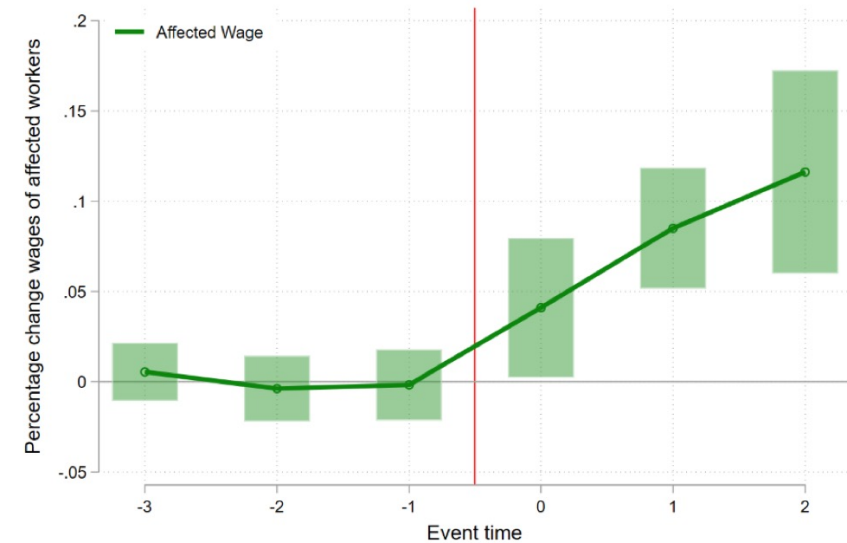
Note: Minimums may vary within California, New York, and other states based on region, employer size, and other factors.

Source: Department of Labor

Bloomberg Law

# Search for turning point (1)

- Dube (2019) used similar method as CDLZ (2019, QJE) to provide initial evaluation of 7 states with highest min wages in US through 2018.
  - OWE 0.08 (s.e. 0.36) for overall low-wage emp
  - No pre-existing trends, but some indication of upper tail changes
  - Maybe the very highest wage states are not satisfying parallel trends



## Search for turning point (2)

- Looking at specific lower skilled groups, Clemens and Strain (2021)
  - *Small effects overall (OWE of -0.25)*
  - Large heterogeneity for >\$2.50/hour increase versus <\$2.50/hour increase. OWE estimate of **-0.71** for 7 larger increases, versus **+0.21** for 16 smaller increases
  - Question: are the bites of these policies really that different? Or could it be something else driving it?

# Search for turning point (3)

- Recent work by Dube, Lindner, Piqueras (2022) uses ACS data to evaluate major minimum wage changes between 2013 and 2019.



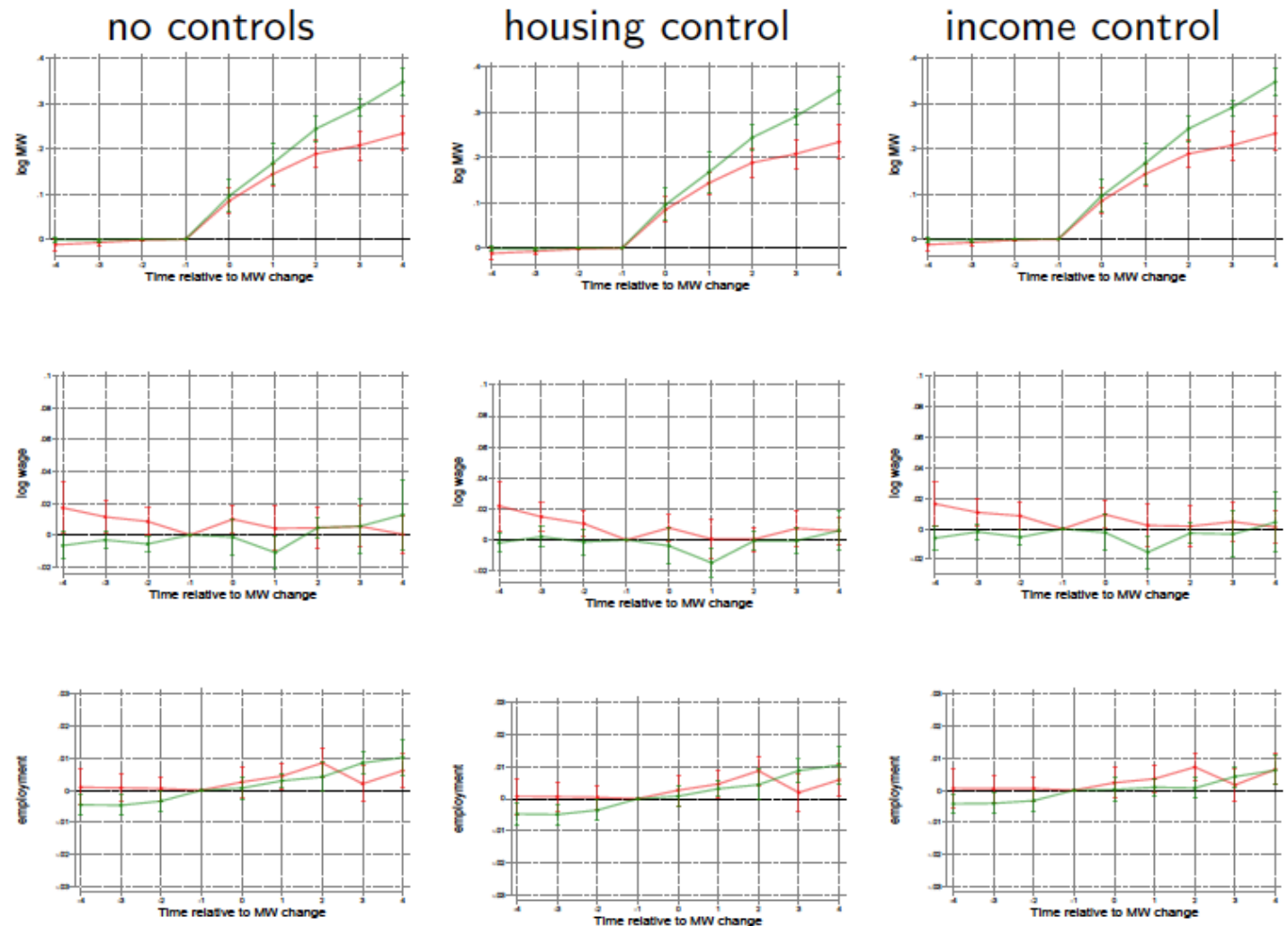
- Similar to Clemens and Strain, find overall very little effect on employment
- Employment heterogeneity highly sensitive to inclusion of “state income” control

