Quitting and Optimal Unemployment Insurance

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Facts about Quitters

Common view:

- layoffs drive most separations to non-employment
- quits are mostly job-to-job transitions

But this view is wrong!

Fact 1: Quits $\geq$ layoffs in separations to non-employment

- Simmons (2023). SIPP, 1996-2013.
  Monthly separation rate 4.2% =
  1.2% layoffs + 1.0% job-to-job transitions + **2.0% other quits**
- Graves, Huckfeldt and Swanson (2024), Ellieroth and Michaud (2024).
  CPS, 1978 to 2023. **1.4–1.9% quit-to-non-employment rate**

Facts about Quitters

Fact 2: Most quits to non-employment are temporary

- Kudlyak and Lange (2017): 39% of non-workers with 3 month history EEN employed in next month, compared to 46% of those with EEU
- 60% of hires from non-employment each month reported being OLF

Fact 3: Economic considerations important for quits

- Coglianese (2018), Ahn, Hobijn and Sahin (2023): "in-and-outs" disproportionately drawn from bottom of wage distribution
- Quit rate strongly pro-cyclical, contractionary monetary shocks reduce quit rate (Graves et al.)

Fact 4: Quitters receive few benefits

- In US, quitters generally ineligible for UI
- In other countries, quitters can collect benefits after waiting period (12 weeks in Germany)

Summary

- Majority of movements into and out of employment in the United States driven by quitters.
- But almost entire literature on public insurance focuses on layoffs
- Should quitters get benefits? If so, how much?

Key Ideas

- We extend a directed search & matching model to include quits
- How does the quit margin change prescriptions for social insurance?
- Idiosyncratic privately-observed disutility of work shocks drive quits
- Workers quit too often ...
- ... which depresses equilibrium wages
- UI for quitters makes excessive quitting problem worse, further depressing wages

$\Rightarrow$ Incentive not to make UI (for quitters) too generous ...

- But want some insurance for quitters!

Four Directed Search Models

1. Tractable static model with linear utility
   - With private preference shocks, economy features high "efficiency" wages and low employment
   - Reducing UI to reduce quitting increases welfare
2. Static model with concave utility
   - Quitters should get positive benefits, but less than fired workers
3. Dynamic representative worker model with concave utility
   - Derive extension of Baily-Chetty formula
   - Quit margin adds a new term: more UI $\Rightarrow$ more quits $\Rightarrow$ lower wages
4. Richer more quantitative model
   - Multiple sectors $\rightarrow$ useful for identifying variation of preference shocks
   - On-the-job search $\rightarrow$ workers quit to get a raise
   - Variation in match quality $\rightarrow$ quits to find a better match
   - Richer dynamic wage contracts $\rightarrow$ firms backload pay, stochastically match outside offers to reduce quitting

Directed Search with Quits

- Dynamic model, workers and firms discount at rate β
- All workers start out unmatched
- Firms post vacancies v at cost ϕ
- Labor markets indexed by constant wage w, job finding probability p
  - higher wage jobs harder to find
- Cobb-Douglas matching function

  $\Rightarrow$ with u searchers and v vacancies job finding probability is $p = \frac{A\sqrt{uv}}{u}$
- If they match, workers draw idiosyncratic utility cost of work $\chi \sim F$
- χ not observed by the firm, iid over time
- Matched workers decide whether to quit
  - Quit iff $\chi \geq \bar{\chi}$, where $\bar{\chi}$ is increasing in w
- Exogenous layoffs at rate $1 - \gamma$, in addition to quits

Income Model

- Workers who do not quit or get laid off produce z
- All receive unearned income φ (spousal income, asset income)
- Common UI benefit κz for all non-workers
- Budget constraints

$$\begin{aligned} c^e &= w(1-\tau)+\varphi \\ c^u &= \kappa z + \varphi \end{aligned}$$

- Utility:

$$U(c^e) - \chi \text{ if employed}$$

$$U(c^u) \text{ if not employed}$$

Equilibrium

- Free entry $\Rightarrow$ vacancy cost equals expected present value of profits:

$$\phi = q(p)\frac{\gamma F(\bar{\chi})}{1-\beta\gamma F(\bar{\chi})}(z-w)$$

  where $1-F(\bar{\chi})$ is the quit rate

- Higher w reduces flow profits
- Offset by
  - higher worker finding probability (higher q)
  - higher worker retention rate $\gamma F(\bar{\chi})$
- Think of workers choosing $p \in [0,1] \Rightarrow w$ pinned down by free entry

$$\begin{aligned} V^u(p) &= U(c^u) + \beta\left(pV^e(p) + (1-p)V^u(p)\right) \\ V^e(p) &= \gamma F(\bar{\chi})(U\left(c^e\right) - \mathbb{E}[\chi_{|\chi\leq\bar{\chi}}] + \beta V^e(p)) + (1-\gamma F(\bar{\chi}))V^u(p) \end{aligned}$$

