Unemployment Insurance, Wage Pass-Through, and Endogenous Take-Up

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*Any opinions and conclusions expressed herein are those of the authors and do not represent the views of the U.S. Census Bureau. The research in this paper does not use any confidential Census Bureau information.

Introduction

How does UI generosity affect reservation wages, re-employment wages, and take-up?

The COVID-19 expansions (FPUC $600 and $300 supplements; PUA expanded eligibility) offer a rare test.

1. Wage/Reservation Wage pass-through was modest – even with replacement rates exceeding 100%
   Krueger & Mueller (2016); Nekoei & Weber (2017); Schmieder, von Wachter & Bender (2013)

2. Take-up responded strongly to UI generosity: 30% ↗ 40% – driven by benefits, not worker composition
   Cf. Blank & Card (1991); Auray, Fuller & Lkhagvasuren (2019); Birinci & See (2023)

3. A directed-search model with heterogeneous filing costs links these two facts:
   large expansions draw in marginal claimants who search for lower wages, dampening aggregate pass-through by 50%

Preview: Empirical Findings

- **BAM data** (2014–2022): random samples of UI paid and denied claims
  - Composition shifts (younger, non-manufacturing workers) pull wages down, dampening average wage of paid claimants
  - PUA+FPUC expansion raised reservation wages by 7.6–12.4% (elasticity: 0.067–0.108) for monetary denied claimants.

⋆ UI Benefit Accuracy Measurement (BAM)

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- **CPS data** (2014–2022): eligibility, take-up, re-employment wages
  - Share of unemployed eligible for UI: 25% ↗ 80% during COVID
  - Take-up rate: 30% ↗ 40% – benefit levels, not worker characteristics, drove the rise
  - Re-employment wage premium for UI-eligible workers rose 9.1%

⋆ UI Benefit Accuracy Measurement (BAM)

Preview: Model

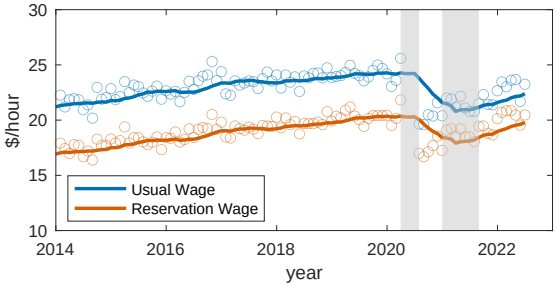
Directed search model with heterogeneous filing costs, eligibility, and a take-up decision.

- Workers differ in cost ε of applying for UI $\Rightarrow$ only low-cost workers collect
- Collectors search in higher-wage submarkets; non-collectors in lower-wage submarkets
- When benefits rise, the marginal collector (near ε^*) has a wage close to non-collectors
  $\Rightarrow$ large take-up response, but modest aggregate wage response
- Counterfactual (fixed filing): wage pass-through (collector premium) would be $\approx$50% higher without endogenous take-up

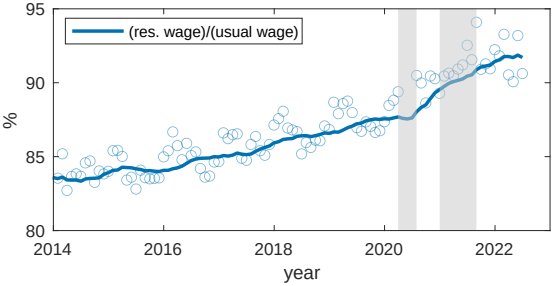
BAM Evidence

Reservation Wages Barely Moved Despite Huge Benefit Increase

Usual & Reservation Wage – Paid Claims



Reservation/Usual Wage Ratio

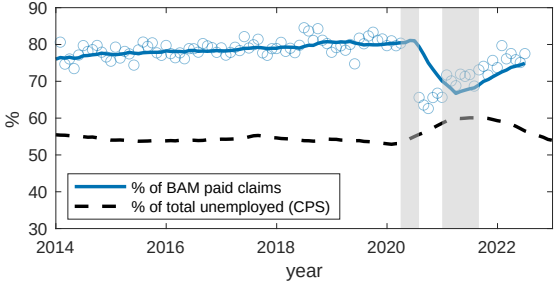


Both wages fell in 2020 and rose in 2021, but the *ratio* increases only slightly throughout the post-COVID period.

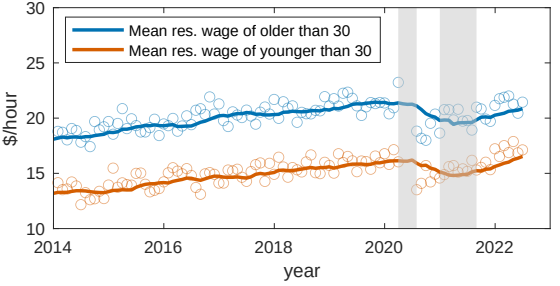
▸ Local Poly. Regression ▸ Data Description

The Pool of Claimants Changed: Composition Drove Wage Declines

Share of 30+ Year-Old Workers



Reservation Wage by Age Group



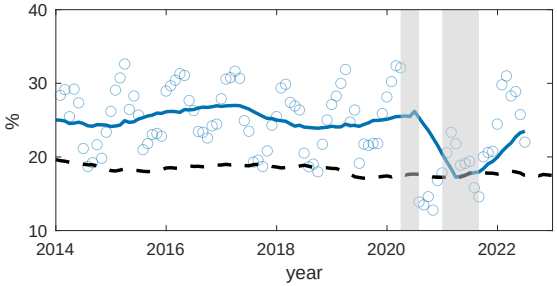
More younger workers (who have lower reservation wages) entered the paid-claims sample during COVID.

