Moving Home: Non-Market Housing and Labour Market Risk

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November 10, 2025

Introduction

New empirical evidence (Health and Retirement Study)

- Children who lose their job are more likely to move home with parents
  - NEW Effect is present both at young adulthood and into middle age
  - Kaplan (2012): evidence for men 17-22, NLSY97
- Effect is robust to controlling for income, eldercare, and parent characteristics

Research questions

1. How does parental coresidence affect job market search among adult children?
2. How does welfare from coresidence interact with the optimal level of UI?

Contribution

Empirical: Health and Retirement Study

- Children are more likely to move home when transitioning into unemployment
  - NEW Observed for children into middle age

Quantitative: structural lifecycle model of job search and coresidence

- Consumers with the option to move home search in higher-wage submarkets
- Welfare from the move home option is decreasing in the size of the UI benefit

HRS Data Selection: Definition of Cross-wave Flows

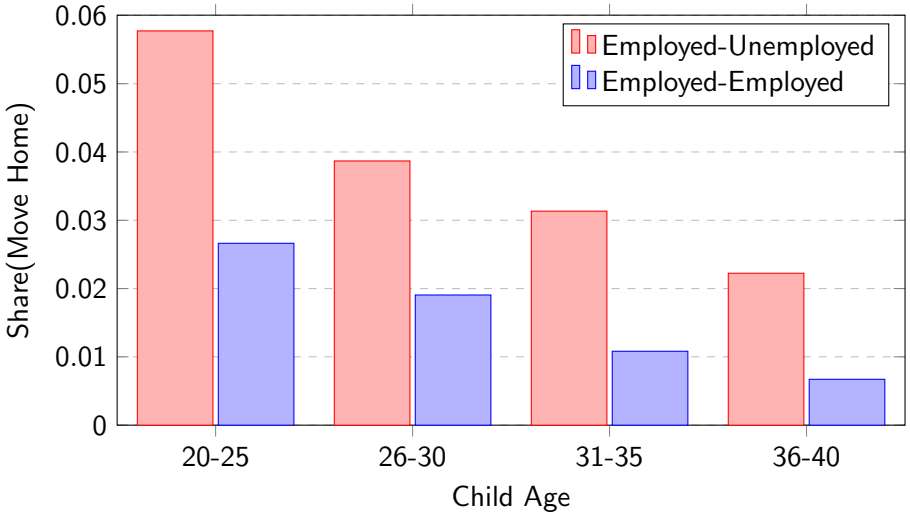
Employment: two types of job transitions

1. Employed-Employed: working in two subsequent waves
2. Employed-Unemployed: working in the previous wave but not in the current wave

Coresidence: child lives independently previously and coresides in the current wave

- If parent is a homeowner and child is not: child moves home
- If child is a homeowner and parent is not: child hosts parent
- Neither (or both) parent and child are homeowners: ambiguous coresidence

HRS: E-U children are more likely to move home at all working ages



NLSY97 Move Out Counterfactual

Probit: Average Marginal Effects on Share(Move Home)

Dependent variable: indicator for moving home after living independently

	Child Age			
Independent Variable	(1) 20-25	(2) 26-30	(3) 31-35	(4) 36-40
Employed-Unemployed	.0312***	.0194***	.0169***	.0050*
Transfer from Parent	.0096*	.0130***	.0078***	.0044***
Child Income				
<10K	*Base*			
10-35K	-.0173***	-.0036	-.0137***	-.0076**
35-70K	-.0387***	-.0051	-.0245***	-.0147***
70-100K	-.0205	-.0068	-.0268***	-.0154***
100K+	.	-.0039	-.0274***	-.0168***
Child Gender (Female)	.0039	-.0013	-.0074***	-.0048***
Child Marital Status	-.0655***	-.0328***	-.0201***	-.0134***
Child Parental Status	.0162**	-.0050*	.0064***	.0010
Mean Share(MH)	.0301	.0147	.0100	.0071

