Discussion of
Involuntary Unemployment and the Business Cycle
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Summary

- New Keynesian business cycle model with indivisible labor
- Workers can make unobservable effort to modify lottery contracts
  \[ \Rightarrow \text{risk sharing imperfect, countercyclical} \]
- Observationally equivalent to standard NK model for hours etc.
- New implications for unemployment, microdata

Discussion

- simple version of within-period family problem
  (no differences in aversion to work)
- interpretation of quantitative results
Benchmark: The Family Rogerson

- Family = measure one of agents; consume $C$ & supply labor hours $H$
- Individuals work one hour or not at all.
- Individual utility from consumption, hours: $\log C - \zeta h$
- Lottery contract: “work” $(c_1, 1)$ with prob $p$, else “slack” $(c_0, 0)$
- Head of family solves

$$U(C, H) = \max_{p, c_1, c_2} p \left( \log c_1 - \zeta \right) + (1 - p) \log c_0$$

s.t.

$$p = H$$
$$pc_1 + (1 - p)c_0 = C$$

- Solution = optimal risk sharing $c_1 = c_0 = C$, indirect utility is

$$U(C, H) = \log C - \zeta H$$

- (With nonseparability can have $C_1 > C_0$ for risk sharing purposes)
The Family Rogerson with Observable Effort Choice

- Family = measure one of agents; consume $C$ & supply labor hours $H$
- Individuals work one hour or not at all.
- Individual utility from consumption, hours, effort: $\log c - \zeta h - \kappa(e)$
- Contract = effort & lottery over “work” ($c_1, 1$), “slack” ($c_0, 0$)
  “work” with prob $p(e)$, where $p'(e) > 0$.
- Effort observable: head of family solves

$$U(C, H) = \max_{e, C_1, C_2} p(e) (\log c_1 - \zeta) + (1 - p(e)) \log c_0$$

s.t.

$$p(e) = H$$
$$p(e) c_1 + (1 - p(e)) c_0 = C$$

- Solution = optimal risk sharing $c_1 = c_0 = C$, indirect utility is

$$U(C, H) = \log C - p(e^*) \zeta - \kappa(e^*) = \log C - \zeta H - \kappa(p^{-1}(H))$$

With linear $p$, quadratic $\kappa$: more curvature
The Family Rogerson with Unobservable Effort Choice

- Family = measure one of agents; consume $C$ & supply labor hours $H$
- Individuals work one hour or not at all.
- Individual utility from consumption, hours, effort: $\log c - \zeta h - \kappa(e)$
- Contract = effort & lottery over “work” $(c_1, 1)$, “slack” $(c_0, 0)$ “work” with prob $p(e)$, where $p'(e) > 0$.
- Effort unobservable: head of family solves

$$U(C, H) = \max_{e, C_1, C_2} p(e) \left( \log c_1 - \zeta \right) + (1 - p(e)) \log c_0$$

s.t.

$$p(e) = H$$

$$p(e) c_1 + (1 - p(e)) c_0 = C$$

$$p'(e) \left( \log \frac{c_1}{c_0} - \zeta \right) = \kappa'(e)$$

- Solution follows from constraints alone!
Unobservable Effort Choice Ctd.

- Constraints

\[
\begin{align*}
    p(e) &= H \\
    p(e) c_1 + (1 - p(e)) c_0 &= C \\
    p'(e) \left( \log \frac{c_1}{c_0} - \zeta \right) &= \kappa'(e)
\end{align*}
\]

- Implications for individuals:
  - \( c \) random, consumption premium \( c_1 / c_0 > 1 \)
  - effort \( e^* \), consumption premium \( c_1 / c_0 \) increasing in \( H \)
Unobservable Effort Choice Ctd.

- **Constraints**

\[ p(e) = H \]
\[ p(e) c_1 + (1 - p(e)) c_0 = C \]
\[ p'(e) \left( \log \frac{c_1}{c_0} - \zeta \right) = \kappa'(e) \]

- **RA indirect utility**

\[ U(C, H) = \log C - p(e^*)\zeta - \frac{1}{2}\kappa(e^*) \]
\[ - \left\{ \log E \left[ \frac{c}{c_0} \right] - E \left[ \log \left( \frac{c}{c_0} \right) \right] \right\} \]
\[ = : \log C - \zeta H - \bar{z}(H; \zeta) \]

using \( c_1 / c_0 = \exp (\kappa'(e^*) / p'(e^*) + \zeta) \)

- **Properties**
  - utility cost of idiosyncratic risk bearing (small?)
  - functional form: more curvature from effort choice
  - role of preference shock \( \zeta \): consumption dispersion changes
Interpreting quantitative results

- Medium scale model
  - has many labor types, sticky wages
  - estimated with hours data (not unemployment)

- NK model + Okun’s law fits well
  (how Okun’s law is derived matters!)

- New story for low estimated Frisch elasticities, also wealth effects on labor supply

- Labor wedge: any hope from reinterpretation of parameters, shocks?

- Model differs from typical search setup since
  - effort complementary to work in production
  - no formation of persistent matches & rent sharing
    ⇒ micro data?
    ⇒ how to think about sticky wages?