‣ B-O 2020 Full Table

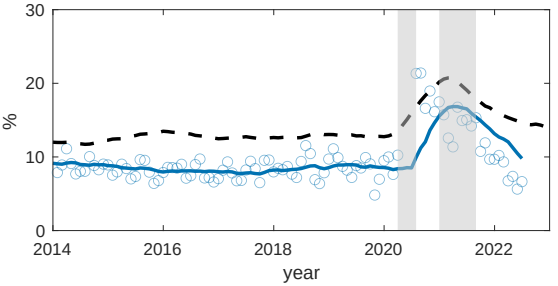
‣ B-O 2021 Full Table

The Pool of Claimants Changed: Composition Drove Wage Declines

Share of Manufacturing Workers



Share of Leisure & Hospitality Workers



Manufacturing share (high-wage) fell; leisure & hospitality (low-wage) rose.

▸ B-O 2020 Full Table

▸ B-O 2021 Full Table

Blinder-Oaxaca: Composition and Behavior Move in Opposite Directions

	2020	2021
Observed $\Delta \log(w_{\text{res}})$	-0.085^{***}	$+0.052^{***}$
Composition (endowments)	-0.127^{***}	-0.022^{**}
Behavior (coefficients)	$+0.040^{***}$	$+0.073^{***}$

- **2020**: composition (younger, lower-wage claimants) fully accounts for the decline.
- **2021**: behavioral response to benefits is about +7.3%, partly offset by composition.
- Holding composition fixed, reservation wage would have risen by about 7–8% in 2021.

▸ B-O 2020 Full Table ▸ B-O 2021 Full Table

Diff-in-Diff: Monetary Denials + State Variation in PUA

- PUA required *prior denial* for regular UI

  $\Rightarrow$ Low-earnings individuals applied, were denied for monetary reasons, then received PUA + FPUC

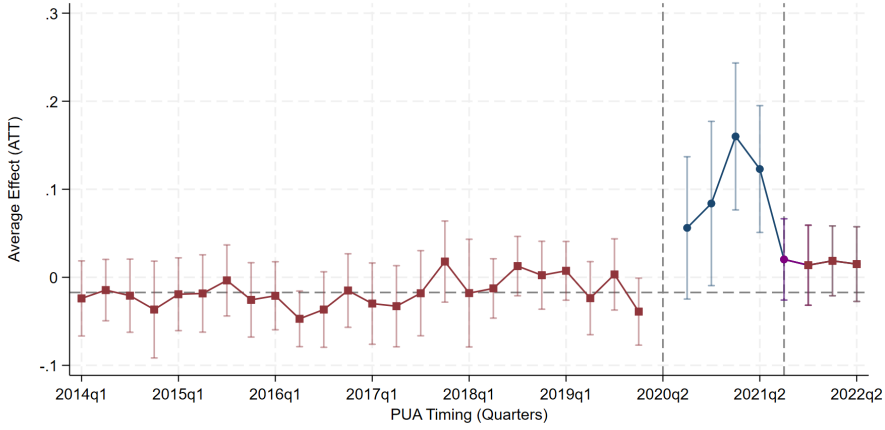
- States varied substantially in their PUA administration (Groen, 2025) ▸ PUA Share Map

- Compare reservation wages of monetary denials: high-PUA states vs low-PUA states

$$\ln \tilde{w}_{ist} = \lambda_t + \beta_1 \mathbb{I}(\text{High}_s) + \boldsymbol{\alpha_t}\, \mathbb{I}(\text{High}_s) \times D_t + \beta' X_{it} + \varepsilon_{ist}$$

- D_t: quarter dummies for PUA and PUA+FPUC periods
- X: log usual wage; age; sex; education; race; 2-digit industry
- S.E. clustered at state level; $\boldsymbol{\alpha_t}$: reservation wage gap, high vs. low PUA states in quarter t

Reservation Wages Rose in High-PUA States – Event Plot



▸ GR Placebo ▸ Deaths Placebo ▸ CPS DiD Table

Continuous Treatment: Specification

- Exploit cross-state variation in PUA exposure across policy regimes to estimate how reservation wages respond to UI generosity.

Specification:

$$Y_{ist} = \lambda_t + \sum_{r \in \mathcal{R}} \alpha_r (S_{st} \cdot D_{rt}) + \delta_t \,\text{Covid}_{st} \times \text{qtr}_t + \gamma_t \,\text{Urate}_{st} \times \text{qtr}_t + \beta' X_{it} + \varepsilon_{ist}$$

- S_{st} is state-quarter treatment intensity – ratio of PUA claims to the average of the state unemployed population in the quarter.
- $r \in \mathcal{R} = \{\text{PUA},\ \text{PUA+FPUC},\ \text{Phase Out}\}$
- D_{rt} indicates quarters in each regime:
  - PUA: 2020Q3–2020Q4
  - PUA+FPUC: 2021Q1–2021Q2
  - Phase Out: 2021Q3