*** 99%, ** 95%, * 90%

Model

Model – Consumers

- Consumers are heterogeneous productivity, assets, and age
  - NEW option to coreside with a parent
  - Assumed to be purely altruistic: no strategic interaction b/t agents
  - **Tradeoff:** can avoid housing costs but lose out on utility from living independently
  - Independence utility subject to a Type-I extreme value shock

- When young, consumers choose:
  - Submarket (piece-rate) for search
  - Whether to coreside or live independently (up to age 40)
  - Saving for next period
- When old, consumers choose:
  - Saving for next period

Consumer Preferences – Utility

$$U(j, a, \epsilon) = \frac{c^{1-\sigma}}{1-\sigma} + d_h \chi$$

Where:

- j: age
- a: assets
- ϵ: individual-specific productivity
- χ: independence utility

$d_h = 1$ when a consumer lives independently, $= 0$ when they coreside

- Beyond age 40, $d_h = 1$ for all consumers

Consumer Preferences – Budget Constraints

Employed: $c + a' = (1 - \tau)\phi\epsilon_j + (1 + r)a - d_h\kappa_h$

Unemployed: $c + a' = (1 - \tau)b + (1 + r)a - d_h\kappa_h$

Retired: $c + a' = (1 - \tau)S + (1 + r)a - \kappa_h$

Where:

- ϕ: piece-rate determined by submarket choice
- b: unemployment benefit
- S: pension benefit
- κ_h: cost of housing
- τ: proportional tax on income
- r: interest rate
- a': savings choice

Labour Market – Workers

- Directed search in submarkets on age j, piece-rate ϕ, and worker productivity ϵ
- Den Haan matching function $M(u, v) = \frac{uv}{(u^\alpha + v^\alpha)^{\frac{1}{\alpha}}}$ with market tightness $\theta = \frac{v}{u}$
- Find job at rate $f(\theta) = \frac{M(u,v)}{u}$
- Provide individual-specific productivity ϵ to the firm
- Earn wage as an after-tax share of output: $w = (1 - \tau)\phi\epsilon_j$
- Proportional tax on output finances unemployment benefit b

Labour Market – Firms

- Hire worker at rate $q(\theta) = \frac{M(u,v)}{v}$ after paying posting cost κ_p
- Match is destroyed in each subsequent period with probability δ

Firm's value function:

$$V_f(j, \epsilon, \phi) = \epsilon_j(1 - \phi) + \beta(1 - \delta)V(j + 1, \epsilon, \phi)$$

Vacancy posting decision: $\max\{V_f(j, \epsilon, \phi) - \kappa_p, 0\} \quad \forall j, \epsilon, \phi$

Search Equilibrium

Value Functions – Young Consumers

$$V_s(j,a,\epsilon) = \max_{\phi} \left\{ f(\theta(j,a,\epsilon)) V_u(j,a,\epsilon) + [1 - f(\theta(j,a,\epsilon))] V_e(j,a,\epsilon,\phi) \right\}$$

$$V_u(j,a,\epsilon) = \max \mathbf{E}_{\xi^c,\xi^i} \left\{ V_u^{cores}(j,a,\epsilon) + \xi^c, V_u^{ind}(j,a,\epsilon) + \xi^i \right\}$$
$$V_e(j,a,\epsilon,\phi) = \max \mathbf{E}_{\xi^c,\xi^i} \left\{ V_e^{cores}(j,a,\epsilon,\phi) + \xi^c, V_e^{ind}(j,a,\epsilon,\phi) + \xi^i \right\}$$

Where:

- $V_u^{cores}(j,a,\epsilon)$, $V_u^{ind}(j,a,\epsilon)$: consumer's value of coresiding and living independently while unemployed
- $V_e^{cores}(j,a,\epsilon,\phi)$, $V_e^{ind}(j,a,\epsilon,\phi)$: consumer's values while employed
- ξ^{cores}, ξ^{ind} are Type-I extreme value shocks on the coresidence choice

