Unemployment Insurance, Wage Dispersion and the Re-entitlement Effect

Adrian Masters Kai You

University at Albany, SUNY.

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Motivation

1. Contribution of the UI system to wage dispersion

2. Quantification of the re-entitlement effect
   - (Extent to which workers lower asking wages due to benefit expiry)

Wage dispersion

- HKV: Sequential search inconsistent with observed wage dispersion
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- Two types of response:
  1. Jobs are more attractive than characterized by the wage
     - Burdett and Mortensen *IER* (1998), OTJ search
     - Burdett et al *IER* (2011), Learning-by-doing
  2. Unemployment is more pernicious than in the simple model
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- UI benefit expiry acts through both channels

Structure of talk

- Reduced-Form
- Model
- Calibration
- Counterfactuals
- Extensions

Survey of Income and Program Participation (SIPP)

1996-2017, Prime-age unemployed males on UI

Table: Estimation on log U to E Wages

	Coef.	Est.	Std. Dev.
$1_{\text{1st benefit quartile}} * 1_{\text{networth}<0} * \log UIbenefit$	β_1	0.405**	0.167
$1_{\text{higher benefit quartiles}} * 1_{\text{networth}<0} * \log UIbenefit$	β_2	0.290**	0.119
$1_{\text{1st benefit quartile}} * 1_{\text{networth}>0} * \log UIbenefit$	β_3	0.167	0.137
$1_{\text{higher benefit quartiles}} * 1_{\text{networth}>0} * \log UIbenefit$	β_4	0.250*	0.120
$1_{\text{1st benefit quartile}} * 1_{\text{networth}<0} * MonthstoExpiry$	γ_1	0.031	0.120
$1_{\text{higher benefit quartiles}} * 1_{\text{networth}<0} * MonthstoExpiry$	γ_2	-0.040	0.089
$1_{\text{1st benefit quartile}} * 1_{\text{networth}>0} * MonthstoExpiry$	γ_3	0.100	0.079
$1_{\text{higher benefit quartiles}} * 1_{\text{networth}>0} * MonthstoExpiry$	γ_4	0.103*	0.055
Observations	309		

Controls: age, education, occupation, state, months.

Wage-duration index $\approx$ 5% (not statistically significant)

Model Background

- Baseline Diamond-Mortensen-Pissarides (DMP) model

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- Directed on-the-job search (Delacroix and Shi 2006)
- Block-recursive equilibrium (Menzio and Shi 2011)

Model Environment

- Discrete time with infinite horizon
- Mass 1 of identical workers
  - Mass of unemployed is u.
  - Unemployed receive z utils per period from non-market activities
- Number of vacant jobs/firms, v, controlled by free-entry
  - Vacancies cost c per period to maintain
  - Jobs self-destruct with probability λ
- Workers and firms are risk-neutral
- Common discount rate, r

Environment (cont.)

- A matched pair of job and worker produces output p per period
- Workers direct search to markets indexed by,
  - Wage, w
  - Periods of remaining UI entitlement, $i \in \mathcal{I} = \{0, 1, .., I\}$
  - Market tightness, θ =vacancies/job-seekers in that market
- Unemployed workers meet a vacancy with probability $m(\theta)$
  - (Standard properties)
- Vacancies meet job-seekers with probability $m(\theta)/\theta$
- On-the-job search efficiency γ

Unemployment benefits

- $b(w) = \min\{\phi w, \bar{b}\}$ where w is the worker's prior wage
- $i \in \mathcal{I} = \{0, 1, .., I\}$ represent the number of periods of a worker's UI entitlement
  - while unemployed,
$$i_{t+1} = \max\{i_t - 1, 0\}$$
  - while employed,
$$i_{t+1} = \begin{cases} \min\{i_t + 1, I\} & \text{with probability } q_e \in [0,1] \\ i_t & \text{with probability } 1 - q_e \end{cases}.$$
- UI financed by payroll tax, τ, levied on firms

Free Entry Conditions

$$\frac{m(\theta)}{\theta} V_f^i(w) \leq c \text{ and } \theta \geq 0$$

with complementary slackness.

