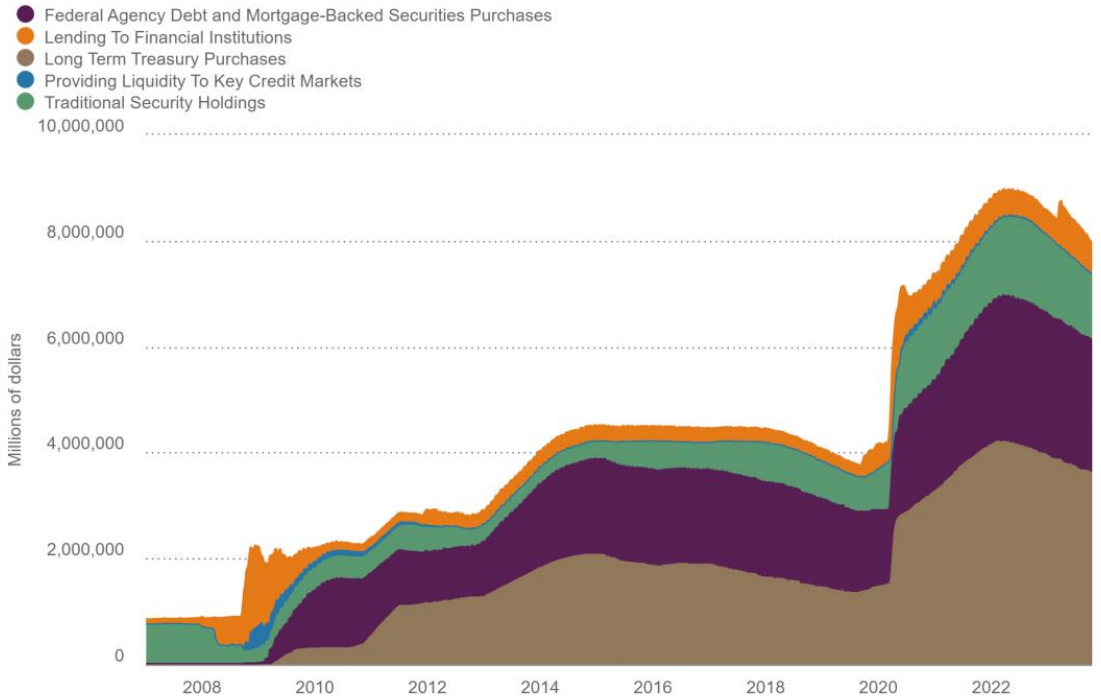
Discussion: Unconventional Credit Policy in an Economy with Supply and Demand Credit Frictions

