The Active Search Premium

Sebastian Graves[1] and Christopher Huckfeldt[2]

[1]University of Cambridge
[2]Federal Reserve Board

BSE Summer Forum
Macroeconomics of Labor Markets

June 19, 2026

What we do

- Two ways of finding a job:
  1. Search for the job: active search (e.g., via unsolicited application)
  2. Let the job search for you: passive search (e.g., via referral)

What we do

- Two ways of finding a job:
  1. Search for the job: active search (e.g., via unsolicited application)
  2. Let the job search for you: passive search (e.g., via referral)
- This paper: use the *active search premium* to study cyclical fluctations in the relative return to active and passive search
  - Active search premium $= \left(f_{Active}/f_{Passive}\right) - 1$

What we do

- Two ways of finding a job:
  1. Search for the job: active search (e.g., via unsolicited application)
  2. Let the job search for you: passive search (e.g., via referral)
- This paper: use the *active search premium* to study cyclical fluctations in the relative return to active and passive search
  - Active search premium $= \left(f_{Active}/f_{Passive}\right) - 1$
- Study job-finding rates of unemployed + nonparticipants who want a job (and available to work) to establish
  1. Relatively modest active search premium ($\sim$ 40% on average)
  2. Active search premium is highly procyclical

What we do

- Two ways of finding a job:
  1. Search for the job: active search (e.g., via unsolicited application)
  2. Let the job search for you: passive search (e.g., via referral)
- This paper: use the *active search premium* to study cyclical fluctations in the relative return to active and passive search
  - Active search premium $= \left(f_{Active}/f_{Passive}\right) - 1$
- Study job-finding rates of unemployed + nonparticipants who want a job (and available to work) to establish
  1. Relatively modest active search premium ($\sim$ 40% on average)
  2. Active search premium is highly procyclical
- Procyclicality of active search premium potentially puzzling, esp. in light of countercyclical search effort

What we do

- Study standard matching framework combining active + passive search
  - Assumes constant relative returns of active and passive search

What we do

- Study standard matching framework combining active + passive search
  - Assumes constant relative returns of active and passive search
- Generate restriction: active search premium should have unit elasticity in average active search effort

What we do

- Study standard matching framework combining active + passive search
  - Assumes constant relative returns of active and passive search
- Generate restriction: active search premium should have unit elasticity in average active search effort
- Estimated elasticity is ≈ -6

What we do

- Study standard matching framework combining active + passive search
  - Assumes constant relative returns of active and passive search
- Generate restriction: active search premium should have unit elasticity in average active search effort
- Estimated elasticity is ≈ -6
- Estimates consistent with active and passive as "imperfect substitutes"
  - See also evidence from Blanchard and Diamond (1990)

Active and passive search as imperfect substitutes

- Consider CES aggregator with unrestricted elasticity over active and passive search:
  (a) Test more general restriction from data and estimate elasticity
  (b) Consider quantitative model with endogenous search along extensive + intensive margin

Active and passive search as imperfect substitutes

- Consider CES aggregator with unrestricted elasticity over active and passive search:
  (a) Test more general restriction from data and estimate elasticity
  (b) Consider quantitative model with endogenous search along extensive + intensive margin
- Both applications support elasticity of substitution ≈ 0.25 (not ∞)

Active and passive search as imperfect substitutes

- Consider CES aggregator with unrestricted elasticity over active and passive search:
  (a) Test more general restriction from data and estimate elasticity
  (b) Consider quantitative model with endogenous search along extensive + intensive margin
- Both applications support elasticity of substitution ≈ 0.25 (not ∞)
- For a "typical" recession, the estimated elasticity implies
  - Active search less effective
  - Disincentive effect of UI less costly

Evidence

CPS, 1996-2019

- Starting in 1994, CPS records following for jobless respondents:
  - Whether the respondent would be willing to accept a job
  - Whether the worker is engaged in nine methods of active search
  - If # search methods $= 0$, why no active search?

  Consistent monthly merges available 1996+
- Non-employed worker willing to accept a job is
  - Active searcher if # search methods > 0
  - Passive searcher: # search methods $= 0$ & want (+ able) to work
- Time spent searching near linear in # of search methods (Mukoyama, Patterson, and Sahin 2018) $\Rightarrow$ measure of search effort

▸ Time Use Evidence ▸ CPS Search Methods ▸ Demographics by labor market group

Job-finding rates of the active and passive non-employed

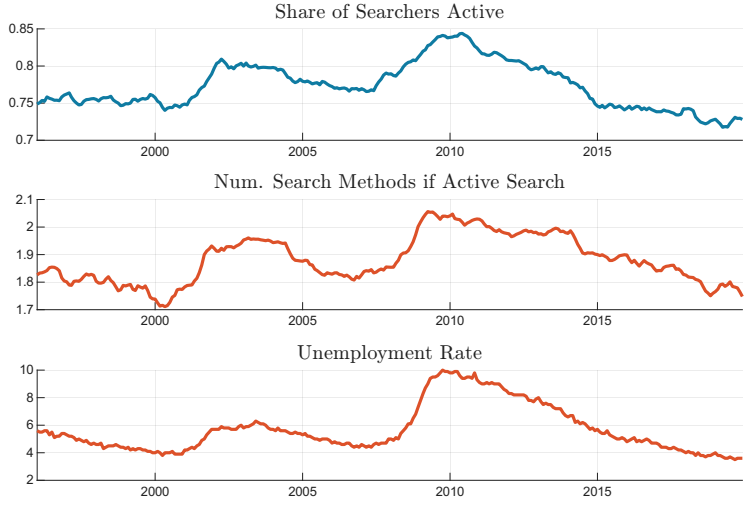
	A-NE $\to E$ probability	*P-NE* $\to E$ probability	*A-P* ratio
mean(x)	0.218	0.153	0.42
std(x)/std(Y)	8.218	7.655	8.02
corr(x, Y)	0.846	0.421	0.47

Note: Data from CPS, 1996-2019. *A-NE* and *P-NE* refer to active and passive non-employed, "*A-P* ratio" refers to active-passive ratio of job-finding probabilities, Y indicates quarterly GDP. For second and third row, series are taken as (1) quarterly averages of seasonally adjusted monthly series, (2) logged, then (3) HP-filtered with smoothing parameter of 1600

- Mildy procyclical job-finding probability of passive non-employed
- Highly procyclical job-finding probability of active non-employed
- Thus, procyclical active search premium

▸ Figure

Extensive and intensive margins of active search



- Both frac. searching & # of search methods are countercyclical

▸ Alternative measures of passive searchers ▸ Cyclicality: table

Matching framework

Active and passive search

- CRS matching function m_t over search efficiency and vacancies
- Search efficiency is composite of active and passive search
- Non-employed workers choose $s_{A,i,t}$ units of active search, inelastically provide one unit of passive search
- Flexible to different notions of active search:
  - Intensive & extensive margin: $s_{A,i,t} \in \mathbb{R}_+$ (e.g., FMST 2022)
  - Extensive margin only: $s_{A,i,t} \in \{0, 1\}$ (e.g., KMRS 2017)

