

# Discussion of Maintaining Central-Bank Solvency under New-Style Central Banking By Robert Hall and Ricardo Reis

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March 1, 2013

# The questions

When interest rates eventually rise...

- Will capital losses and interest on reserves imperil Fed solvency?
- Will the Fed's ability to conduct monetary policy interest rates be compromised?
- Will the Fed continue to make payments to the Treasury?

# The questions

When interest rates eventually rise...

- Will capital losses and interest on reserves imperil Fed solvency?

No

- Will the Fed's ability to conduct monetary policy interest rates be compromised?

No

- Will the Fed continue to make payments to the Treasury?

Maybe

# What do they do?

Essentially an exercise in accounting.

Begin with the evolution equation for real reserves

$$V_{t+1} = (1 + r_t)V_t + q_{t+1}(B_{t+1} - (1 - \delta)B_t) - c_t B_t - n_{t+1} + d_{t+1}$$

- First part of the paper discusses the stationarity of  $V$
- Second part simulates exit from the LSAP program by making assumptions on the evolution of these
- Particular attention to various rules for  $d$  and whether ever turns negative

# What do they do?

Other papers perform similar exercises

- Carpenter, Ihrig, Klee, Boote, Quinn (Jan 2013)
- Greenlaw, Hamilton, Hooper, Miskin (Feb 2013)

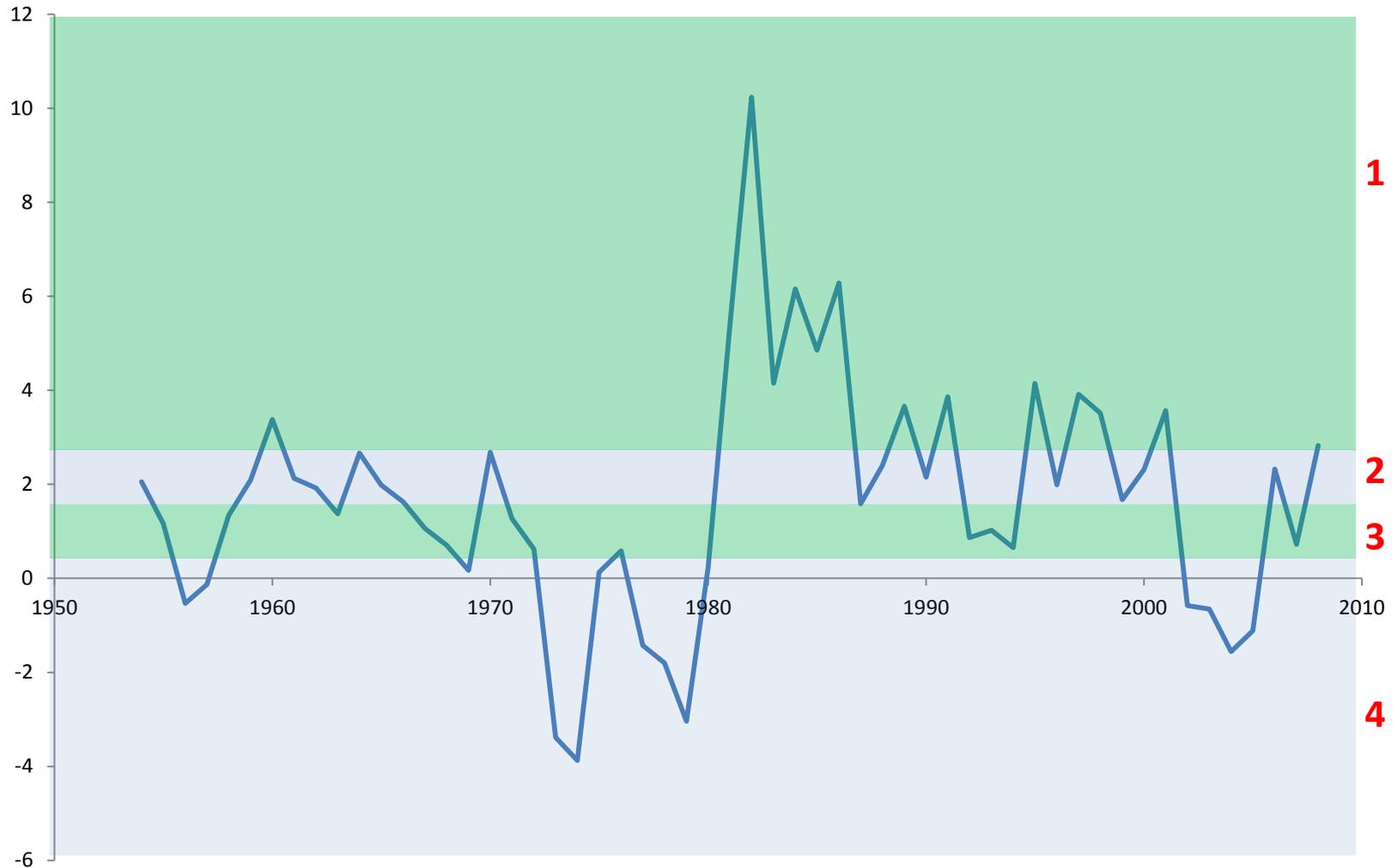
The three papers differ in the assumptions placed on the evolution of prices and the Fed balance sheet.