Albert Queralto
Federal Reserve Board

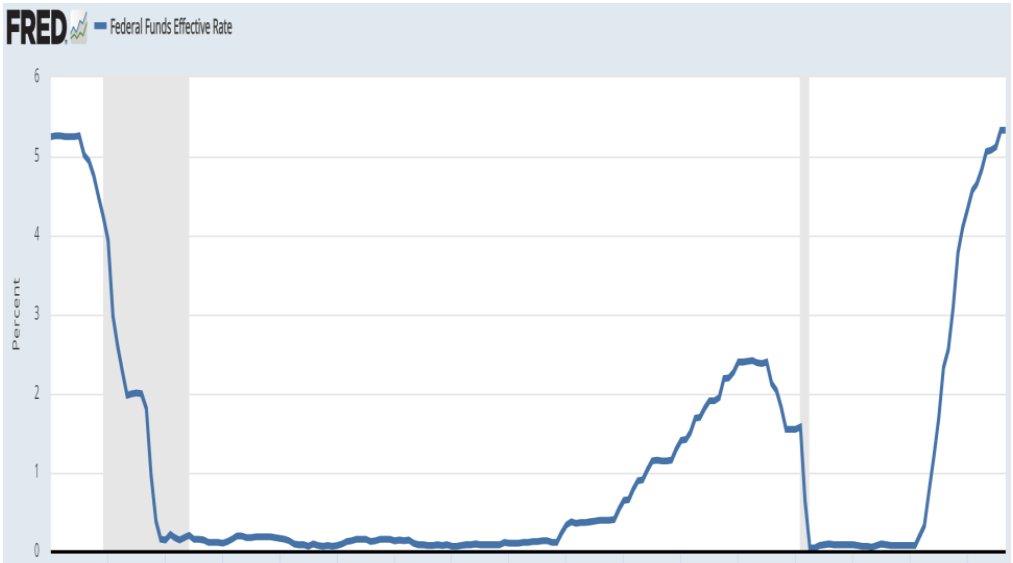
BIS CCA Research Conference

October 26-27, 2022

Motivation



Source: Federal Reserve Bank of Cleveland calculations based on data from Federal Reserve Board and Haver Analytics.



This paper

- What are the aggregate effects of *credit polices*?
- Model: Combines frictions to *credit supply* and *credit demand*.
- My discussion:
  - A simple model of credit supply frictions.
  - Questions / comments.

Simple Model

One-Period Bankers

- One-period-lived representative banker:
  - Endowed with resources W_t (*exogenous*).
  - Issues deposits D_t to households, at non-contingent rate R_t.
  - Buys S_t securities issued by nonfinancial firms, price Q_t.

$$Q_t S_t = W_t + D_t$$

  - At $t+1$ receives return from securities $R_{K,t+1}$, repays deposits, and exits.

One-Period Bankers

- One-period-lived representative banker:
  - Endowed with resources W_t (*exogenous*).
  - Issues deposits D_t to households, at non-contingent rate R_t.
  - Buys S_t securities issued by nonfinancial firms, price Q_t.

$$Q_t S_t = W_t + D_t$$

  - At $t+1$ receives return from securities $R_{K,t+1}$, repays deposits, and exits.

- *Enforcement friction:*
  At end of t, banker may default on D_t and walk away with $\lambda Q_t S_t$.

One-Period Bankers

- One-period-lived representative banker:
  - Endowed with resources W_t (*exogenous*).
  - Issues deposits D_t to households, at non-contingent rate R_t.
  - Buys S_t securities issued by nonfinancial firms, price Q_t.

$$Q_t S_t = W_t + D_t$$

  - At $t+1$ receives return from securities $R_{K,t+1}$, repays deposits, and exits.

- *Enforcement friction:*
  At end of t, banker may default on D_t and walk away with $\lambda Q_t S_t$.

- Incentive constraint:

$$\beta \left(R_{K,t+1} Q_t S_t - R_t D_t \right) \geq \lambda Q_t S_t$$

Banker's Problem

$$\max_{S_t} \quad \beta \left(R_{K,t+1} - R_t \right) Q_t S_t + \beta R_t W_t$$

$$s.t.$$

$$\beta \left(R_{K,t+1} - R_t \right) Q_t S_t + \beta R_t W_t \geq \lambda Q_t S_t$$

Banker's Problem

$$\max_{S_t} \quad \beta \left(R_{K,t+1} - R_t \right) Q_t S_t + \beta R_t W_t$$

$$s.t.$$

$$\beta \left(R_{K,t+1} - R_t \right) Q_t S_t + \beta R_t W_t \geq \lambda Q_t S_t$$

- Define $\mu_{S,t} \equiv \beta \left(R_{K,t+1} - R_t \right)$ and assume $\beta R_t = 1$

$$\max_{S_t} \quad \mu_{S,t} Q_t S_t + W_t$$

$$s.t.$$

$$Q_t S_t \leq \frac{1}{\lambda - \mu_{S,t}} W_t$$

Banker's Problem, Binding Constraint

- As long as $0 < \mu_{S,t} < \lambda$ banker borrows to the limit:

$$Q_t S_t = \frac{1}{\lambda - \mu_{S,t}} W_t$$

Banker's Problem, Binding Constraint

- As long as $0 < \mu_{S,t} < \lambda$ banker borrows to the limit:

$$Q_t S_t = \frac{1}{\lambda - \mu_{S,t}} W_t$$

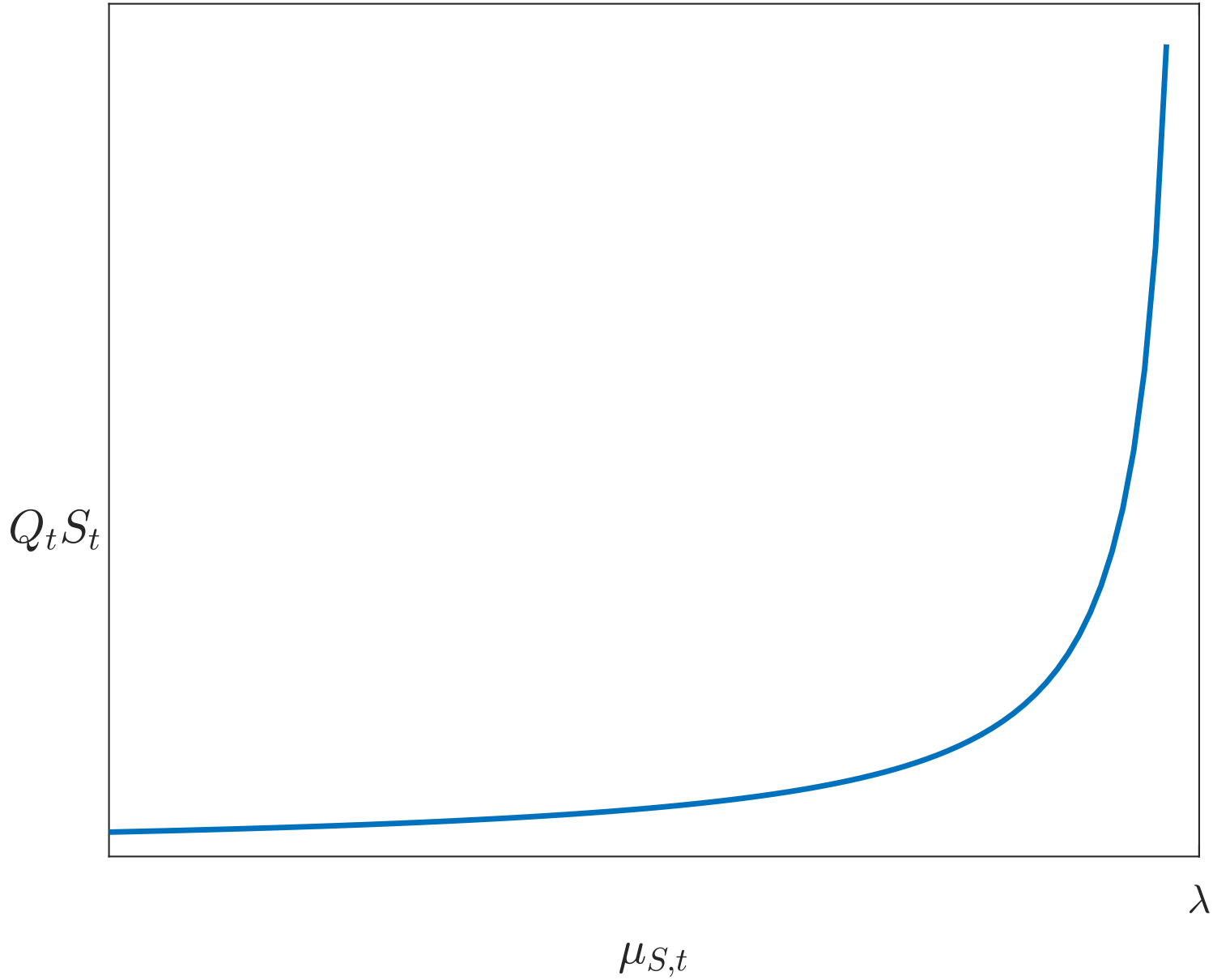
  - Decision rule for S_t linear in $W_t \longrightarrow$ aggregation.