Matching function and job-finding probabilities

- Job-finding rate, $f_{i,t}$

$$f_{i,t} = s_{i,t} \cdot \left(\frac{m_t(s_t, v_t)}{s_t} \right) \qquad (*)$$

- Search efficiency, $s_{i,t}$

$$s_{i,t} = \omega \cdot s_{A,i,t} + (1 - \omega) \cdot 1 \qquad (**)$$

- Let $\bar{s}^*_{A,t}$ be the average level of active search among active searchers
- Restriction in active search premium $\bar{f}_{A,t}/\bar{f}_{P,t}$ from $(*)$ and $(**)$:

$$\frac{\bar{f}_{A,t}}{\bar{f}_{P,t}} - 1 = \frac{\left(\omega \cdot \bar{s}^*_{A,t} + (1 - \omega)\right) \left(\frac{m_t(s_t, v_t)}{s_t} \right)}{(1 - \omega) \left(\frac{m_t(s_t, v_t)}{s_t} \right)} - 1 = \left(\frac{\omega}{1 - \omega} \right) \cdot \bar{s}^*_{A,t}$$

Testing the restriction

- Take logs on both sides:

$$\log\left(\frac{\bar{f}_{A,t}}{\bar{f}_{P,t}} - 1\right) = \log\left(\frac{\omega}{1-\omega}\right) + 1 \cdot \log \bar{s}^*_{A,t}$$

Framework predicts unit elasticity

Testing the restriction

- Take logs on both sides:

$$\log\left(\frac{\bar{f}_{A,t}}{\bar{f}_{P,t}} - 1\right) = \log\left(\frac{\omega}{1-\omega}\right) + 1 \cdot \log \bar{s}^*_{A,t}$$

  Framework predicts unit elasticity

- Estimated elasticity from data: -6.52 (SE$=0.88$)

Testing the restriction

- Take logs on both sides:

$$\log\left(\frac{\bar{f}_{A,t}}{\bar{f}_{P,t}} - 1\right) = \log\left(\frac{\omega}{1-\omega}\right) + 1 \cdot \log \bar{s}^*_{A,t}$$

  Framework predicts unit elasticity

- Estimated elasticity from data: -6.52 (SE$=0.88$)
- Robust to:
  - Different measures of $\bar{f}_{P,t}$ ▸ Alternative passive searcher measures
  - Time aggregation bias ▸ Time aggregation
  - Only including passive searchers who were also N at $t-1$ ▸ Duration passive
  - Controls for cyclical composition ▸ Composition 1/2 ▸ Composition 2/2
  - Controls for duration dependence among active searchers ▸ DD

An unrestricted
CES search aggregator

CES aggregator for search effort

- Aggregate search effort s_t given by CES aggregator over $s_{A,t}$ and $s_{P,t}$

$$s_t = \left(\omega\, s_{A,t}^{\frac{\nu-1}{\nu}} + (1-\omega) s_{P,t}^{\frac{\nu-1}{\nu}}\right)^{\frac{\nu}{\nu-1}}$$

- Aggregate active & passive search of non-employed (ne_t) satisfy

$$s_{A,t} = \int s_{A,i,t}\, d\mathcal{G}_t(i) = \left(\check{\mathcal{G}}_t \cdot ne_t\right) \cdot \bar{s}^*_{A,t} \quad \& \quad s_{P,t} = \int d\mathcal{G}_t(i) = ne_t$$

where $\check{\mathcal{G}}_t$ is the fraction of non-employed who engage in active search

- $ME_{A,t}$ and $ME_{P,t}$ are marginal efficiencies of active and passive search

$$ME_{A,t} = \frac{\partial s_t}{\partial s_{A,t}} = \omega \cdot \left(\frac{s_t}{s_{A,t}}\right)^{\frac{1}{\nu}}, \quad ME_{P,t} = \frac{\partial s_t}{\partial s_{P,t}} = (1-\omega) \cdot \left(\frac{s_t}{s_{P,t}}\right)^{\frac{1}{\nu}}$$

Returns to search

- The job-finding probability $f_{i,t}$ of a worker with search efficiency $s_{i,t}$ is

$$f_{i,t} = s_{i,t} \cdot \left(\frac{m_t(\boldsymbol{s}_t, v_t)}{\boldsymbol{s}_t} \right)$$

- The search efficiency $s_{i,t}$ of a worker supplying $s_{A,i,t}$

$$s_{i,t} = ME_{A,t} \cdot s_{A,i,t} + ME_{P,t} \cdot 1$$

by linear homogeneity of the CES search aggregator

- Nests prior case when $\nu = \infty$:

$$s_{i,t} = \omega \cdot s_{A,i,t} + (1 - \omega) \cdot 1$$

Restriction from theory, redux

- Relative job-finding probabilities, active vs. passive search

$$\frac{\bar{f}_{A,t}}{\bar{f}_{P,t}} - 1 = \frac{\left(ME_{A,t} \cdot \bar{s}^{*}_{A,t} + ME_{P,t}\right)\left(\frac{m_t(s_t,v_t)}{s_t}\right)}{ME_{P,t}\left(\frac{m_t(s_t,v_t)}{s_t}\right)} - 1$$

Restriction from theory, redux

- Relative job-finding probabilities, active vs. passive search

$$\frac{\bar{f}_{A,t}}{\bar{f}_{P,t}} - 1 = \frac{\left(ME_{A,t} \cdot \bar{s}^*_{A,t} + ME_{P,t}\right)\left(\frac{m_t(s_t,v_t)}{s_t}\right)}{ME_{P,t}\left(\frac{m_t(s_t,v_t)}{s_t}\right)} - 1$$

$$= \frac{ME_{A,t}}{ME_{P,t}} \cdot \bar{s}^*_{A,t}$$

Restriction from theory, redux

- Relative job-finding probabilities, active vs. passive search

$$\frac{\bar{f}_{A,t}}{\bar{f}_{P,t}} - 1 = \frac{\left(ME_{A,t} \cdot \bar{s}^*_{A,t} + ME_{P,t}\right)\left(\frac{m_t(s_t,v_t)}{s_t}\right)}{ME_{P,t}\left(\frac{m_t(s_t,v_t)}{s_t}\right)} - 1$$

$$= \left(\frac{\omega}{1-\omega}\right)\left(\frac{1}{\breve{\mathcal{G}}_t \cdot \bar{s}^*_{A,t}}\right)^{\frac{1}{\nu}} \cdot \bar{s}^*_{A,t}$$