Value of Unemployment

$$V_u(j,a,\epsilon) = \max \mathbf{E}_{\xi_c,\xi_i}\left\{ V_u^{cores}(j,a,\epsilon) + \xi_c, V_u^{ind}(j,a,\epsilon) + \xi_i \right\}$$

$$V_u^{cores}(j,a,\epsilon) = \max_{a' \geq 0} \left\{ \frac{[b + (1+r)a - a']^{1-\sigma}}{1-\sigma} + \beta V_s(j+1, a', \epsilon) \right\}$$

$$V_u^{indep}(j,a,\epsilon) = \max_{a' \geq 0} \left\{ \frac{[b + (1+r)a - a' - \kappa_h]^{1-\sigma}}{1-\sigma} + \chi + \beta V_s(j+1, a', \epsilon) \right\}$$

Value of Employment

$$V_e(j,a,\epsilon,\phi) = \max \mathbf{E}_{\xi_c,\xi_i}\left\{ V_e^{cores}(j,a,\epsilon,\phi) + \xi_c,\, V_{ind}^{e}(j,a,\epsilon,\phi) + \xi_i \right\}$$

$$V_e^{cores}(j,a,\epsilon,\phi) = \max_{a' \geq 0} \left\{ \frac{[(1-\tau)\epsilon_j \phi + (1+r)a - a']^{1-\sigma}}{1-\sigma} \right.$$
$$\left. + \beta[(1-\delta)V_e(j+1,a',\epsilon,\phi) + \delta V^s(j+1,a',\epsilon)] \right\}$$

$$V_e^{indep}(j,a,\epsilon,\phi) = \max_{a' \geq 0} \left\{ \frac{[(1-\tau)\epsilon_j \phi + (1+r)a - a' - \kappa_h]^{1-\sigma}}{1-\sigma} + \chi \right.$$
$$\left. + \beta[(1-\delta)V_e(j+1,a',\epsilon,\phi) + \delta V_s(j+1,a',\epsilon)] \right\}$$

Value Functions – Old Consumers

$$V_r(j,a) = \max_{a'} \left\{ \frac{[S + (1+r)a - a' - \kappa_h]^{1-\sigma}}{1-\sigma} + \beta \psi_j V^r(j+1, a') \right\}$$

Where ψ_j is a survival probability that increases in age

Government

The government provides an unemployment benefit (b) and pension benefit (S) by choosing income taxes (τ) such that:

$$\int \tau \epsilon_j \phi d\omega_e(j, a, \epsilon, \phi) = \int b d\omega_u(j, a, \epsilon) + \int S d\omega_r(j, a)$$

Where $\omega_e, \omega_u, \omega_r$ are stationary distributions of employed, searchers, and retirees

Equilibrium

Given initial distributions of assets and productivity there is an equilibrium such that:

1. Consumers solve their problem by choosing a piece-rate, coresidence, and saving
2. Firms face zero expected profits for each submarket in which they post
3. Government funds unemployment and pension benefits via a proportional tax

