The Great Resignation and Optimal Unemployment Insurance

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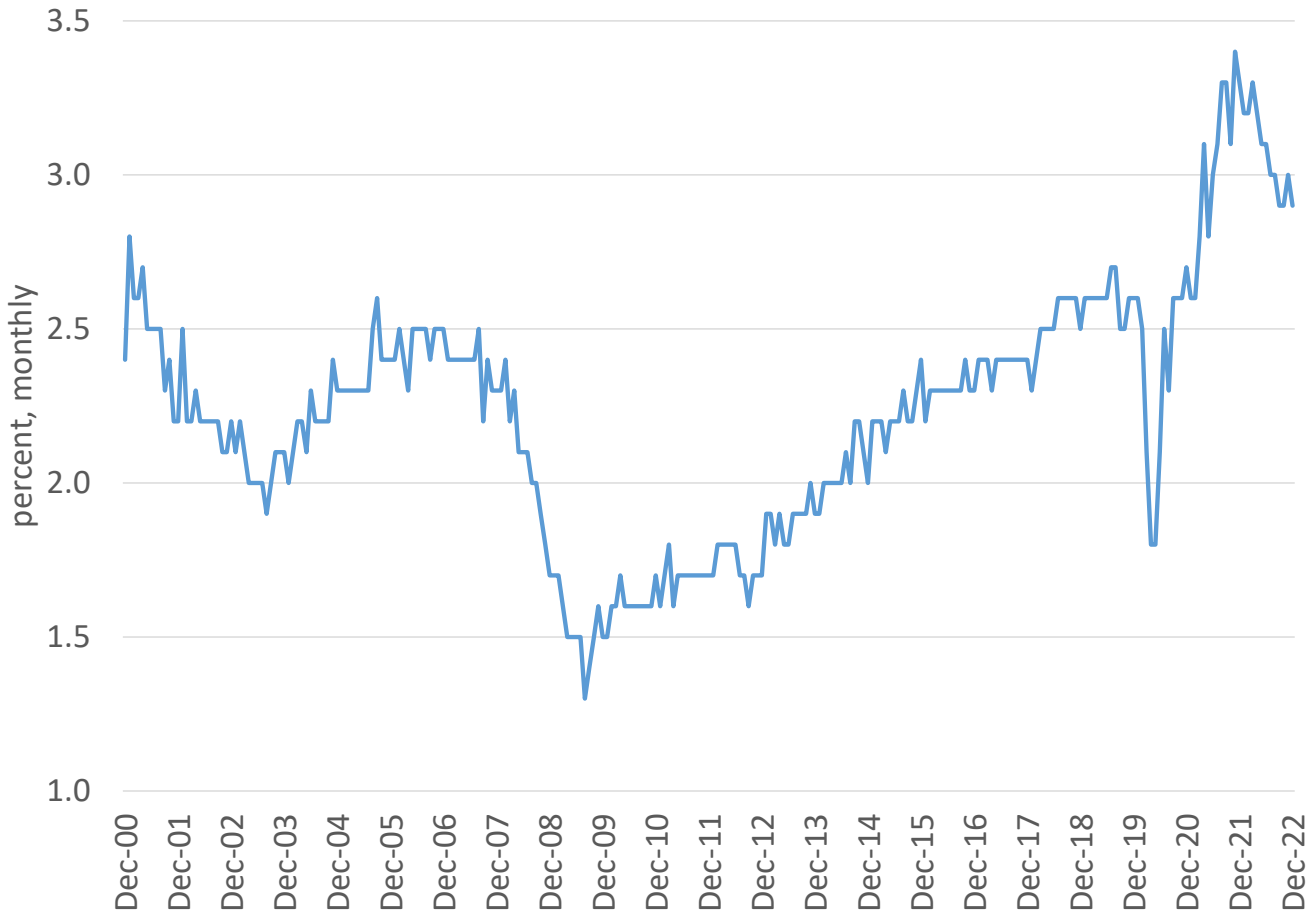
The Great Resignation: JOLTS Quit Rate



- Quits near all time high
- A global phenomenon

Quitting and UI

- Large literature on interaction between worker search effort and optimal UI policy
- But non-employment also driven by workers quitting jobs
- Margin becoming more relevant in the "Great Resignation"
- Extend directed search & matching model to include quitting margins:
  1. Quits to non-employment
  2. Quits to other jobs
- Theoretical and quantitative exploration of implications for optimal UI