Restriction from theory, redux

- Relative job-finding probabilities, active vs. passive search

$$\frac{\bar{f}_{A,t}}{\bar{f}_{P,t}} - 1 = \frac{\left(ME_{A,t} \cdot \bar{s}^*_{A,t} + ME_{P,t}\right)\left(\frac{m_t(s_t,v_t)}{s_t}\right)}{ME_{P,t}\left(\frac{m_t(s_t,v_t)}{s_t}\right)} - 1$$

$$= \left(\frac{\omega}{1-\omega}\right)\left(\frac{1}{\check{\mathcal{G}}_t \cdot \bar{s}^*_{A,t}}\right)^{\frac{1}{\nu}} \cdot \bar{s}^*_{A,t}$$

- Thus,

$$\log\left(\frac{\bar{f}_{A,t}}{\bar{f}_{P,t}} - 1\right) = \log\left(\frac{\omega}{1-\omega}\right) - \left(\frac{1}{\nu}\right) \cdot \log \check{\mathcal{G}}_t + \left(1 - \frac{1}{\nu}\right) \cdot \log \bar{s}^*_{A,t}$$

- Return to data: test restriction in ν, estimate ω and ν

Regression estimates

	(1)	(2)	(3)
β_{Frac}	-5.936^{***}	-4.597^{***}	-8.718^{***}
	(1.5446)	(0.5070)	(1.1014)
$\beta_{\#}$	-2.568^{**}	-3.597^{***}	—
	(1.1829)	(0.5070)	
β_0	0.366	1.141^{***}	-1.443^{***}
	(0.7973)	(0.2097)	(0.3417)
Passive searchers:	*N* + want job + available		
Constrain $\beta_{\text{Frac}} + 1 = \beta_{\#}$?	No	Yes	—
F-test	$p(\beta_{\text{Frac}} + 1 = \beta_{\#})$	$p(\nu = \infty)$	$p(\nu = \infty)$
	$= 0.350$	$= 0.000$	$= 0.000$
N	283	283	283
Implied ν	—	0.218	0.115
Implied ω		0.562	0.825

Note: CPS, 1996-20019

▸ Alternative Passive Searchers

Applications

- **Recovering the marginal efficiencies in the data** details
  - Strongly procyclical $ME_{A,t}$ in the data
  - Notional share of vacancies intermediating active search decreases during recessions
- **Simple Baily-Chetty formula** details
  - UI less distortionary during recessions (when active search $\uparrow \Rightarrow ME_{A,t} \downarrow$)
  - Optimal policy supports a higher replacement rate R during recessions

Quantitative model

Model: key features

- DMP + RBC + household consumption insurance
  - à la Merz (1995) and Andolfatto (1996)
- Allow for non-employed who want a job (ne_t) & employed
- Extensive (fixed cost) + intensive (convex cost) margins of active search
  - Non-searchers still receive offers
- Utility value of leisure (Chodorow-Reich & Karabarbounis 2016)
  - Procyclical opportunity cost $\Rightarrow$ allows countercyclical search
- Staggered wage bargaining à la Gertler and Trigari (2009)

Today: Focus on the search decision of non-employed + quant. results

Problem of nonemployed

Worker draws fixed search cost γ, chooses whether to participate:

$$U_t(\gamma) = \max\left\{U_t^s(\gamma),\ U_t^{ns}\right\}, \qquad \text{participate iff } \gamma < \gamma_t^*.$$

Per-worker arrival rates:

$$f_{A,t}(s_A) \equiv (ME_{A,t}\, s_A + ME_{P,t})\, \bar{f}_t, \qquad f_{P,t} \equiv ME_{P,t}\, \bar{f}_t, \qquad \bar{f}_t = m(\boldsymbol{s}_t, \upsilon_t)/\boldsymbol{s}_t$$

Active value $U_t^s(\gamma)$: pay fixed cost γ + convex $\psi(s_A) = \frac{\psi_0}{1+\frac{1}{\varepsilon}}\, s_{A,t}^{*\,1+\frac{1}{\varepsilon}}$, choose s_A:

$$U_t^s(\gamma) = \max_{s_{A,t}}\left\{b + \frac{\xi - \psi(s_{A,t}) - \gamma}{u'(c_t)} + \beta\,\mathbb{E}_t\left[\frac{u'(c_{t+1})}{u'(c_t)}\left\{f_{A,t}(s_{A,t})\,\bar{W}_{t+1} + \left(1 - f_{A,t}(s_{A,t})\right)\mathcal{U}_{t+1}\right\}\right]\right\}.$$

Passive value U_t^{ns} (pay neither cost: $s_A = 0$, γ unpaid):

$$U_t^{ns} = b + \frac{\xi}{u'(c_t)} + \beta\,\mathbb{E}_t\left[\frac{u'(c_{t+1})}{u'(c_t)}\left\{f_{P,t}\,\bar{W}_{t+1} + (1 - f_{P,t})\,\mathcal{U}_{t+1}\right\}\right].$$

where $\mathcal{U}_{t+1}$ is the (ex-ante) value of non-empl. and $\bar{W}_{t+1}$ the value of a job

▸ $ME_{A,t}$ & $ME_{P,t}$

Solution: $s^*_{A,t}$ and γ^*_t

Optimal intensity $s^*_{A,t}$ (interior FOC in U^s_t), where $\bar{H}_{t+1}$ denotes the worker surplus:

$$\psi_0 \cdot {s^*_{A,t}}^{1/\varepsilon_s} = \beta\, \mathbb{E}_t\left[u'(c_{t+1}) \cdot ME_{A,t} \cdot \bar{f}_t \cdot \bar{H}_{t+1}\right].$$

Participation cutoff γ^*_t from indifference $U^s_t(\gamma^*_t) = U^{ns}_t$:

$$\gamma^*_t = \beta\, \mathbb{E}_t\left[u'(c_{t+1})\, ME_{A,t}\, s^*_{A,t}\, \bar{f}_t\, \bar{H}_{t+1}\right] - \psi(s^*_{A,t}).$$

where $\mathcal{G}_t(\gamma^*_t) = \check{\mathcal{G}}_t$ is the fraction who search

Solution: $s^*_{A,t}$ and γ^*_t

Optimal intensity $s^*_{A,t}$ (interior FOC in U^s_t), where $\bar{H}_{t+1}$ denotes the worker surplus:

$$\psi_0 \cdot {s^*_{A,t}}^{1/\varepsilon_s} = \beta\, \mathbb{E}_t\left[u'(c_{t+1}) \cdot ME_{A,t} \cdot \bar{f}_t \cdot \bar{H}_{t+1}\right].$$