# Search for turning point (3)

CLEMENS STRAIN UPDATED GROUPS - Q1 - SPLIT

- Recent work by Dube, Lindner, Piqueras (2022) uses ACS data to evaluate major minimum wage changes between 2013 and 2019.

- The 7 “large changers” more likely to experience wage/employment change in “low probability” groups - suggesting violations of parallel trends



# Search for turning point (3)

CLEMENS STRAIN UPDATED GROUPS - Q2 - SPLIT

- Recent work by Dube, Lindner, Piqueras (2022) uses ACS data to evaluate major minimum wage changes between 2013 and 2019.

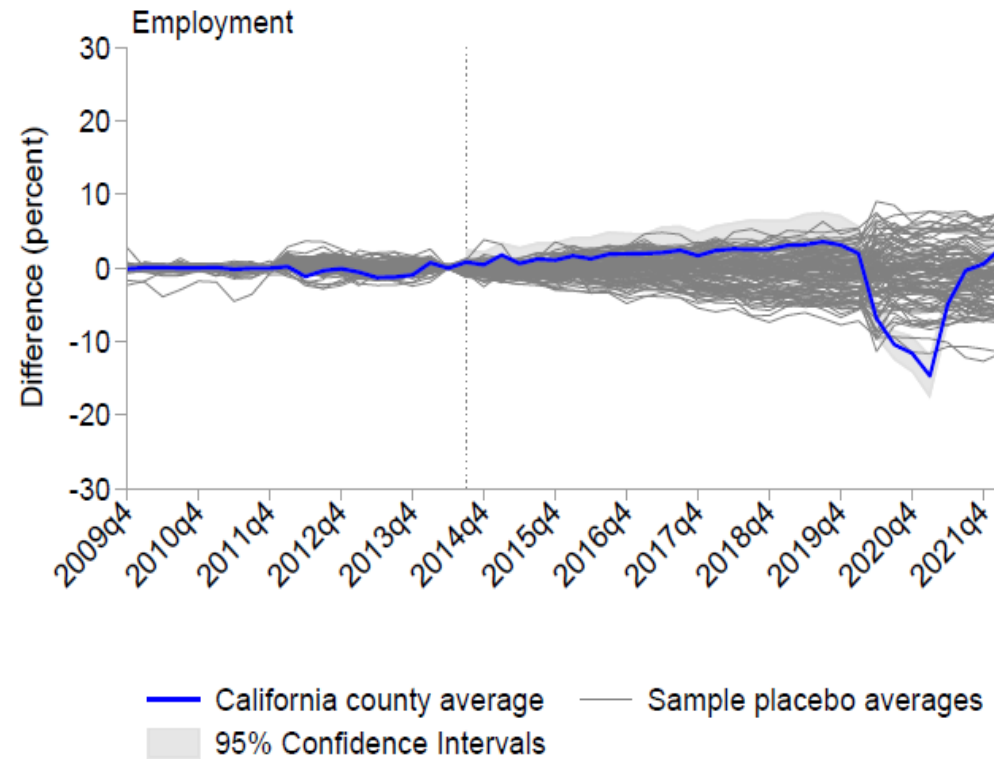
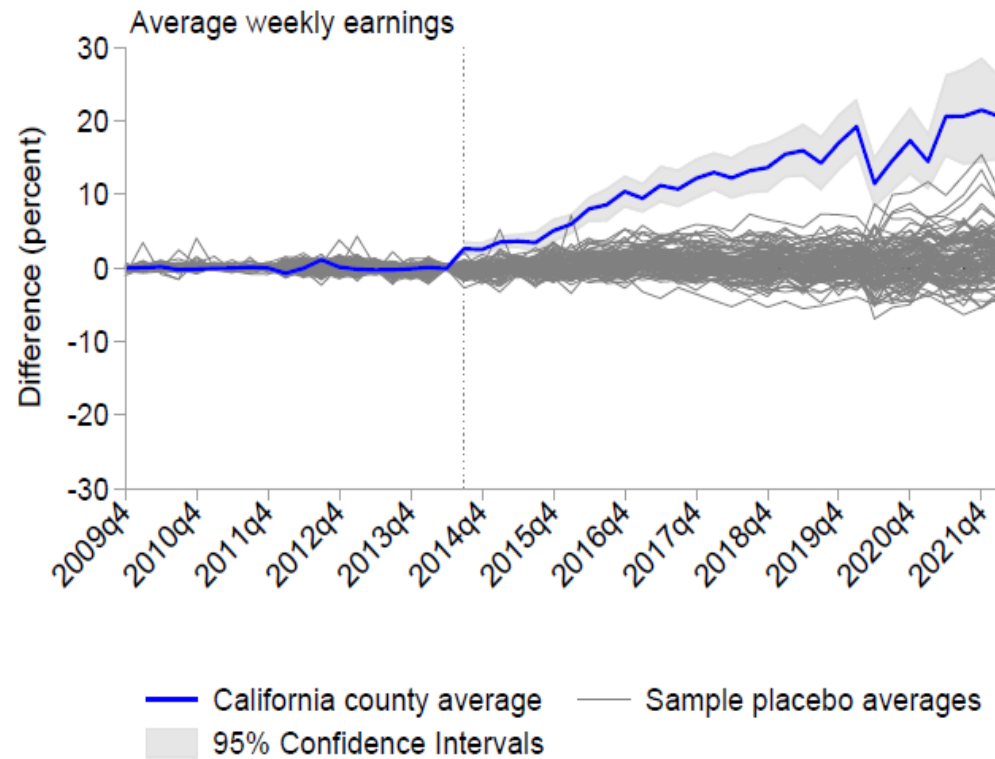
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## Search for turning point (4)