Continuous Treatment: Results

	$\ln(\tilde{w})$	$\ln(\tilde{w})$	$\ln(\tilde{w})$
PUA	0.023	0.029	−0.008
	(0.039)	(0.035)	(0.037)
PUA + FPUC	0.099***	0.108***	0.116**
	(0.030)	(0.029)	(0.043)
Phase Out	0.014	0.011	−0.015
	(0.042)	(0.041)	(0.037)
Difference	0.076**	0.080**	0.123***
	(0.038)	(0.037)	(0.045)
Elasticity	0.067**	0.070**	0.108***
	(0.033)	(0.032)	(0.039)
Qtly Controls	No	Yes	No
Qtly Controls x Time	No	No	Yes
Adj. R-squared	0.761	0.762	0.763
Observations	33,868	33,868	33,868

Continuous Treatment: Elasticity Calculation

Elasticity of reservation wage w.r.t. UI benefits:

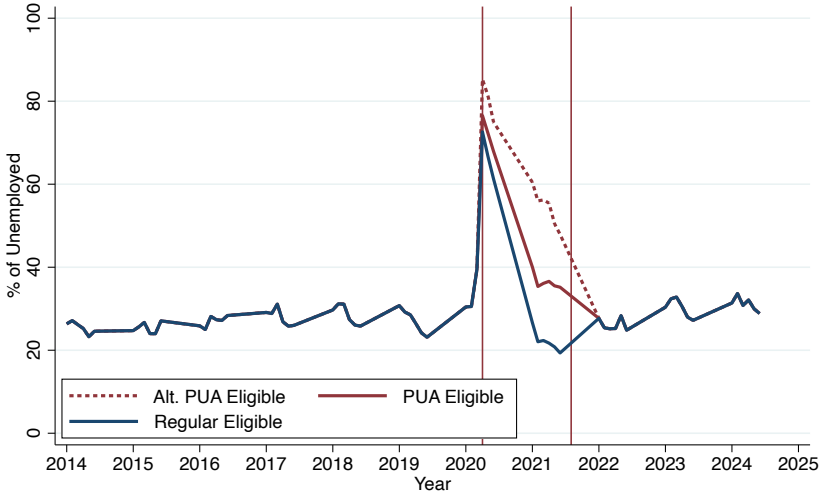
$$\varepsilon(\bar{S}) = \frac{\Delta \log \hat{Y}_{\text{PUA, PUA+FPUC}}(\bar{S})}{\Delta \log B_{\text{PUA, PUA+FPUC}}} = \frac{(\alpha_{\text{PUA+FPUC}} - \alpha_{\text{PUA}})\,\bar{S}}{\log B_{\text{PUA+FPUC}} - \log B_{\text{PUA}}}$$

- PUA/DUA baseline (avg. \$176/week) increased by \$300 to \$476/week (PUA+FPUC)
- Mean treatment intensity in 2021Q1–Q2: $\bar{S} = 0.871$.
- Using col. (3): $\varepsilon = \dfrac{(.116 + .008) \times .871}{.995} = 0.108$ (s.e. 0.039).
- Across specifications: implied elasticity range is 0.067–0.108.

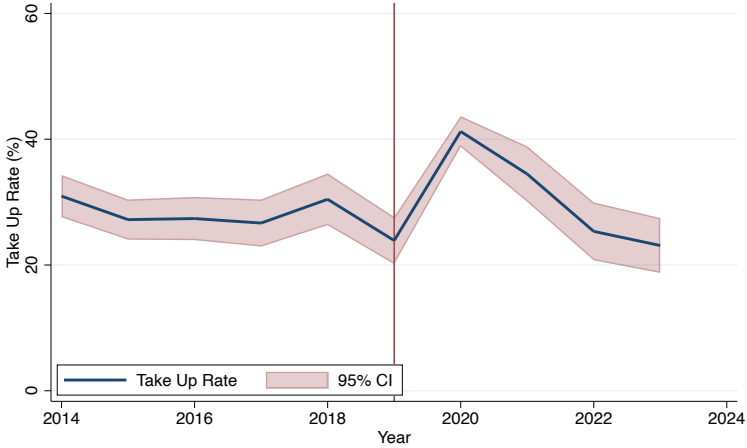
$\Rightarrow$ **A 10% benefit increase raises reservation wages by 0.7–1.1%**

CPS: Take-Up

UI Eligibility Expanded Dramatically



Take-Up Rose – Benefits or Composition?



Take-up among eligible unemployed rose from ≈30% pre-COVID to ≈40% during expanded benefits.

Probit: Predicting Take-Up Using Pre-2020 Coefficients

- Probit of UI receipt on eligible unemployed, estimated on pre-2020 data:

$$\Pr(\text{Collect}_i = 1) = \Phi\left(\beta X_i + \theta \log(\text{Earnings}_i) + \psi \log(\text{Benefit}_i) + \gamma_s + \varepsilon_i\right)$$

  - Controls: age, sex, education, race, occupation, industry, spell duration, past earnings
  - **Model A**: *excluding* benefit amounts
  - **Model B**: *including* benefit amounts
- Use estimated coefficients to predict take-up in 2020–2021