  where $\bar{\chi}$ is solution to

$$U\left(c^e\right) - \bar{\chi} + \beta V^e(p) = V^u(p)$$

Planner Problem

- Benevolent govt maximizes initial unmatched workers' value subject to budget constraint

$$\tau(1-\tilde{u})w = \kappa\tilde{u}z$$

  where $1-\tilde{u} = \frac{\gamma p F(\bar{\chi})}{1-\beta\gamma(1-p)F(\bar{\chi})}$ is present value of time spent employed
- Govt moves first, choosing κ (which implies τ via GBC)
- Unmatched workers choose $p \Rightarrow w$ given κ, internalizing impact on $\bar{\chi}$
- Matched workers choose $\bar{\chi}$, given (κ, τ, w)
- Planner problem:

$$\max_{\kappa} W\left(\kappa, p(\kappa), \bar{\chi}\left(\kappa\right), \tau(\kappa)\right)$$

- The FOC of this problem delivers an extended Baily-Chetty formula

Extended Baily-Chetty Formula

- FOC wrt κ:

$$\underbrace{\frac{U'(c^u) - U'(c^e)}{U'(c^e)}}_{\text{Insurance}} + \underbrace{-\left[\frac{1}{1-\tilde{u}}\varepsilon_{\tilde{u},\kappa} - \varepsilon_{w,\kappa}\right]}_{\text{Fiscal Externality}} + \underbrace{\frac{1-\tilde{u}}{\tilde{u}}\frac{c^e}{c^u}\varepsilon_{w,\kappa|p}}_{\text{Quitting Externality}} = 0$$

  where

  $\varepsilon_{\tilde{u},\kappa}$ is the total elasticity of unemployment $\tilde{u}$ wrt κ

  $\varepsilon_{w,\kappa}$ is the total elasticity of the wage w wrt κ

  $\varepsilon_{w,\kappa|p}$ is the partial elasticity of w wrt κ via $\bar{\chi}$, holding fixed p.

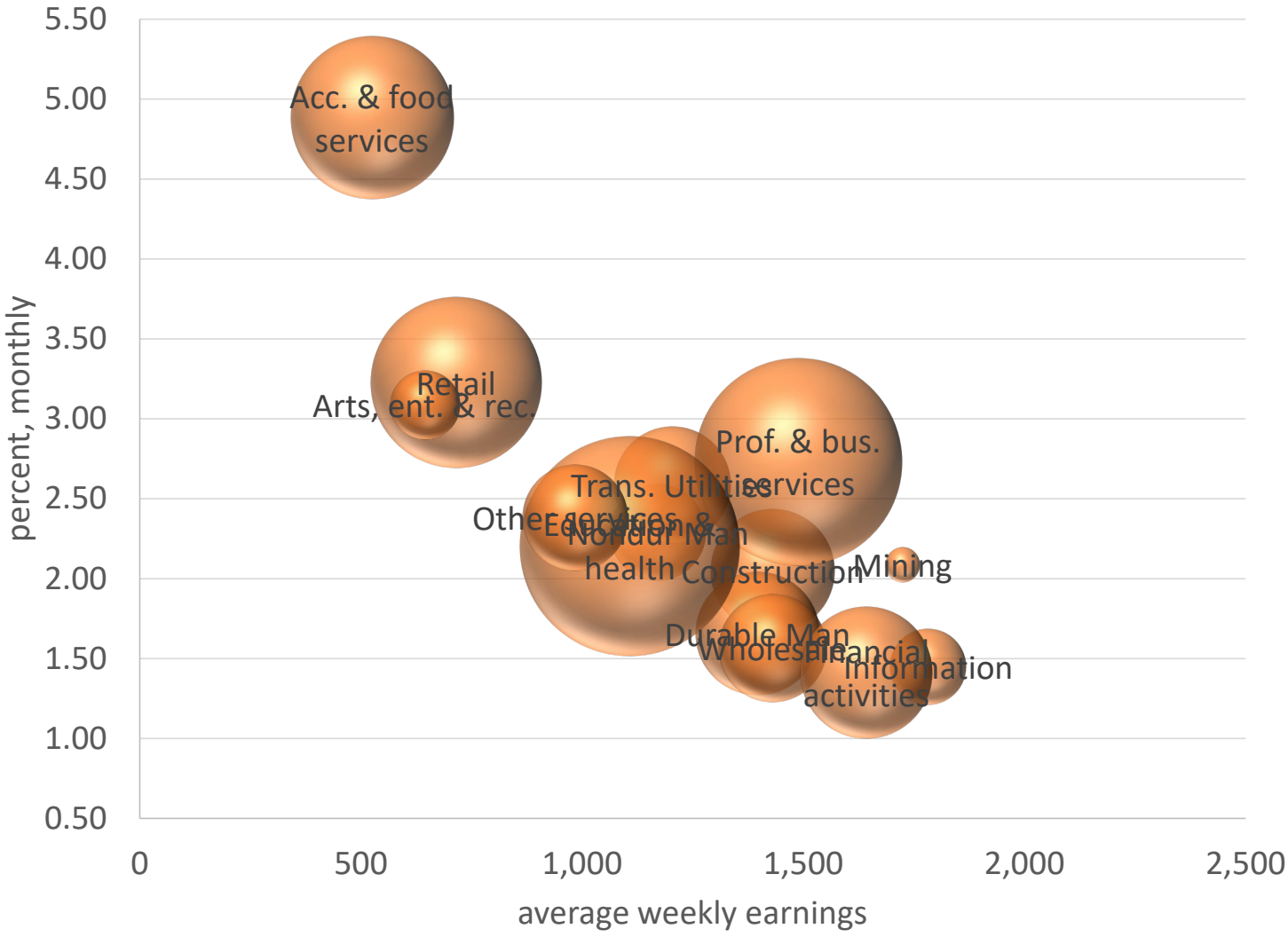
- Quitting externality affects all workers $\rightarrow$ potentially important!
- $\varepsilon_{w,\kappa|p}$ depends on sensitivity of quits to $\kappa \rightarrow$ shape of F important
- Elasticity of w to κ via p does not show up because unmatched workers have chosen p optimally internalizing impact on w (envelope theorem)