Solution Algorithm

Results

Calibration: Internal

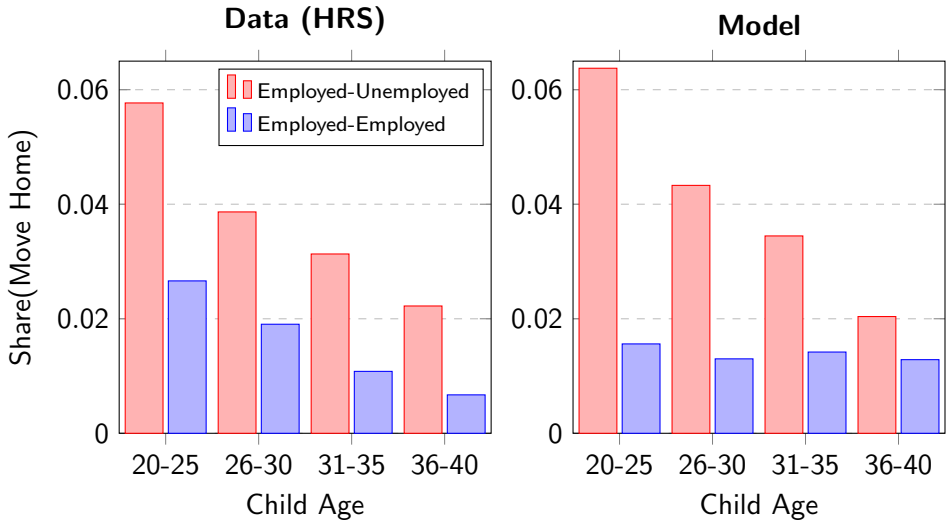
	Parameter	Value	Target	Model	Data
κ_h	Cost of Housing	.1171	Rent-to-Income Ratio	*.0500*	
χ	Independence Utility	4.703	E-U Move Home Share	*.0413*	*.0413*
η	EV Distribution Scale	1.000	Coresidence Share	*.0273*	*.1460*
κ_j	Cost of Posting	.0034	Unemployment Share[1]	*.0478*	*.0420*
b	UI Benefit	.2454	UI Exp. to Income Ratio[2]	*.0042*	*.0042*
S	Social Security Benefit	.7537	SS Exp. to Income Ratio[3]	*.0525*	*.0525*
σ_ϵ	St. Dev. Productivity	.8868	SD Log Earnings (Age 26-30)[4]	*.9000*	*.9000*

[1] BLS (2025) [2,3] BEA (2024) [4] Kuhn & Ríos-Rull (2013)

Calibration: External

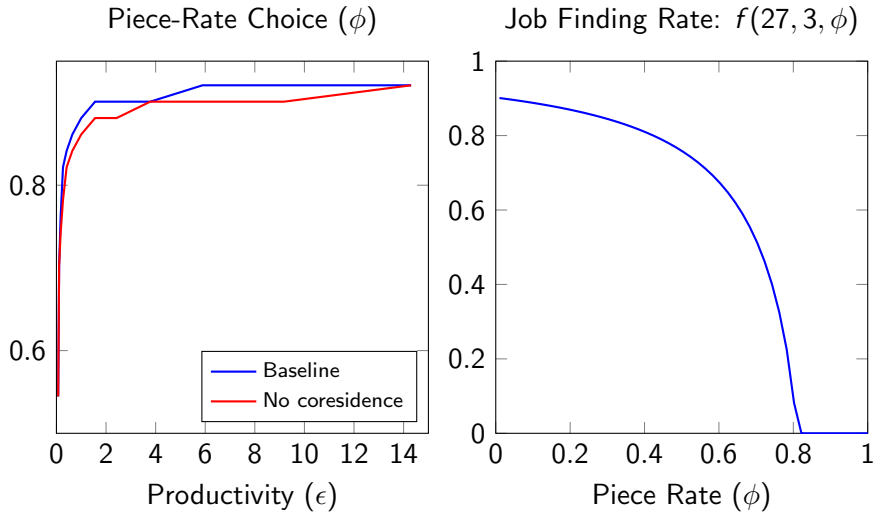
	Parameter	Value	Source
α	Match Elasticity	1.27	Den Haan (2000)
δ	Job Destruction Rate	0.0192	E-U Share (HRS)
σ	Risk Aversion	2	
β	Discount Factor	0.96	
r	Interest Rate	0.04	