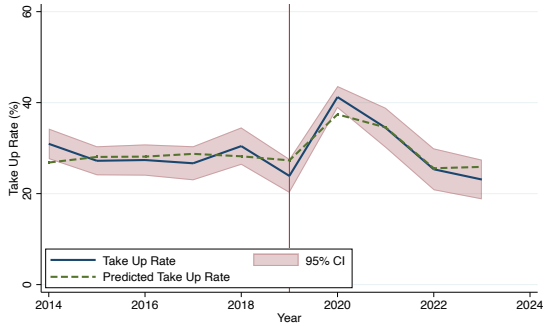
- If Model A predicts the 2020–21 rise ⇒ composition change drove take-up
- If Model B predicts the rise but Model A does not ⇒ benefits drove take-up

▸ Full CPS Sample Details

Benefits, Not Composition, Drive the Take-Up Increase

Model A: Excluding Benefit Amounts

Model B: Including Benefit Amounts



Including benefit amounts: predicted take-up rises to match the data. Excluding benefit amounts: predicted take-up is *flat*. Higher benefits – not changed worker characteristics – drove the take-up surge.

CPS Diff-in-Diff: Wage Premium of Eligible vs Ineligible Workers

$$w_{it} = \alpha_0 \mathbb{I}(\text{eligible}) + \alpha_1 \mathbb{I}(\text{COVID}) + \gamma \mathbb{I}(\text{eligible}) \times \mathbb{I}(\text{COVID}) + \beta X_{it} + \varepsilon_{it}$$

	Include 2020		Exclude 2020	
	(1)	(2)	(3)	(4)
Wage level ($)				
$\hat{\gamma}$	91.00***	−4.437	73.34**	64.34**
	(33.81)	(41.08)	(30.08)	(26.84)
Log wage				
$\hat{\gamma}$	0.126***	0.0347	0.112***	0.0911***
	(0.0369)	(0.0434)	(0.0336)	(0.0320)
Year FE	No	Yes	No	Yes
N	7,523	7,523	6,719	6,719

Controls: age, gender, education, race, industry, occupation.

A Directed Search Model with Endogenous Take-Up

Model Environment

- **Directed search** + on-the-job search: free entry pins down wages given market tightness
- **Stochastic eligibility**: become eligible w/ prob. φ while employed; lose it w/ prob. ψ while unemployed
- **Endogenous filing decision**: each worker draws cost $\varepsilon \sim U[0, \bar{\varepsilon}]$ at start of unemployment spell
  - Collectors: receive benefit b, pay cost $\varepsilon \Rightarrow$ choose higher-wage markets
  - Non-collectors: receive home production $d < b \Rightarrow$ choose lower-wage markets
- **Log utility** $v(c) = \log(c)$: gives insurance value to UI

▸ Worker/Firm Value Functions ▸ Parameterization

Model: Value Functions and Collection Decision

- Value of employment at wage w for type ε: $W(w, \varepsilon) = \dfrac{w + \beta\delta\, U(\varepsilon)}{1 - \beta(1-\delta)}$
- Non-collectors: $U^N = v(d) + \beta \left\{ U^N + R(U^N) \right\}$
- Collectors: $U^C(\varepsilon) = v(b) - \varepsilon + \beta \left\{ U^C(\varepsilon) + R(U^C(\varepsilon)) \right\}$
- Collection decision: $U(\varepsilon) \equiv \max \left\{ U^N,\, U^C(\varepsilon) \right\}$
- Threshold: $\varepsilon^* = v(b) - v(d)$ s.t. $\varepsilon \leq \varepsilon^*$ collect, $\varepsilon > \varepsilon^*$ do not
  - For non-collectors: value of unemployment independent of b
  - For collectors: value of unemployment increasing in $b \Rightarrow$ higher reservation wage

Why Does Take-Up Dampen Wage Pass-Through?

- Workers collect if $\varepsilon \leq \varepsilon^* = v(b) - v(d) \Rightarrow$ higher b raises ε^*: more workers collect
- Effect of $b \uparrow$ on average wage of collectors:

$$\frac{dw^C}{db} = \underbrace{\text{direct effect on wages of existing collectors}}_{>0} + \underbrace{\text{effect on JFR among collectors}}_{<0} + \underbrace{\text{change in composition of collectors}}_{<0}$$

- New collectors (near ε^*) barely find it worthwhile to collect
  $\Rightarrow$ their reservation wages are close to *non-collectors*
  $\Rightarrow$ average collector wage rises slowly despite large $\uparrow b$
- Calibrated model quantifies take-up response + dampened wage response

Quantitative Exercise

- **Objective**: quantify how much endogenous take-up dampens wage pass-through from UI benefit expansions.
- **Shock path**: at period 0, an unexpected separation shock raises unemployment to 15%.
- **Labor-demand side**: vacancy creation cost rises by 50% in periods 0–12, then gradually returns to trend by period 24.
- **Policy experiment**: increase UI generosity and compare:
  - benchmark economy with endogenous filing costs and take-up;
  - counterfactual economy with filing behavior fixed.
- **Targets**: unemployment path, job-finding path, change in take-up, and change in collector wage premium.