Outline

1. Directed search model of labor market extended to include quits due to high idiosyncratic disutility of work
2. Simple version of model
   - Modified Baily-Chetty formula
   - Quits depress wages $\Rightarrow$ motive for low UI replacement rate
3. Calibrated multi-sector version with OJS, variation in match quality
   - Firms backload pay, stochastically match outside offers to reduce quitting
4. Optimal policy: much lower UI optimal with quitting
5. Application to Great Resignation

Technology

- Workers vary by sector n which determines expected productivity Y_n
- Idiosyncratic match quality $z \in \{z_H, z_L\}$ revealed after match formed
- Workers produce $z_H Y_n$ with prob. μ_H and $z_L Y_n$ with prob. $1 - \mu_H$
- Match output constant during life of match
- Exogenous match destruction with probability $1 - \gamma$

Labor Markets

- Directed search
- Unemployed and employed workers both search (within their sector)
- Markets indexed by promised worker value V^s, tightness $\theta = v/u$
  - higher value jobs harder to find
- Also on-the-job search

Preferences

- Each period, workers draw idiosyncratic publicly unobservable utility cost χ of work
- Period utility

$$U(w(1-\tau)) - \chi \text{ if employed, where } \chi \sim F(.)$$

$$U(b(n)) \text{ if not employed}$$

- Workers and firms discount at rate β

Timeline

1. Workers start out matched or unmatched. If matched, state is (V, z)
2. **Search and matching**. All workers choose where to search
   - Unmatched workers find jobs with probability $p(\theta)$. If unsuccessful they spend the period unemployed
   - Matched workers who receive outside offers switch jobs iff existing employer does not match offer V^s $(EE$ transition$)$
3. **Match quality draw** z for new matches
4. **Exogenous match destruction**: fraction $1 - \gamma$ of matches end (EU)
5. **Quitting**: matched workers draw work cost χ, may quit (EN)
6. **Production**: workers who remain matched produce
7. **Consumption**

Directed Search Markets

- ϕ : cost of posting a vacancy
- θ : vacancies relative to searching workers
- $q(\theta)$: probability vacancy finds a worker
- $\zeta\left(V^s, V, z\right)$: probability offer V^s is matched
- Expected profit from posting vacancy in market (V^s, V, z):

$$q\left(\theta\right)\left(1-\zeta\left(V^s, V, z\right)\right) E\left[\Pi\left(V^s\right)\right]-\phi$$

- Free entry $\Rightarrow$ expected profit must be zero in any active markets

Firm Wage Contracts

- Firms observe match quality z once worker hired
- Do not observe preference shock χ
- Workers report outside offers, firms cannot verify
- Offer rich dynamic contracts, where wages depend on
  (i) match quality z, (ii) tenure, (iii) outside offers
- Also specify probabilities $\zeta(V^s, V, z)$ of matching reported outside offers versus firing workers reporting such offers
- Fired worker switches to new job if offer real, otherwise unemployed

Firm problem (after search and matching stage)

State is (V, z). To maximize profit, firm chooses:

- w : current period wage
- V' : continuation value absent outside offer
- ζ' : probability firm will match outside offer in next period

Subject to constraints that:

1. Contract delivers promised value V
2. Workers without an outside offer will not choose to report one

Firm Problem

$\Pi(V, z)$: present value of profits given V and z

$$\Pi(V, z)$$

$$= \max_{\{w, V', V^{s\prime}, \bar{\chi}, \zeta'\}} \gamma F(\bar{\chi}) \left[z - w + \beta \left(1 - p(V^{s\prime})\right) \Pi(V', z) + \beta p(V^{s\prime}) \zeta' \Pi(V^{s\prime}, z) \right]$$

$$s.t.$$

$$\gamma F(\bar{\chi}) \left[U(w(1-\tau)) + \beta p(V^{s\prime}) V^{s\prime} + \beta \left(1 - p(V^{s\prime})\right) V' - E[\chi | \chi < \bar{\chi}] \right] + (1 - \gamma F(\bar{\chi})) V^u \geq V$$

$$U(w(1-\tau)) - \bar{\chi} + \beta p\left(V^{s\prime}\right) V^{s\prime} + \beta \left(1 - p\left(V^{s\prime}\right)\right) V' = V^u$$

$$V^{s\prime} \in \arg\max \left\{ p\left(V^{s\prime}\right) V^{s\prime} + \left(1 - p\left(V^{s\prime}\right)\right) V' \right\}$$

$$\zeta' V^{s\prime} + (1 - \zeta') V^u \leq V'$$

Backloading Wages

1. Workers have concave utility → prefer flat wage profiles
2. But increasing wage profile reduces future EN flow (quits)
3. Also increasing wage profile reduces future EE flow