Model Validation: Share who Move Home



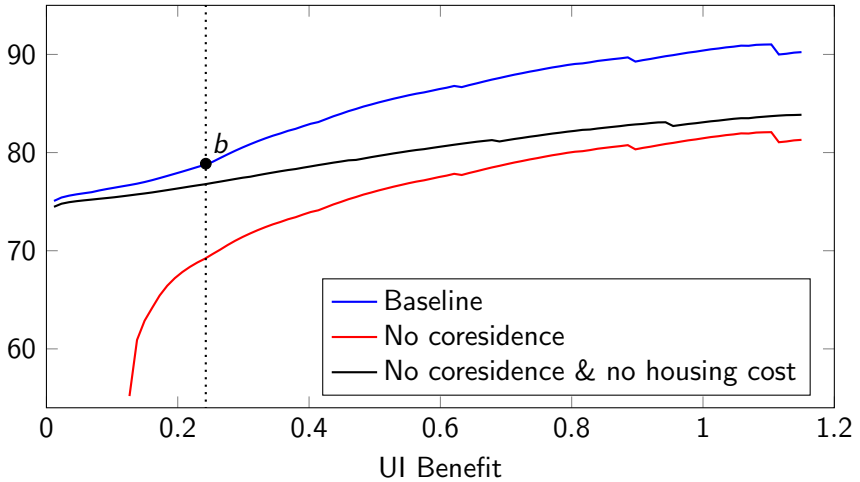
- Move home flows are larger for E-U consumers and are decreasing in age

Ex Ante Search Choice ($j = 27, a = .16$)



- Consumers without the coresidence option search in lower piece-rate submarkets

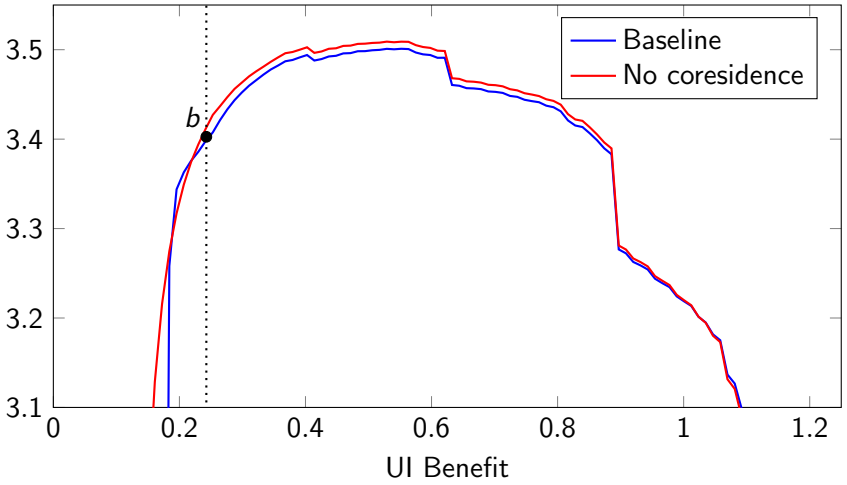
Optimal UI Benefit: Expected Lifetime Utility



- Consumers prefer higher UI benefits until everyone selects into unemployment

Tax Rate

Optimal UI Benefit: Equilibrium Utility



- Optimal UI under this welfare measure is roughly twice its calibrated value (b)

Tax Rate

Conclusion

Empirical observation: E-U children are more likely to enter coresidence

Structural model:

1. Children who can coreside search in submarkets with lower job-finding rates
   - Relative cost of unemployment is lower due to the coresidence option
   - Coresidence allows children to avoid housing cost κ_h
2. Welfare benefits of coresidence are largest at lower unemployment benefits
   - Suggests coresidence and UI are complementary insurance mechanisms