Participation cutoff γ^*_t from indifference $U^s_t(\gamma^*_t) = U^{ns}_t$:

$$\gamma^*_t = \beta\, \mathbb{E}_t\left[u'(c_{t+1})\, ME_{A,t}\, s^*_{A,t}\, \bar{f}_t\, \bar{H}_{t+1}\right] - \psi(s^*_{A,t}).$$

where $\mathcal{G}_t(\gamma^*_t) = \check{\mathcal{G}}_t$ is the fraction who search

Combine equations:

$$\gamma^*_t \;=\; s^*_{A,t}\,\psi'(s^*_{A,t}) - \psi(s^*_{A,t}) \;=\; \frac{\psi_0 \cdot {s^*_{A,t}}^{1+1/\varepsilon_s}}{1+\varepsilon_s}.$$

Closed-form link between extensive cutoff and intensive choice

▸ Worker & firm values

Internally calibrated parameters

Joint calibration of four parameters to four moments:

Parameters

Symbol	Value	Description
ε_s	0.25	Search-effort elast.
σ_γ	2.07	Particip. dispersion
ν	0.23	CES substitutability
ξ^c/MPL	0.54	Leisure value

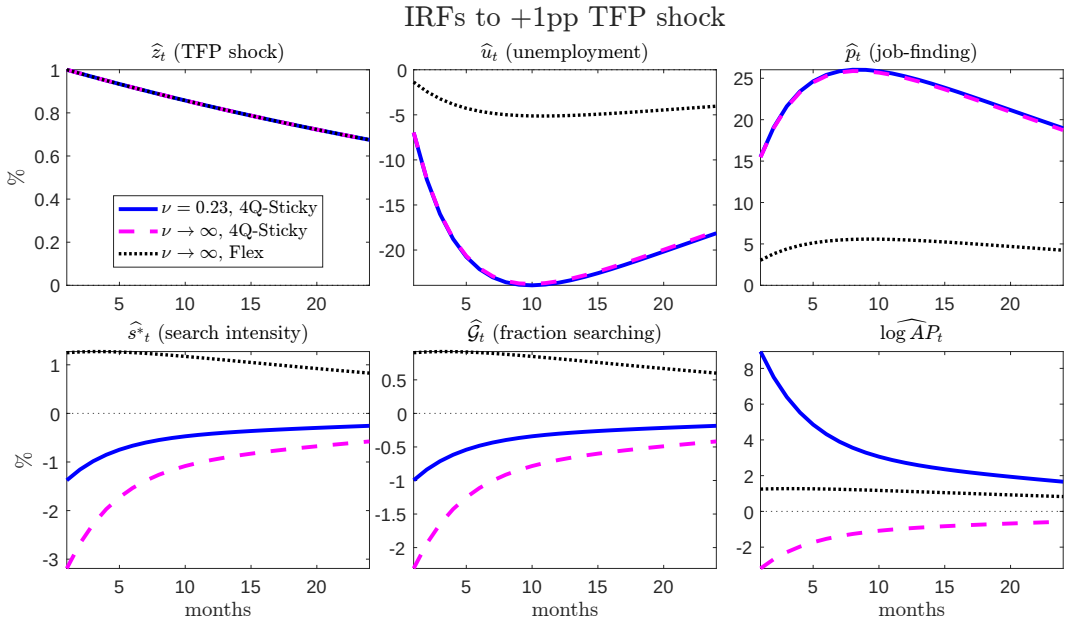
Moments

Moment	Target	Model
PE int. duration elast. to UI	0.45	0.45
$\mathrm{sd}(\log \check{\mathcal{G}})/\mathrm{sd}(\log s^*)$	0.73	0.72
β (ASP regression)	-6.52	-6.49
$\mathrm{corr}(\log s^*, \log y)$	-0.80	-0.64
$\mathrm{corr}(\log AP, \log y)$	$+0.47$	$+0.63$

- Model hits procyclical ASP and countercyclical s^*
- Similar value of ν as estimated directly from data

▸ Externally calibrated parameters

IRFs to +1pp TFP shock



More variables

Macro UI elasticity: the role of a diminishing $ME_{A,t}$

Anticipated UI level increase lasting K months, perfect-foresight transition.

K (months)	Full CES	ME_A & ME_P fixed	Δ from CES
1	0.05	0.05	~ 0
3	0.10	0.17	-0.07
6	0.21	0.35	-0.14
12	0.34	0.51	-0.17

Mechanism (CES with $\nu < 1$):

- UI $\uparrow \Rightarrow s^*_{A,t}$, γ^* fall (workers cut effort) $\Rightarrow$ active input $s_{A,t} = \mathcal{G}_t(\gamma^*_t)\, s^*_{A,t}$ falls
- Falling active search + diminishing returns $\Rightarrow$ $ME_{A,t}$ rises (and $ME_{P,t}$ falls)
- Rising $ME_{A,t}$ partially offsets the drop in $s^*_{A,t} \Rightarrow$ per-worker arrival rate $f_{A,t} = (ME_{A,t}\, s^*_{A,t} + ME_{P,t})\, \bar{f}_t$ falls by less

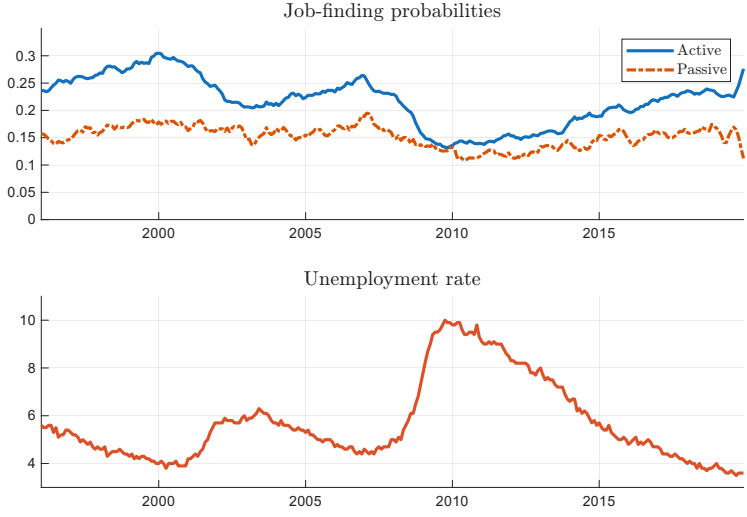
Conclusion

Conclusion

- Crowding-out of active search: during recession,
  - Active search goes up
  - Active search premium in job-finding probabilities goes down
- Inconsistent with perfect substitutability of active and passive search
- Instead, consistent with elasticity of substitution ≈ 0.25
- Implications:
  - Active search is less effective during recessions
  - Macro-elasticity of unempl. durations to UI dampened by $\approx 40\%$
  - Adjusted Baily-Chetty formula implies higher benefits during recessions

Extra slides

Job-finding rates of the active and passive non-employed



Alternative measures of passive searchers
Alternative measures of active searchers
Back

