The Financial (In)Stability Real Interest Rate, r**

Ozge Akinci[†*], Gianluca Benigno[†*♯], Marco Del Negro[†*], Albert Queralto[‡]

Federal Reserve Bank of New York[†], Federal Reserve Board[‡], CEPR[*], University of Lausanne[♯]

Financial Stability Considerations for Monetary Policy

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Why do we need another *?

- The *natural rate of interest* r* is associated with the notion of *macroeconomic* stability: the rate consistent with output equaling its natural rate and constant inflation (Wicksell, Woodford, ..., Laubach & Williams, ...)

- This paper introduces **r****, the **financial stability interest rate**: the *threshold real rate above which financial instability arises*

- Goal of r**: Map the notion of financial stability onto the interest rate space, and complement r* as a guide to policy

Outline

1. Illustrate r** in the context of a simple macrofinance model with an occasionally binding financing constraint

2. Discuss the drivers and dynamics of r**

   - e.g., "financial dominance": persistently low real interest rates trigger financial vulnerability and an eventual drop in r**, which may constrain monetary policy

3. Provide an empirical measure of r**

   - Show that the Fed effectively tracked r** in periods of financial stress

A Model With Financial (In)Stability Regimes

A Model With Financial (In)Stability Regimes

- Dynamic macrofinance model with financial intermediaries that face *agency frictions* in raising funds $\rightarrow$ (Gertler & Kiyotaki '10)

- Occasionally binding leverage constraint $\rightarrow$
  - *Tranquil times*: dynamics resemble run-of-the-mill DSGE
  - *Financial instability*: financial accelerator, asset fire-sale dynamics

- **r**** is the threshold real rate above which financial instability arises:
  $\rightarrow$ *the real interest rate that makes the financial constraint just bind*

- Use r** as a summary statistic for financial stability, just like r* is for macro conditions

The Economy

- Bankers
  - Hold (risky) capital s_t and safe asset b_t
- Households
  - Consume, supply labor, save through bank deposits d_t (interest R_t^d)
- The real interest rate on the safe asset, R_t, follows an exogenous process

  $\rightarrow$ In the background we will be thinking of monetary policy as determining R_t

ASSETS	LIABILITIES
$Q_t s_t$	d_t
b_t	n_t

Bankers' Problem

$$V_t(n_t) = max_{s_t, b_t, d_t} \ \mathbb{E}_t \Lambda_{t+1}[(1-\sigma)n_{t+1} + \sigma V_{t+1}(n_{t+1})] + \zeta_t b_t$$

$\zeta_t \rightarrow$ utility from holding safe asset (KVJ *exogenous* safety/liquidity shocks/preferences)

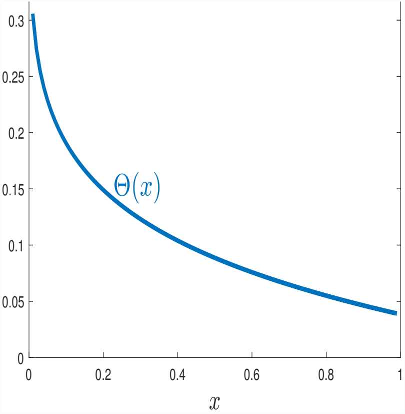
subject to

1. Evolution of net worth: $n_t = (R_{Kt} - R^d_{t-1})Q_{t-1}s_{t-1} + (R_{t-1} - R^d_{t-1})b_{t-1} + R^d_{t-1}n_{t-1}$
2. Incentive Constraint:

$$V_t(n_t) \geq \Theta(x_t)\left(Q_t s_t + b_t\right), \text{where } x_t = \frac{b_t}{Q_t s_t + b_t} \text{ and } \Theta' < 0,\ \Theta'' > 0$$

$\rightarrow$ *Occasionally binding* leverage constraint: $\underbrace{\frac{Q_t s_t + b_t}{n_t}}_{\textit{leverage}} \leq \underbrace{\frac{V_t'}{\Theta(x_t)}}_{\text{max. leverage}}$

$\Theta(\cdot)$ function



- Financial frictions become more severe when the bankers' portfolio is tilted toward risky assets $\rightarrow$ vulnerabilities $\Uparrow$

Financial (In)Stability Regimes

- When the constraint does not bind (financial stability):