Quantification

- $U(c) = \log(c)$, $\beta = 0.96^{1/12}$
- F lognormal with parameters μ_χ and σ_χ^2
- $z = 1$, $\kappa = 0.43$, $\varphi = 0.721$ (ASEC)
- $(A, \phi, \gamma, \mu_\chi)$ to match 2022-25 CPS / JOLTS (i) unemployment 3.78%, (ii) job openings 5.81%, (iii) layoffs 1.22% (iv) quits to non-emp. 1.91%
- σ_χ to match elasticity of sectoral quit rate to sectoral earnings

Quit Rates by Industry

- Higher quit rates in low wage jobs



Optimal Policy via Extended Baily-Chetty Formula

Panel A: Parameter values

	A	ϕ	μ_χ	σ_χ	γ	φ	z
Baseline	0.563	0.117	-1.700	0.51	0.988	0.721	1
$\sigma_\chi = 100$	0.563	0.605	-207.709	100	0.988	0.721	1

Panel B: Terms in Baily-Chetty formula and elasticities

	κ	c ineq.	fiscal extn.	quit extn.	$\varepsilon_{\tilde{u},\kappa}$	$\varepsilon_{w,\kappa}$	$\varepsilon_{w,\kappa\|p}$
Baseline	0.430	0.466	-3.424	-1.126	3.224	-0.003	-0.031
Optimum	0.111	1.058	-0.246	-0.813	0.241	-0.001	-0.001
$\sigma_x = 100$	0.430	0.440	-0.549	-0.021	0.536	0.020	-0.0006
Optimum	0.392	0.491	-0.469	-0.022	0.461	0.018	-0.0005

Richer Quantitative Model with New Ingredients

- Workers vary by sector n which determines expected productivity Y_n
  - Replicate productivity-quit relationship at sector level
- Variation in match quality
  - Idiosyncratic match quality shock $z \in \{z_H, z_L\}$ revealed after match formed
  - On the job search / quits as ways to improve match quality
- Richer contracts to reduce quit rate:
  - Firms backload wages
  - Stochastically match unobserved outside offers