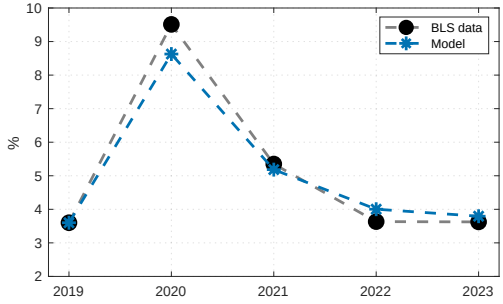
Parameterization

Param	Description	Value	Target
β	discount factor	0.996	annual real return of 5%
δ	exog. job separation	0.015	unemployment rate of 3.8%
k	cost of creating vacancy	3.03	avg. job finding rate of 38%
λ_e	prob. of OTJ search	0.224	share of employed actively searching
γ	matching function parameter	1.3	den Haan et al. (2000)
d	home production value	0.2	(see text)
b	consumption of UI collectors	0.6	replacement rate of 45%
ψ	UI benefit expiration rate	0	(see text)
φ	prob. of becoming UI eligible	0.1	10-month work history
ε	UI collection cost	$U[0, 4.3]$	31.0% take-up rate

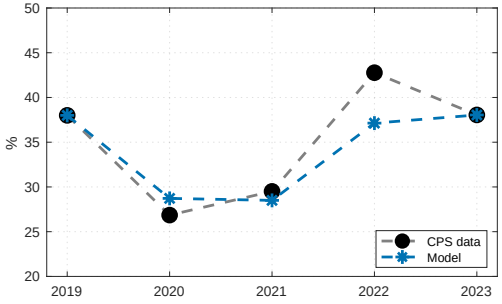
Quantitative Experiment: Model Fits Unemployment and Job-Finding

- Unexpected shock raises unemployment rate to 15%; vacancy creation cost rises 50% (periods 0–12), then gradually recovers

Unemployment Rate

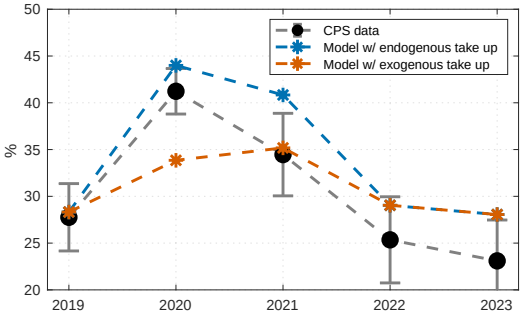


Job Finding Rate

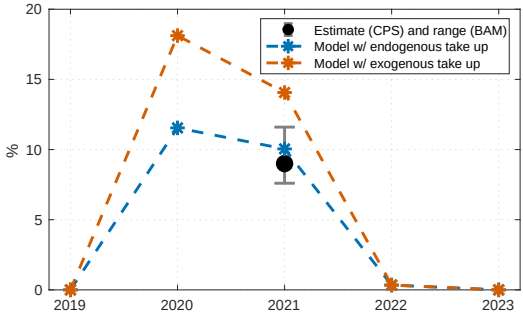


Quantitative Results: Take-Up and Wage Pass-Through

UI Take-Up Rate



Δ Collector Wage Premium



Model replicates both the large take-up increase and the modest wage response with benefit increase.

Without endogenous take-up (fixed filing), pass-through is about 50% higher.

Conclusion

- Even with unprecedented COVID-era benefit expansions, wage pass-through was modest
  - BAM DiD elasticity: 0.067–0.108;
- UI take-up responded strongly to benefit generosity, not worker composition
  - Take-up rose 30% $\rightarrow$ 40%; probit without benefits predicts *no increase*
- A directed-search model with heterogeneous filing costs unifies both facts
  - Benefit expansions attract marginal claimants with lower wages
  - This composition effect dampens aggregate pass-through by $\approx$50%
- Large UI benefit expansions affect take-up, claimant composition. This dampens aggregate wage distortions from UI.

Back-up Slides

Backup Menu

BAM

- Descriptive Stats
- B-O 2020 Full
- B-O 2021 Full
- PUA State Map
- Timing Placebo
- COVID Robustness
- Cts. Treatment Table
- Local Poly. Regression

CPS

- CPS Survey Structure
- Non-monetary Elig.
- Monetary Elig.

Model

- Value Functions
- Parameterization

Other

- Literature
- Reasons for Non-filing

Literature

- **UI benefits and labor supply/search during COVID:**
  Petrosky-Nadeau and Valletta (2025); Ganong, Greig, Liebeskind, Noel, Sullivan, and Vavra (2024);
  Boar and Mongey (2020); Michaud (2023); Forsythe, Kahn, Lange, and Wiczer (2022)

- **Wage response to UI (level and duration):**
  Krueger and Mueller (2016); Card, Chetty, and Weber (2007); Nekoei and Weber (2017);
  Schmieder, von Wachter, and Bender (2013); Chodorow-Reich, Coglianese, and Karabarbounis (2019)

- **Endogenous UI take-up:**
  Auray, Fuller, and Lkhagvasuren (2019); Auray and Fuller (2020);
  Blasco and Fontaine (2021); Birinci and See (2023, 2024)

Why Don't People File for UI? (2018 UI Supplement)

Main reason	Percent	Cumulative
Do not need money / do not want hassle	19.42	19.42
Negative attitude about UI	2.45	21.87
Do not know about UI or how to file	5.94	27.81
Problems with application process	2.05	29.86
Plan to file soon	4.68	34.55
Constraints on accepting employment	25.07	59.62
Expect to start working soon	19.56	79.18
All other / not provided	20.82	100.00

BAM: Descriptive Statistics (2014–2022)

