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Comments on “Adverse Selection, Uncertainty Shocks and Business Cycles” by Daisuke Ikeda

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Motivation1: To understand the great recession

- ▶ Candidates for the cause of great recession:
 - ▶ Risk shock: Christiano et al,
 - ▶ Financial shock (interest rate spread) : Hall, Gilchrist et al,
 - ▶ Marginal Efficiecy of Investment (MEI) shocks (investment good to capital good): Justiniano, et al
- ▶ This paper aims to provide microfoundation of financial shock and MEI shock \Rightarrow Uncertainty shock

Motivation 2: To develop a computable GE model with adverse selection

Two financial frictions to consider

- ▶ Ex ante private information \implies Adverse selection ν_t .
- ▶ Ex post diversion of resources \implies Moral hazard ϕ .

Summary

Partial Equilibrium model

Financial contract between Entrepreneur and Financier

1. Adverse selection

Entrepreneur has net worth N_n and private information p .

The project yields $\frac{1}{p}R$ with probability p . $p \sim F(p)$, where $F(p)$ is publicly known.

2. Moral hazard

Entrepreneur can divert ϕ of gross revenue ex post.

3. Zero profits for banks

Equilibrium conditions

1. Truth telling constraint \Leftarrow Adverse selection
2. No diversion constraint \Leftarrow Moral Hazard
3. Entrepreneurs' participation constraint
4. Zero profits for banks (\Leftarrow Condition is independent of net worth of borrowers)

Characterization of equilibrium

- ▶ Threshold p^* does not depend on net worth
- ▶ The amounts of loan ($B_n(p)$) and repayment ($X_n(p)$) are linear in net worth
- ▶ Risky entrepreneurs can borrow and pay more in the equilibrium contract (Riskier entrepreneurs have smaller expected repayment)
- ▶ Intermediaries offer loans to more entrepreneurs as the returns earned by entrepreneurs get higher.

General Equilibrium Models

Consumption good \Rightarrow Capital good \Rightarrow Consumption good

Model 1 – Adverse selection in the demand of capital

- ▶ Entrepreneurs buy capital good and rent it out for competitive production of consumption goods
- ▶ Capital good producers are in the competitive market

Model 2 – Adverse selection in the supply of capital

- ▶ Entrepreneurs buy consumption goods and produce capital goods
- ▶ They sell capital goods in the competitive market

Simulation Results

- ▶ In response to uncertainty shocks, comovements are reproduced
- ▶ In Model 2 net worth increase in response to uncertainty shock or MEI shock (because there is no CEE adjustment cost)
- ▶ Countercyclical markup in wages and capital utilization rates are crucial for comovement.
- ▶ CEE adjustment costs makes humpshaped and persistent responses.
- ▶ CEE adjustment costs is crucial for predictive power of external finance premium.

Extensions

- ▶ Uncertainty shock (v_t) is qualitatively equivalent to risk shock in CMR

$$\hat{s}_t = -\chi_{1,r} \left(\hat{N}_t - \hat{q}_t - \hat{K}_{t+1} \right) - \chi_{2,r} E_t u_{r,t+1},$$

$$\hat{s}_t = -\chi_1 \left(\hat{N}_t - \hat{q}_t - \hat{K}_{t+1} \right) - \chi_2 v_t.$$

- ▶ Unrealized uncertainty shock has similar effect as realized uncertainty shock

$$\hat{s}_t = -\chi_1 \left(\hat{N}_t - \hat{q}_t - \hat{K}_{t+1} \right) - \chi_2 v_t + \chi_4 \eta_t.$$

General Comment

- ▶ Tractable model of adverse selection in the DSGE framework
(\Leftrightarrow Kurlat 2010, Bigio 2010)
- ▶ One period financial contract in DSGE model:
 - ▶ CF 1997
 - ▶ BGG 1999
 - ▶ CMR 2010 (Risk shock)
 - ▶ Hirakata Sudo Ueda 2009
 - ▶ Kato 2006 (Holmstrom-Tirole type)
- ▶ This model is equivalent to BGG if $v_t = 0$.

Comment 1

Similarity between Risk shock and Uncertainty shock

- ▶ Risk Shock: σ_t
 - ▶ BGG framework: Costly State Verification
 - ▶ Ex post idiosyncratic shock on project: $\ln \omega_t \sim N(\mu, \sigma)$
 - ▶ In BGG model, σ is constant
 - ▶ In CMR model, it is time variant \rightarrow Risk shock
- ▶ Uncertainty shock: v_t
 - ▶ This paper: Adverse selection + Moral hazard
 - ▶ Ex ante idiosyncratic shock on project: $p \sim U[\underline{p}e^{v_t}, 1]$
 - ▶ v_t follows $v_t = \rho_v v_{t-1} + \epsilon_t$.

The aggregate effect of risk shock and uncertainty shock are similar

Comment 1 (continued)

Risk shock v.s. Uncertainty shock

- ▶ Incorporating adverse selection into DSGE model
- ▶ Effect on macroeconomic dynamics
- ▶ Microfoundation for financial shocks (interest rate spread)
 - ▶ Is it “micro” foundation?
- ▶ Can introduce additional features, e.g., Knightian uncertainty (Fukuda 2008)

Comment 2

Shocks on investment (i.e., MEI shock or financial shock):
main driving force of business cycle?

- ▶ This paper
 - ▶ Shocks on investment \Leftarrow Financial frictions
 - ▶ Shocks on investment = the main driving force (Justiniano et al.)
- ▶ Justiniano et al.
 - ▶ If $MPL = MRS$ investment shock cannot reproduce comovement
 - ▶ Sticky prices and wages make $MPL \neq MRS$ and investment shocks generate comovements

Comment 2 (continued)

- ▶ Labor wedge arguments (Chari et al., Shimer)
 - ▶ Labor wedge $1 - \tau_t = MRS/MPL$
 - ▶ Changes in labor wedge can reproduce business cycles
 - ▶ Shocks on τ_t may be the driving force of business cycles
 - ▶ Search friction in the labor market
 - ▶ Frictions on working capital financing (Jermann and Quadrini 2006, Mendoza 2010)
 - ▶ Nominal wage rigidities + productivity shock
 - ▶ Nominal wage rigidities + investment shock
- ▶ Investment may fluctuate in response to shocks on search friction and/or working capital financing

Comment 3

DSGE model + Large shock = Great recession?

- ▶ What is the cause of uncertainty shocks (or risk shocks)?
- ▶ We may not need to know the cause of shock for
 - ▶ analysis of mechanism of propagation
 - ▶ assessment of (unconventional) policy
- ▶ We need to know the cause of large shock for prevention of recurrence of financial crisis.

Comment 3 (continued)

Stylized pattern of financial crisis (Reinhart and Rogoff)

- ▶ Financial liberalization or financial innovation / Capital inflow bonanza
- ▶ Asset price bubble and **overleverage**
- ▶ Banking crisis
- ▶ Inflation / Government debt crisis (external and/or domestic)

Cause of financial crisis

- ▶ DSGE literature: Large shock to a *normal* economy
- ▶ RR imply: Small shock to an *overleveraged* economy

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Minor comment

Moral hazard shock

- ▶ What is the effect of shocks to ϕ ?

$$\phi_t = (1 - \rho)\bar{\phi} + \rho\phi_t + \epsilon_t$$

- ▶ Is it equivalent to net worth shock?