Wages and Quit Rates by Tenure

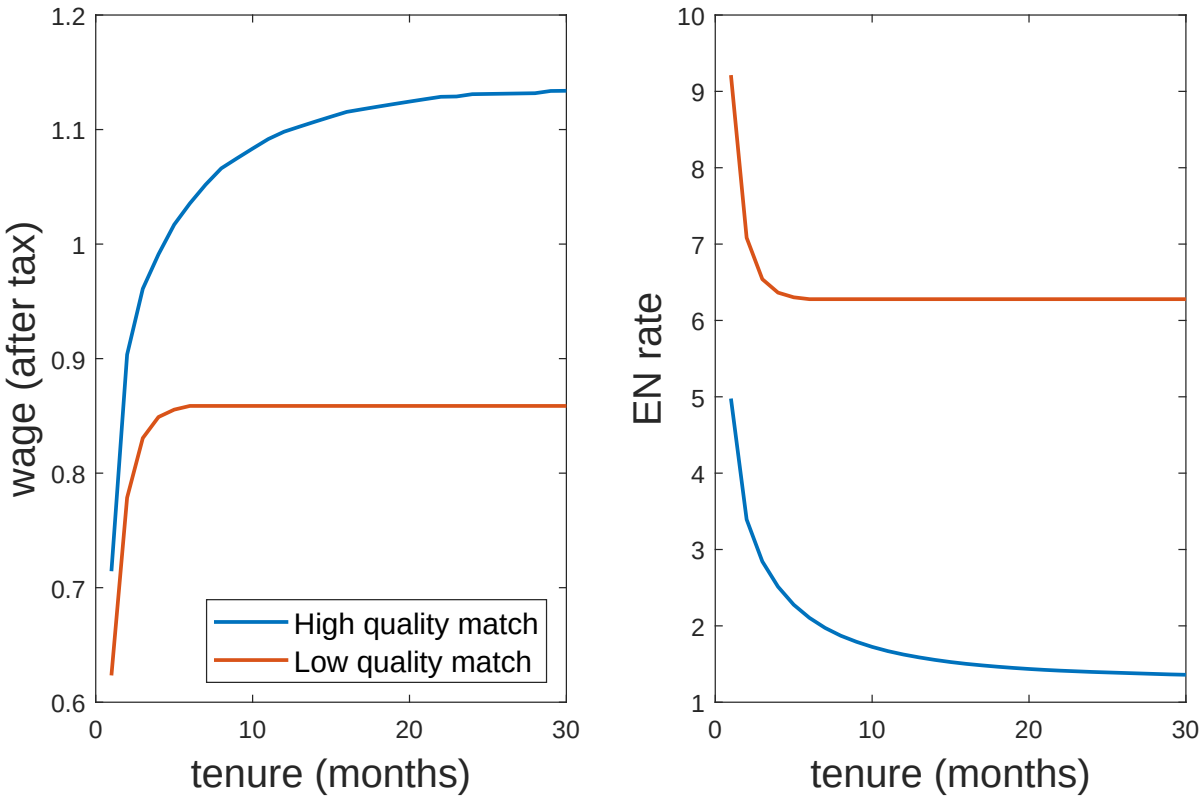


Figure 1: Wages and Quit Rate by Tenure (worker in sector with $Y_n = 1$)

Sample Income Path

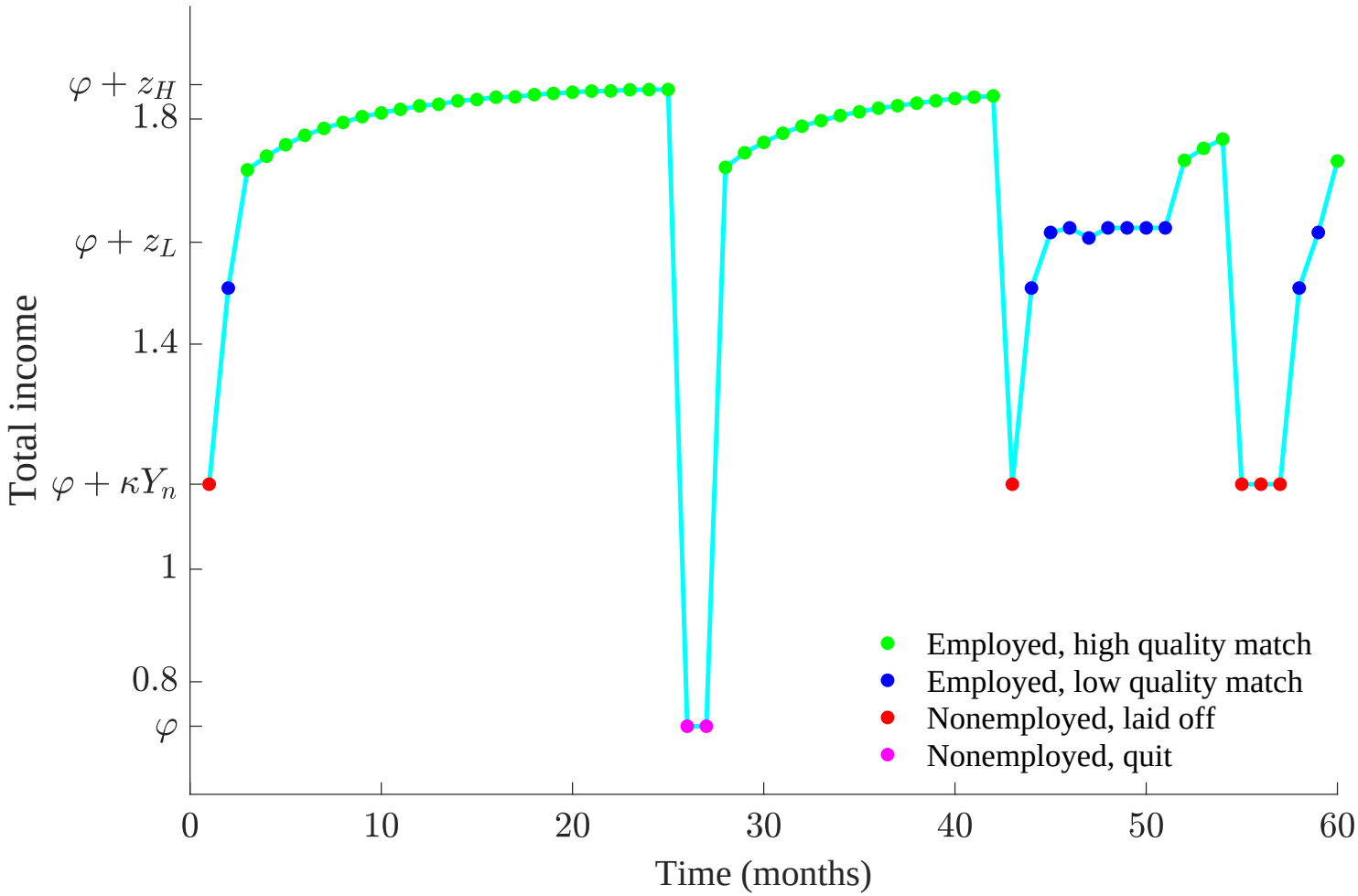


Figure 2: Sample Path for Total Income (worker in sector with $Y_n = 1$)