The cyclicality of active search

	Active non-employed	Passive non-employed	$\frac{A\text{-}NE}{A\text{-}NE+P\text{-}NE}$	Avg. # of search methods
mean(x)	0.05	0.01	0.77	1.87
std(x)/std(Y)	10.83	5.47	1.56	2.15
corr(x, Y)	−0.89	−0.71	−0.76	−0.80

Note: Data from CPS, 1996-2019. *A-NE* and *P-NE* refer to active and passive non-employed Y indicates quarterly GDP. For second and third row, series are taken as (1) quarterly averages of seasonally adjusted monthly series, (2) logged, then (3) HP-filtered with smoothing parameter of 1600

- Both frac. searching & # of search methods are countercyclical
- See also Osberg (1993), Shimer (2004), Faberman and Kudlyak (2016), Elsby, Hobijn and Sahin (2015), Mukoyama, Patterson, and Sahin (2018)

Back

Worker value and surplus

Expected value of unemployment $\mathcal{U}_t$ taken over γ, with $\bar{\Gamma}_t = \int_0^{\gamma_t^*} \gamma \, d\mathcal{G}(\gamma)$:

$$\mathcal{U}_t = b + \frac{\xi - \mathcal{G}(\gamma_t^*)\,\psi(s_{A,t}^*) - \bar{\Gamma}_t}{u'(c_t)} + \beta\,\mathbb{E}_t\left[\frac{u'(c_{t+1})}{u'(c_t)}\left\{\bar{f}_t\,\bar{W}_{t+1} + (1-\bar{f}_t)\,\mathcal{U}_{t+1}\right\}\right].$$

Worker value W_t (employed at wage w_t):

$$W_t = w_t + \beta\,\mathbb{E}_t\left[\frac{u'(c_{t+1})}{u'(c_t)}\left\{\rho\,W_{t+1} + (1-\rho)\,\mathcal{U}_{t+1}\right\}\right].$$

Surplus $H_t \equiv W_t - \mathcal{U}_t$:

$$H_t = w_t - b - \frac{\xi - \mathcal{G}(\gamma_t^*)\,\psi(s_{A,t}^*) - \bar{\Gamma}_t}{u'(c_t)} + \beta\,\mathbb{E}_t\left[\frac{u'(c_{t+1})}{u'(c_t)}\left(\rho\,H_{t+1} - \bar{f}_t\,\bar{H}_{t+1}\right)\right],$$

Back

Firm value, hiring, and contract wage

Firm value J_t with convex hiring cost $\frac{\kappa}{2} x_t^2$:

$$J_t = a_t - w_t - \frac{\kappa}{2} x_t^2 + (\rho + x_t)\, \beta\, \mathbb{E}_t \left[\frac{u'(c_{t+1})}{u'(c_t)} \left\{ J_{t+1} \right\} \right].$$

Hiring FOC:

$$\kappa\, x_t = \beta\, \mathbb{E}_t \left[\frac{u'(c_{t+1})}{u'(c_t)}\, J_{t+1} \right].$$

Contract wage w^* (Nash with staggered renegotiation à la GT 2009):

$$\max_{w^*} H(w, s)^{\eta}\, J(w, s)^{1-\eta} \qquad \text{subject to} \qquad w' = \begin{cases} w & \text{w.p. } \lambda \\ w^{*\prime} & \text{w.p. } 1 - \lambda \end{cases}$$

- λ controls wage stickiness; $\lambda = 11/12$ in calibrated headline.
- Workers observe γ after wage negotiated

Back

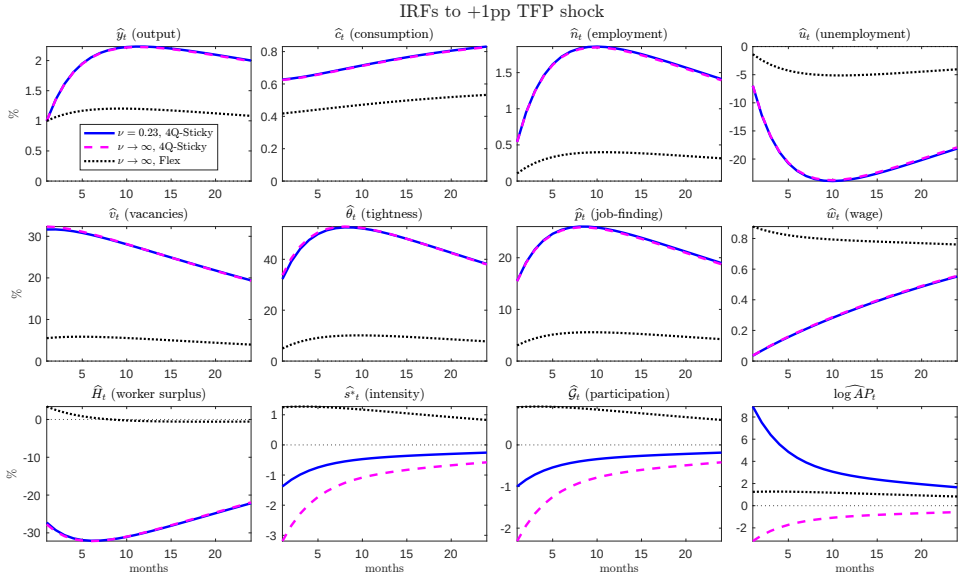
Calibration

Externally calibrated parameters

Object	Value	Source / interpretation
f_A	0.45	Monthly UE rate (CPS)
$f_A/f_P - 1$	0.42	ASP premium
ρ_n	0.965	Job survival; 3.5% monthly separation
$\mathcal{G}(\gamma^*)$	0.833	Participation share among nonemployed
b/MPL	0.40	Pecuniary UI replacement (Shimer 2005)

Back

IRFs to +1pp TFP shock — full set of variables

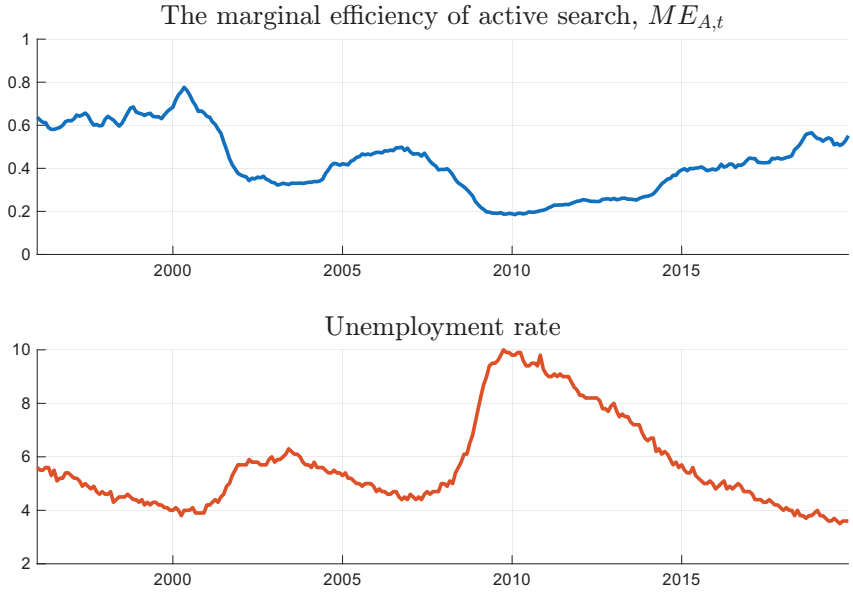


Back

Application 1:

The marginal efficiency of active search over the business cycle

Recovering the marginal efficiency of active search



Back to Applications

What is a CES search aggregator?