- McPherson, Reich, Wiltshire (2022) apply *Synthetic Control Methods* to identify causal effects of a \$15 MW in California, the first state to reach \$15 in January 2022
  - An 87.5 percent increase since 2014 (from \$8)
  - In some counties MW/median wage of .82
  - From a control group that has not changed its MW since 2009
- Comparison to previous MW research: Cengiz et al. QJE 2019
  - Highest MW \$12, avg increase 10 percent
  - Highest MW/ median wage .59

# Restaurant workers, average county-level estimates



	Average weekly earnings (percent)	Employment (percent)	Own-wage Elasticity
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## Restaurant Workers, All Counties

Treatment Effect

17.07

3.34

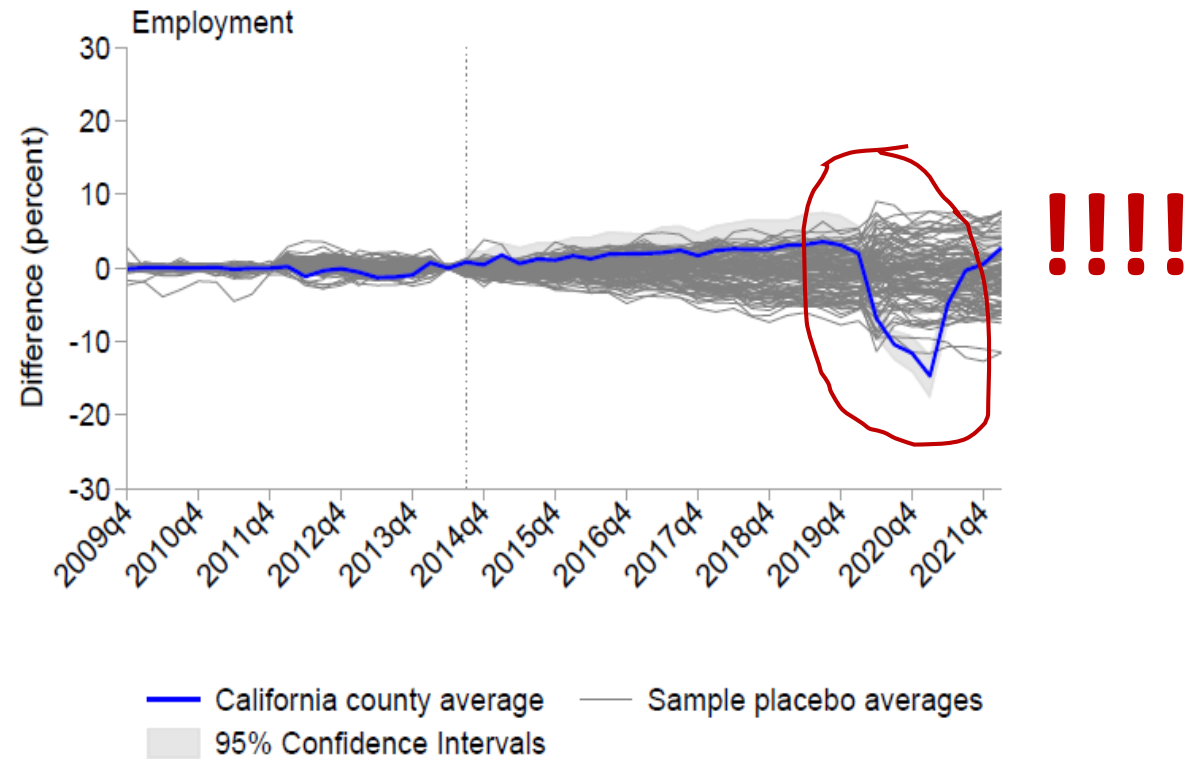
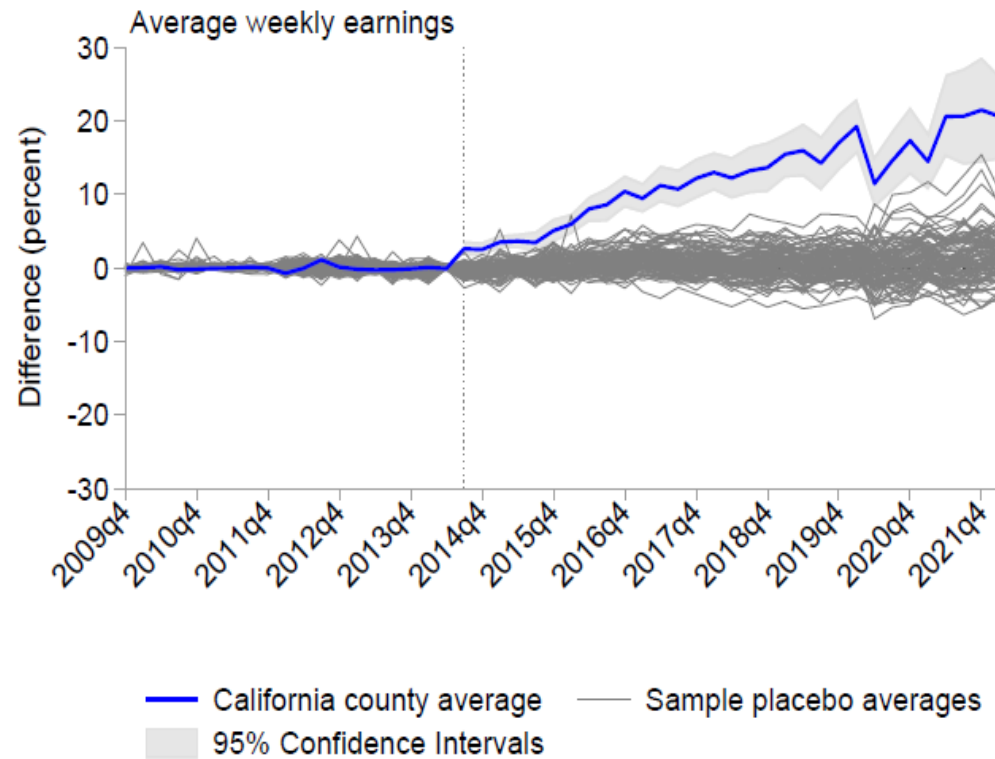
0.20

