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**
- LEHD + JOLTS. Monthly **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

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

Literature

1. Empirical impact of UI on quits and wages
   - Quits: Jager, Shoefer, Zweimuller (2023), Jurajda (2003), Schmieder, von Wachter and Bender (2016), Christofides and McKenna (1996), Green and Riddell (1997), Baker and Rea (1998)
   - Wages: Schmieder et al. (2016), Nekoei and Weber (2017), Jager, Shoefer, Young and Zweimuller (2023)
2. Directed search and optimal UI:
   - Acemoglu and Shimer (1999) and Golosov, Maziero, Menzio (2013)
3. Job-to-job transitions:
   - Shimer (2006), Delacroix and Shi (2006), Menzio and Shi (2011), Mercan and Schoefer (2020), Elsby, Gottfries, Michaels, Ratner (2022)
4. Backloading wages to reduce quitting:
   - Stevens (2004), Burdett and Coles (2003), Shi (2009), Balke and Lamadon (2022)
5. Stochastic contracts: Moore (1985)
6. Quits to non-employment:
   - Guerrieri (2008), Hopenhayn and Nicolini (2009), Mazur (2016), Blanco, Drenik, Moser, Zaratiegui (2023), Qiu (2023), Bagga, Mann, Sahin and Violante (2024)

Tractable One Period Model —— Directed Search with Quits

- All workers start out unmatched
- Firms post vacancies v at cost ϕ
- Labor markets indexed by promised wage w, job finding probability p
  - higher wage jobs harder to find
- If they match, workers draw idiosyncratic utility cost of work $\chi \sim F$
- Matched workers decide whether to quit
- Matched workers who do not quit produce z
- Benefit b for all non-workers, financed by tax τ on workers:

$$
\begin{aligned}
U^e &= w - \tau - \chi \\
U^n &= b
\end{aligned}
$$

Two Versions of Model

1. Baseline: χ is private $\Rightarrow$ wage must be independent of χ

   $\Rightarrow$ worker will quit iff $\chi > \bar{\chi} = w - \tau - b$

   - Thus, quit rate declining in wage in search sub-market

2. Alternative: χ is public $\Rightarrow$ firms offer χ contingent wages up to $w = z$

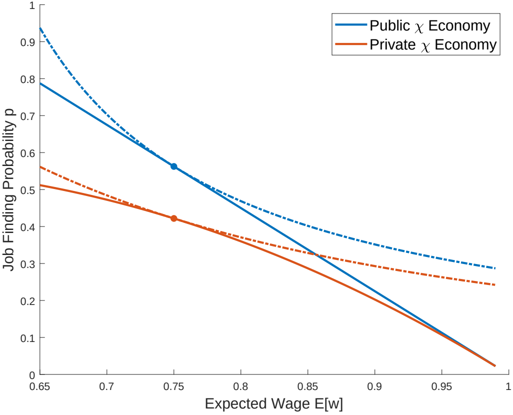
   $\Rightarrow$ worker will quit iff $\chi > \bar{\chi} = z - \tau - b$

   - Thus, quit rate independent of expected wage in search sub-market

Tractable Example

Matching: $p = \frac{A\sqrt{uv}}{u}$, $q = \frac{A^2}{p}$; Preference shock: $\chi \sim U\,[0, a]$

$z = 1$, $b = \tau = 0$,



- Solid line: $q(p)F(\bar{\chi})(z - \mathbb{E}[w]) = \phi$
- Dash line: $pF(\bar{\chi})\left(\mathbb{E}[w] - \tau - \mathbb{E}\left[\chi_{|\chi<\bar{\chi}}\right]\right) + (1 - pF(\bar{\chi}))b = \bar{U}$

Intuition

Markets address excess quitting by implementing efficiency wages

- Searchers always tradeoff higher w versus lower p
- But low w jobs imply more quitting, so firms offer only small increase in p in exchange for lower w

  $\Rightarrow$ workers choose to search in relatively high w, low p market

Optimal policy

- Public χ economy: $b^* = \tau^* = 0$ delivers first best:
  - Contingent wages deliver efficient quitting threshold $\bar{\chi} = z$
  - Competitive search ensures efficient level of vacancy posting
- Baseline private χ economy:
  - At $b = 0$, quit rate is too high
  - $(\tau^* + b^*) = -\frac{z}{5}$ reduces quits & boosts wages
  - Cannot achieve first best $\bar{\chi}$ and p with common b for all non-workers
  - Can recover first best with differential benefits:
    - $\tau^* + b^* = 0$ for those who don't find a job
    - $\tau^* + b^* = -\frac{z}{4}$ for those who quit

