Discussion of "A model of the Reserve Asset", by He, Krishnamurthy, Milbradt

Eduardo Dávila
NYU Stern

Columbia Safe Assets Conference

Summary

- **This paper:** A theory of reserve assets

Summary

- **This paper:** A theory of reserve assets
  - Very important issue: little formal work
  - Very interesting paper

Summary

- **This paper:** A theory of reserve assets
  - Very important issue: little formal work
  - Very interesting paper
- Results
  1. Baseline model
     - How aggregate funding conditions, f and θ, and size s determine reserve asset
  2. Endogenous choice of size of issuance
  3. Coordination of issuance

Summary

- **This paper:** A theory of reserve assets
  - Very important issue: little formal work
  - Very interesting paper
- Results
  1. Baseline model
     - How aggregate funding conditions, f and θ, and size s determine reserve asset
  2. Endogenous choice of size of issuance
  3. Coordination of issuance
- **Two** important **assumptions**:
  - Rollover risk $\Rightarrow$ Strategic complementarities
  - Fixed demand for safety $\Rightarrow$ Strategic substitutabilities

Review of the model

Environment

- Two countries, $i = 1, 2$
  - Supply of (unit face value) bonds: s_1, s_2, with prices p_1, p_2
  - Fiscal shortfall: $1 - \theta_1$, $1 - \theta_2$

Review of the model

Environment

- Two countries, $i = 1, 2$
  - Supply of (unit face value) bonds: s_1, s_2, with prices p_1, p_2
  - Fiscal shortfall: $1 - \theta_1$, $1 - \theta_2$
- Unit measure of identical investors: $s_1 p_1 + s_2 p_2 = 1 + f$
  - Fixed demand for bonds: $1 + f$

Review of the model

Environment

- Two countries, $i = 1, 2$
  - Supply of (unit face value) bonds: s_1, s_2, with prices p_1, p_2
  - Fiscal shortfall: $1 - \theta_1$, $1 - \theta_2$
- Unit measure of identical investors: $s_1 p_1 + s_2 p_2 = 1 + f$
  - Fixed demand for bonds: $1 + f$
- Rollover risk: default if $p_i < 1 - \theta_i$

Review of the model

Environment

- Two countries, $i = 1, 2$
  - Supply of (unit face value) bonds: s_1, s_2, with prices p_1, p_2
  - Fiscal shortfall: $1 - \theta_1$, $1 - \theta_2$
- Unit measure of identical investors: $s_1 p_1 + s_2 p_2 = 1 + f$
  - Fixed demand for bonds: $1 + f$
- Rollover risk: default if $p_i < 1 - \theta_i$

Information structure

- Paper: public and private signals about $\theta_1 - \theta_2$
  - Threshold equilibrium
  - Non-monotone equilibrium

Review of the model

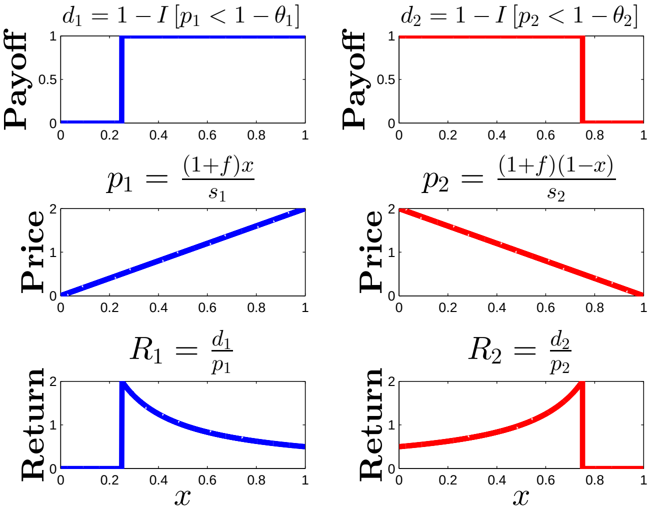
Environment

- Two countries, $i = 1, 2$
  - Supply of (unit face value) bonds: s_1, s_2, with prices p_1, p_2
  - Fiscal shortfall: $1 - \theta_1$, $1 - \theta_2$
- Unit measure of identical investors: $s_1 p_1 + s_2 p_2 = 1 + f$
  - Fixed demand for bonds: $1 + f$
- Rollover risk: default if $p_i < 1 - \theta_i$