Banker's Problem, Binding Constraint

- As long as $0 < \mu_{S,t} < \lambda$ banker borrows to the limit:

$$Q_t S_t = \frac{1}{\lambda - \mu_{S,t}} W_t$$

Banker Problem, Binding Constraint



Banker Problem, Binding Constraint

- As long as $0 < \mu_{S,t} < \lambda$ banker borrows to the limit:

$$Q_t S_t = \frac{1}{\lambda - \mu_{S,t}} W_t$$

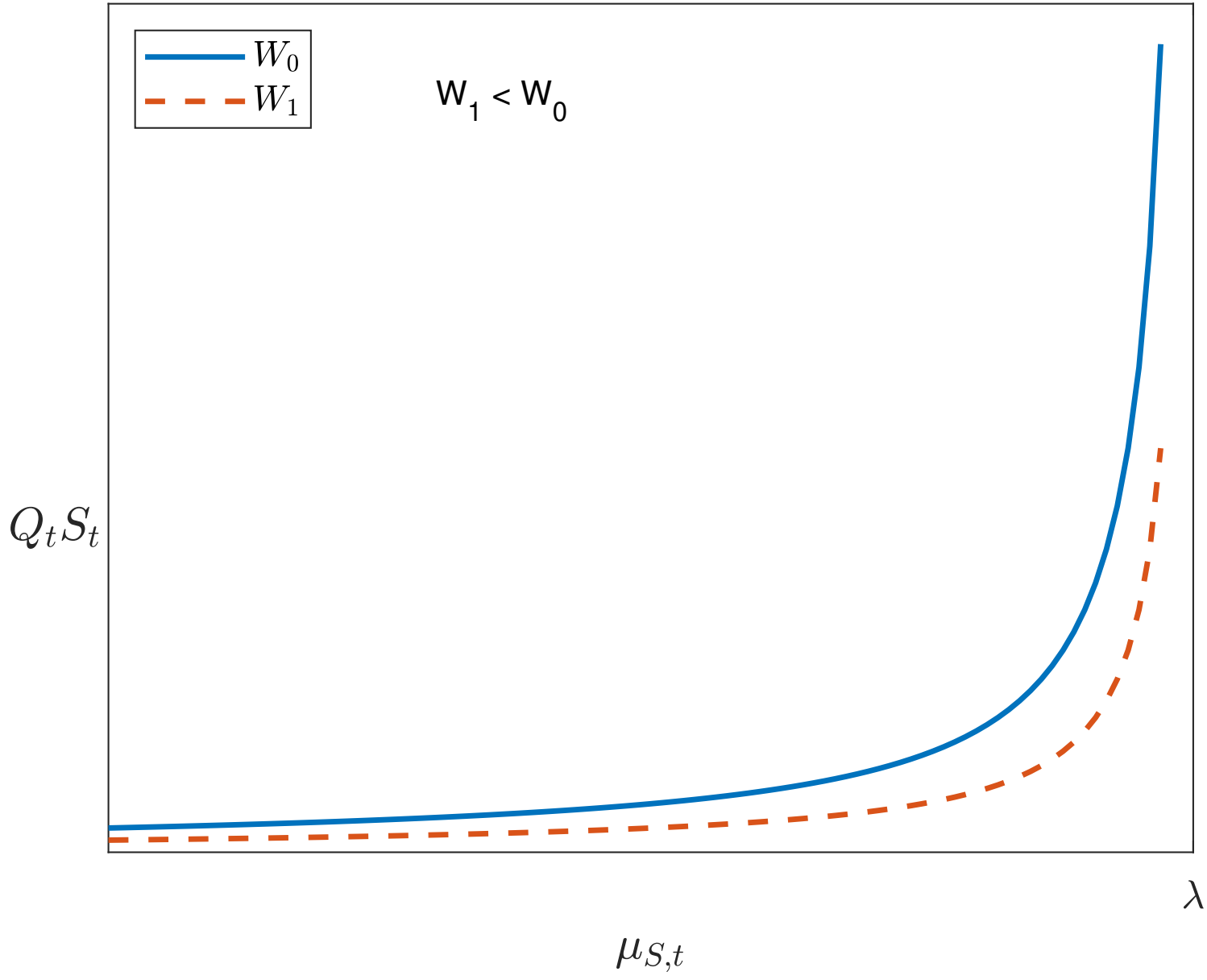
Banker Problem, Binding Constraint

- As long as $0 < \mu_{S,t} < \lambda$ banker borrows to the limit:

$$Q_t S_t = \frac{1}{\lambda - \mu_{S,t}} W_t$$

- Suppose $\downarrow W_t$:

Banker Problem, Binding Constraint



Banker Problem, Binding Constraint

- As long as $0 < \mu_{S,t} < \lambda$ banker borrows to the limit:

$$Q_t S_t = \frac{1}{\lambda - \mu_{S,t}} W_t$$

- Suppose $\downarrow W_t$: With downward-sloping credit demand,
  - $Q_t S_t \downarrow$ (credit falls)
  - $\mu_{S,t} \uparrow$ (lending spread rises)

Banker Problem, Binding Constraint

- As long as $0 < \mu_{S,t} < \lambda$ banker borrows to the limit:

$$Q_t S_t = \frac{1}{\lambda - \mu_{S,t}} W_t$$

- Suppose $\downarrow W_t$: With downward-sloping credit demand,
  - $Q_t S_t \downarrow$ (credit falls)
  - $\mu_{S,t} \uparrow$ (lending spread rises)
- With endogenous W_t, financial accelerator:

$$W_t \downarrow \longrightarrow I_t, Q_t \downarrow \longrightarrow R_{K,t} \rightarrow W_t \downarrow\downarrow$$

Comments

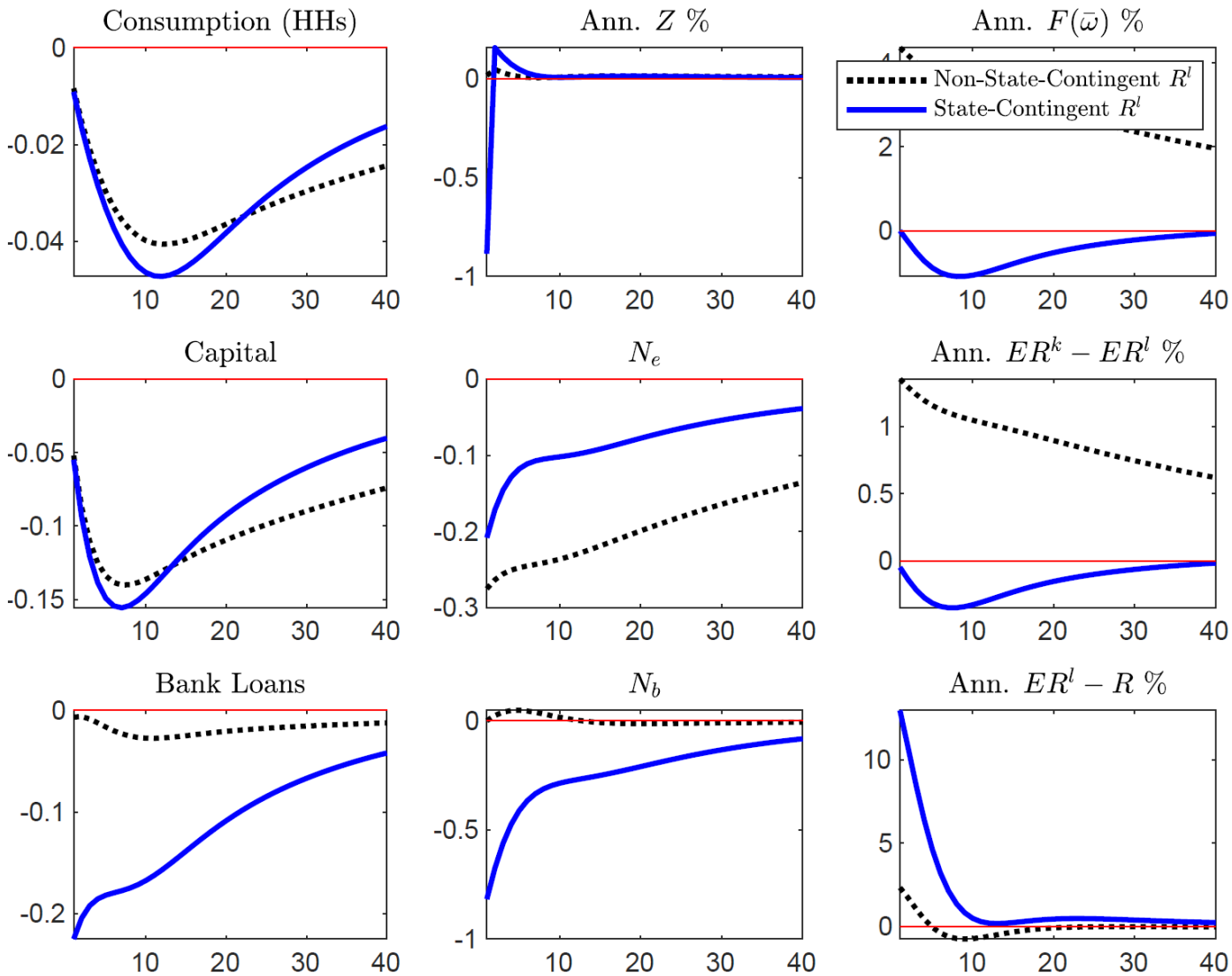
1. Credit demand and the BGG contract.