Static Model with Concave Utility

- Same model, but with concave utility ⇒ insurance motive for UI
- More generous UI ⇒ better insurance, but ...
- Workers become pickier, search for high w, low p jobs
- Fiscal externality (standard):
  - If all searchers are pickier, then ...
  - equilibrium unemployment is higher, which necessitates ...
  - higher tax rates to fund UI
- Assume govt can pay different benefits to
  1. those who never find a job, b_s
  2. those who quit, b_q
  3. those fired, b_f

Two Results

1. Without quits, optimal to perfectly insure fired workers: $b_f = w - \tau$
   - Direct benefit from insurance + increases value of finding a job (mitigates fiscal externality)
2. With quits, optimal policy features $0 < b_q < b_f < w - \tau$
   - Excessive quitting $\Rightarrow$ want to make quitting costly
   - But also want consumption insurance for quitters
   - $\Rightarrow$ Reduce quitting by rewarding work as well as by punishing quitting

Intermediate Model

- Dynamic model, workers and firms discount at rate β
- Private disutility of work shocks χ iid over time
- Exogenous match destruction at rate $1 - \gamma$, in addition to quits
- Common benefit κz for all non-workers
- Concave period utility:

$$U(w(1-\tau)) - \chi \text{ if employed}$$

$$U(\kappa z) \text{ if not employed}$$

- Directed search, assume firms post constant wages

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,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 → potentially important!
- $\varepsilon_{w,\kappa|p}$ depends on sensitivity of quits to κ → 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

- $U(c) = \log(C)$, $\beta = 0.99^{1/3}$
- F lognormal with parameters μ_χ and σ^2_χ
- $\kappa = 0.5$
- A, ϕ, γ, μ_χ to match 2021-22 JOLTS/CPS rates for (i) unemployment 4.15%, (ii) job openings 8.03%, (iii) layoffs 1.94% (iv) quits to non-emp. 1.88%

Panel A: Parameter values

	σ^2_χ	ϕ	μ_χ	A	γ
Baseline	0.25	0.103	-1.22	0.563	0.9806
Insensitive quits	100	0.405	-20.83	0.563	0.9806

Panel B: Terms in Baily-Chetty formula and elasticities

	κ	insurance	fiscal extn.	quit extn.	$\varepsilon_{\tilde{u},\kappa}$	$\varepsilon_{w,\kappa}$	$\varepsilon_{w,\kappa\|p}$
Baseline	0.500	0.918	-4.545	-1.364	4.271	0.002	-0.046
Optimum	0.328	1.996	-1.012	-0.984	0.980	-0.008	-0.008
Insensitive quits	0.500	0.867	-0.983	-0.202	0.948	0.027	-0.007
Optimum	0.455	1.057	-0.838	-0.220	0.814	0.025	-0.006

Richer Quantitative Model with New Ingredients

- How sensitive are quits to wages / benefits?
  - Workers vary by sector n which determines expected productivity Y_n
  - Replicate productivity-quit relationship at sector level
- What if quits are an important part of reallocation to improve match quality?
  - Idiosyncratic match quality shock $z \in \{z_H, z_L\}$ revealed after match formed
  - On the job search for better jobs
- Can firms design contracts to reduce quits?
  - Allow for sophisticated dynamic contracts

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. 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**

Firm Wage Contracts

- Firms observe match quality z once worker hired
- Do not observe preference shock χ
- Workers report outside offers, firms cannot verify but can incentivize truth-telling
  - Specify probabilities ζ of matching reported outside offers versus firing workers reporting such offers
  - If outside offer not matched, worker switches to new job if offer exists, otherwise is let go (as penalty)
- Offer rich dynamic contracts, where wages depend on (i) match quality z, (ii) tenure Wage backloading, (iii) reported outside offers Income sample path

Firm's problem Insurance against match quality shocks

Quantitative Model Calibration (Internally Calibrated Parameters)