Information structure

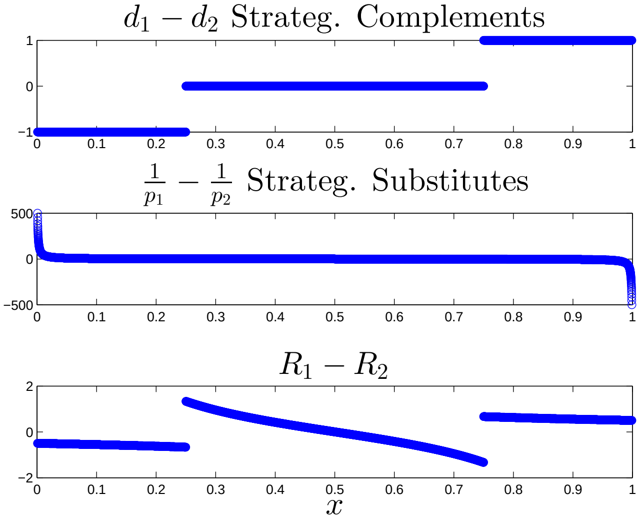
- Paper: public and private signals about $\theta_1 - \theta_2$
  - Threshold equilibrium
  - Non-monotone equilibrium
- Discussion: **common knowledge**
  - Do we need the specific information structure?

Characterizing equilibria



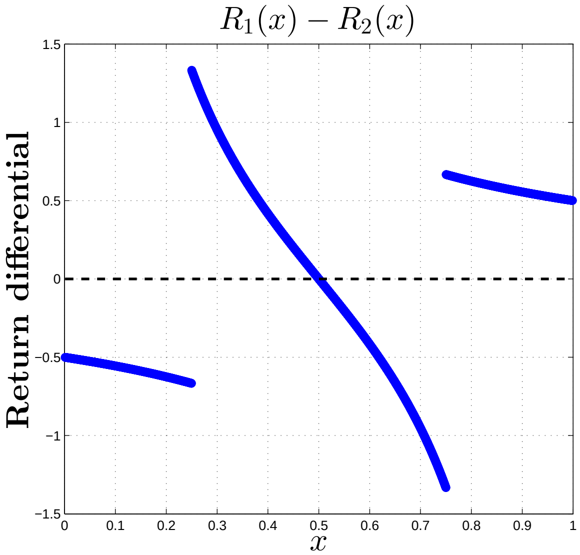
- $x \equiv$ fraction of investors that buy country 1 bond
- $s_1 = s_2 = 1,\ \theta_1 = \theta_2 = 0.5,\ f = 1$ (symmetric case)

Characterizing equilibria



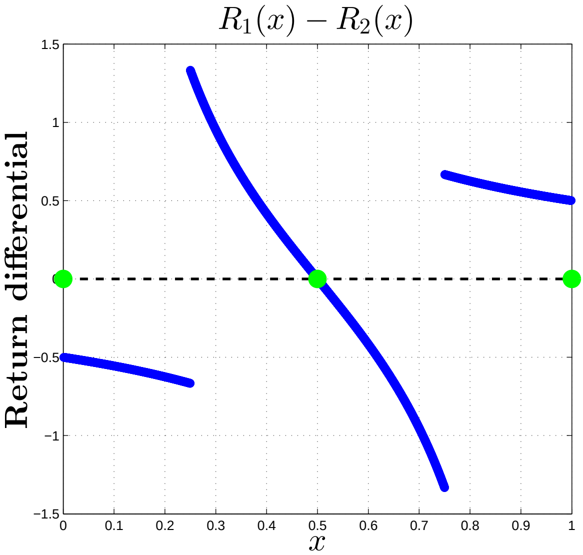
- $s_1 = s_2 = 1$, $\theta_1 = \theta_2 = 0.5$, $f = 1$ (symmetric case)