Thank you

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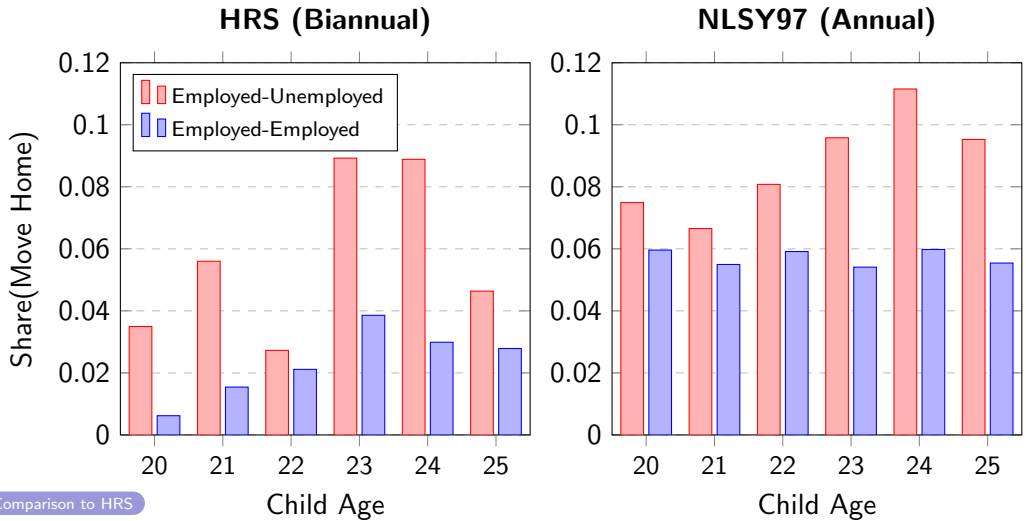
HRS v. NLSY97: E-U young adults are more likely to move home



Comparison to HRS
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HRS v. NLSY97

Health and Retirement Study (1998-2018):

- Biannual frequency, ages 18-45
- Categorical child income, no unemployment benefits
- Coresidence and transfers in all years

NLSY97 (1998-2021):

- Annual frequency, ages 18-42
- Child income, employment, and unemployment benefits
- **Key variables:**
  1. Coresidence: available until 2009 (age 26)
  2. Transfers: available until 2002 (22); extensive margin until 2011 (age 32)

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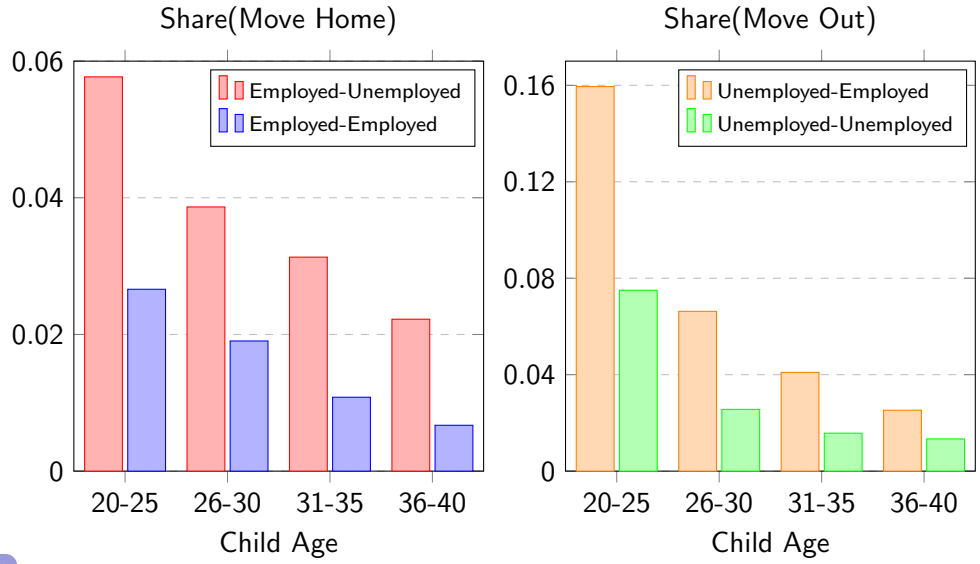
Counterfactual: U-E children are more likely to move out



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HRS: Coresidence

- 8% of adult children (excluding students) live with their parents
- In any individual wave, 1.3% of adult children move home
  - 0.71% move in with parents
  - 0.15% host parents
  - 0.44% are ambiguous
- Children who move home tend to be younger and have less education
- Parents of children who move home have lower incomes but higher wealth