Optimal Replacement Rates

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

	Actual	Optimal			Counterfactuals	
		$\kappa_q^* = 0$	$\kappa_f^* = \kappa_q^*$	Flex.	No OJS	$z_H = z_L$
κ_f^* rate (%)	43.0	38.0	19.7	39.9	37.5	32.6
κ_q^* rate (%)	00.0	00.0	19.7	15.6	17.2	12.7
EN rate (%)	1.91	1.91	2.95	2.69	3.46	4.63
EE rate (%)	2.42	2.53	2.89	2.74	0.00	0.24
u rate (%)	3.89	2.92	3.75	4.04	4.46	5.16
v rate (%)	5.73	5.91	7.10	6.55	5.23	5.80
p_f rate (%)	42.9	51.1	69.2	48.0	50.7	48.1
p_q rate (%)	88.1	88.2	69.2	73.3	73.5	69.1

Conclusions

1. With quits driven by private idiosyncratic preference shocks, workers quit too often, destroying matches with positive joint surplus
2. This shows up as depressed wages, wasteful vacancy creation
3. Planner incentivized to cut UI to reduce excess quitting
4. Margin appears quantitatively important: key elasticity is response of quit rate to UI
5. Equilibrium response to quitting helps explain some labor market features:
   - High "efficiency" wages $\rightarrow$ significant unemployment even when cheap to contact workers
   - Wages that rise with tenure
   - Stochastic matching of outside offers

Experiment 1: Role of the Quitting Margin

- Set $\sigma_\chi^2 \approxeq 0$ (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

Return

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

Return

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

Return

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.
- Consider fall in ϕ: $\phi_{2006} = 0.320 \rightarrow \phi_{2021/2} = 0.165$

	2006	2021-22	Δ (pp)	Δ Model
EN rate (%)	0.8	1.8	1.0	0.9
EE rate (%)	1.8	1.8	0.0	0.3
u rate (%)	4.6	4.1	-0.5	-1.0
v rate (%)	4.0	7.7	3.7	3.5

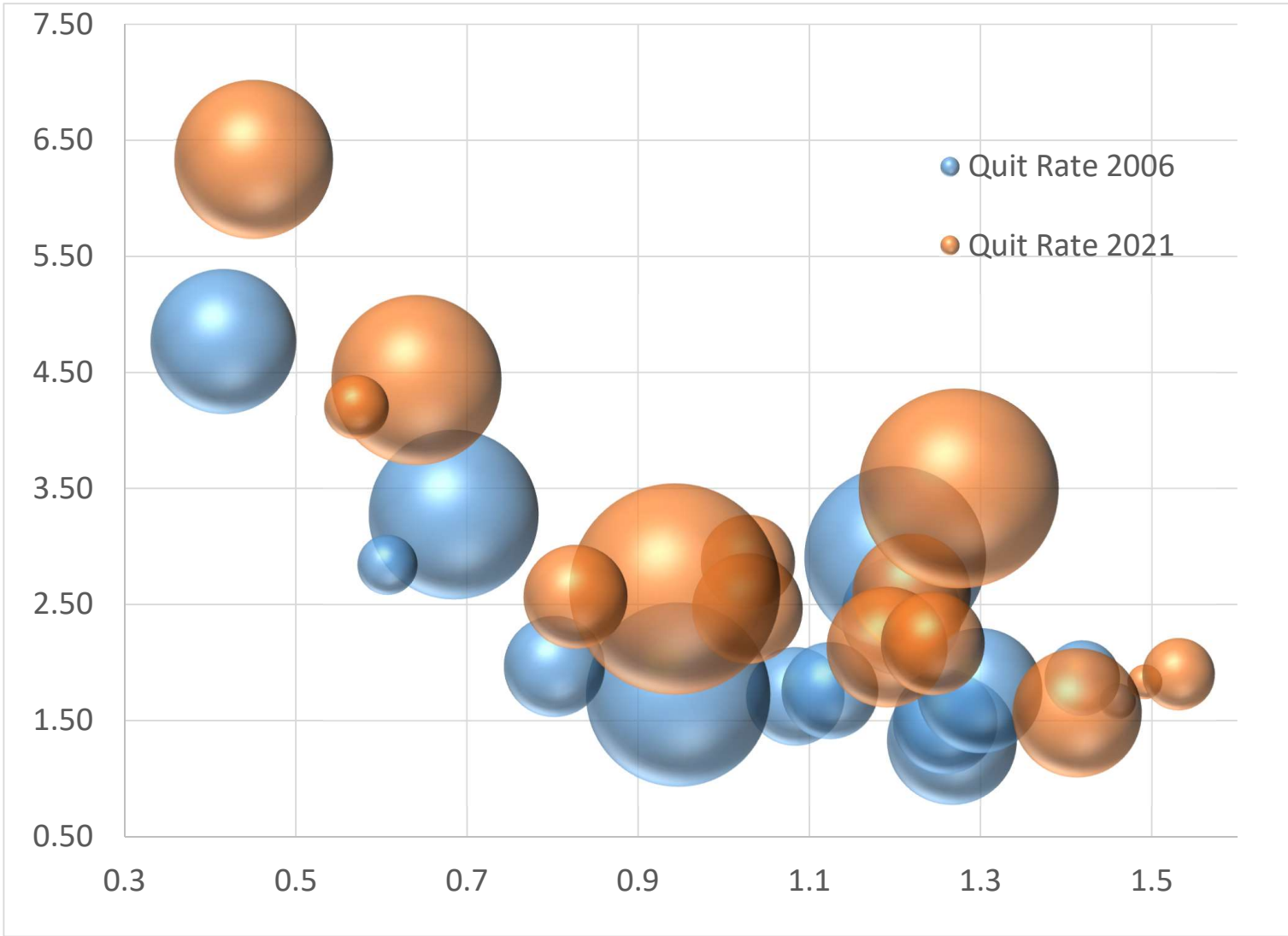
- Lower $\phi \rightarrow$ more vacancies $\rightarrow$ easier to find (good) jobs $\rightarrow$ workers quit more often $\rightarrow$ even more vacancies
- Also labor market becomes less frictional $\rightarrow$ harder to backload wages $\rightarrow$ more quitting