*p*-value

0.01

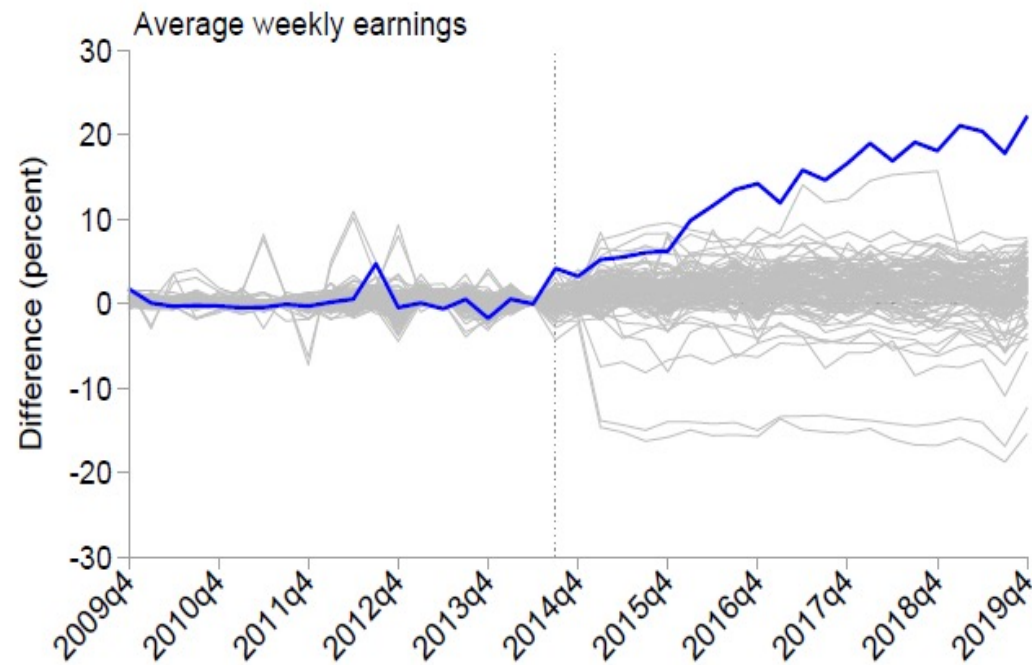
0.28

# Restaurant workers, average county-level estimates



	Average weekly earnings (percent)	Employment (percent)	Own-wage Elasticity
<b>Restaurant Workers, All Counties</b>			
Treatment Effect	17.07	3.34	0.20
<i>p</i> -value	0.01	0.28	