	Move home	Stay independent
Child age	36.2	42.1
Child education (years)	12.4	13.8
Parent income	$89,357	$79,104
Parent assets	$465,707	$578,635

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HRS: Transfers

Parents transfer choices and co-residence depend on child employment outcomes

- Children who have recently lost their jobs are more likely to receive transfers relative to those who stay employed
- The quantity of these transfers is also larger in both the unconditional average and intensive margin
- Job-losing children are also approximately 3.5 times more likely to move home

	E-U	E-E
Extensive margin	0.1932	0.1672
Intensive margin	\$10,336	\$9,740
Average transfer	\$1,997	\$1,628
Share(Move home)	0.03773	0.01354
Share(MH & Transfer)	0.00683	0.00214

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Linear Probability Model: Share(Move Home)

Dependent variable: indicator for moving home after living independently

	Child Age			
Independent Variable	(1) 20-25	(2) 26-30	(3) 31-35	(4) 36-40
Employed-Unemployed	.0315***	.0202***	.0205***	.00814**
Transfer from Parent	.0091*	.0144***	.0092***	.0045**
Child Income				
<10K	*Base*			
10-35K	-.0186***	-.0056	-.0206***	-.0208**
35-70K	-.0354***	-.0054	-.0313***	-.0284***
70-100K	-.0226	-.0067	-.0321***	-.0286***
100K+	-.0541***	-.0061	-.0334***	-.0282***
Child Gender (Female)	.0046	-.0018	-.0068***	-.0058***
Child Marital Status	-.0418***	-.0312***	-.0235***	-.0174***
Child Parental Status	.0118	-.0044*	.0075***	.0037*
Mean Share(MH)	.0301	.0147	.0100	.0071

*** 99%, ** 95%, * 90%

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Search Equilibrium

Value for a firm with a match:

$$V_f(j,\epsilon,\phi) = \epsilon(1-\phi) + \beta(1-\delta)V_f(j+1,\epsilon,\phi)$$

Free entry condition:

$$q(\theta(j,\epsilon,\phi))V_f(j,\epsilon,\phi) = \kappa_p \quad \forall j,\epsilon,\phi$$

If $V_f(j,\epsilon,\phi) < \kappa_j \rightarrow \theta = 0$ since the firm does not post in submarket (j,ϵ,ϕ)
Otherwise:

$$q(\theta) = \frac{\kappa_p}{V_f} = \frac{M(u,v)}{v} = \frac{u}{(u^\alpha + v^\alpha)^{\frac{1}{\alpha}}}$$

$$u = \frac{\kappa_p}{V_f}(u^\alpha + v^\alpha)^{\frac{1}{\alpha}} \Rightarrow \frac{u^\alpha}{u^\alpha + v^\alpha} = \left(\frac{\kappa_p}{V_f}\right)^\alpha$$

$$1 + \theta^\alpha = \left(\frac{V_f}{\kappa_p}\right)^\alpha \Rightarrow \theta^\alpha = \left(\frac{V_f}{\kappa_p}\right)^\alpha - 1 \Rightarrow \theta = \left[\left(\frac{V_f}{\kappa_p}\right)^\alpha - 1\right]^{\frac{1}{\alpha}} \quad \forall j,\epsilon,\phi$$

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Solution Algorithm

Assuming an initial distribution of consumers (ω_s) at $j = 1$ $\forall a, \epsilon$

(1) Guess labour income tax rate $\tau \in \{0, 1\}$

(2) Firm: solve for $V_f(j, \epsilon, \phi)$ where $V_f(J, \epsilon, \phi) = 0$ $\forall \epsilon, \phi$
- Using $V_f(j, \epsilon, \phi)$, compute market tightness θ