Log utility + no OJS ⇒ optimal wage path satisfies

$$w_{t+1} - w_t = \frac{f(\bar{\chi}_{t+1})}{F(\bar{\chi}_{t+1})} [z - w_{t+1} + \beta \Pi_{t+2}]$$

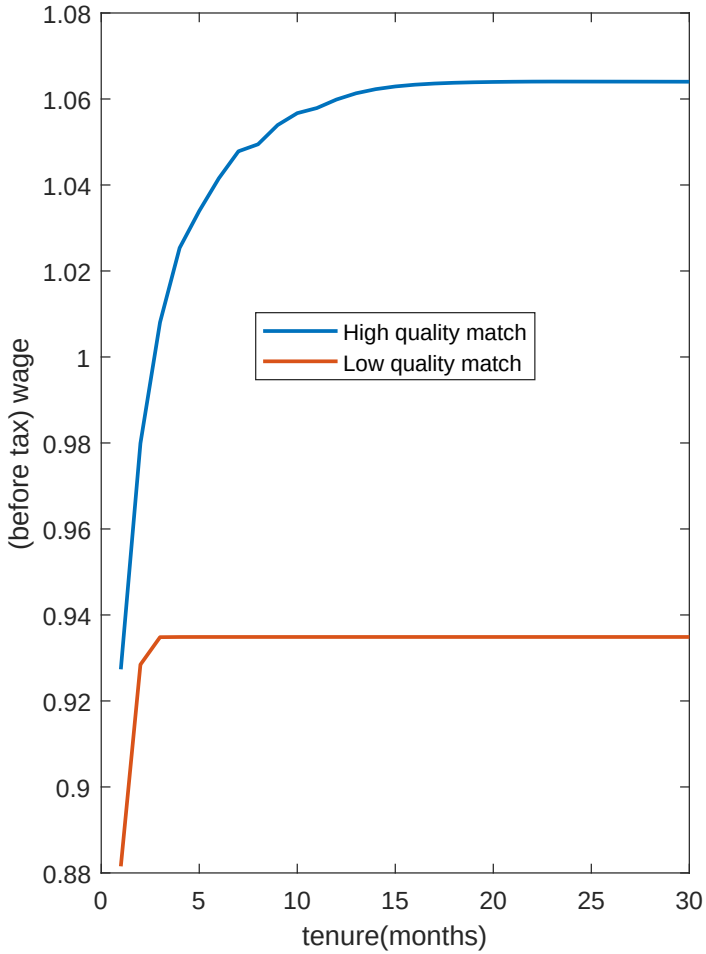
- Wages increase with tenure and converge to $\lim_{t\to\infty} w_t = z$

