Discussion of Involuntary Umeployment and the Business Cycle by Larry Christiano, Mathias Trabandt & Karl Walentin

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Conference for Gary Stern, April 23 & 24, 2010

Summary

- New Keynesian business cycle model with indivisible labor
- Workers can make unobservable effort to modify lottery contracts
  $\Rightarrow$ 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

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

s.t.

$$\begin{aligned} p &= H \\ pc_1 + (1-p)\,c_0 &= C \end{aligned}$$

- 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.

$$\begin{aligned} p(e) &= H \\ p(e)\, c_1 + (1 - p(e))\, c_0 &= C \end{aligned}$$

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

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

With linear p, quadratic κ: 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

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

s.t.

$$\begin{aligned} p(e) &= H \\ p(e)\, c_1 + (1 - p(e))\, c_0 &= C \\ p'(e)\left(\log \frac{c_1}{c_0} - \zeta\right) &= \kappa'(e) \end{aligned}$$

- Solution follows from constraints alone!

Unobservable Effort Choice Ctd.

- Constraints

$$\begin{aligned} p(e) &= H \\ p(e)\, c_1 + (1 - p(e))\, c_0 &= C \\ p'(e) \left(\log \frac{c_1}{c_0} - \zeta \right) &= \kappa'(e) \end{aligned}$$

- 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

$$\begin{aligned} p(e) &= H \\ p(e)\, c_1 + (1 - p(e))\, c_0 &= C \\ p'(e) \left(\log \frac{c_1}{c_0} - \zeta \right) &= \kappa'(e) \end{aligned}$$

- RA indirect utility

$$\begin{aligned} U(C, H) &= \log C - p(e^*)\zeta - \frac{1}{2}\kappa(e^*) \\ &\quad - \left\{ \log E\left[\frac{c}{c_0}\right] - E\left[\log\left(\frac{c}{c_0}\right)\right] \right\} \\ &= : \log C - \zeta H - \tilde{z}(H; \zeta) \end{aligned}$$

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

- Properties
  - utility cost of idiosyncratic risk bearing (small?)
  - functional form: more curvature from effort choice
  - role of preference shock ζ: 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

  $\Rightarrow$ micro data?

  $\Rightarrow$ how to think about sticky wages?