Credit booms, financial crises and macroprudential policy

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Contribution

- Extends Gertler & Kiyotaki (2015, AER) bank run model
  - Booms induced by news shocks (GKP 2018)
  - Macroprudential policy
- Main results
  - Crises are hard to forecast
  - Regulatory capital requirement should not be constant

Model

- Fixed supply of capital managed by banks or housholds
- Households less efficient
- Banks financed with short term debt facing leverage constraint
- "Bank run" equilibrium possible
- Model driven by productivity shocks

Bank's problem

- $V_t(n) = \max_{\phi \geq 0} \{0, E_t \Lambda_{t,t+1} [(1-\sigma) n' + \sigma V_{t+1}(n')]\}$

$$n' = \left[\left(\frac{Z_{t+1} + Q_{t+1}}{Q_t} - \bar{R}_{t,t+1}(\phi) \right) \phi + \bar{R}_{t,t+1}(\phi) \right] n : \text{"net worth"}$$

$$\phi = \frac{Q_t k^b}{n} : \text{ "leverage ratio"}$$

$$\theta Q_t k^b \leq V_t(n)$$

  - no dividend/equity choice
  - time-varying choice of ϕ through equilibrium
  - need $n > 0$, (new banks get "start-up equity")

Bank run

- Possible if

$$\left(Z_t + Q_t^*\right) K_{t-1}^b < D_{t-1} \bar{R}_{t-1,t}$$

  - $Q_t^* < Q_t$, run can make banks insolvent!
- Need large decline in price of capital

$$Q_t = \sum_{j=1}^{\infty} E_t \left(\Lambda_{t,t+1} Z_{t+j}\right) - \alpha \sum_{j=0}^{\infty} E_t \left(\Lambda_{t,t+1} \left(1 - K_{t+j}^b\right)\right)$$

- Bank net worth is the endogenous state variable $K_t^b \left(N_t, Z_t\right)$

$$N_{t+1} = \sigma \left[\left(\frac{Z_{t+1} + Q_{t+1}}{Q_t} - \bar{R}_{t,t+1}\right) \phi_t + \bar{R}_{t,t+1}\right] N_t + W$$

- Bank capitalization affected by exogenous "start-up equity" W

Bank run, history dependence

- Possible if

$$(Z_t + Q_t^*)\, K_{t-1}^b < D_{t-1} \bar{R}_{t-1,t}$$

or

$$Z_t + Q_t^* < Q_{t-1} \bar{R}_{t-1,t} \left(\frac{\phi_{t-1} - 1}{\phi_{t-1}} \right)$$