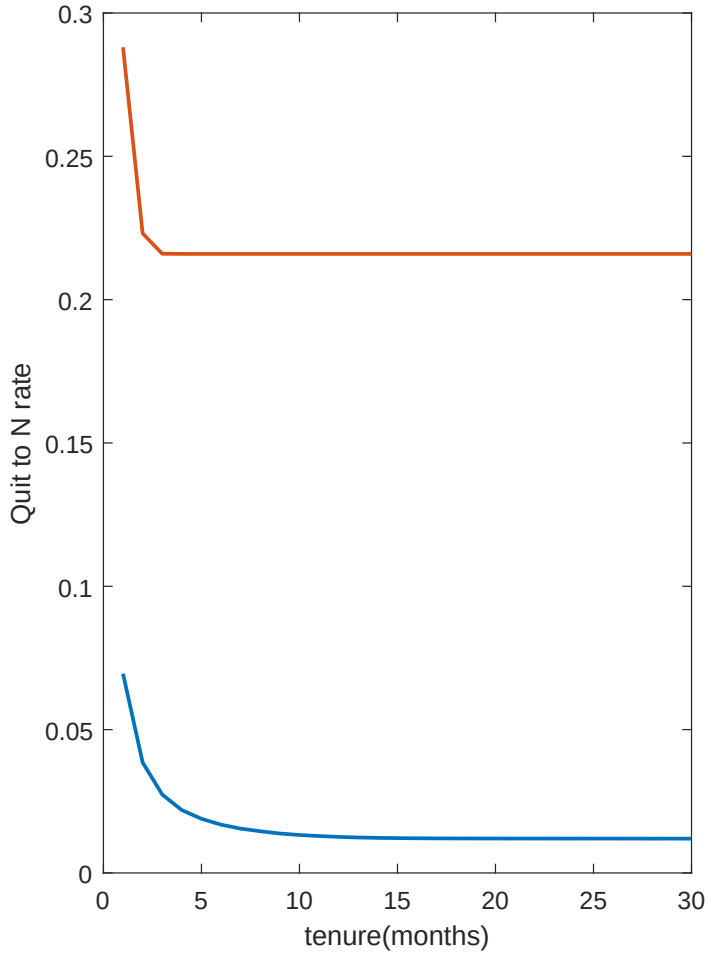
Equilibrium Conditions

In a stationary equilibrium:

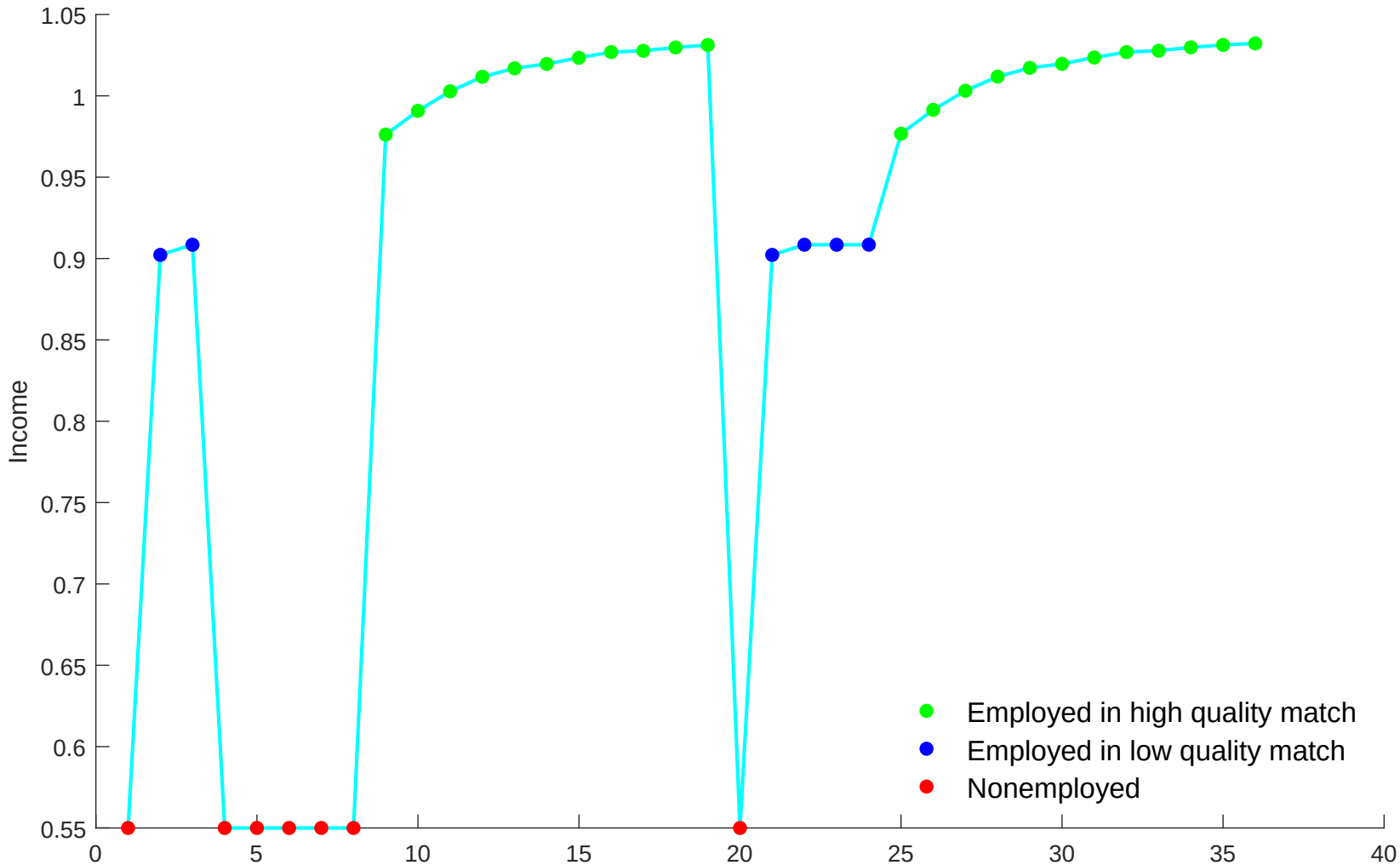
1. Workers direct search to the highest expected welfare sub-markets
2. Workers quit optimally
3. Workers report outside offers truthfully
4. Firms posting vacancies make zero expected profits
5. Firms deliver promised values as profitably as possible
6. Revenue from taxes finances benefits to unmatched workers
7. The share of unmatched workers is constant over time