	Paid Claims	Denied Claims	Monetary Denials
Age	41.24	38.23	36.81
Share Female	0.46	0.49	0.48
Share White	0.48	0.44	0.40
Share with College Deg.	0.50	0.47	0.35
Share Manufacturing	0.23	0.19	0.15
Share Leisure & Hosp.	0.12	0.12	0.16
Usual Hourly Wage	$22.17	$18.90	$16.64
Reservation Wage	$18.56	$16.17	$14.67
Weekly Benefit Amount	354.75	-	-
Observations	179,230	153,727	42,056

▸ Return to Wage Figures

B-O Decomposition: Paid Claims – Pre-COVID vs 2020

	Decomposition	95% CI
Pre-COVID	2.798^{***}	[2.761, 2.835]
2020 Expanded Benefit	2.714^{***}	[2.656, 2.771]
Difference	-0.085^{***}	[−0.133, −0.036]
Composition (endowments)	-0.127^{***}	[−0.166, −0.088]
Behavior (coefficients)	$+0.040^{***}$	[0.014, 0.066]
Interaction	0.002	[−0.005, 0.010]

In 2020: composition (younger, non-manufacturing claimants) accounts for nearly the entire -8.5% decline.

▸ 2021 Table

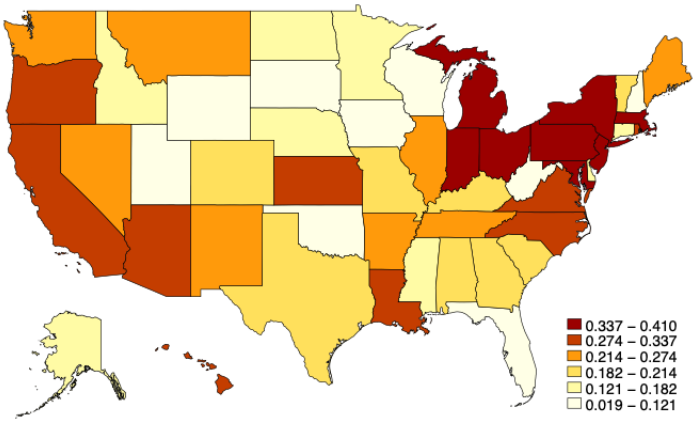
B-O Decomposition: Paid Claims – Pre-COVID vs 2021

	Decomposition	95% CI
Pre-COVID	2.798^{***}	[2.761, 2.835]
2021 Expanded Benefit	2.851^{***}	[2.805, 2.896]
Difference	$+0.052^{***}$	[0.027, 0.078]
Composition (endowments)	-0.022^{**}	[−0.040, −0.004]
Behavior (coefficients)	$+0.073^{***}$	[0.056, 0.090]
Interaction	0.001^{**}	[0.000, 0.003]

In 2021: behavioral response to benefits $\approx +7.3\%$, offset -2.2% by composition.

▸ 2020 Table

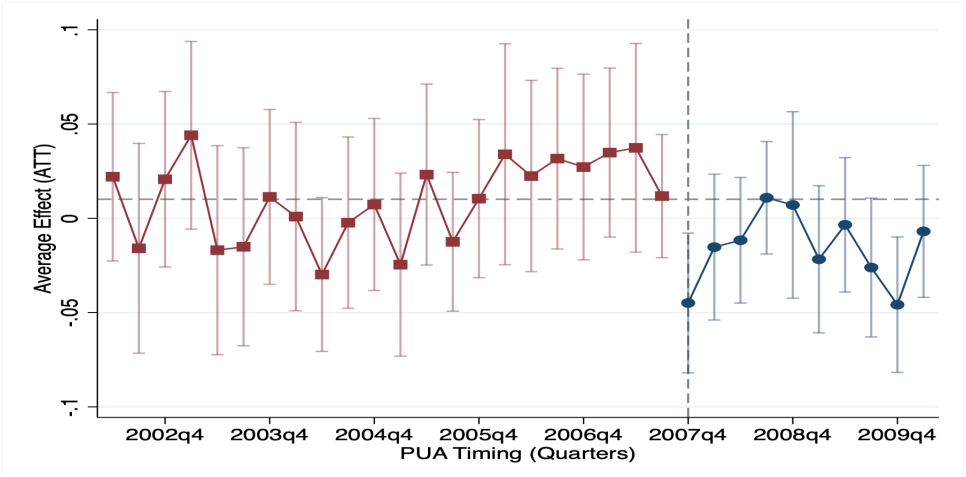
State Variation in PUA Utilization



State-monthly PUA claim share = PUA claims / (PUA + regular UI claims). High-PUA states defined as above-median average claim share.