Implications of Great Resignation for Optimal UI

- What does lower $\hat{\phi}$ imply for optimal UI replacement rate?
- $\kappa^*_{2006} = 40.3\% \rightarrow \kappa^*_{2021/2} = 38.4\%$
- 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

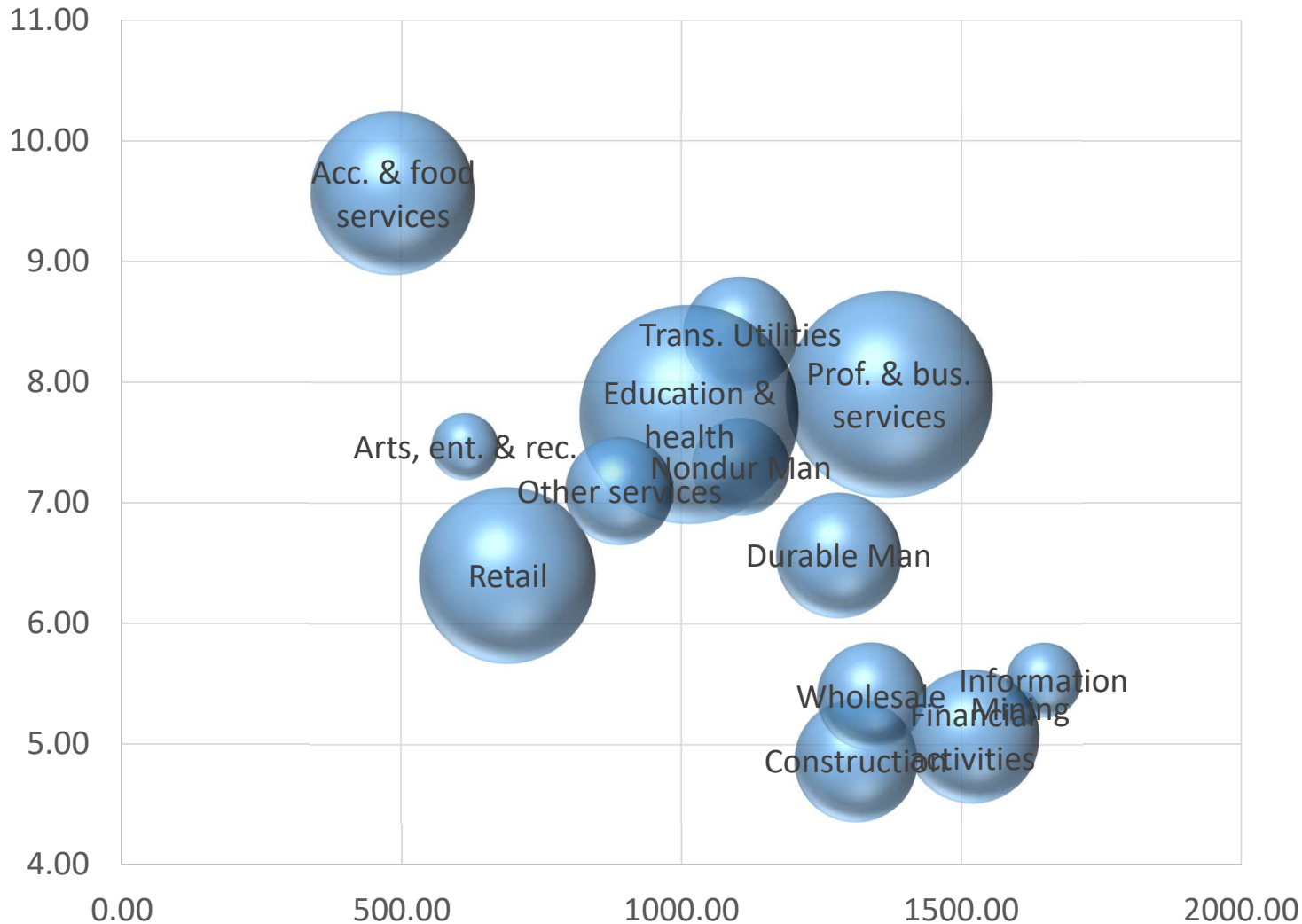
Rise in Quits

- Quits have risen across the board

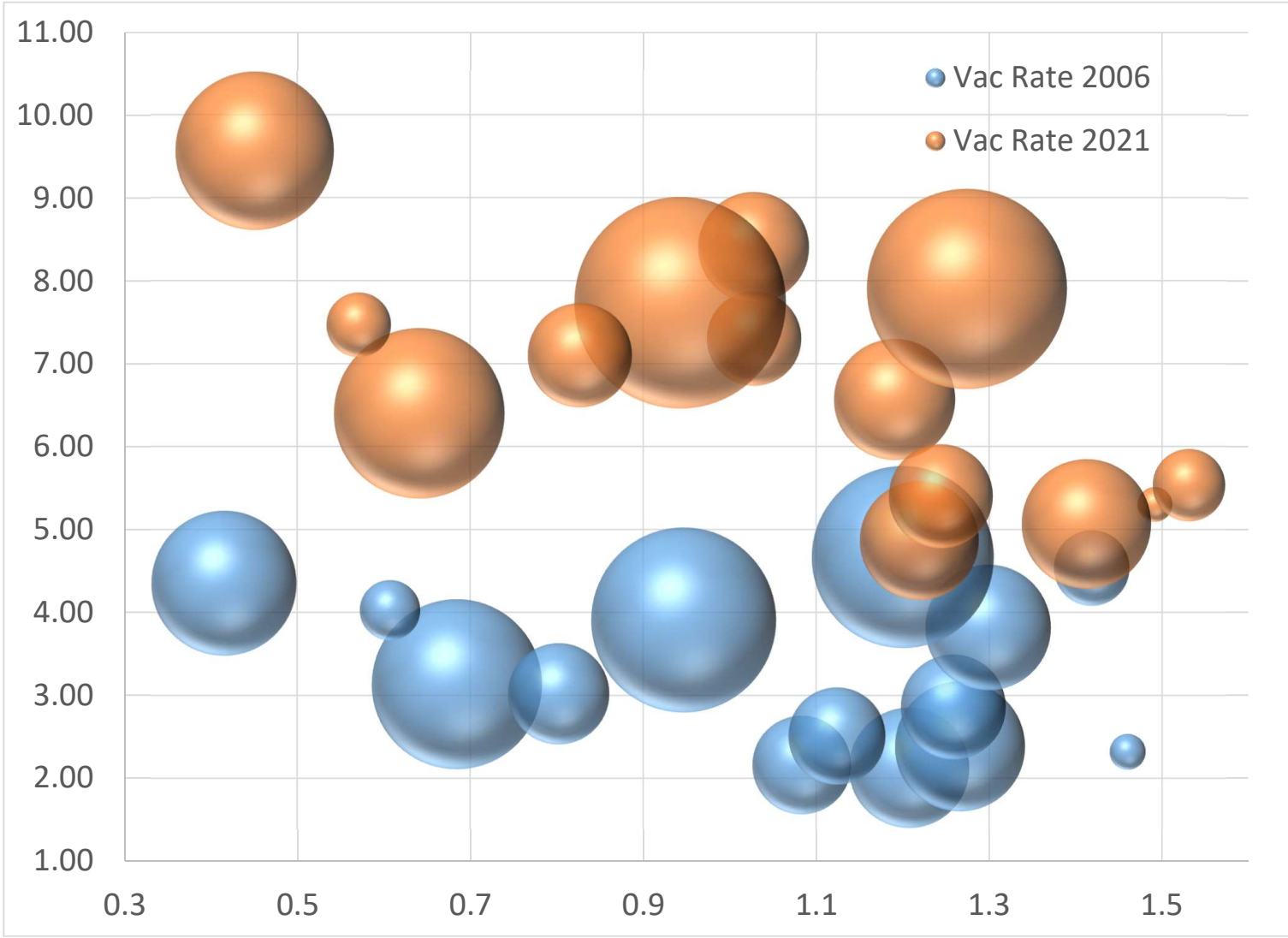


Vacancy Rates by Industry, Fall 2021

- High quits and high vacancies go together



Rise in Vacancies



Firm Problem (Conditional on Match Quality)

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

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

$$s.t.$$

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

(Promise keeping)

