

# Financial Liberalization, Debt Mismatch, Allocative Efficiency and Growth

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# Summary

- Model of growth & crises
  - ▶ two sector AK structure: **T**radables & **N**ontradables (capital intensive)
  - ▶ N sector firms face financial frictions → balance sheet effects
- Sunspot equilibria
  - ▶ crisis = self-fulfilling drop in N price + many N sector defaults
  - ▶ crisis risk if N sector issues enough T denominated debt
- Role of asset structure ("stages of financial liberalization")
  - ▶ if contracts allow more contingencies, get more leverage
  - more investment & growth, but also more crisis risk
- Cross country evidence
  - ▶ compare output loss in crises & leverage through lens of model
  - conclude that benefit of fast growth outweighs costs from crisis risk
- Discussion
  - ▶ review model ingredients
  - ▶ comment on connection to data

## Benchmark 2 sector AK model

- Preferences (workers, entrepreneurs); world interest rate  $\delta^{-1}$

$$\sum_t \delta^t c_t^i$$

- Technology

$$\sum_i c_t^i = n_t^\alpha l_t^{1-\alpha} + \text{net foreign stuff} \quad (\text{tradables})$$

$$n_t + q_{t+1} = \theta q_t \quad (\text{nontradables})$$

- Planner problem

- ▶ constant investment rate  $q_{t+1} = \phi^* \theta q_t$
- ▶ "capital deepening": N capital grows faster than T output

- Competitive equilibrium

$$n(p_t) + \phi^* \theta q_t = \theta q_t$$

- ▶ T sector input demand  $n(\cdot)$  decreasing in  $p_t =$  relative price of N goods  $p_t$

# Mechanics: balance sheet effects & multiple equilibria

- Replace investment rate  $\phi^*$  by  $\phi(w_t) < \phi^*$

$$\underset{-}{n(p_t)} + \underset{+}{\phi(w_t)\theta q_t} = \theta q_t$$

- ▶ balance sheet effect:  $\phi$  increasing in  $w_t = N$  sector net worth
- N sector net worth increasing in price

$$w_t = w(\underset{+}{w_{t-1}}, \underset{+}{p_t})$$

- ▶ strong balance sheet effect  $\rightarrow$  backward bending demand for N goods
- Areas of state space with multiple market clearing prices
  - ▶ hi or lo price, net worth  $w_t$ , investment, demand
- Rational expectations equilibria driven by binary sunspot  $s_t$ 
  - ▶ price process  $p(w_{t-1}, s_t)$ : sunspot selects hi or lo price
- Hard work in paper
  - ▶ set up "credit market game" with explicit financial frictions
  - ▶ derive  $w(\cdot)$  as optimal strategy of N sector firms
  - ▶ obtain further predictions on risk taking & role of asset structure

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# Credit market game (played every period)

- N sector firms & risk neutral lenders (break even)
- Financial frictions faced by N sector
  - ① firms cannot commit to repay debt
    - ★ limited debt capacity; net worth matters for investment
  - ② systemic bailout guarantee (lump sum taxes used to pay lenders if many defaults)
    - ★ debt capacity still limited (no insurance against individual default)
    - ★ debt capacity higher (present value of bailout = capital)
    - ★ incentive to default when others default (price low!)
- Debt denomination: a tool to exploit bailout guarantees
  - ▶ denominate debt in T goods to default when N good price is low
  - ▶ if bailout expected, achieve higher debt capacity & ex ante investment

# Equilibria under different asset structures

- Sunspot not relevant if
  - ▶ only N debt can be issued by N firms
  - ▶ N sector small (balance sheet effect not strong enough)
- Self-fulfilling creation of crisis risk if enough T debt issued
  - ▶ suppose sunspot can trigger crisis tomorrow
  - ▶ systemic bailout expected in bad equilibrium tomorrow
  - ▶ coordinated risk taking profitable today
  - ▶ all firms denominate debt in T goods today
  - ▶ sunspot can indeed trigger crisis
- Welfare comparisons: 2nd best world with competing distortions
  - ▶ underinvestment from commitment problem...
  - ▶ ... alleviated by use of T debt + bailouts
  - ▶ whether allowing T debt is better depends on parameters, taxation

# Quantitative analysis of financial frictions

- Approach 1: "Summary statistics" for welfare effects
  - ▶ in stylized model, find number that captures welfare effects
  - ▶ e.g. wedges from frictionless FOC, or (here) leverage vs crisis loss
  - ▶ collect observable counterparts for many countries/industries/firms
  - ▶ interpret cross section as driven by as differences in frictions
- "Summary statistics" approach
  - ▶ leans heavily on model structure to derive statistic
  - ▶ assumes model applies equally to all countries etc
- "Summary statistics" approach does not
  - ▶ provide evidence in favor of model structure
  - ▶ explicitly handle other sources of variation across countries etc
- Approach may uncover x-sectional patterns, but welfare conclusions?



# Quantitative analysis of financial frictions

- Approach 2: "Country studies" using DSGE models
  - ▶ use country specific data to inform technology, financial structure
    - ★ what are key N goods (capital intensity, durability – housing vs other)
    - ★ how important is external finance in N sector
    - ★ availability of different securities
  - ▶ arrive at joint distribution of financial & macro variables
    - ★ compare to data over transition episode
    - ★ do spreads on N sector firms reflect bailout guarantees?
    - ★ does volatility vary across areas of state space?
    - ★ investment vs employment over cycle
- "Country studies approach"
  - ▶ confronts model's cross equation restrictions with data
  - ▶ failures & caveats more apparent
  - ▶ welfare conclusions easier to interpret