$\rightarrow$ $\mathbb{E}_t(R_{Kt+1}) \approx R_t + \zeta_t$: *Spreads are low* (mostly determined by the safety/liquidity preference shock)

  - The economy resembles frictionless RBC

- When the constraint binds (*financial instability*):
  - $\mathbb{E}_t[\boldsymbol{\Omega}_{t+1}(R_{Kt+1} - R_t)] > \zeta_t \rightarrow$ *spreads are large and volatile*
  - Responses of the economy to shocks reflect the *nonlinear financial accelerator* effect: $N_t(\equiv \int n_t) \downarrow \Rightarrow Q_t \downarrow \Rightarrow N_t \downarrow$

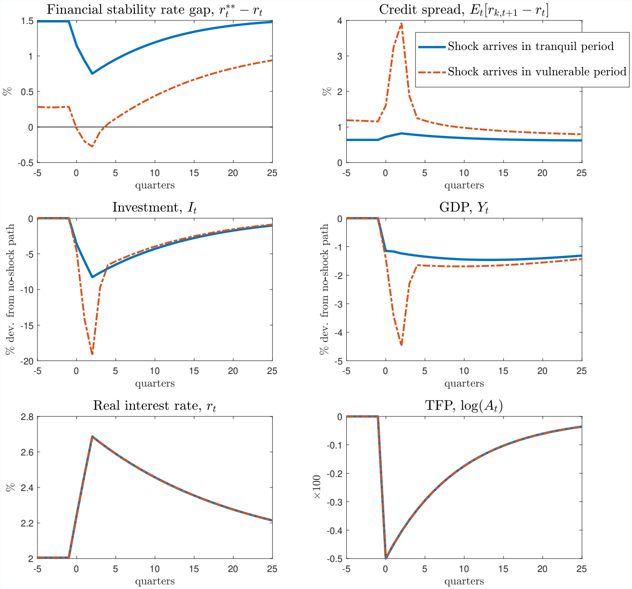
Constructing r**

- If the economy is in the unconstrained/constrained regime: increase/decrease R_t such that the constraint just binds/ceases to bind, *given the other state variables*

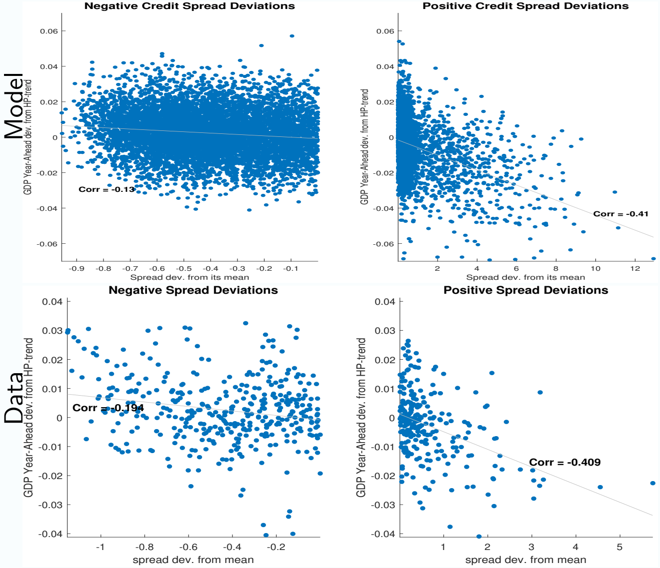
  $\Rightarrow$ r** is a *threshold* : real interest rate below r** ensures the economy remains in the financial stability regime

- Financial stability rate gap, $\mathbf{r}^{**} - \mathbf{r}$, *depends* on the evolution of other state variables, e.g., leverage and the share of risky assets in banks' portfolio

