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:

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

Leverage constraint

$$\frac{Q_t K_t}{E_t} \leq \overline{\phi}_t$$

Two Regimes

Based on whether leverage constraint is binding:

1. $\frac{Q_t K_t}{E_t} < \overline{\phi}_t \rightarrow$ no limits to arbitrage:

$$\overline{R}_t^k \approx R_t$$

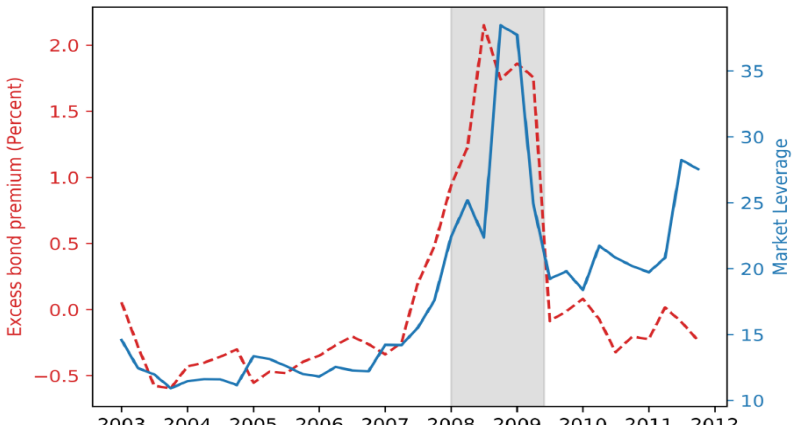
2. $\frac{Q_t K_t}{E_t} = \overline{\phi}_t \rightarrow$ bank is "capital constrained"

$$\overline{R}_t^k > R_t$$

- Financial crisis: sharp drop in E_t that tightens constraint, pushing up $\overline{R}_t^k - R_t$
- Financial instability rate R_t^{**} :
  - Threshold value of R_t at which leverage constraint just binds.

Primary Dealer Market Leverage and Financial EBP

red = Financial EBP, blue = Leverage



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

$$\frac{Q_t K_t}{E_t} = \frac{Q_t K_t}{Q_t K_t - D_t} = \frac{K_t}{K_t - D_t/Q_t}$$

2 - Q_t varies inversely with R_t

$$Q_t = \sum_{j=t}^{\infty} \frac{\Pi}{R^{j-t}} = \frac{\Pi}{R-1}$$

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

Intuition:

$R_t \downarrow \rightarrow E_t \uparrow$ relative to $Q_t K_t$, relaxing leverage constraint $\frac{Q_t K_t}{E_t} < \overline{\phi}_t$

Constructing R^{**} (con't)

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

- R_t^{**} is the maximum value of R_t that solves

$$\frac{K_t}{K_t - D_t/Q(\Pi, R^{**})} = \overline{\phi}_t$$

  - $R_t < R_t^{**}$: leverage constraint not binding
  - $R_t \geq R_t^{**}$: constraint binding $\rightarrow$ crisis region

- R_t^{**} 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 $\overline{R}_t^k - R_t$

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

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

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

$\rightarrow$ 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