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

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

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

Return

Optimal insurance against match quality risk

Given promise of expected value V^s to a newly matched worker, firm allocate values to different matching quality realizations to deliver the promised value

$$\mathbb{E}\left[\Pi\left(V^s\right)\right] = \max_{V_H, V_L} E_z \Pi\left(V_z, z\right)$$

$$s.t.$$

$$E_z V_z \geq V^s$$

Return

Wages and Quit Rates by Tenure – Wage Backloading

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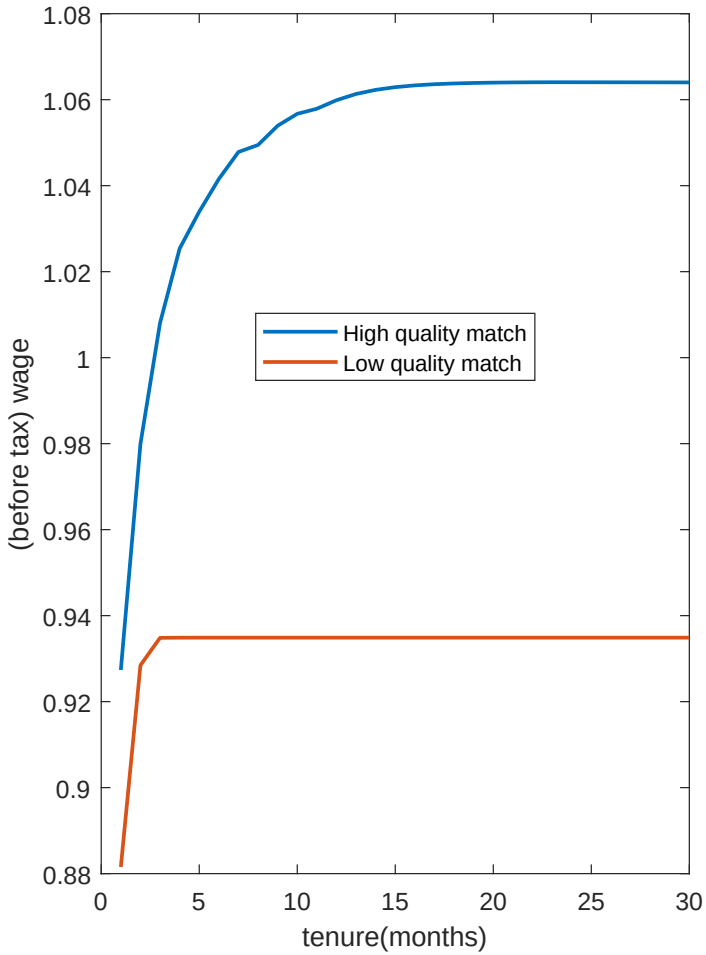

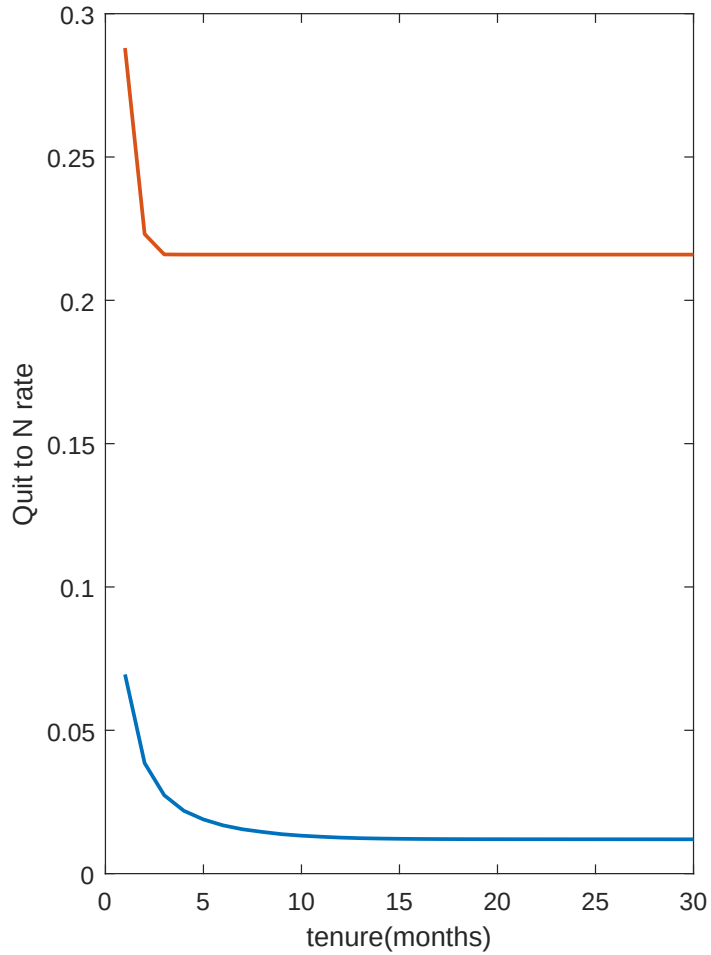

Income and Employment Status Sample Path

Return