

# Discussion

## Self-Fulfilling Asset Prices

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# Summary

- ▶ Dynamic model of trading in financial markets with collateral constraints
  - ▶ Generates multiple equilibria
  - ▶ Feedback:  $\uparrow$  prices,  $\uparrow$  collateral values,  $\uparrow$  increase leverage,  $\uparrow$  asset demand,  $\uparrow$  prices

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  - ▶ Feedback:  $\uparrow$  prices,  $\uparrow$  collateral values,  $\uparrow$  increase leverage,  $\uparrow$  asset demand,  $\uparrow$  prices
- ▶ Main results
  - ▶ *Extrinsic* uncertainty as driver of asset prices
    - ▶ Crashes
    - ▶ Booms
    - ▶ Leverage cycles
    - ▶ Overshooting
    - ▶ etc

# Discussion

1. Describe the model, highlighting some assumptions
2. General comments/thoughts

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- ▶ Conventional:

$$b_t R_t^f \geq -\theta q_{t+1} k_t$$

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  - ▶ Everyone is ex-ante identical  $\Rightarrow$  Equilibria with mixing

# Solution

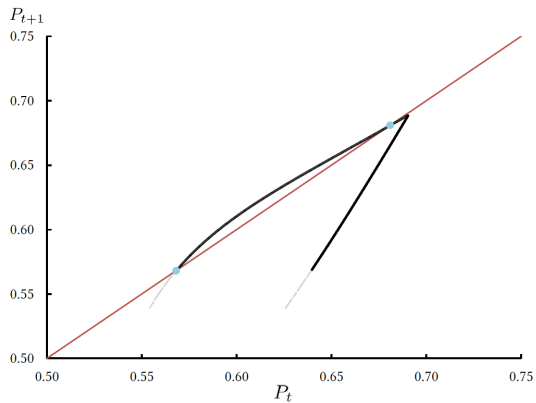
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  - ▶ Agents must be indifferent between
    - ▶ Buying both assets while borrowing
    - ▶ Investing on a single asset (high payoff)
  - ▶ Arbitrageur's collateral constraint will bind
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  - ▶ Arbitrageur's collateral constraint will bind
  - ▶ Synthetic risk-free asset yields a higher return to compensate for  $\kappa$
- ▶ Source of multiplicity different from fire-sales models
  - ▶ More selling, lower prices
  - ▶ Lower prices, more need to sell

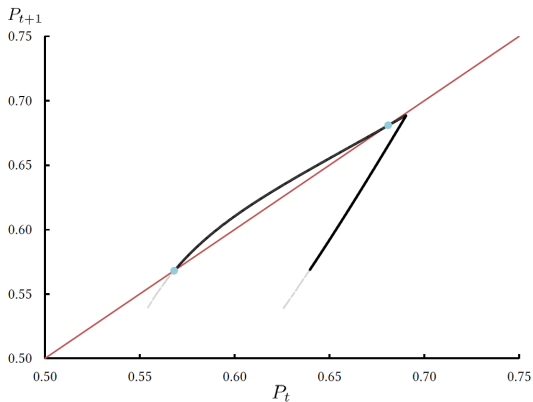
# Multiplicity

Figure 4: Multi-valued Dynamical System



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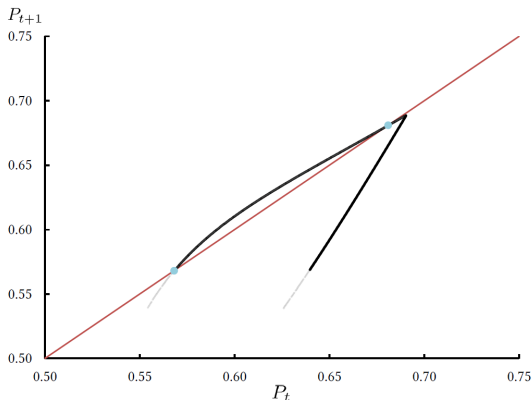
Figure 4: Multi-valued Dynamical System



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- ▶ Multiple  $P_{t+1}$  for a given  $P_t$
- ▶ My reading of the paper is that it cannot accommodate a random extrinsic aggregate shock  $\zeta_t \Rightarrow$  Analysis valid for perfect foresight shocks  $\zeta_t$ 
  - ▶ Bacchetta, Tille, Van Wincoop AER 12: “Self-Fulfilling Risk Panics”



# General Comments

## 1. Relation to the literature

- ▶ A fair of number of papers identify collateral constraints as source of multiplicity, at least since Kiyotaki/Moore 97
  - ▶ see e.g. Krishnamurthy JET 03, Lorenzoni Restud 08, Gai et al EJ 10, Benhabib and coauthors, Davila/Korinek Restud 18
- ▶ Schmitt-Grohe and Uribe WP 16: *"Multiple Equilibria in Open Economy Models with Collateral Constraints"*

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- ▶ Some of these papers find multiple equilibrium with constraints that include *current* prices

$$b_{t+1} \leq q_t k_{t+1}$$

- ▶ Purely on the theory side: What are we learning?
  - ▶ Is the arbitrage setup essential? (closer to Gromb/Vayanos, but that model does not have multiplicity)
  - ▶ Additional assumptions in addition to collateral constraint? Short selling?
  - ▶ Cost of trading?
  - ▶ Timing of constraints?

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## 2. Motivation of the choice of framework

- ▶ How to map these two assets to reality? Why this arbitrage framework?
- ▶ In the model when  $P$  goes up,  $1 - P$  goes down, by construction
- ▶ Which assets are those that alternate being collateralizable and not?

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## 3. Refinements

- ▶ Multiplicity if often seen as a nuisance, not a feature
- ▶ Robustness of the multi-valued region to information structure
- ▶ Robustness to specifications of extrinsic uncertainty