# Fast food workers, average county-level estimates

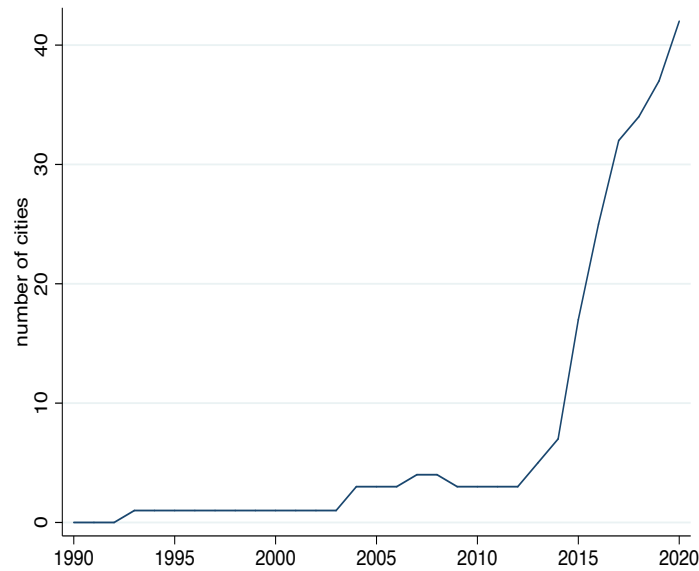


	Average weekly earnings (percent)	Employment (percent)	Own-wage Elasticity
<b>Fast Food Workers, All Counties</b>			
Treatment Effect	22.24	5.20	0.23
<i>p</i> -value	0.02	0.21	

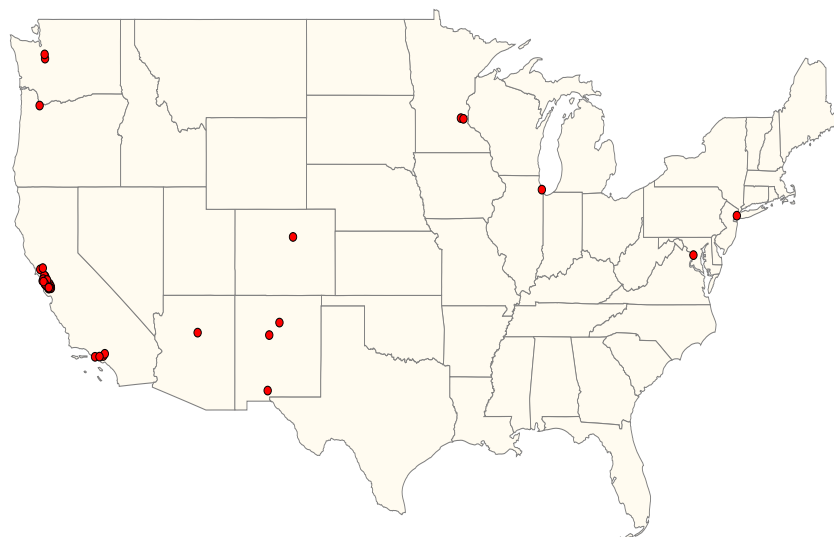
# Taking stock of new evidence from US states

- State increases in the US over the past 10 years shows estimates similar to before, though the minimum wage increases are occurring at a more elevated level
- If we want to study the highest of these state experiments—only around half a dozen—then it becomes trickier to get clear signal
  - General point: studying subgroup heterogeneity is harder than studying overall treatment effect!

# Evidence from high minimum wages across US Cities



- Over 40 cities have minimums  $>$  federal minimum wage today
- Heavily concentrated in West Coast; and Minneapolis, Chicago, NY, DC