- Equivalence: separate submarkets for active and passive search

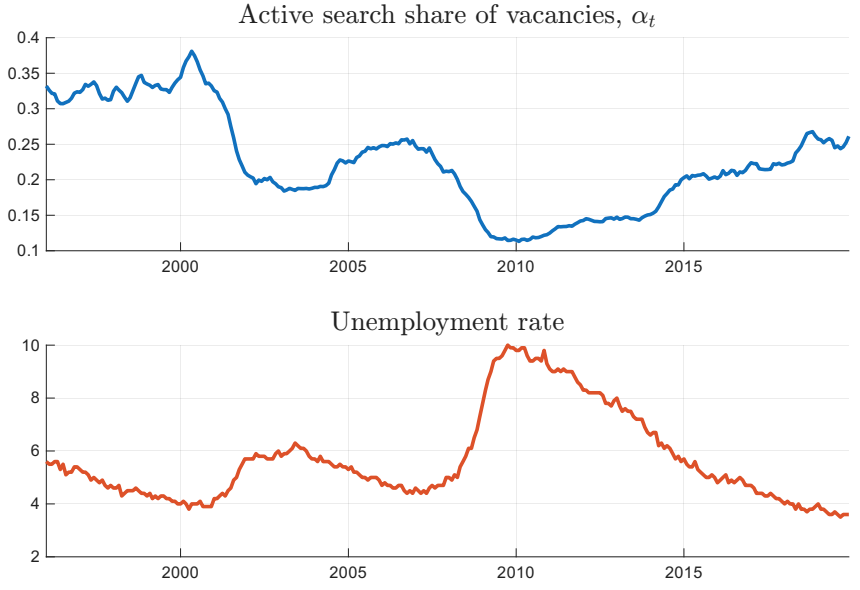
$$m_t(s_t, v_t) = m_t\left(ME_{A,t} \cdot s_{A,t}, \alpha_t \cdot v_t\right) + m_t\left(ME_{P,t} \cdot s_{P,t}, (1-\alpha_t) \cdot v_t\right)$$

$$\text{with} \quad \alpha_t = \frac{ME_{A,t} \cdot s_{A,t}}{s_t}$$

- (Obtains through constant returns)
- Vacancy share of active search α_t analogous to factor share
  - $\nu < 1 \Rightarrow \alpha_t$ decreasing in $(s_{A,t}/s_{P,t})$
  - Countercyclical $(s_{A,t}/s_{P,t}) \Rightarrow$ Procyclical α_t

Back to Applications

Recovering the marginal efficiency of active search



Back to Applications

Application 2:
Baily-Chetty Formula

Appl. 2) Baily-Chetty Formula

- Optimal UI described by Baily-Chetty formula:

$$\underbrace{\frac{d \log u}{d \log R}}_{\text{increasing in } R} = \underbrace{\left(\frac{U'(c^u)}{U'(c^e)} - 1 \right)}_{\text{decreasing in } R} \qquad \text{(BC)}$$

  where u is unemployment and R is the replacement rate

- Landais et al. (2018): if wages are perfectly rigid (+ other conditions), (BC) describes optimal replacement rate R
- Micro-elasticity $\frac{d \log u}{d \log R}$ typically taken as constant $\Rightarrow$ R constant
- But $\frac{d \log u}{d \log R}$ is proportional to the marginal efficiency of active search…

Back to Applications

Appl. 2) Baily-Chetty Formula, cont'd

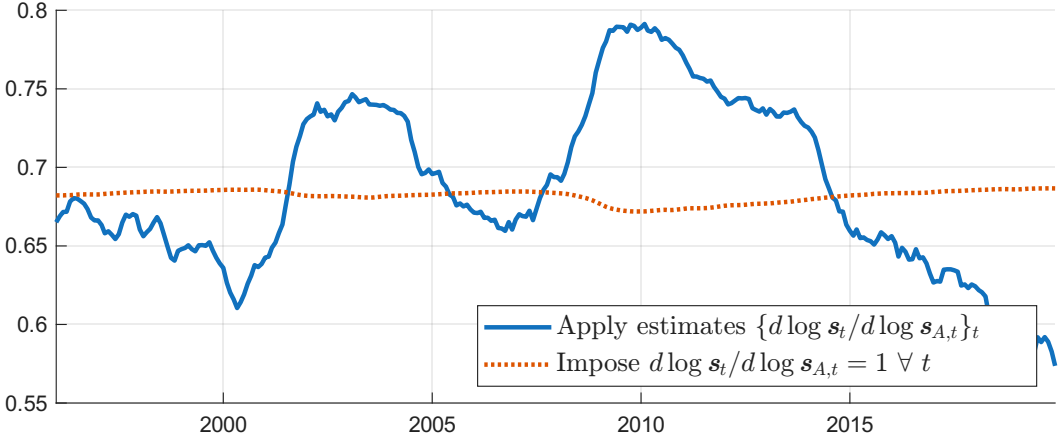
- Write micro-elasticity as

$$\begin{aligned}\frac{d\log u}{d\log R} &= \frac{d\log u}{d\log f}\cdot\frac{d\log f}{d\log R}\\ &\approx -(1-\bar{u})\cdot\frac{d\log f}{d\log s}\cdot\frac{d\log s}{d\log s_A}\cdot\frac{d\log s_A}{d\log R}\\ &= -(1-\bar{u})\cdot\sigma\cdot\left[\omega\cdot\left(\frac{s_A}{s}\right)^{\frac{\nu-1}{\nu}}\right]\cdot\frac{d\log s_A}{d\log R}\end{aligned}$$

- Note, $\nu < \infty$, so the elasticity is not constant!
- Next, (*i*) take avg. $-\frac{d\log f}{d\log R}$ to be equal to 0.42 (Katz and Meyer, 1990), (*ii*) compute average $\frac{d\log s}{d\log s_A}$, and (*iii*) solve for $\frac{d\log s_A}{d\log R}$
- Use to obtain time series for $\frac{d\log u}{d\log R}$