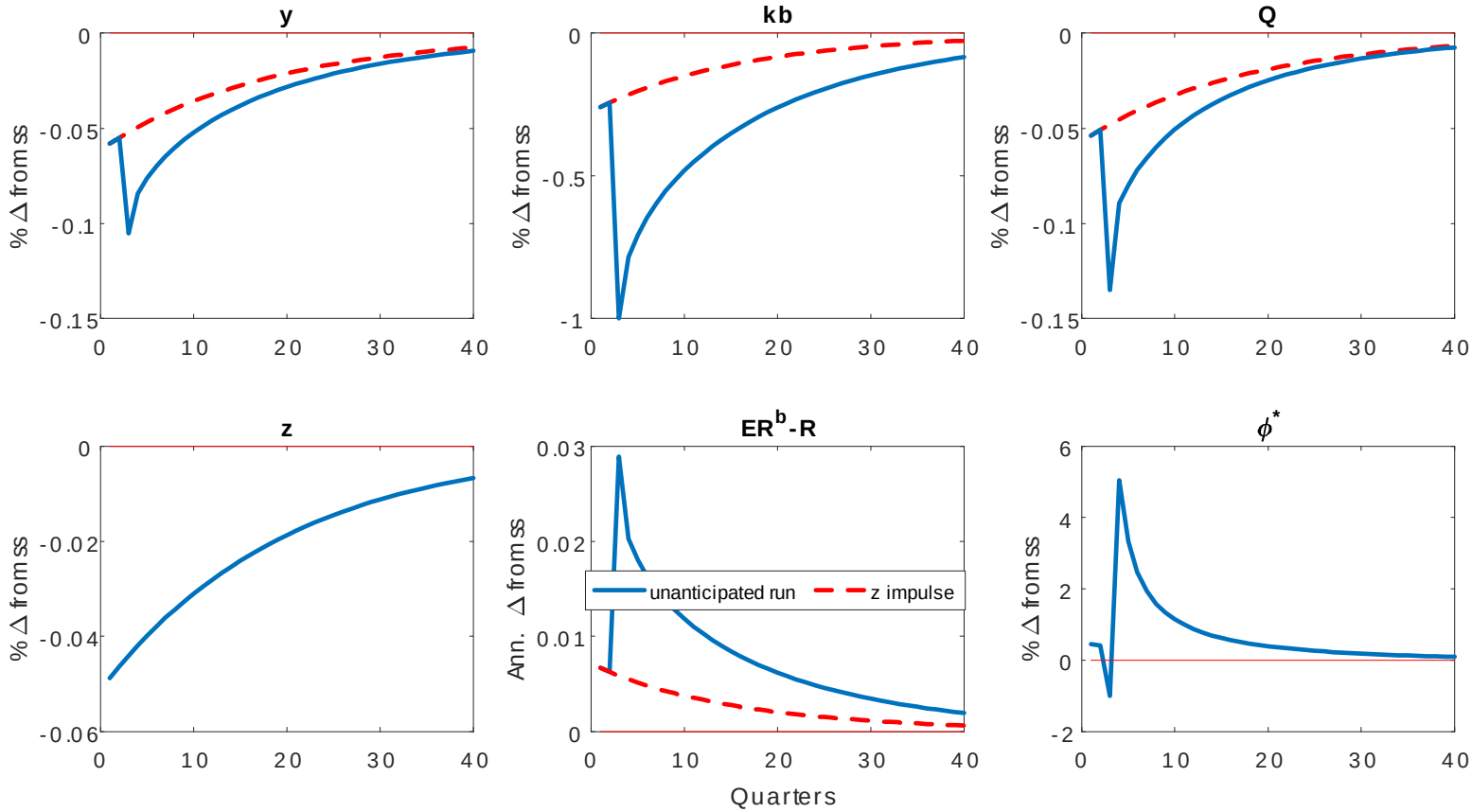
with $\phi = Q_t k^b / n$

  - More likely if ϕ_{t-1} high and Q_{t-1} high
  - ϕ_{t-1} high with high expected returns
  - Q_{t-1} high with high bank intermediation