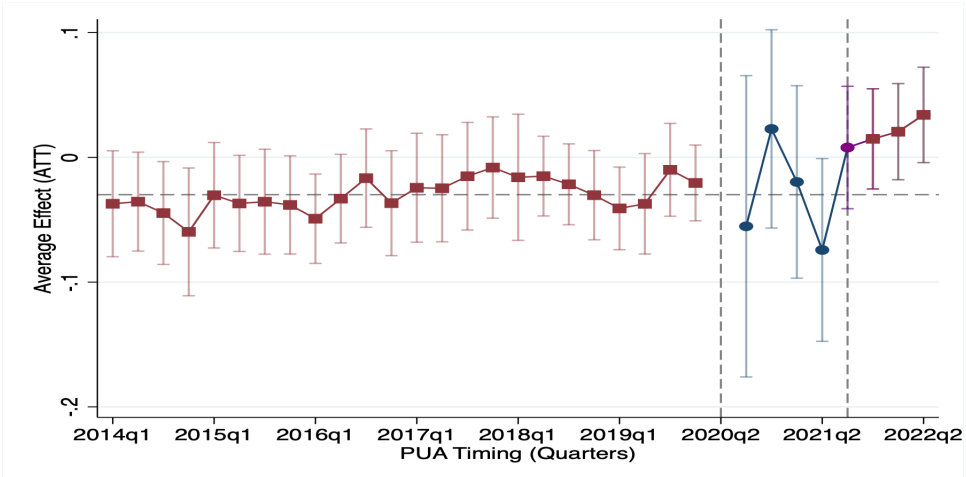
Return to DiD

Placebo Timing: Great Recession



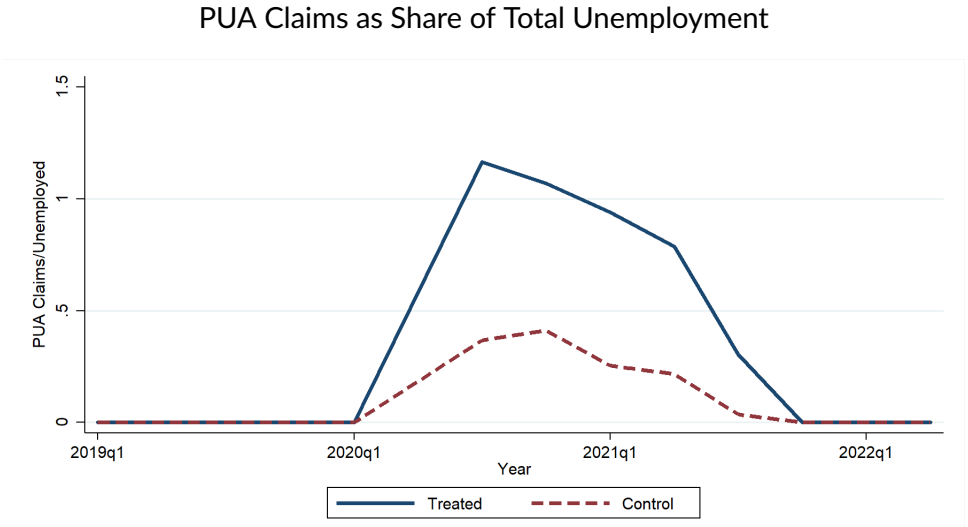
Return to DiD

Placebo Treatment: COVID Deaths per 100k



Return to DiD

Time Series: Treatment/Control States PUA Claims



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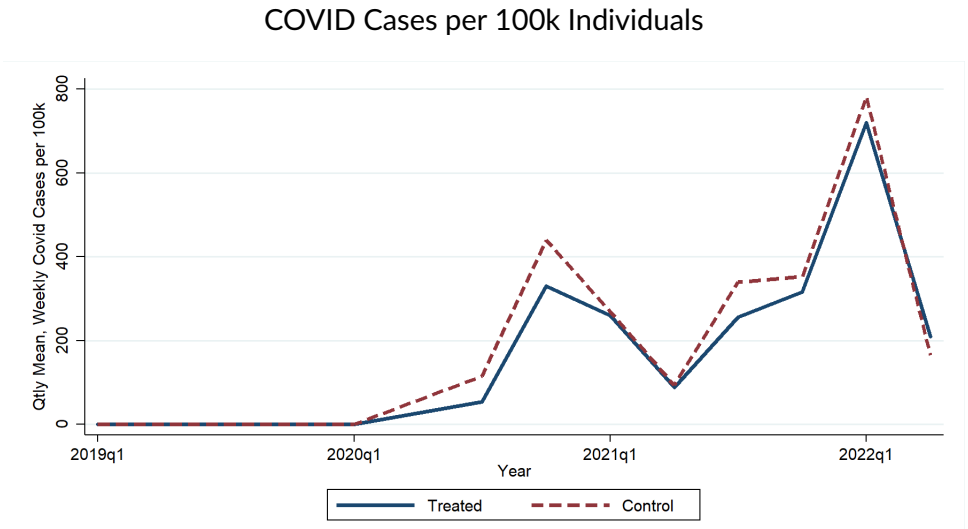
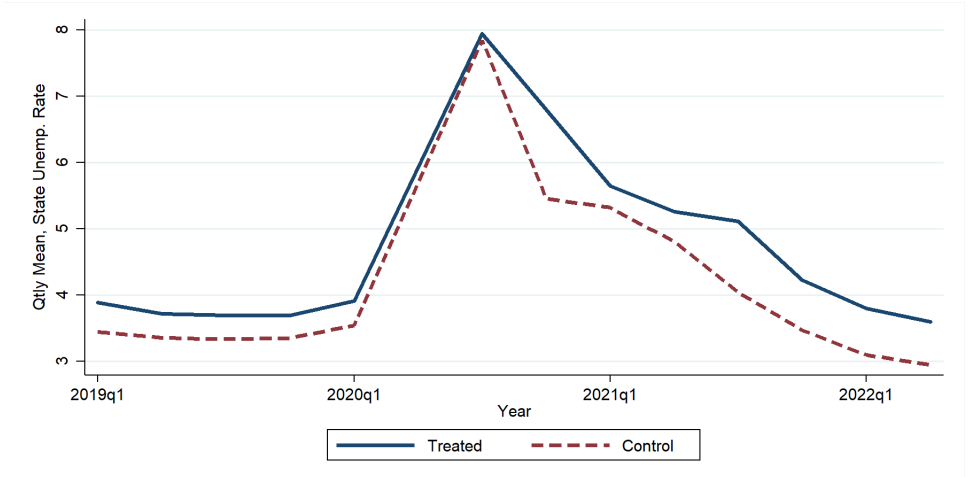
COVID Severity Does Not Drive the Result