Back to Applications

Appl. 2) Baily-Chetty Formula, cont'd



- Define *unemployed/employed consumption ratio*: $\Delta_t = c_t^u / c_t^e$
- Assume $U(c) = \log c$. Then, (BC) $\Rightarrow \Delta_t^* = (1 + \frac{d \log u}{d \log R})^{-1}$
- Δ_t^* higher during recessions due to marginal efficiency of active search

Back to Applications

Marginal efficiencies $ME_{A,t}$ and $ME_{P,t}$

Derived from the CES search aggregator $s_t = F\left(\mathcal{G}_t(\gamma_t^*)\, s_{A,t}^*\, ne_t,\ ne_t\right)$ as marginal products of the aggregate active and passive inputs:

$$ME_{A,t} = (1-\omega)\left(s_t \,/\, \left(\mathcal{G}_t(\gamma_t^*)\, ne_t\, s_{A,t}^*\right)\right)^{1/\nu},$$

$$ME_{P,t} = \omega\left(s_t \,/\, ne_t\right)^{1/\nu}.$$

Back to Problem of nonemployed

Time spent searching (MPS 2018)

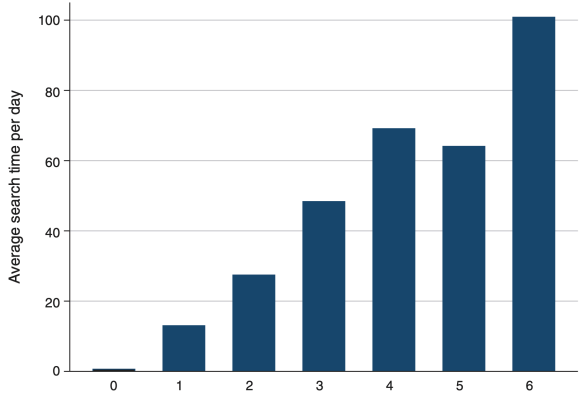


FIGURE 1. THE AVERAGE MINUTES (*per day*) SPENT ON JOB SEARCH ACTIVITIES BY THE NUMBER OF SEARCH METHODS

Notes: Each bin reflects the average search time in minutes per day by the number of search methods that the individual reports using in the previous month. Data is pooled from 2003–2014 and observations are weighted by the individual sample weight.

Back

Definitions of job search (MPS 2018)

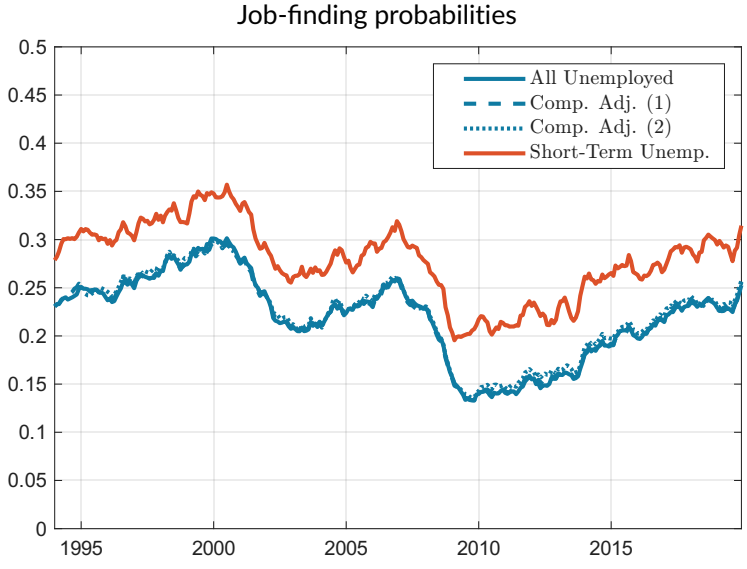
TABLE 2—DEFINITIONS OF JOB SEARCH METHODS IN CPS AND ATUS

Contacting an employer directly or having a job interview
Contacting a public employment agency
Contacting a private employment agency
Contacting friends or relatives
Contacting a school or university employment center
Checking union or professional registers
Sending out resumes or filling out applications
Placing or answering advertisements
Other means of active job search
Reading about job openings that are posted in newspapers or on the internet
Attending job training program or course
Other means of passive job search

Note: The first nine are active, the last three are passive.