Market tightness indexed by i and w, $\theta(i, w)$

Steady States

Measures of employed and unemployed workers

$$e = \sum_{i \in \mathcal{I}} \int_0^p e^i(w) dw \quad \text{and} \quad u = \sum_{i \in \mathcal{I}} \int_0^p u^i(w) dw$$

Government budget constraint

$$\sum_{i \in \mathcal{I}} \int_0^p \tau w e^i(w) dw = \sum_{i \in \mathcal{I} \setminus \{0\}} \int_0^p b(w) u^i(w) dw.$$

Equilibrium (Block-recursive)

Definition

A steady state, free-entry, directed search equilibrium consists of a pair of worker policy functions, $\tilde{w}_y^i : \mathcal{I} \times \{e, u\} \times [0, p] \to [0, p]$ and $\tilde{\theta}_y^i : \mathcal{I} \times \{e, u\} \times [0, p] \to \mathbb{R}_+$, a set of active submarkets, $\mathcal{A} \subset \mathcal{I} \times [0, p]$, a market tightness function, $\theta : \mathcal{A} \to \mathbb{R}_+$, the steady state population measures, $e^i(w)$ and $u^i(w)$, and a pay-roll tax rate, τ such that:

1. Given the set of active markets, the market tightness function and pay-roll tax rate, the worker policy functions emerge from optimal search and matching.
2. The set of active markets, $\mathcal{A}$, is determined where $\frac{m(\theta)}{\theta} V_f^i(w) = c$ and $\theta > 0$
3. The tightness function, $\theta(i, w)$, emerges from free-entry of vacancies for all $(i, w) \in \mathcal{A}$.
4. The steady state population measures, $e^i(w)$ and $u^i(w)$ represent the ergodic distribution that emerges from the worker policy functions.
5. The balanced budget condition holds.

Calibration: Parameters

Time unit: 1 month

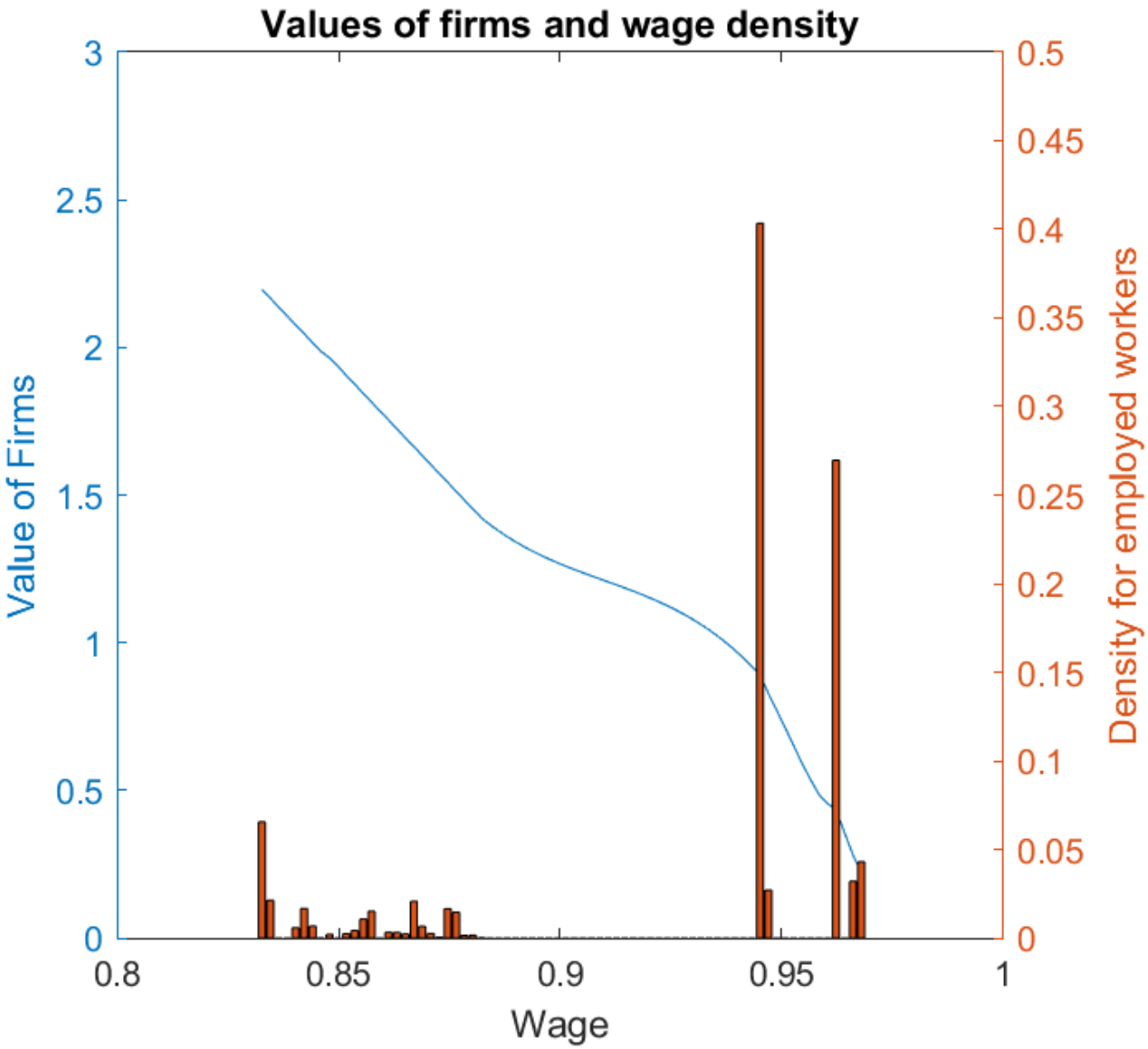
Matching function: $m(\theta) = \min\{m\theta^{\eta}, 1\}$