Parameters

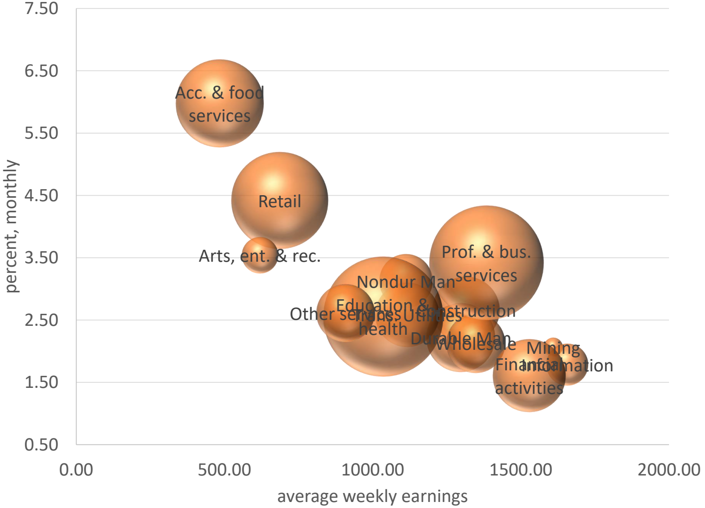
1. Variance of preference shock: σ_χ^2
2. Share of high quality matches: μ_H
3. Match quality dispersion: z_H/z_L

Targets

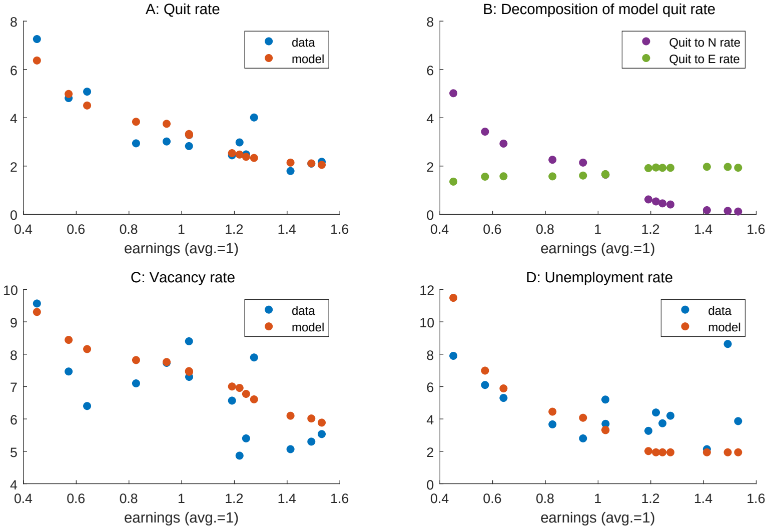
1. Elasticity of quit rate to sectoral variation in average earnings
2. LEHD share of separations that are J2J continuous employment 32.2%
   - $\Rightarrow$ EE rate = 1.81% EN rate = 1.88%, EU rate = 1.94%
3. LEHD wage growth for J2J switchers 9% (Birinci et al., 2022)

Quit Rates by Industry, 2021-2022

- Higher quit rates in low wage jobs



Model versus Data



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

- Optimal replacement rate less generous than current policy
- Reducing UI $\Rightarrow$ big decline in equilibrium unemployment rate
    1. Lower UI $\Rightarrow$ lower quitting
    2. Lower UI $\Rightarrow$ workers less picky

Counterfactuals

Optimal κ^*:

1. If no quitting margin (no disutility shocks) $\Rightarrow$ 38.4% $\nearrow$ 48.9% Details
2. If no on-the-job search $\Rightarrow$ 38.4% $\nearrow$ 44.0% Details
3. If no variation in match quality shocks $\Rightarrow$ 38.4% $\searrow$ 33.5% Details

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

⇒ 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

$$\kappa = 0.5 \quad \underbrace{\rightarrow \kappa^* = 0.384}_{\text{welfare gain of } 1.0\% \text{ of consumption}} \quad \underbrace{\rightarrow \begin{array}{c} \kappa^*_{EU} = 0.485 \\ \kappa^*_{EN} = 0.295 \end{array}}_{\text{welfare gain of } 0.3\% \text{ of consumption}}$$

- Universal benefits to non-workers might be optimal if costly to differentiate quitters versus firees

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

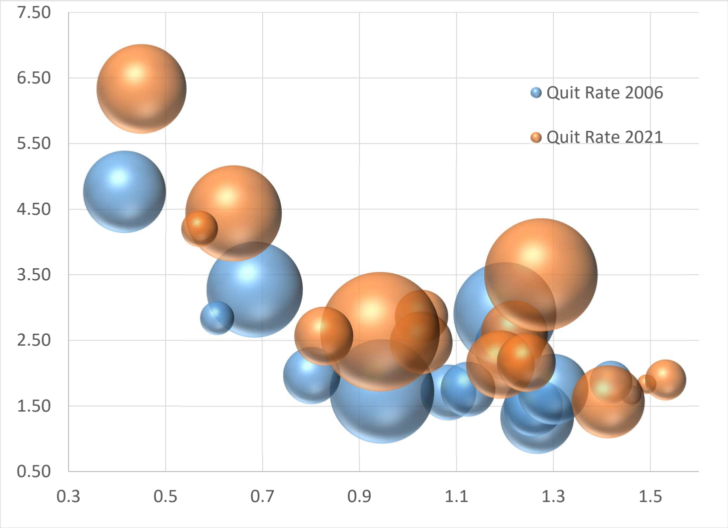
- Lower $\phi \rightarrow$ more vacancies $\rightarrow$ easier to find (good) jobs $\rightarrow$ workers quit more often $\rightarrow$ even more vacancies
- Also labor market becomes less frictional $\rightarrow$ harder to backload wages $\rightarrow$ more quitting