Common knowledge equilibria



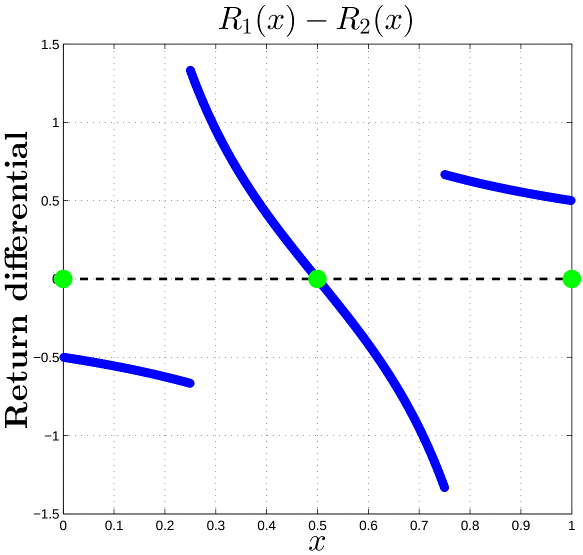
- $s_1 = s_2 = 1$, $\theta_1 = \theta_2 = 0.5$, $f = 1$ (symmetric case)

Common knowledge equilibria



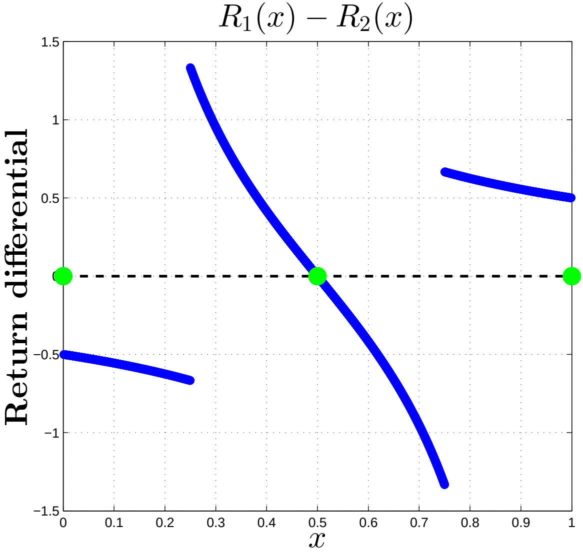
- Three **stable**, equilibria

Common knowledge equilibria



- Three **stable**, Pareto ranked equilibria

Common knowledge equilibria



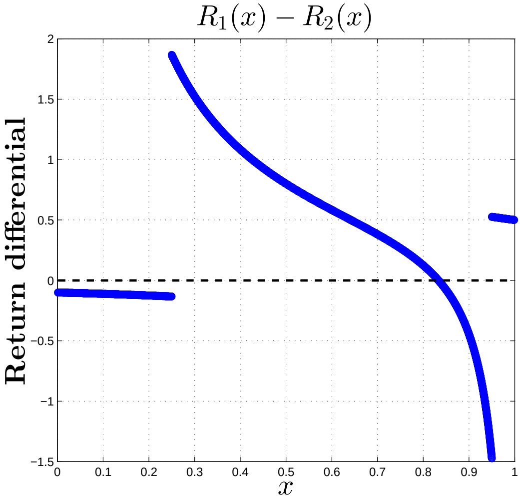
- Three **stable**, Pareto ranked equilibria
- a.e. substitutability, "overall" complementarities

Main results in the paper

- Country 1 more likely to be reserve asset when:
  1. $\downarrow s_2$ or $\uparrow s_1$: Country 1 is relatively large
  2. $\uparrow f$ or $\uparrow \theta$: Savings glut or healthy global economy
  3. $\theta_1 > \theta_2$: Country 1 is doing well
- Why? How are equilibria affected?
- Will the results on endogenous choice of size and coordination still hold using sunspots?