(3) Consumer: using $V^r(J, a) = 0$ $\forall a$, compute
- $V_r(j, a)$ $\forall a$ and $j \in \{65, ..., J-1\}$
- $V_u(j, a, \epsilon)$, $V_u^{indep}(j, a, \epsilon)$, and $V_u^{cores}(j, a, \epsilon)$ $\forall a, \epsilon$ and $j \in \{0, ..., 64\}$
- $V_e(j, a, \epsilon, \phi)$, $V_e^{indep}(j, a, \epsilon, \phi)$, and $V_e^{cores}(j, a, \epsilon, \phi)$ $\forall a, \epsilon, \phi$ and $j \in \{0, ..., 64\}$
- $V_s(j, a, \epsilon)$ $\forall a, \epsilon$ and $j \in \{0, ..., 64\}$

(4) Compute distributions for workers $\omega_s(j, a, \epsilon), \omega_e(j, a, \epsilon, \phi)$ and retirees $\omega_r(j, a)$

(5) Compute tax rate to balance the government's budget constraint; update guess

(6) Iterate on (2) – (5) until convergence

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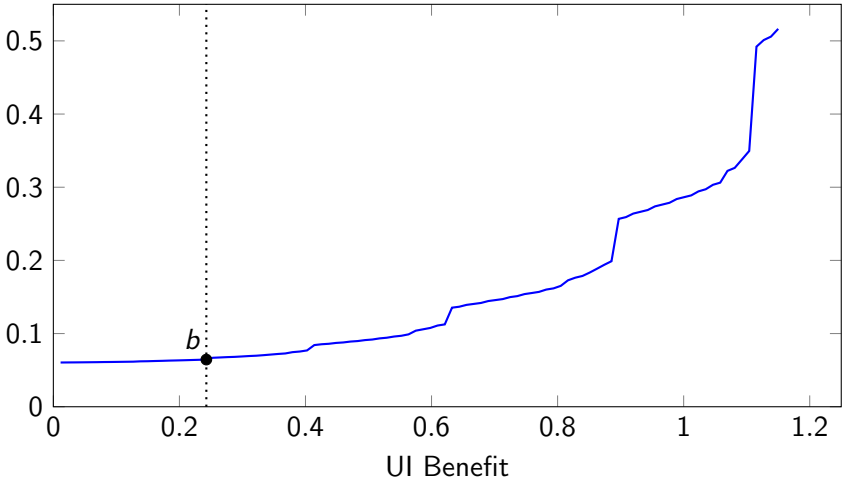
Tax Rate: Expected Lifetime Utility



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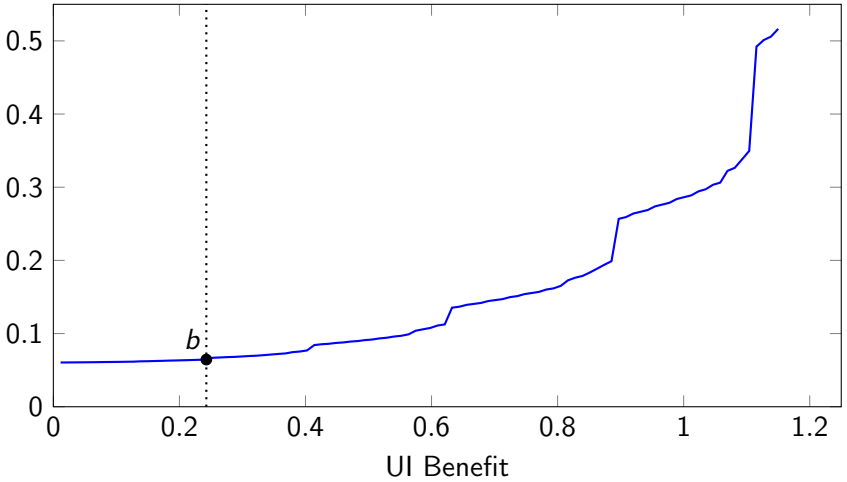
Tax Rate: Equilibrium Utility



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