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

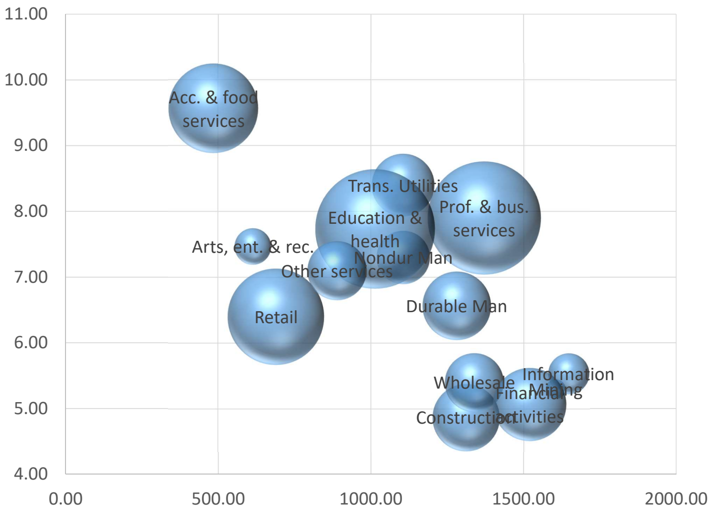
Rise in Quits

- Quits have risen across the board

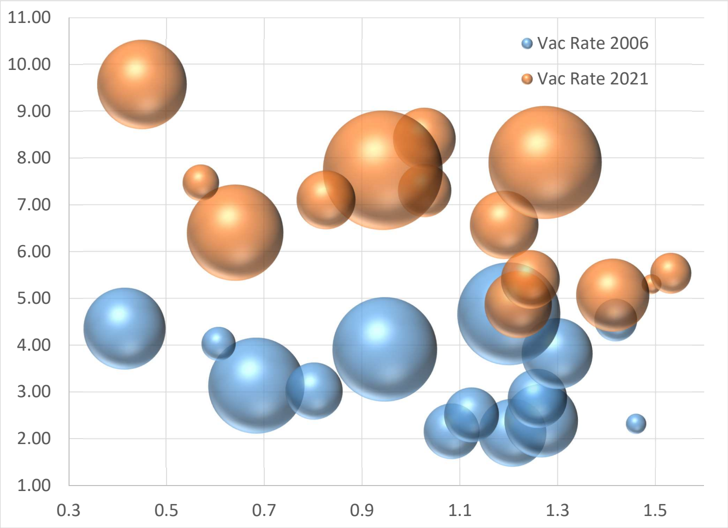


Vacancy Rates by Industry, Fall 2021

- 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

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

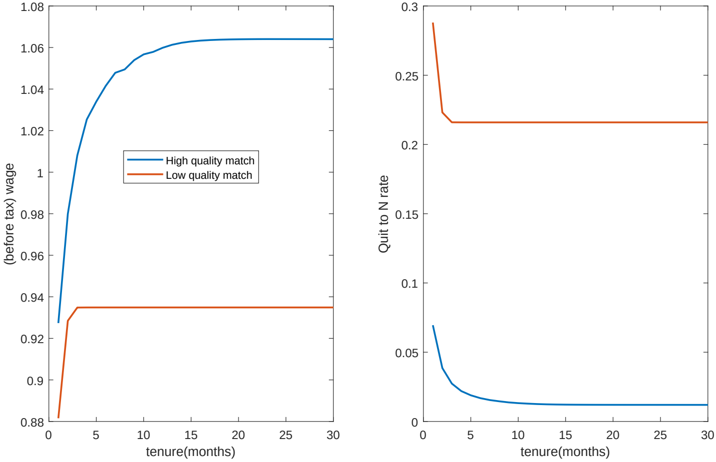
$$s.t.$$

$$E_z V_z \geq V^s$$

Return

Wages and Quit Rates by Tenure – Wage Backloading

Return



Income and Employment Status Sample Path

Return