	Symbol	Value
Monthly discount factor	$1/(1+r)$	0.996
Value of leisure	z	0.494
Matching function TFP	m	0.1
Tightness elasticity	η	0.653
Vacancy cost	c	0.121
On-the-job search efficiency	γ	0.834
Separation rate	λ	1.5%
Max. eligibility	I	6
Replacement ratio	ϕ	50%

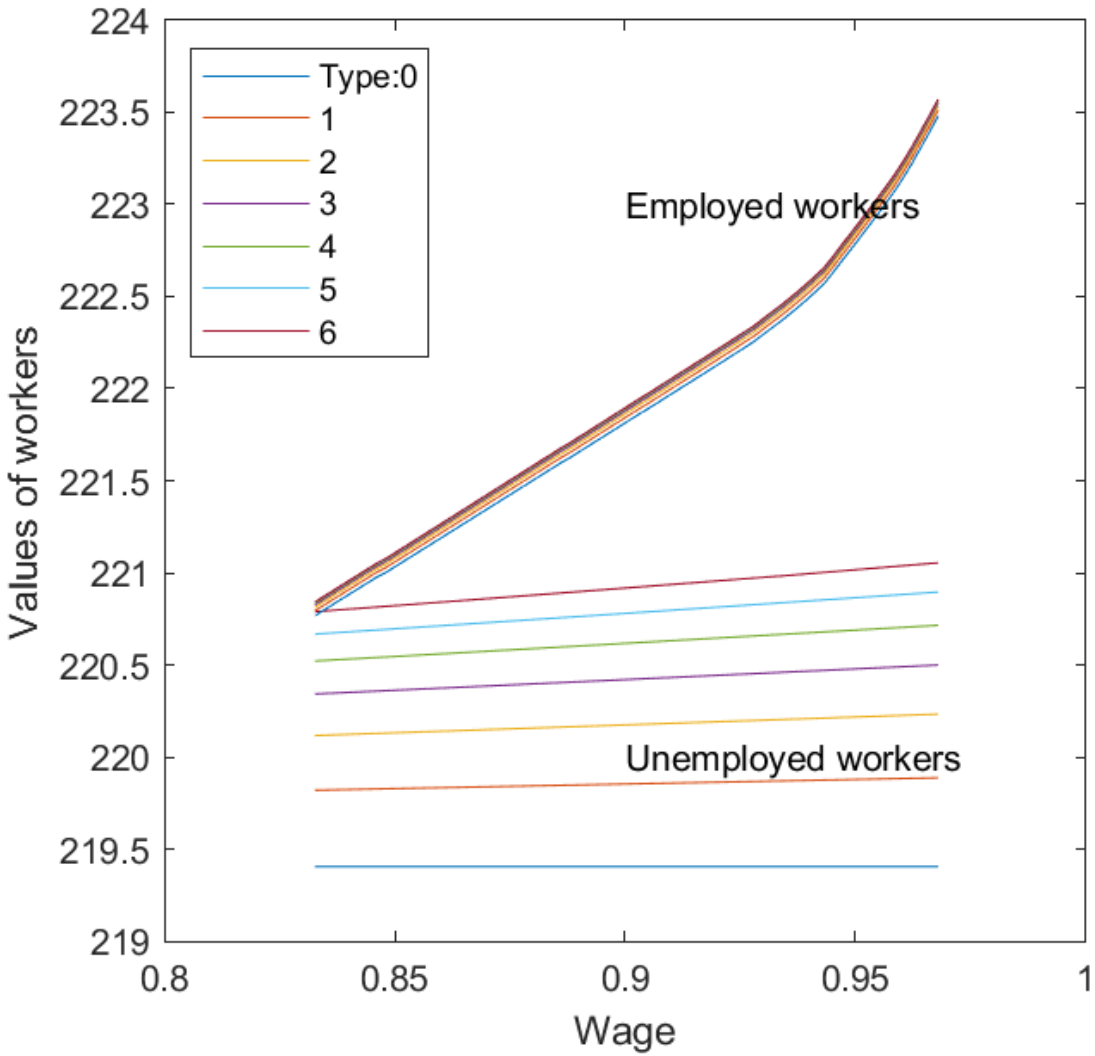
Calibration: Identification

- γ identified from the overall employment-to-employment movement rate.
- η identified from differential matching rates between workers searching for higher and lower wages.
- z comes from $\varepsilon_{w,b}$
- c pinned down by the overall unemployment rate.

