Reservation Wages and Unemployment Insurance

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Motivation

- Baily (1978), Chetty (2006) propose a test for optimality of the level of unemployment benefits based on:
  1. Elasticity of unemployment durations with respect to benefits
  2. Observed drop in lifetime consumption as a result of unemployment
  3. Properties of utility function - risk aversion, prudence etc.

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  1. Elasticity of unemployment durations with respect to benefits
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- Propose an alternative test based on:
  1. Elasticity of unemployment durations with respect to benefits
  2. Responsiveness of reservation wage to change in benefits

Overview of Ideas

- Benefit system is optimal if gains from a revenue-neutral increase in benefits equal costs
- Cost: higher payments and longer average duration
- Benefit: higher average welfare through shift of consumption from employed to unemployed state
- CARA preferences $\Rightarrow$ welfare is increasing function of reservation wages
- Elasticity of reservation wages and durations w.r.t to benefits can be used to assess optimality of system

Model

- Single risk-averse worker with preferences:

$$E\int_0^\infty e^{-\rho t}U(c(t))dt$$
$$U(c) = -e^{-\gamma C}$$

- **Unemployed**
  - Benefit rate, $b \Rightarrow y = b$
  - Job offer arrival rate, λ
  - Job offer is wage, $w \sim F$
- **Employed**
  - Wage rate, w
  - Constant Taxes, $\tau \Rightarrow y = w - \tau$
  - Job lasts for T periods, time remaining = t

Worker Behavior

1. **Risk-free Bond:** $\dot{a}(t) = ra(t) + y(t) - c(t)$

   If $\rho = r$ then:

$$V_u(a) = \frac{U(ra + \overline{w} - \tau)}{\rho}$$

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$$\Rightarrow \overline{\mathbf{w}}^{\mathbf{aut}} < \overline{\mathbf{w}}$$

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- Choose b,τ to maximize $V_u(a)$ or V_u^{aut} at zero expected cost.
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- Flow NPV cost of program:

$$rC = b - \lambda(1 - F(\overline{w}))\left(C - \left[e^{-rT}C - \alpha_T\tau\right]\right)$$

- Expected duration of unemployment spell:

$$D = \frac{1}{\lambda(1 - F(\overline{w}))}$$

- Budget constraint: $Db = \alpha_T\tau$ where $\alpha_t = \int_0^t e^{-rs}ds$
- As $r \to 0$, $\alpha_T = T$ so budget constraint becomes $ub = (1-u)\tau$

A Behavioral Test

- Denote elasticity of average unemployment duration w.r.t benefits:

$$\epsilon_{D,b} = b\frac{D_b(b,\tau)}{D(b,\tau)}$$

- If unemployment benefit and taxes are optimal then:

$$\overline{w}_b(b^*,\tau^*) = \frac{D(b^*,\tau^*)}{\alpha_T + D(b^*,\tau^*)}(1+\epsilon_{D,b}(b^*,\tau^*))$$

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- As $r \to 0$, this becomes:

$$\overline{w}_b(b^*,\tau^*) = u(b^*,\tau^*)\left(1+\frac{\epsilon_{u,b}(b^*,\tau^*)}{1-u(b^*,\tau^*)}\right)$$

Extensions

Discount Rate $\neq$ Interest Rate

$\Rightarrow$ no change with CARA since effect on c is level shift

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Sampling Job Durations

$\Rightarrow$ let $\hat{\alpha} = E[\alpha_T | w > \overline{w}]$

$\Rightarrow$ $\overline{w}_b = \frac{D}{\hat{\alpha}+D}(1 + \epsilon_{D,b} + \epsilon_{\hat{\alpha},b})$

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$\Rightarrow U(c - v(e))$, arrival rate $= \lambda(e)$

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Effort on the Job, e

$\Rightarrow U(c) - v(e)$, income $= ew$

$\Rightarrow$ choose $e(w)$ s.t. $v'(e(w)) = w \Rightarrow$ isomorphic $F[e(w)w - v(e(w))]$