State dependent IRFs

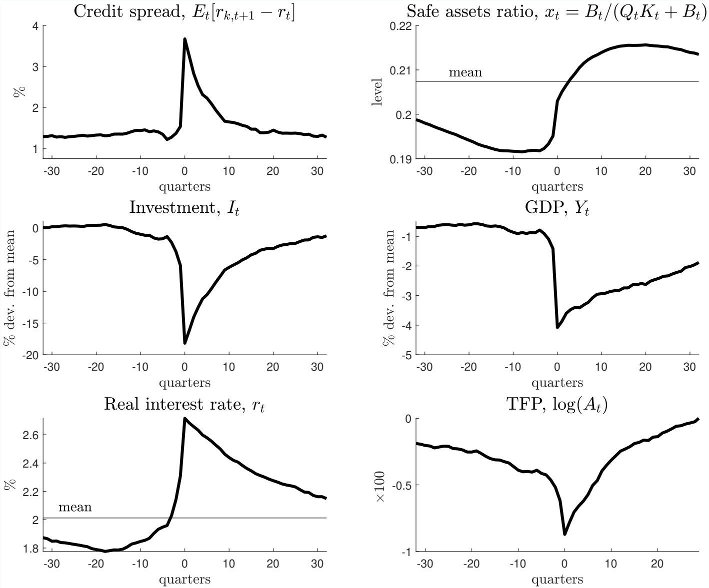


Credit spreads and economic activity



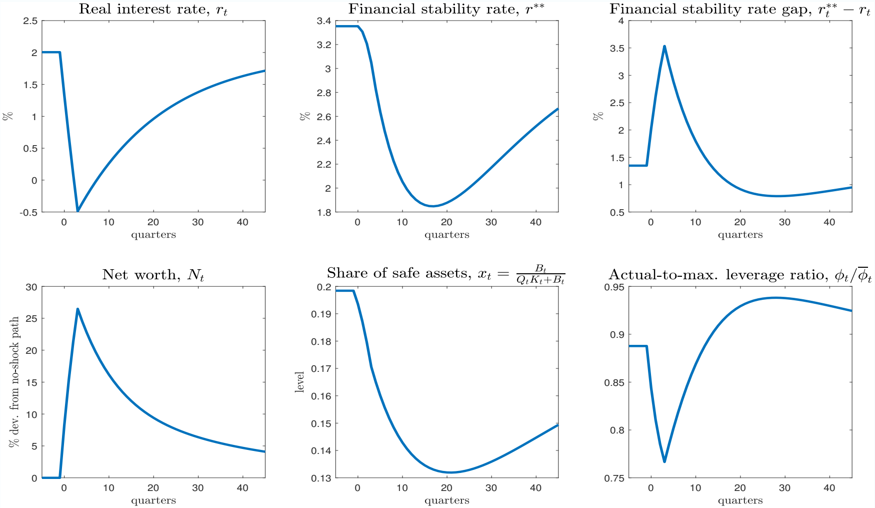
- Model captures asymmetries in the relationship between output and credit spreads

Average financial crisis in the model



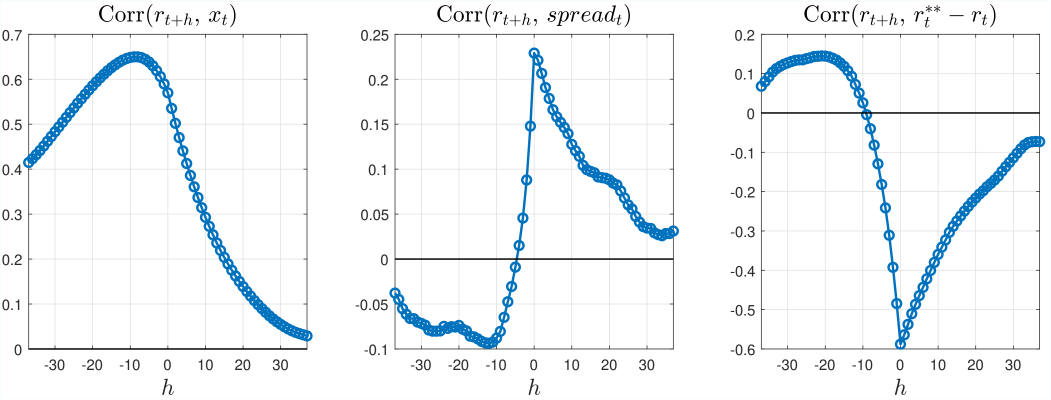
Dynamics of r**

Dynamics of r**: Impulse responses to low interest rates



- Persistently low rates today cause vulnerabilities to build up $\rightarrow$ reduce monetary policy space for maintaining "financial stability" in the future