   - BGG assume the return paid by entrepreneurs does *not* vary with the aggregate state.
   - Chari (2003) originally pointed out (at a BIS conference!) that with risk-neutral entrepreneurs and risk-averse households, BGG's assumption cannot be optimal.
     - See e.g. Carlstrom, Fuerst, & Paustian (2016, AEJ: Macro) who derive fully optimal contract in the BGG setting.
   - Authors assume $R^l_{t+1} = \xi_t R^k_{t+1}$, with ξ_t "endogenously determined in the general equilibrium."
   - How is ξ_t determined? How does it depend on aggregate shocks or other aggregates? Is this contract optimal?

Comments

2. Do assumptions on who bears aggregate risk matter *for aggregates*?

Figure 1. *A five percent negative capital quality shock: State vs non-state contingent contract*



Comments

3. For stage-setting, the following figure might be useful: capital quality shock with
   - No frictions.
   - Only credit supply frictions.
   - Only credit demand frictions.
   - Both frictions simultaneously.

Comments

3. For stage-setting, the following figure might be useful: capital quality shock with
   - No frictions.
   - Only credit supply frictions.
   - Only credit demand frictions.
   - Both frictions simultaneously.
4. Effects on GDP are conspicuous by absence in figures and discussion.

Comments

3. For stage-setting, the following figure might be useful: capital quality shock with
   - No frictions.
   - Only credit supply frictions.
   - Only credit demand frictions.
   - Both frictions simultaneously.
4. Effects on GDP are conspicuous by absence in figures and discussion.
5. Paper shows many results (up to 10 figures in main text) with many comparisons across policies. Suggestion: pick the most important ones, those with a clear punchline, and focus on delivering a strong message on them.

Comments

3. For stage-setting, the following figure might be useful: capital quality shock with
   - No frictions.
   - Only credit supply frictions.
   - Only credit demand frictions.
   - Both frictions simultaneously.
4. Effects on GDP are conspicuous by absence in figures and discussion.
5. Paper shows many results (up to 10 figures in main text) with many comparisons across policies. Suggestion: pick the most important ones, those with a clear punchline, and focus on delivering a strong message on them.
6. Final suggestion: Effects of various policies with/without zero lower bound on policy rate.

Conclusions

- Well-crafted, comprehensive, and timely paper, studying effects of new policy tools using the right framework to do so.

- Welcome effort to combine credit supply and credit demand frictions in a single model.