Wages and Quit Rates by Tenure





Income and Employment Status Sample Path



Baily-Chetty Formula

- Consider version of model with one sector, no variation in match quality, constant wage
- Can write expected lifetime utility for unmatched worker as

$$W\left(p,\bar{\chi},\tau,\kappa\right)=\left(1-\tilde{u}(p,\bar{\chi})\right)\left(\log\left(w(p,\bar{\chi})\left(1-\tau\right)\right)-E[\chi_{|\chi\leq\bar{\chi}}]\right)+\tilde{u}(p,\bar{\chi})\log(\kappa z)$$

- Government moves first, choosing κ. Given κ, GBC implies $\tau(\kappa)$
- Households take (κ,τ) as given
- Think of one individual choosing p, internalizing impact on $\bar{\chi}$
- Think of (a future) individual choosing $\bar{\chi}$
- Planner FOC wrt $\kappa \Rightarrow$ Baily-Chetty-like formula

$$\underbrace{\frac{u'(c^u) - u'(c^w)}{u'(c^w)}}_{\text{inequality (2.5)}} + \underbrace{\left(\frac{-\varepsilon_{\tilde{u},\kappa}}{1-\tilde{u}} - \varepsilon_{w,\kappa}\right)}_{\text{tax effect (-1)}} + \underbrace{\frac{(1-\tau)}{\tau}\left(\frac{\kappa}{w}\frac{\partial w}{\partial \bar{\chi}}\left(\frac{\partial \bar{\chi}}{\partial \tau}\frac{d\tau}{d\kappa} + \frac{\partial \bar{\chi}}{\partial \kappa}\right)\right)}_{\text{wage effect via quits (-1.5)}} = 0$$

Quantitative model calibration (monthly model)

- Log utility from consumption $U(c) = \log(c)$
- $\beta = 0.99^{\frac{1}{3}}$
- Non-employed consumption $b(n) = \delta E[Y_n] + \min\{\kappa Y_n, \kappa E[Y_n]\}$
  - SNAP + UI $\Rightarrow \delta = 0.05$, $\kappa = 0.5$
- Exogenous separation rate $1 - \gamma = 1.94\%$
  - JOLTS layoff + other separations
- N sectors with population weights μ_n and productivity values Y_n to match CES sectoral employment and sectoral average earnings