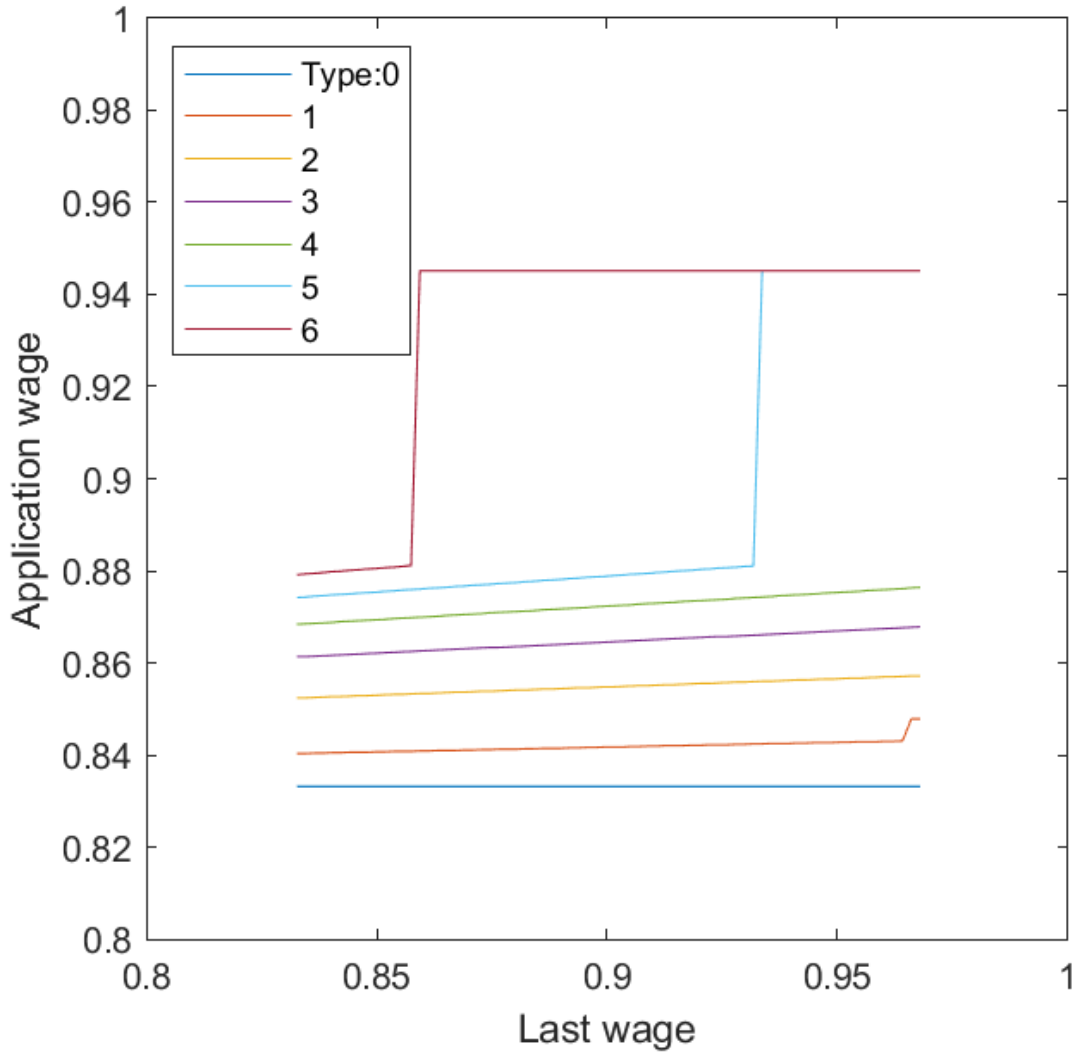
Baseline Results: Wage distribution



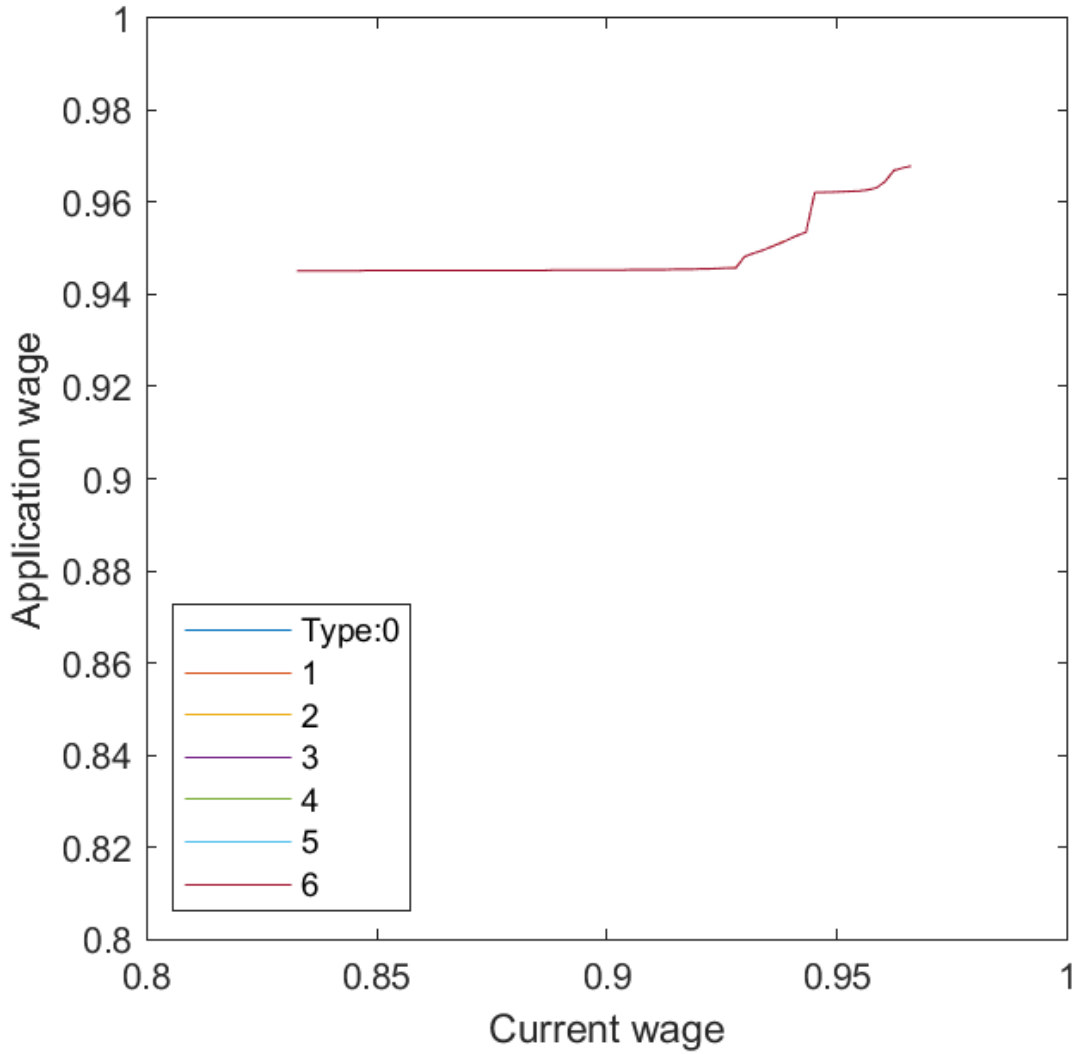
Baseline Results: Worker values



Baseline Results: Unemployed application wages



Baseline Results: Employed application wages



Counterfactual: Indefinite benefits

	Baseline model	Indefinite benefits
Replacement ratio	50%	26.5%
Unemployment rate	6.37%	9.28%
Tax rate	2.88%	2.74%
Mean wage	0.9301	0.9382
Minimum wage	0.8327	0.8992
Wage Mean-Min ratio	1.1169	1.0434
Wage-Duration Index	1.44%	0%

Counterfactual: Indefinite benefits

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Wage-Duration Index	1.44%	0%

Counterfactual: Fixed and indefinite benefits

	Baseline model	Fixed and indefinite benefit
Benefit	50% of wage	0.3109
Unemployment rate	6.37%	7.93%
Tax rate	2.88%	3.01%
Mean wage	0.9301	0.9354
Minimum wage	0.8327	0.8915
Wage Mean-Min ratio	1.1169	1.0492
Wage-Duration Index	1.44%	0%

Counterfactual: Sequential search

	OTJ search(baseline)	No OTJ search
Replacement ratio	50%	53.86%
Unemployment rate	6.37%	5.67%
Tax rate	2.88%	2.71%
Mean wage	0.9301	0.9388
Minimum wage	0.8327	0.9293
Wage Mean-Min ratio	1.1169	1.0102
Wage-Duration Index	1.44%	0.32%