Comparative statics: **Country** 2 **small**

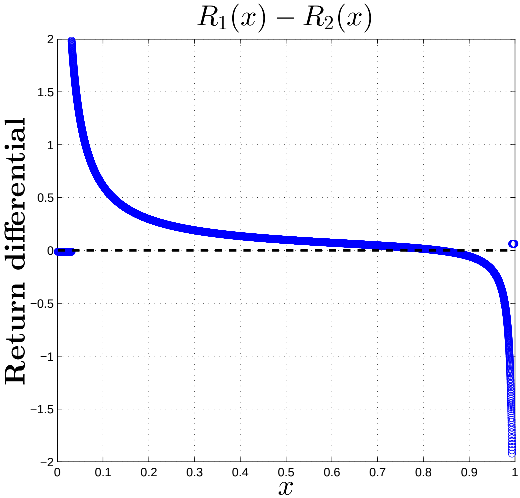
- **Thresholds:** $\underline{x} = s_1 \frac{1-\theta_1}{1+f}$, $x^* = \frac{s_1}{s_1+s_2}$, $\overline{x} = 1 - s_2 \frac{1-\theta_2}{1+f}$



- Country 2 small: $s_1 = 1$, $\mathbf{s_2 = 0.2}$, $\theta_1 = \theta_2 = 0.5$, $f = 1$

Comparative statics: **Savings glut/Healthy economy**

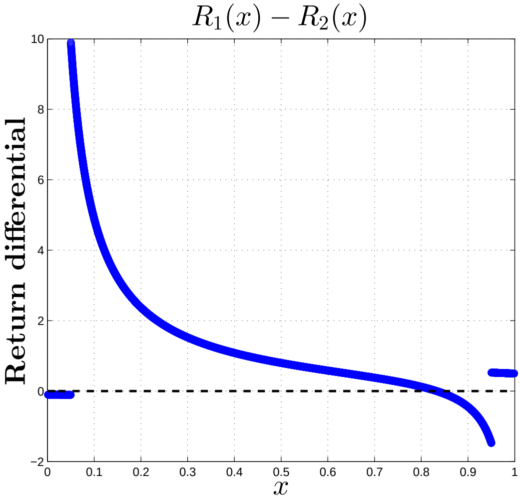
- **Thresholds:** $\underline{x} = s_1 \frac{1-\theta_1}{1+f}$, $x^* = \frac{s_1}{s_1+s_2}$, $\overline{x} = 1 - s_2 \frac{1-\theta_2}{1+f}$



- Savings glut f high: $s_1 = 1$, $\mathbf{s_2 = 0.2}$, $\theta_1 = \theta_2 = 0.5$, $\mathbf{f = 15}$

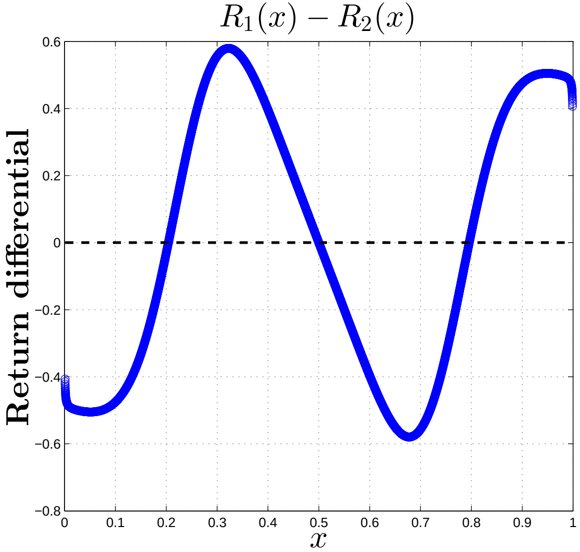
Comparative statics: **Country 1 doing well**

- **Thresholds:** $\underline{x} = s_1 \frac{1-\theta_1}{1+f}$, $x^* = \frac{s_1}{s_1+s_2}$, $\overline{x} = 1 - s_2 \frac{1-\theta_2}{1+f}$



- Country 2 small: $s_1 = 1$, $\mathbf{s_2 = 0.2}$, $\boldsymbol{\theta_1 = 0.9}$ $\theta_2 = 0.5$, $f = 1$

Common knowledge equilibria with public signals on θ_1, θ_2



- Information smooths effects out
- Five equilibria (2 unstable)

Conclusion

1. Final comments
    - Bonds are denominated in real terms
        - Currency risk for bonds
        - Reserve currency
    - How different are rollover risk complementarities from thick market complementarities?
    - Can rollover risk based theories be used to explain the reserve status of assets in positive net supply (e.g. gold)?
2. Very interesting paper: lots to explore