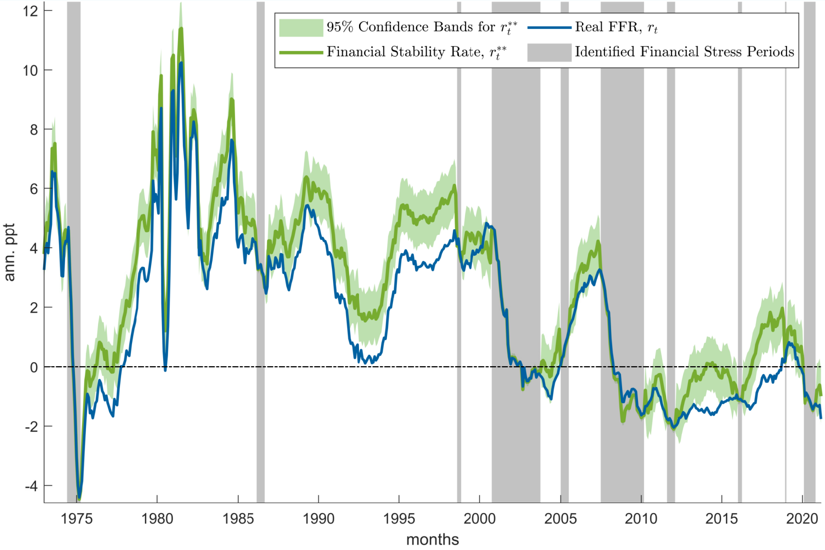
Real Rate, share of safe assets, and r**-r: Lead-lag correlations



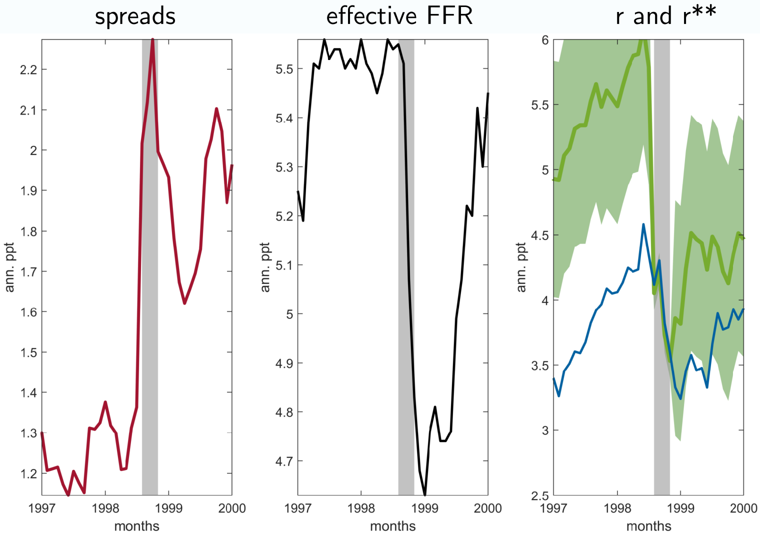
- Low real interest rates today predict search for yield and vulnerabilities (low r**-r) in the future

Measuring r**

The financial stability interest rate r_t^{**} in the **data**

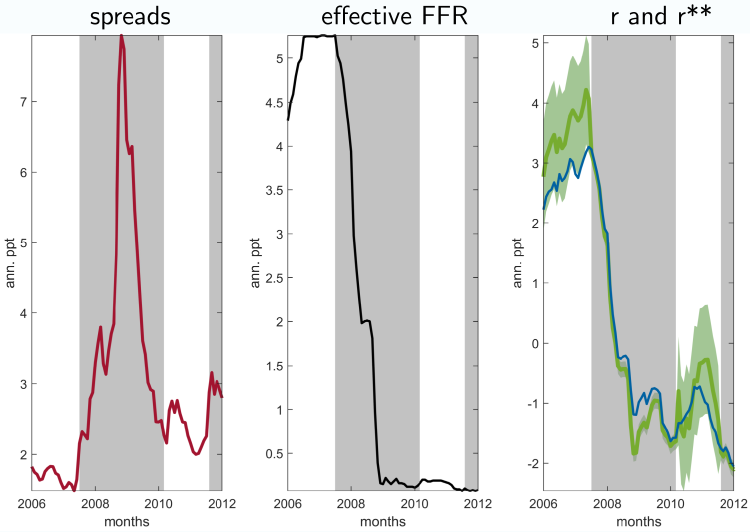


LTCM episode



"Greenspan's put"

Global Financial Crisis



Conclusion

- Introduce a new concept: **r****
  - threshold real interest rate above which the tightness of financial conditions may generate financial instability
  - enables us to translate financial vulnerabilities into an object comparable to the monetary policy rate and to the natural real interest rate
- Thank you for your attention!