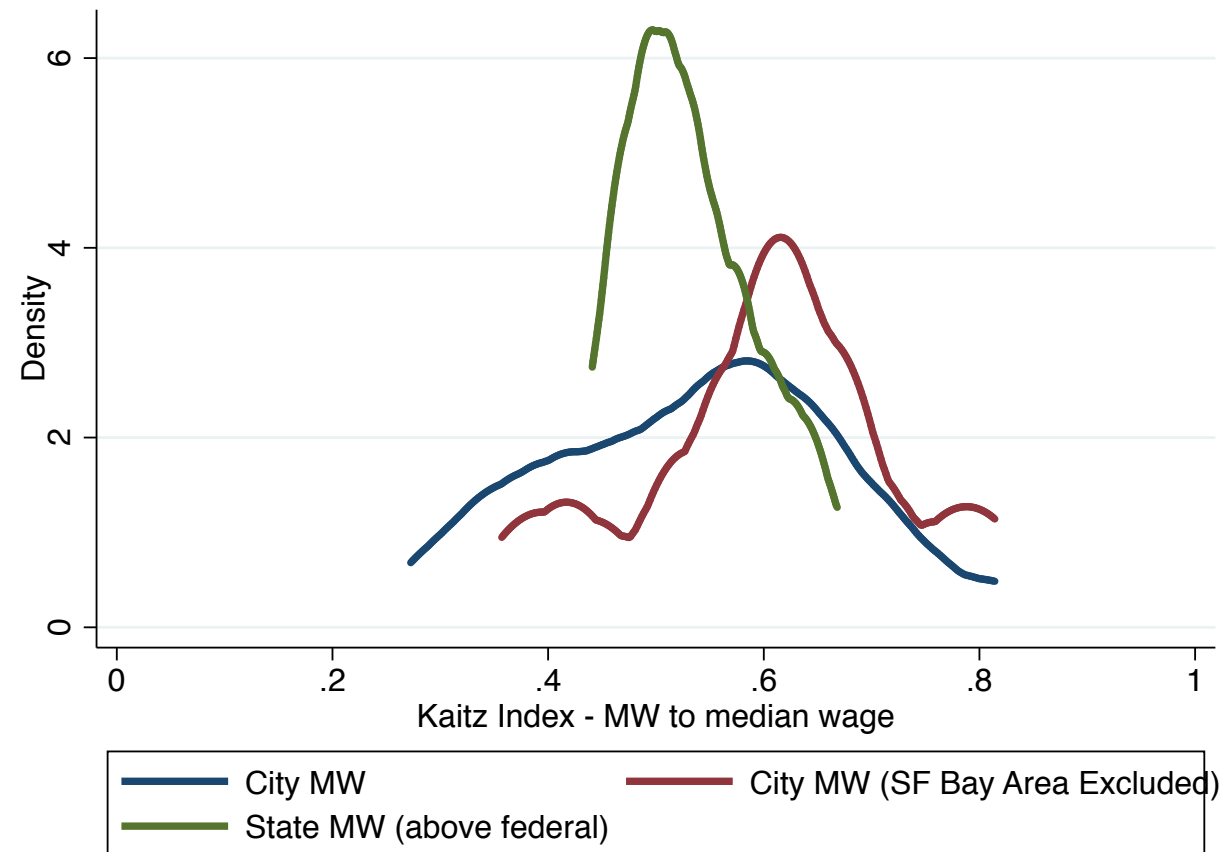


# How high are city minimums in big cities?

Cities	Population	MW in 2020	Kaitz index	Planned nominal MW in 2022
Panel A: Largest cities with minimum wages above the state-level one				
1. New York City	8,398,748	15.00	0.66	15.00
<b>2. Los Angeles</b>	3,990,469	14.25	<b>0.75</b>	15.72
3. Chicago	2,705,988	13.00	0.65	13.60
4. San Jose	1,030,119	15.25	0.56	16.20
<b>5. San Francisco</b>	883,305	15.59	<b>0.45</b>	17.05
6. Seattle	744,949	16.39	0.57	17.19
7. Denver	716,492	12.85	0.58	15.87
8. Washington, D.C.	702,455	14.00	0.48	14.50
9. Portland	652,573	12.50	0.56	14.75
10. Albuquerque	560,234	9.35	0.55	9.60
Mean of top 10				
Unweighted	2,038,533	13.82	0.58	14.95
Pop weighted		14.33	0.64	15.04

# Distribution of Kaitz Indices at city and state levels

- In general, city minimums are more binding than state minimums
- Especially true excluding high wage SF Bay Area



## Recent evidence from city minimums

PAPER	CITY	WAGE	EMPLOYMENT	OWN-WAGE ELAST.
<b>Allegretto et al. (2018b) - restaurants</b>	Oakland	0.10 [0.06,0.14]	0.07 [0.03,0.11]	0.71 [0.20,1.22]
	San Francisco	0.06 [0.04,0.09]	0.01 [-0.05,0.07]	0.14 [-0.83,1.11]
	San Jose	0.11 [0.06,0.15]	0.00 [-0.06,0.06]	-0.02 [-0.5,0.53]
	Seattle	0.04 [0.02,0.07]	0.01 [-0.05,0.07]	0.20 [-1.16,1.57]
<b>Dube, Naidu, Reich (2007) - restaurants</b>	San Francisco	0.14 [0.06,0.22]	0.04 [-0.12,0.2]	0.29 [-0.34,0.91]
<b>Jardim et al. (2017, 2018, 2020) - jobs below \$19</b>	Seattle, worker level	0.15 [0.14,0.17]	0.01 [-0.01,0.02]	0.03 [-0.04,0.11]
	Seattle, aggregate level	0.03 [0.03,0.03]	-0.07 [-0.14,-0.01]	-2.18 [-4.14,-0.22]
<b>Moe, Parrott, Lathrop (2019) - full service restaurants</b>	New York City	0.10 [0.03,0.16]	0.02 [-0.16,0.21]	0.25 [-2.89,3.38.]
<b>Karabarbounis – low wage firms</b>	Minneapolis	0.14 [0.07,0.21]	-0.16 [-0.25, -0.06]	-1.14 [-2.06, -.23]

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	Seattle	0.04 [0.02,0.07]	0.01 [-0.05,0.07]	0.20 [-1.16,1.57]
<b>Dube, Naidu, Reich (2007) - restaurants</b>	San Francisco	0.14 [0.06,0.22]	0.04 [-0.12,0.2]	0.29 [-0.34,0.91]
<b>Jardim et al. (2017, 2018, 2020) - jobs below \$19</b>	Seattle, worker level	0.15 [0.14,0.17]	0.01 [-0.01,0.02]	0.03 [-0.04,0.11]
	Seattle, aggregate level	0.03 [0.03,0.03]	-0.07 [-0.14,-0.01]	-2.18 [-4.14,-0.22]
<b>Moe, Parrott, Lathrop (2019) - full service restaurants</b>	New York City	0.10 [0.03,0.16]	0.02 [-0.16,0.21]	0.25 [-2.89,3.38.]
<b>Karabarbounis – low wage firms</b>	Minneapolis	0.14 [0.07,0.21]	-0.16 [-0.25, -0.06]	-1.14 [-2.06, -.23]

# Take away from existing City-wide research

- Average across 9 estimates from 5 cities: mean OWE **-0.19**; median OWE **+0.14**
  - Some studies tend to find modest OWE's, similar to overall international evidence
    - Allegretto et al. (2018); Moe Parrott and Lathrop (2019)
  - Other studies find larger job losses
  - Jardim et al (2019) aggregate level OWE estimate is **-2.1**
    - Concern: wage growth in Seattle compared to other areas in WA can bias the estimated impact on total low-wage jobs. Individual level estimate is **+0.03**
  - Karabarounis et al. (2021) find job loss for restaurants, with OWE estimate of **-1.3**
- But what about overall evidence? Dube and Lindner (2020, JEP) provide evidence on *aggregate* low-wage jobs **pooling 21 city-wide policies**

