Discussion of

The Financial (In)Stability Real Interest Rate, $R^{**}$

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Motivation

- Connection between financial stability and stance of monetary policy
  - Ceteris Paribus: Increasing interest rates weakens borrower balance sheets
  - In turn, weakened balance sheets reduce credit access, etc

- Other factors may be driving financial instability (e.g., house price collapse)
  - But stance of monetary policy affects if and how crisis plays out

- Standard crisis indicators (e.g., leverage ratios, credit spreads) limited
  - Do not provide clear implications for rate setting

- Standard benchmark: Natural Rate of Interest, $R^*$, silent about financial factors
What This Paper Does

▶ Constructs benchmark interest rate $R^{**}$ where

▶ $R > R^{**} \rightarrow$ financial distress
▶ $R < R^{**} \rightarrow$ no distress

▶ $R^{**}$ is a companion to the natural rate $R^*$

▶ $R^{**} > R^* \rightarrow R^*$ compatible with financial stability
▶ $R^{**} < R^* \rightarrow R^*$ NOT compatible with financial stability

▶ Approach: Start with model of banking distress

▶ Derive $R^{**}$ from mapping with standard measures of distress (leverage, spreads)
▶ Add descriptive evidence to show model mapping is reasonable
Simple Banking Crisis Model

Bank balance sheet:

\[ Q_t K_t = D_t + E_t \]

Evolution of equity:

\[ E_{t+1} = R_k^t Q_t K_t - R_t D_t - Div_t \]

Leverage constraint

\[ \frac{Q_t K_t}{E_t} \leq \phi_t \]
Two Regimes

Based on whether leverage constraint is binding:

1. \( \frac{Q_tK_t}{E_t} < \phi_t \rightarrow \) no limits to arbitrage:
   \[ \bar{R}_t^k \approx R_t \]

2. \( \frac{Q_tK_t}{E_t} = \phi_t \rightarrow \) bank is "capital constrained"
   \[ \bar{R}_t^k > R_t \]

- Financial crisis: sharp drop in \( E_t \) that tightens constraint, pushing up \( \bar{R}_t^k - R_t \)
- Financial instability rate \( R^{**}_t \):
  - Threshold value of \( R_t \) at which leverage constraint just binds.
Primary dealers include the largest U.S. commercial and investment banks.
Dealer leverage from He, Kelly, and Manela (JFE 2017)
**Constructing $R^{**}$**

1 - Leverage varies inversely with asset price $Q_t$

\[
\frac{Q_tK_t}{E_t} = \frac{Q_tK_t}{Q_tK_t-D_t} = \frac{K_t}{K_t-D_t/Q_t}
\]

2 - $Q_t$ varies inversely with $R_t$

\[
Q_t = \sum_{j=t}^{\infty} \frac{\prod}{R^{j-t}} = \frac{\prod}{R-1}
\]

3 - 1 and 2 $\rightarrow$ leverage $\frac{Q_tK_t}{E_t}$ varies positively with $R_t$ $\rightarrow$

Intuition:

$R_t \downarrow \rightarrow E_t \uparrow$ relative to $Q_tK_t$, relaxing leverage constraint $\frac{Q_tK_t}{E_t} < \phi_t$
Constructing \( R^{**} \) (con’t)

Given \( \frac{Q_t K_t}{E_t} = \frac{K_t}{K_t - D_t / Q(\Pi, R^{**})} \):

- \( R^{**} \) is the maximum value of \( R_t \) that solves
  \[
  \frac{K_t}{K_t - D_t / Q(\Pi, R^{**})} = \phi_t
  \]
- \( R_t < R^{**} \): leverage constraint not binding
- \( R_t \geq R^{**} \): constraint binding \( \rightarrow \) crisis region

- \( R^{**} \) depends on financial conditions
  - (i) \( D_t \uparrow \rightarrow R_t^{**} \downarrow \) (ii) \( K_t \uparrow \rightarrow R_t^{**} \uparrow \) (iii) \( \Pi_t \uparrow \rightarrow R_t^{**} \uparrow \)
  - Varies inversely with credit spread \( \bar{R}_t^k - R_t \)
Generalized Model: Banks also hold safe assets $B_t$

Banks also hold safe assets $B_t$:

$$Q_t K_t + B_t = D_t + E_t$$

Evolution of equity:

$$E_{t+1} = R_t^k Q_t K_t + R_t B - R_t^d D_t - Div_t$$

Leverage constraint

$$\frac{Q_t K_t + B_t}{E_t} \leq \bar{\phi}(\frac{B_t}{Q_t K_t + B_t})_t \text{ with } \bar{\phi}'(\cdot)_t > 0$$

Safe assets relax constraint
Generalized Model (con’t)

Two (extra) implications:

1. $R_{t}^{**}$ depends also on fraction of safe assets in bank portfolio
   
   (a) Varies positively with $\frac{B_{t}}{Q_{t}K_{t} + B_{t}}$

2. Prolonged low interest rates can move banks into crisis region

   (a) Reduces rate of return on bank assets $\rightarrow$ reduces accumulation of bank equity

   $$E_{t+1} = R_{t}^{k}Q_{t}K_{t} + R_{t}B - R_{t}^{d}D_{t} - Div_{t}$$

   (b) $\rightarrow$ Leverage increases $\rightarrow$ $R^{**}$ declines
Some Comments

1 - Model generates inverse relation between $R^{**}$ and credit spreads

→ Can recover $R^{**}$ from spreads

*Comment:* How does $R^{**}$ line up with other financial indicators?

2 - $R^{**} < R^{*}$ suggests tradeoff between financial stability and price/output stability

*Comment:* Fed should avoid this tradeoff at all costs by using additional tools

  a - Macroprudential tools: e.g., capital, liquidity requirements

  b - Lender of last resort tools: e.g., asset swaps and purchases