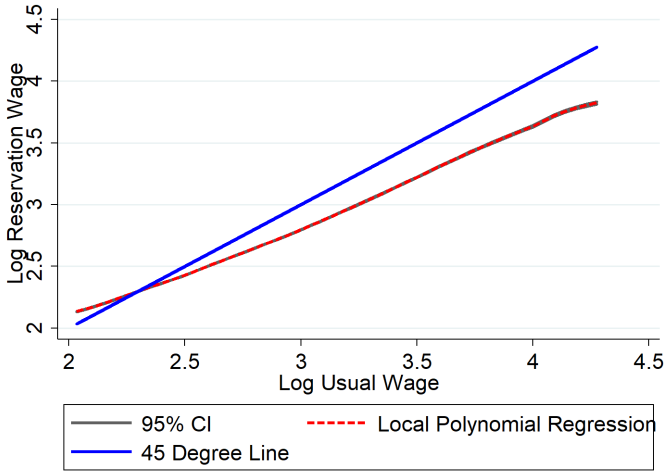
Return to DiD

COVID Layoffs Do Not Drive the Result



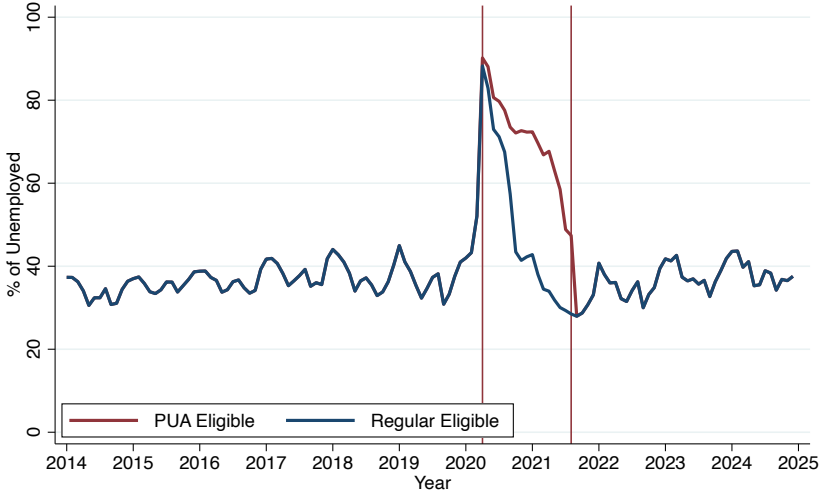
Return to DiD

Local Polynomial: Usual vs Reservation Wage

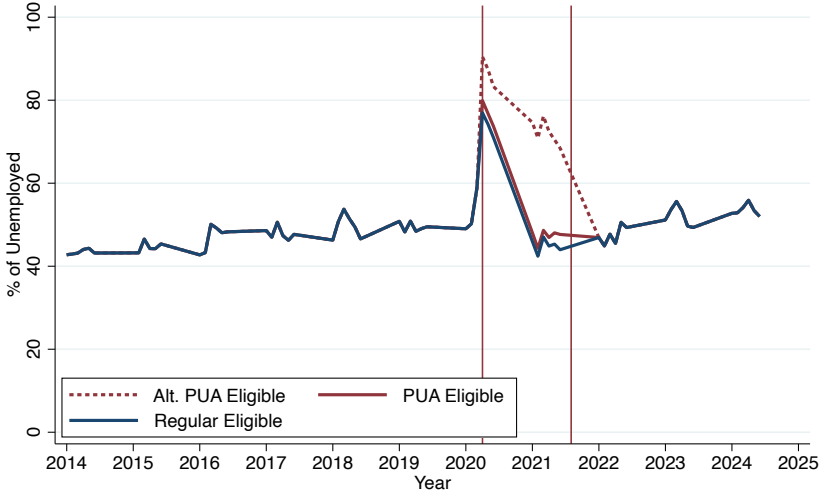


Local polynomial of $\log(\tilde{w})$ on $\log(w_{\text{usual}})$. Correlation $\approx 75\%$ (with controls). Cross at $\approx$\$10/hr – consistent

Non-Monetary Eligibility for UI



Monetary Eligibility for UI



CPS: Survey Structure and Data Requirements

- CPS rotates individuals: 4 months in, 8 out, 4 in; weekly earnings asked in outgoing rotation (interviews 4 and 8)
- March ASEC: asks "Did you receive UI benefits last year?" $\Rightarrow$ UI collectors in year y identified in March of year $y+1$
- Monetary eligibility: use Ganong et al. (2020) `ui-calculator` applied to CPS earnings history
- Non-monetary eligibility (COVID period): separation reason, COVID-related indicators, self-employment income
- First wage after transition: observed when individual moves from U to E before outgoing rotation

▸ Return to Take-Up