# What do they do?

Model real interest rate as a five state Markov chain.

- Four states associated with quartiles of ex post real one-year t-bill rates over the post-war/pre-crisis period
  - Uses observed transitions to calibrate transition matrix
- Fifth state = crisis
  - Begins in 2009
  - Assume 7% chance of entering crisis from high rate state
  - 20% chance of leaving crisis and entering mid-low rate state

# What do they do?



# What do they do?

- For each state calculate average
  - Safe rate
  - Fed bond holdings
  - Currency outstanding
- Use Markov model to price bonds
  - Use markov chain and real rates to back out stochastic discount factor
  - Choose delta to match maturity distribution of Fed debt holdings
  - Set  $c = 1$
- Dividends set according to nominal mark to market rule
  - Theorem that this leads to asymptotically stationary reserve process

# What do they do?

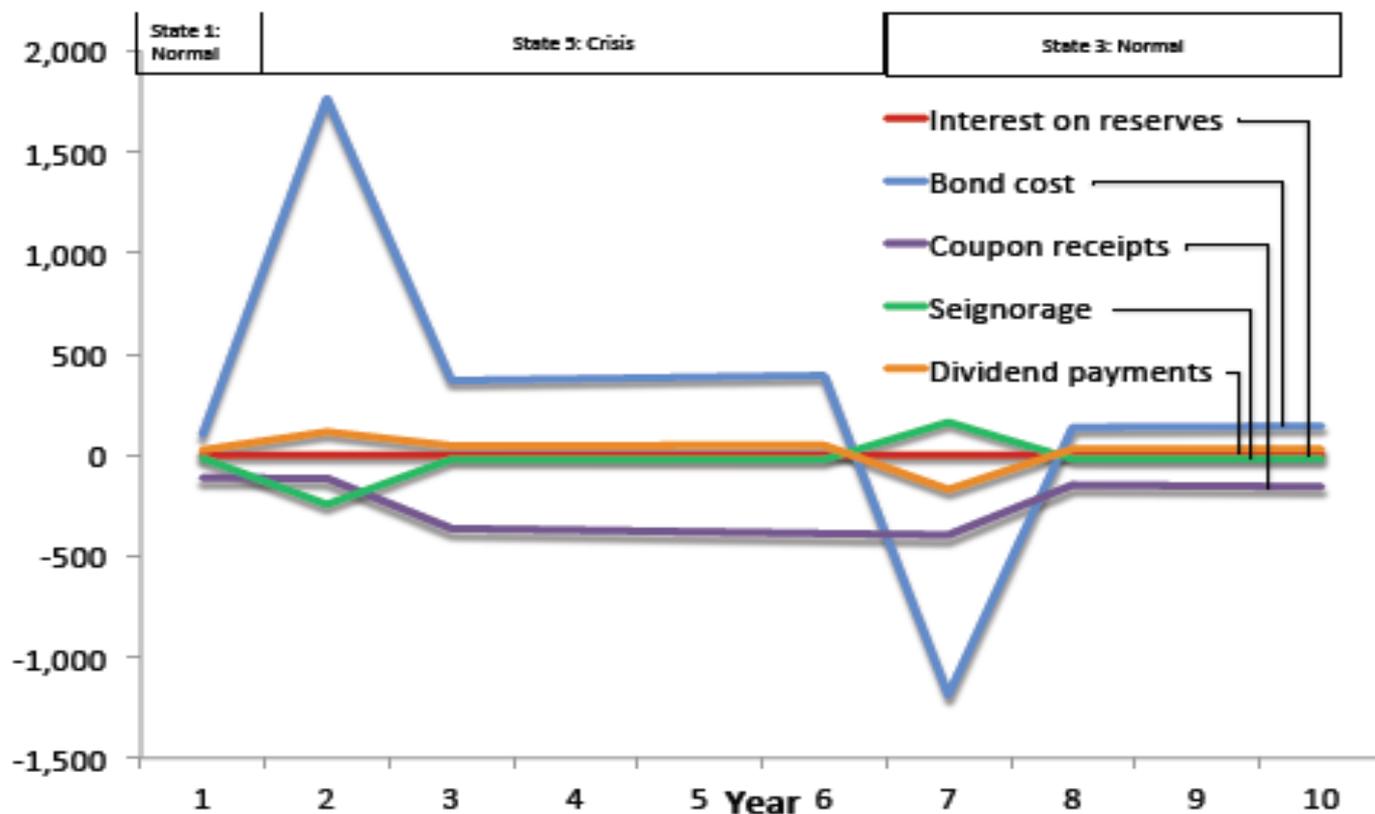
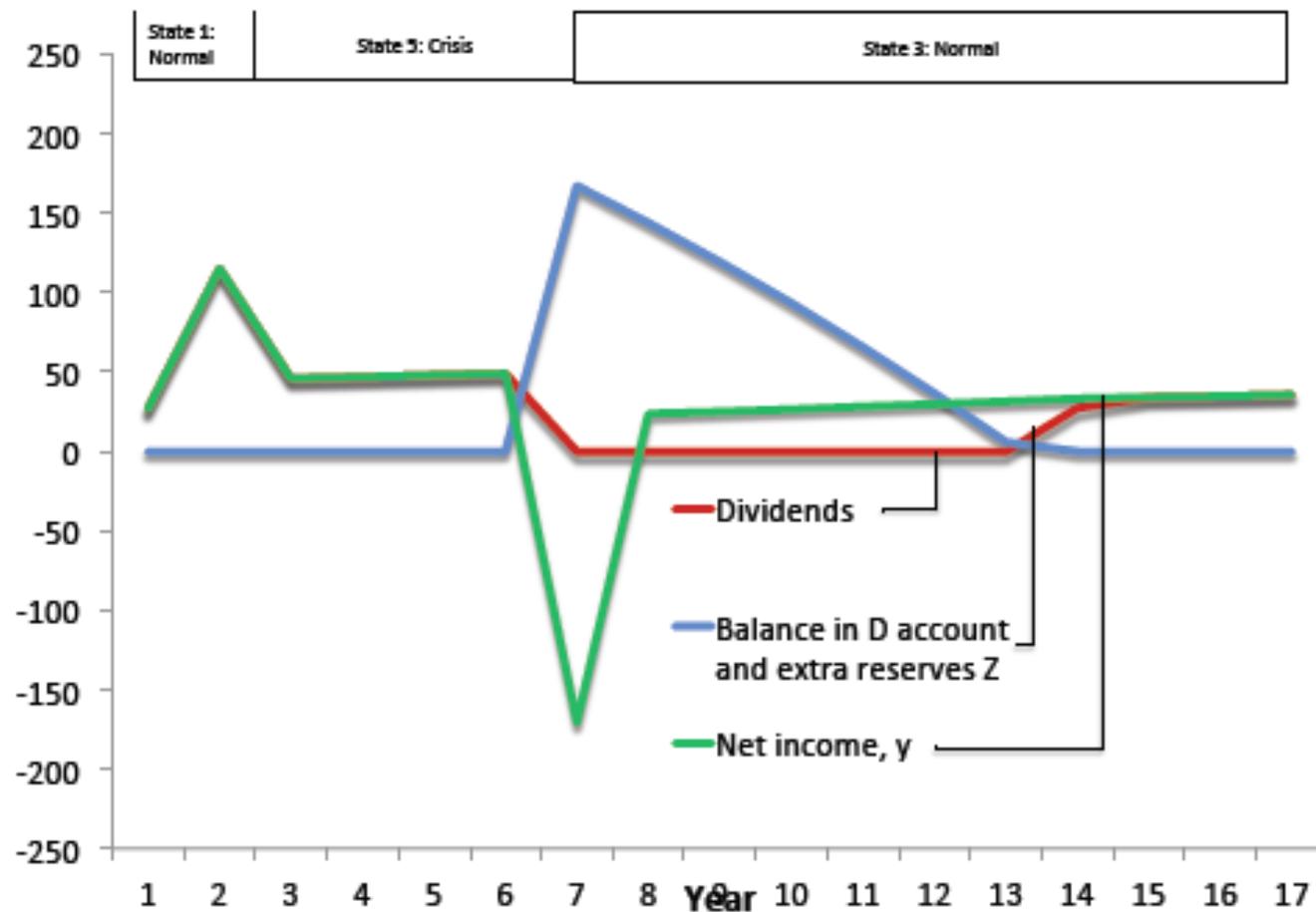


Figure 4: Flows Into and Out of Reserves

# What do they do?



# Comparison

	CIKBQ/GHHM	HR
Bond holdings	Match actual holdings of Treasury debt and agency MBS	Single Calvo bond
Bond prices	Impute yield curve from Blue Chip forecasts of long and short rates	Markov model
Asset purchases and sales	Quantify Fed intentions regarding purchases and sales from policy statements; Private sector prepayment model for mortgages	Bond holdings match historical holdings in states of Markov model
Remittances	Based on realized asset sales	Portfolio marked to market

# Additional comments

- Do not exploit the full potential of their model.
- Lots of potential endogeneity among components of model
  - Asset sales affect interest rates
  - Monetary policy affects output and inflation
  - Seignorage responds to inflationary expectations
  - Abstract from effects of policy on growth economic growth
- Only a part of the fiscal impact of the fed
  - Effect of interest rates on debt payments
  - Effect of growth on taxes

# What about the private sector?

More important question might be how rise in interest rates affect private sector.

- Begenau, Piazzesi, and Schneider