Internally calibrated parameters

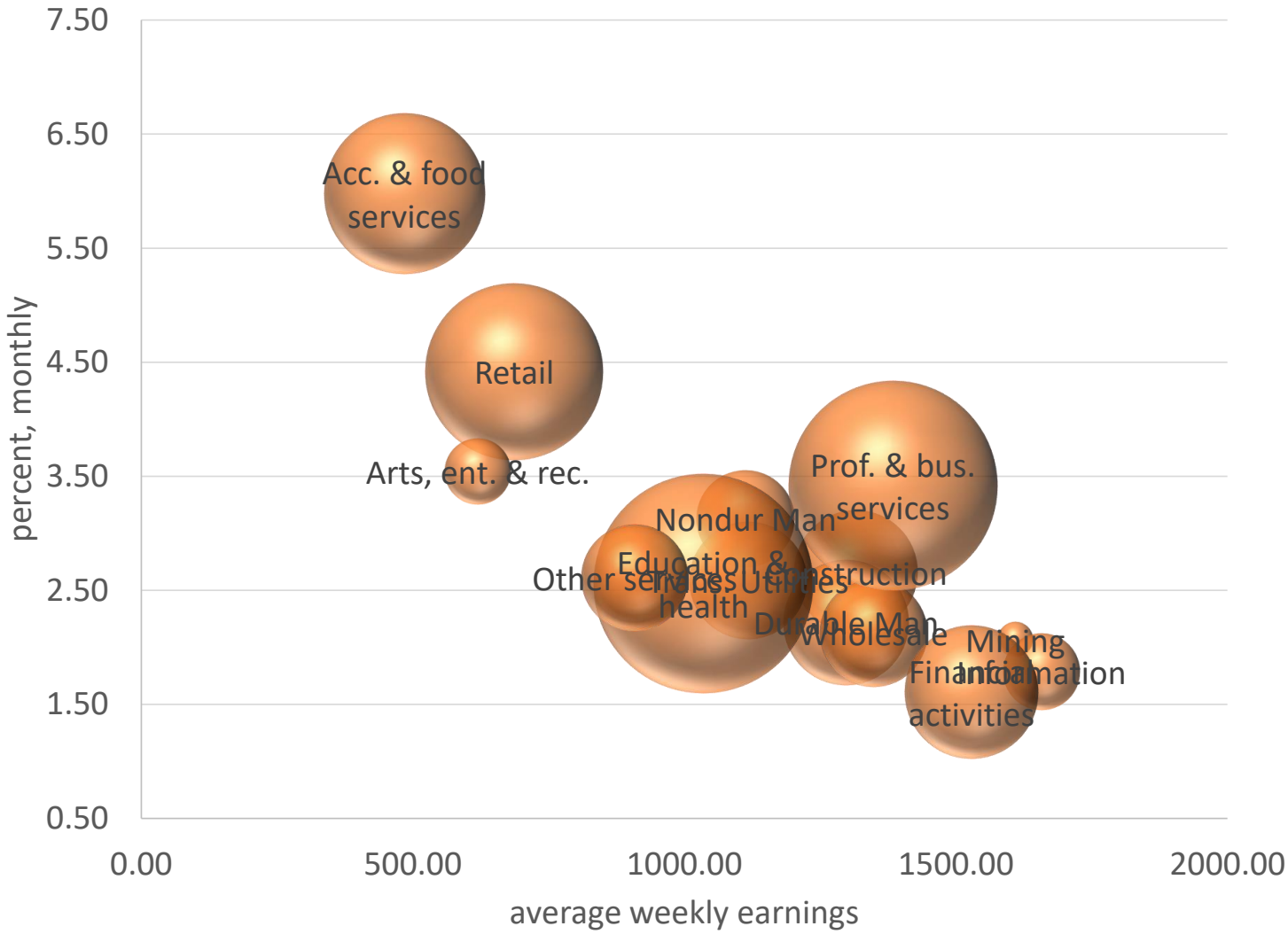
1. Vacancy posting cost: $\phi_n = \hat{\phi} z_n$
2. Preference shock: $\chi \sim Lognormal(\mu_\chi, \sigma_\chi^2)$
3. Share of high quality matches: μ_H
4. Match quality dispersion: z_H / z_L
5. Matching function $A\sqrt{uv}$

Targets. Avg July 21–June 22. JOLTS + Davis et al. 2008 adjustment

1. JOLTS job openings rate 8.03%
2. JOLTS quit rate 3.69%
3. LEHD share of separations that are J2J continuous employment 32.2%
   - $\Rightarrow$ EE rate = 1.81% EN rate = 1.88%, EU rate = 1.94%
4. Elasticity of quit rate to sectoral variation in average earnings
5. LEHD wage growth for J2J switchers 9% (Birinci et al., 2022)
6. CPS unemployment rate 4.15%

Quit Rates by Industry, 2021-2022

- Higher quit rates in low wage jobs



Optimal Replacement Rates

- Define optimal policy as replacement rate κ^* that maximizes expected lifetime utility in steady state for an unemployed individual

	US Policy	Optimal Policy
κ^* (%)	50.0	38.4
EN rate (%)	1.80	0.46
EE rate (%)	1.85	2.09
u rate (%)	4.13	1.98
v rate (%)	7.69	6.82
p rate (%)	78.1	98.7