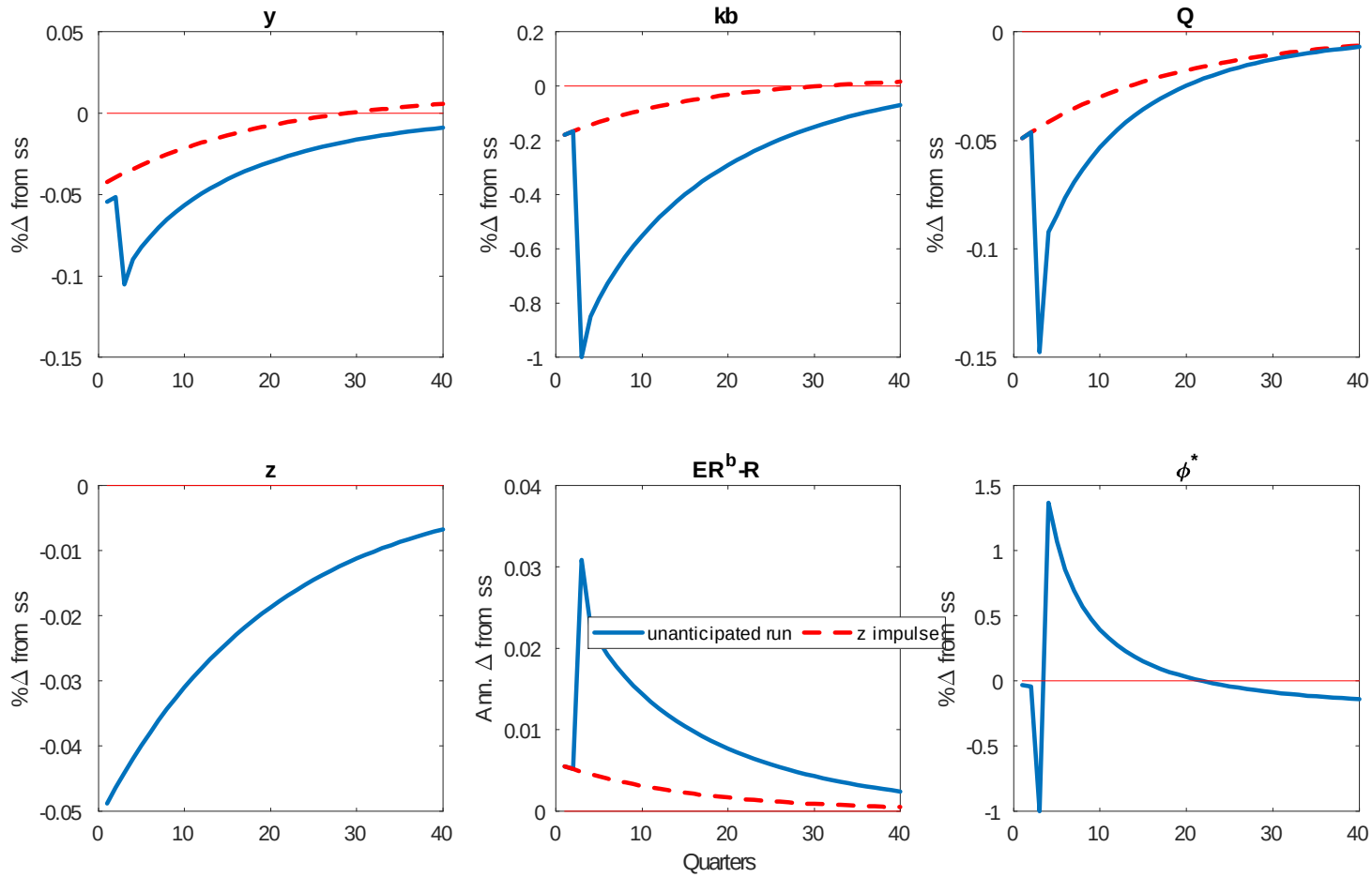
Regulatory capital ratio

- $$\bar{\kappa}_t \leq \frac{n_t}{Q_t k_t^b} = \frac{1}{\phi_t}$$
- Trade off
  - lower run probability
  - lower bank intermediation, k_t^b
  - more useful when economy fragile (high N)

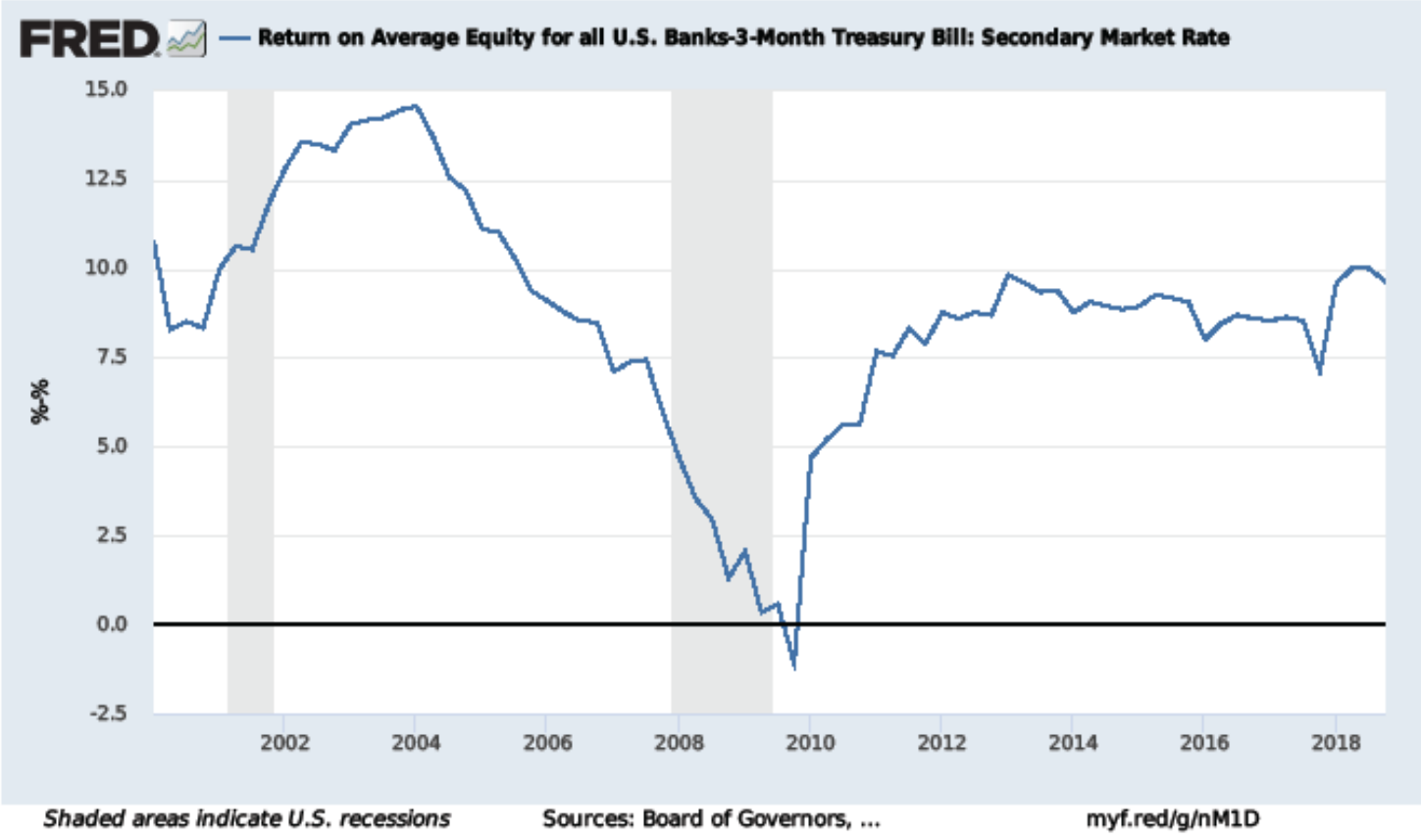
Run after large negative shock - benchmark



Run after large negative shock - high "start-up equity"



Excess Return on Equity U.S. banks



Conclusion

- Important work. Nonlinearity and history dependence in parsimonious environment.
- Endogenous external bank equity would be useful