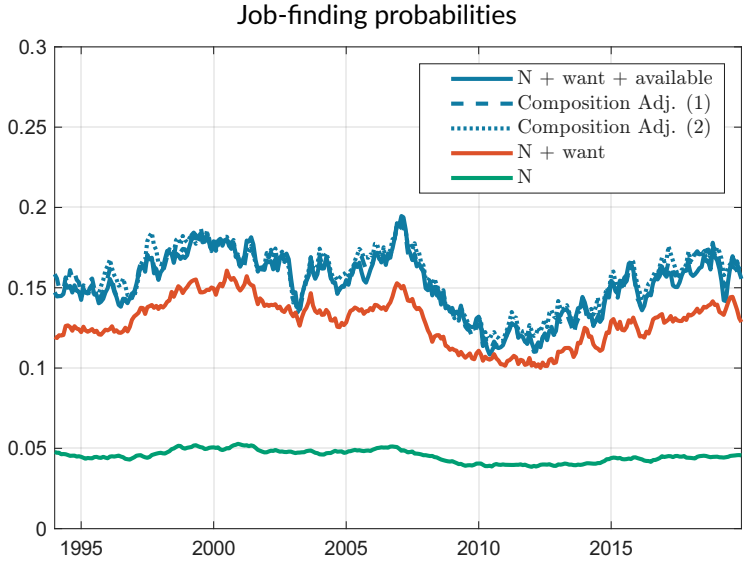
Back

Alternative measures of active searchers



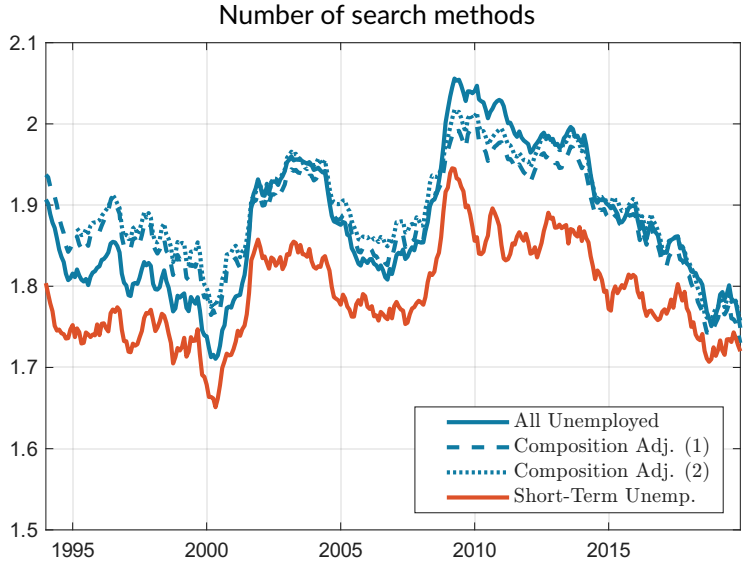
Back

Alternative measures of passive searchers



Back

Alternative measures of active searchers



Back

Demographics by labor market group

	Non-participants (N)	N + Want job	N + Want + Available	Active searchers
Mean Age	53.1	38.3	42.4	34.7
Share Male	0.39	0.45	0.53	0.54
Share Married	0.49	0.35	0.37	0.32
Share LHS	0.28	0.30	0.25	0.24
Share HS	0.32	0.30	0.34	0.34
Share Some Coll.	0.23	0.24	0.23	0.26
Share College+	0.17	0.15	0.19	0.16
Share White	0.80	0.71	0.71	0.70
Share Black	0.13	0.21	0.21	0.22
Observations	11,489,206	641,578	304,887	1,001,977

Back

Elasticity of active search premium

Dependent variable: Log active search premium			
	(1)	(2)	(3)
Log # of search methods	−6.519***	−4.865***	−3.004***
	(0.8798)	(0.3939)	(0.1492)
Time trend	−8.3e-4*	−4.3e-4**	−7.9e-5
	(4.9e-4)	(2.0e-4)	(7.9e-5)
Constant	3.523***	2.813***	3.227***
	(0.4124)	(0.2182)	(0.0951)
$Pr(H_0 : \beta_{\#} = 1)$	0.000	0.000	0.000
N	283	288	288
Passive searchers:	N + want job + available	N + want job	Nonparticipants (N)

CPS, 1996-2019

Elasticity of active search premium: Rates adjusted for time aggregation

Dependent variable: Log active search premium			
	(1)	(2)	(3)
Log # of search methods	−3.136***	−5.933***	−6.626***
	(0.1545)	(0.6178)	(0.8549)
Time trend	−1.1e-4	−6.3e-4**	−1.3e-3***
	(8.1e-5)	(2.6e-4)	(4.9e-4)
Constant	3.431***	3.482***	3.682***
	(0.0982)	(0.3268)	(0.4373)
$Pr(H_0 : \beta_{\#} = 1)$	0.000	0.000	0.000
N	288	288	272
Passive searchers:	Nonparticipants (N)	N + want job	N + want job + available

CPS, 1996-2019

Elasticity of active search premium: Only passive searchers N at t-1

Dependent variable: Log active search premium			
	(1)	(2)	(3)
Log # of search methods	-2.230^{***}	-3.291^{***}	-3.848^{***}
	(0.1426)	(0.3662)	(0.7607)
Time trend	1.1e-4	8.0e-4***	7.7e-4
	(8.6e-5)	(2.7e-4)	(5.9e-4)
Constant	3.505^{***}	2.102^{***}	2.329^{***}
	(0.1003)	(0.1859)	(0.2799)
$Pr(H_0 : \beta_{\#} = 1)$	0.000	0.000	0.000
N	288	288	288
Passive searchers:	Nonparticipants (N)	N + want job	N + want job + available

CPS, 1996-2019

Elasticity of the active search premium: adjustment for cyclical composition 1/2

Dependent variable: Log active search premium			
	(1)	(2)	(3)
Log # of search methods	−2.681***	−5.565***	−5.249***
	(0.2381)	(0.7490)	(1.0561)
Time trend	−3.8e-4***	−1.4e-3***	−2.2e-3***
	(1.3e-4)	(4.2e-4)	(5.8e-4)
Constant	−6.120***	−14.415***	−13.586***
	(0.6513)	(2.0484)	(2.8921)
$Pr(H_0 : \beta_{\#} = 1)$	0.000	0.000	0.000
N	288	287	269
Passive searchers:	Nonparticipants (N)	N + want job	N + want job + available

CPS, 1996-2019

- Population weights of 72 subgroups held constant in regression groups, where subgroups are defined by reason for unemployment (if unemployed), education level, age group, and gender

Elasticity of the active search premium: adjustment for cyclical composition 2/2

Dependent variable: Log active search premium			
	(1)	(2)	(3)
Log # of search methods	−3.213***	−2.743***	−2.626***
	(0.3666)	(0.6088)	(0.8335)
Time trend	−1.7e-3***	−2.6e-3***	−2.9e-3***
	(3.4e-4)	(5.7e-4)	(8.0e-4)
Constant	−7.563***	−6.729***	−6.614***
	(1.0511)	(1.7439)	(2.3970)
$Pr(H_0 : \beta_{\#} = 1)$	0.000	0.000	0.000
N	288	275	251
Passive searchers:	Nonparticipants (N)	N + want job	N + want job + available

CPS, 1996-2019

- Population weights of 360 subgroups held constant in regression groups, where subgroups are defined by reason for unemployment (if unemployed), education level, age group, gender, and labor market status a year ago (employed, temporary layoff, unemployed, passive searcher, other nonparticipant)

Elasticity of the active search premium: Only short-term unemployed

Dependent variable: Log active search premium			
	(1)	(2)	(3)
Log # of search methods	-1.745^{***}	-1.585^{***}	-1.689^{***}
	(0.1071)	(0.2193)	(0.3589)
Time trend	2.0e-4***	4.5e-5	−8.0e-5
	(7.3e-5)	(1.5e-4)	(2.5e-4)
Constant	2.593^{***}	1.076^{***}	0.867^{***}
	(0.0626)	(0.1280)	(0.2095)
$Pr(H_0 : \beta_{\#} = 1)$	0.000	0.000	0.000
N	288	288	288
Passive searchers:	Nonparticipants (N)	N + want job	N + want job + available

CPS, 1996-2019

Regression estimates, Broader Passive Searchers

	(1)	(2)	(3)
β_{Frac}	-2.767^{***}	-2.463^{***}	-3.298^{***}
	(0.4062)	(0.1469)	(0.2380)
$\beta_{\#}$	-0.964^{*}	-1.463^{***}	–
	(0.5252)	(0.1469)	
β_0	-0.427	-0.039	-1.148^{***}
	(0.4281)	(0.0931)	(0.1554)
Passive searchers:		N + want job	
Constrain $\beta_{\text{Frac}} + 1 = \beta_{\#}$?	No	Yes	–
F-test	$p(\beta_{\text{Frac}} + 1 = \beta_{\#})$	$p(\nu = \infty)$	$p(\nu = \infty)$
	$= 0.367$	$= 0.000$	$= 0.000$
N	288	288	288
Implied ν	–	0.406	0.303
Implied ω		0.496	0.644

Note: CPS, 1996-20019