# Impact of City Minimums on Wage Inequality

American Community Survey (ACS)

All cities with a population of at least 100,000 in 2018: 21 city-level minimum wage changes

We estimate the following regression using samples from 2012, 2013, 2017 and 2018:

- 

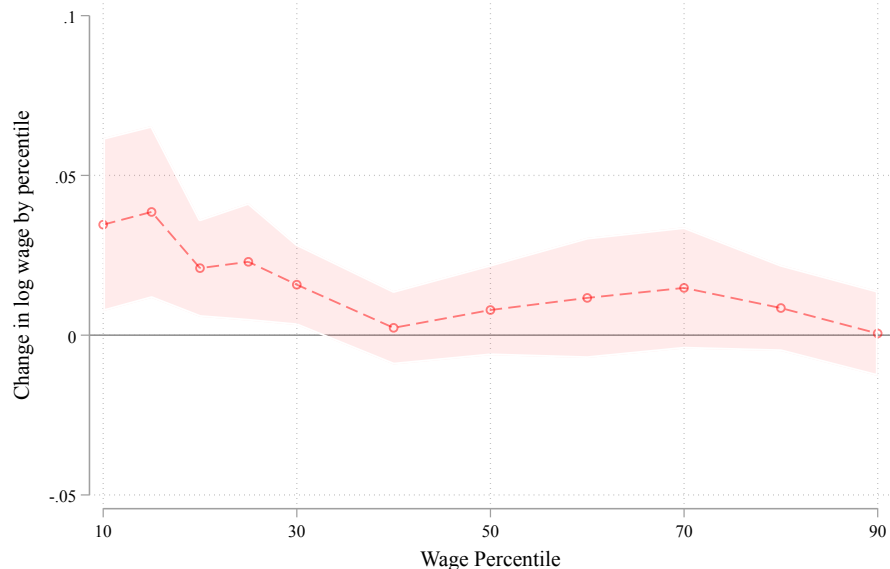
$$y_{ct} = \beta_0 + \beta_1(Treat_c \times Post_t) + \beta_2(X_{c,2012} \times Post_t) + \mu_c + \tau_t + e_{ct}$$

Controls: *2012 values of cost of living, employment to population ratio, average wage, wage percentiles, shares of employment below wage cutoffs, and 1-digit level sectoral shares*

**Controls matter!** Else fail upper tail falsification (like Autor, Manning Smith 2016)



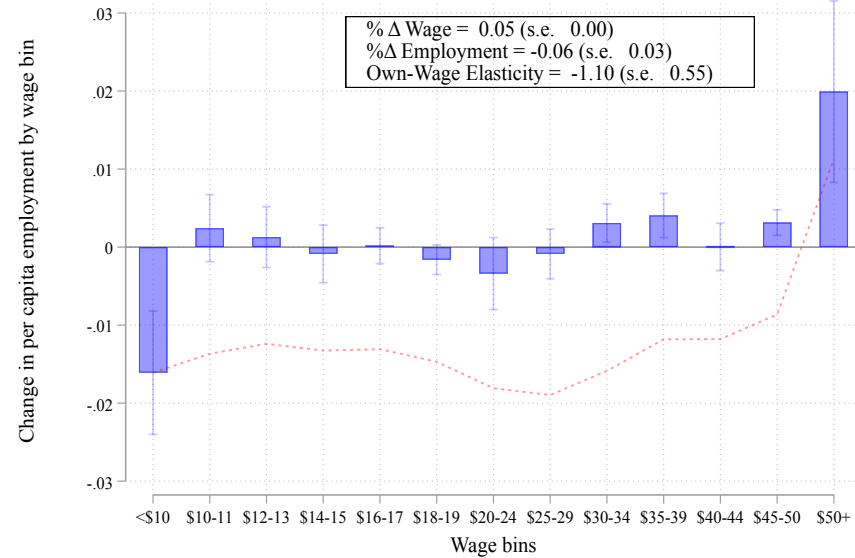
No controls



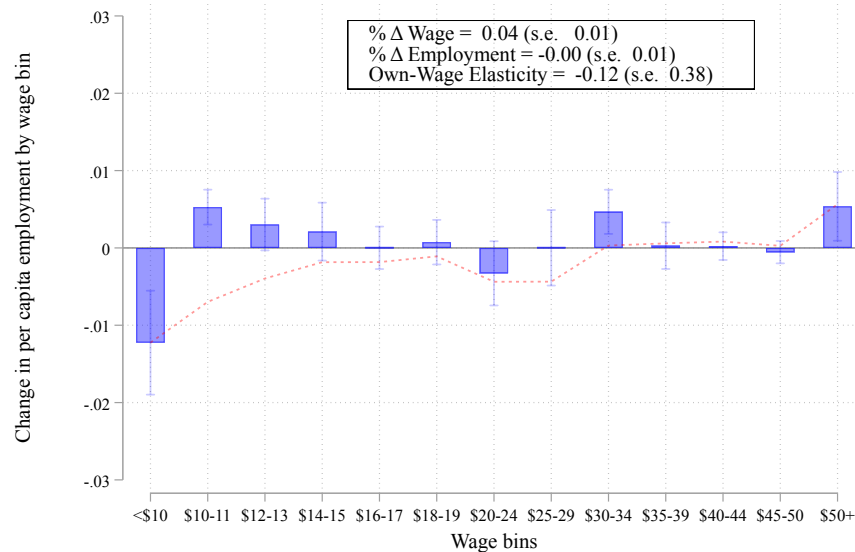
With controls

Source: Dube, Lindner, (2020)