Experiment 1: Role of the Quitting Margin

- By how much does incorporating quitting margin change optimal UI?
- Set $\sigma_\chi^2 \approx 0$ (keep mean the same) $\Rightarrow$ minimal EN flow

	Optimal Policies	
	Baseline	$\sigma_\chi^2 = 0.01$
κ^* (%)	38.4	48.9
EN rate (%)	0.46	0.07
EE rate (%)	2.09	1.78
u rate (%)	1.98	2.32
v rate (%)	6.82	5.19
p rate (%)	98.7	87.5

Experiment 2: no OJS (no EE flow)

	Optimal Policies	
	Baseline	No OJS
κ^* (%)	38.4	44.0
EN rate (%)	0.46	1.42
EE rate (%)	2.09	0.00
u rate (%)	1.98	2.38
v rate (%)	6.82	7.42
p rate (%)	98.7	92.7

- Interpretation: now workers in bad matches can only transition to better matches via unemployment

$\Rightarrow$ more generous UI benefits to support efficient reallocation

Experiment 3: no variation in match quality (minimal EE flow)

	Optimal Policies	
	Baseline	$\frac{z_H}{z_L} = 1$
κ^* (%)	38.4	33.5
EN rate (%)	0.46	1.08
EE rate (%)	2.09	0.04
u rate (%)	1.98	1.95
v rate (%)	6.82	5.43
p rate (%)	98.7	99.7

- Interpretation: If OJS fails, can exit a bad match in baseline model by quitting to unemployment

$\Rightarrow$ variation in match quality a rationale for more generous UI

Differential Benefits for Quitters and Laid-off Workers

- Suppose planner can distinguish workers who quit from those fired, pay different benefits to the two groups

$\Rightarrow$ Pay less generous benefits to quitters to discourage wasteful quitting

	Actual	Optimal Policies	
		Baseline	$\kappa^*_{EU} \neq \kappa^*_{EN}$
κ^*_{EU} (%)	50.0	38.4	48.5
κ^*_{EN} (%)	50.0	38.4	29.8
EN rate (%)	1.80	0.46	0.01
EE rate (%)	1.85	2.09	1.97
u rate (%)	4.13	1.98	2.26
v rate (%)	7.69	6.82	5.26
p_U rate (%)	78.1	98.7	87.5
p_N rate (%)	78.1	98.7	100.0

Welfare Gains from Optimal UI Reform

- $\kappa = 0.5 \rightarrow \kappa^* = 0.384 \Rightarrow$ welfare gain of 1.0% of consumption
- $\kappa^* = 0.384 \rightarrow \begin{matrix} \kappa^*_{EU} = 0.485 \\ \kappa^*_{EN} = 0.295 \end{matrix} \Rightarrow$ welfare gain of 0.3% of consumption
- Universal benefits to non-workers might be optimal if costly to differentiate quitters versus firees

Explaining the Great Resignation

Compare 2006 (end of previous boom) to 2021-2022

	2006	2021-22	Δ (pp)
EN rate (%)	0.8	1.8	1.0
EE rate (%)	1.8	1.8	0.0
u rate (%)	4.6	4.1	-0.5
v rate (%)	4.0	7.7	3.7

- Big rise in quits
- Big increase in vacancies
- Modest decline in unemployment

What accounts for these changes?

- Hypothesis: decline in cost of posting vacancies
  - Indeed, Monster etc.
- Fall in ϕ: $\phi_{2006} = 0.320 \to \phi_{2021/2} = 0.165$ can deliver most of the facts
- Lower $\phi \to$ more vacancies $\to$ easier to find (good) jobs $\to$ workers quit more often $\to$ even more vacancies
- Also labor market becomes less frictional $\to$ harder to backload wages $\to$ more quitting
- $\kappa^*_{2006} = 40.3\% \to \kappa^*_{2021/2} = 38.4\%$
- Intuition:
  - Lower $\phi \Rightarrow$ fired workers find jobs faster $\Rightarrow$ lower UI less costly
  - Lower $\phi \Rightarrow$ worse excess quitting problem $\Rightarrow$ want to reduce UI

Conclusions

1. The more important is quitting, the less generous UI should be
2. Moving to unconditional optimal policy yields large welfare gain, moving further to conditional optimum yields much less
3. If Great Resignation driven by lower vacancy costs, optimal UI has fallen