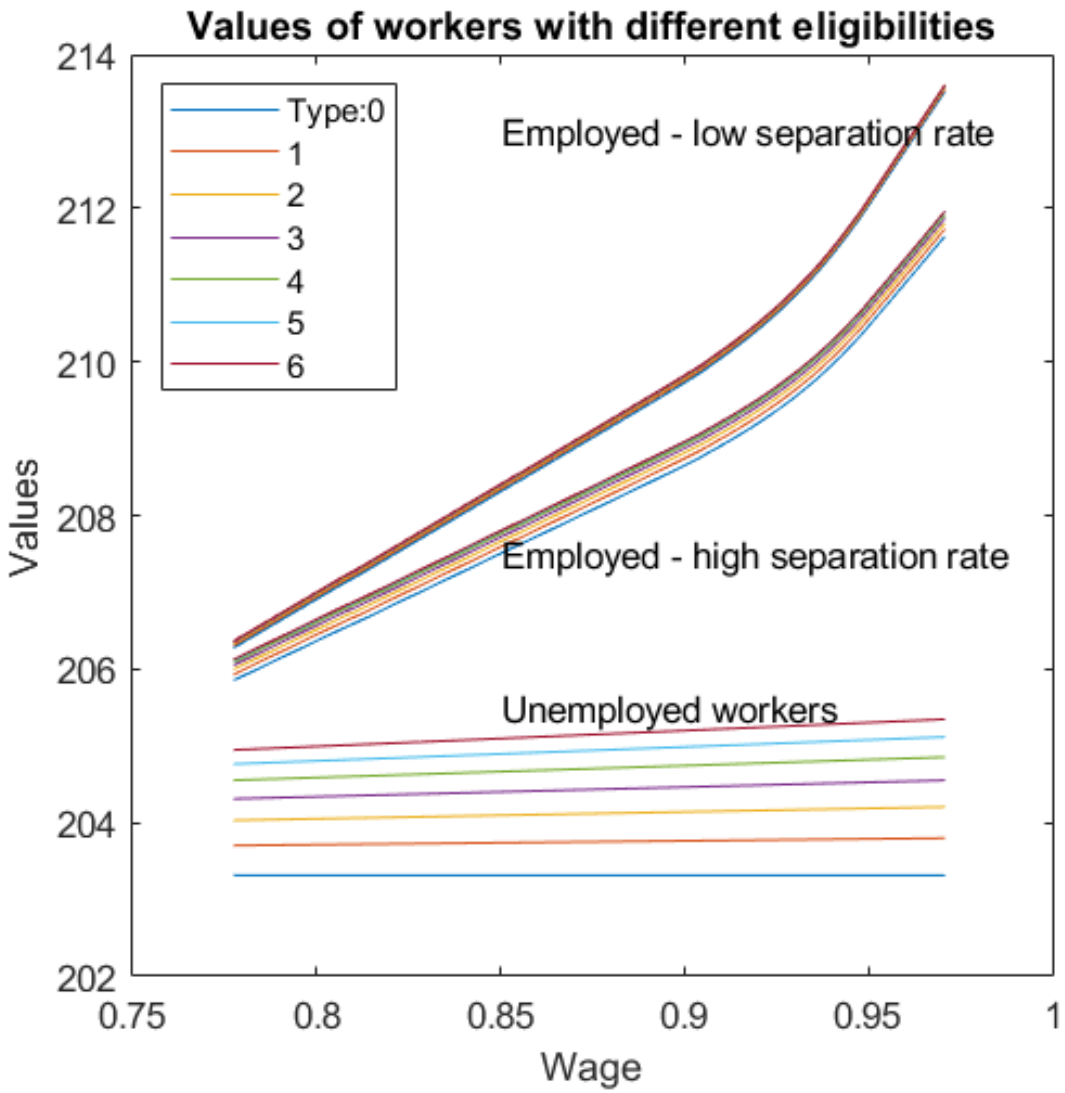
Extension: Two Separation Rates

	Symbol	Values
Tightness elasticity	η	0.637
Vacancy cost	c	0.309
On-the-job search efficiency	γ	0.654
Value of leisure	z	0.338
Separation rate switch rate	q_λ	0.25
High Separation rate	λ_h	10.0%
Low Separation rate	λ_l	1.0%

Two Separation Rates

	Baseline	Two λ's
% of U pop with exhausted UI	17.6%	35.4%
Replacement ratio	50%	50%
Unemployment rate	6.37%	6.80%
Tax rate	2.88%	2.31%
Mean wage	0.9301	0.8919
Minimum wage	0.8327	0.7777
Wage Mean-Min ratio	1.1169	1.1469
Wage-Duration Index	1.44%	0.90%

Extension: Two separation rates



Extension: Risk aversion

	CRRA=2	Linear Utility(Baseline)
Unemployment rate	9.35%	6.37%
Tax rate	3.14%	2.88%
Mean wage	0.6863	0.9301
Minimum wage	0.4904	0.8327
Wage Mean-Min ratio	1.3893	1.1169
Wage-Duration Index	2.53%	1.44%

Conclusion

- We consider the role of UI in the generation of wage dispersion
  - Baseline MMR=1.117
- We quantify the re-entitlement effect using the WDI
  - Baseline WDI=1.44%
- Results point to strong interaction between on-the-job search and UI entitlement.