# Impact of City Minimums on Jobs



No controls



With controls

Without controls, findings strikingly similar to Jardim et al. (2019) aggregate estimates

But this is due to wage drift (as shown above)

**Controls matter!** Else fail upper tail falsification (see Cengiz et al. 2019)

Once we better match cities raising wages to those that are not based on past characteristics, OWE of  $-0.12$  (s.e. 0.38) very close to overall international evidence

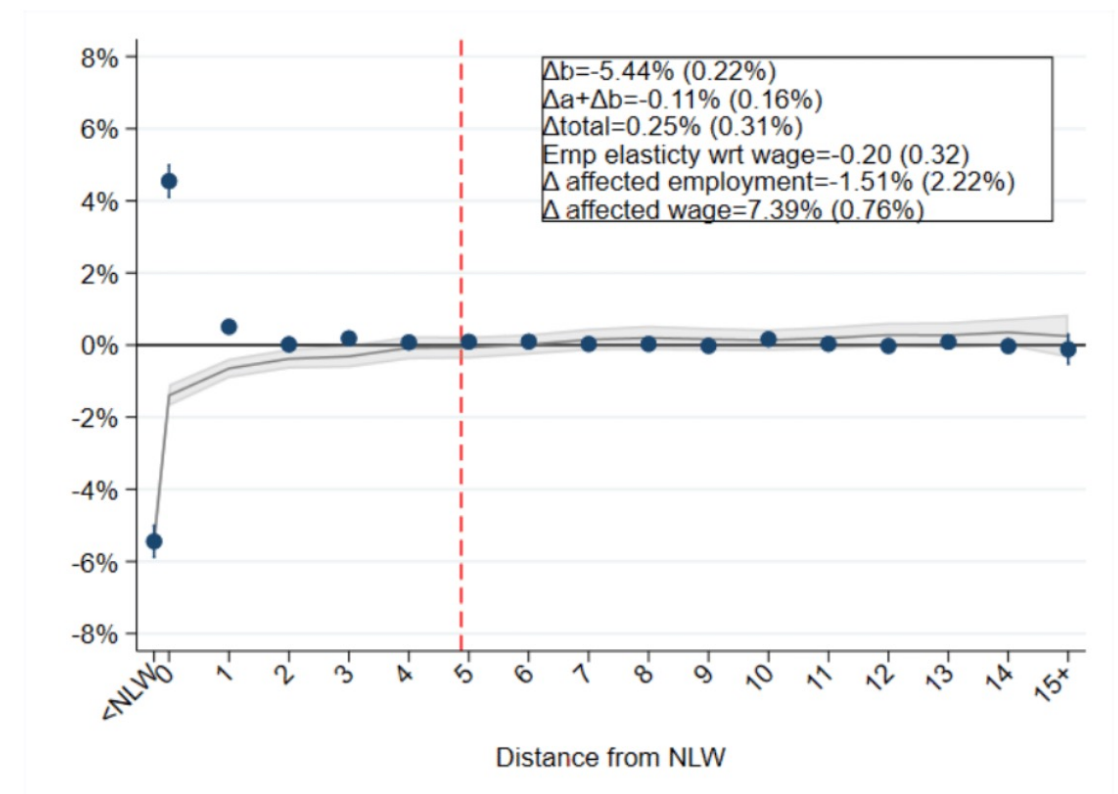
Overall, evidence from strategy similar to Jardim et al., and Cengiz et al., but better matching city characteristics suggests city wage policies have lowered inequality with modest impact on jobs.

Source: Dube, Lindner, (2020)

# National Living Wage, Recent Upratings

- Cribb et al. (2021) extend *bunching estimator* to using cross-sectional difference in bite and look at more recent “ambitious” upratings.
- Even as the Kaitz increased from 0.47 to 0.55 using FT wage between 2013 and 2019, (of 60% of overall wage) employment effects were elusive

Figure 3. IMPACT OF THE MINIMUM WAGE ON THE WAGE DISTRIBUTION: BASELINE ESTIM ON WORKERS AGED 25-64



# An outline for the talk

- International Context
  - What's happening with minimum wages?
- Conceptual Framework for Understanding Minimum Wage Impacts
  - Absorption of minimum wages in imperfectly competitive labor markets
  - Role of re-allocation
- Key sources of evidence
  - Overall meta-analysis using the Own-Wage-Elasticity of employment
  - German minimum wage
  - Recent increases in US states, cities
  - National Living Wage in UK
- New frontiers (“high minimum wages”)
  - Evidence from Cities, States in US
  - Evidence from UK National Living Wage
- Methodological Challenges
  - Turning point by what?
  - Covid crisis

# Conclusions

- Minimum wages are on the rise internationally
  - Even in US, though not at the federal level
- We're also seeing increased granularity in US context
  - High wage/cost cities have raised minimums more. This is sensible from targeting perspective. But are there bigger costs?
  - Overall evidence from the past decade does not suggest substantial disemployment effects
  - However, turning points and nonlinearities are **even tougher** to identify than overall policy effects: requires stronger identifying assumptions
  - US evidence on a small number of highest wage states is more mixed
- Extracting signal from noise of the pandemic is a formidable challenge
  - Best to probably separately analyze the pre-2020 or post-2021 periods
  - At the minimum, probably should drop 2020/21 from all policy evaluations