MACROPRUDENTIAL POLICY: PROMISE AND CHALLENGES

Enrique G. Mendoza

Discussion by

Luigi Bocola

Northwestern University and NBER

XX Annual Conference of the Central Bank of Chile

November 11 2016

The Paper

- Paper surveys advances in the literature on quantitative models with collateral constraints
- Promise of these models
  - Financial amplification allows model to reproduce key features of financial crises (qualitatively and quantitatively)
  - Scope for financial policies, both ex-ante (“macroprudential") and ex-post
- Challenges (for policymakers)
  - Optimal financial policies difficult to implement (complex, lack credibility)
  - Need coordination with other policies

Overview of Discussion

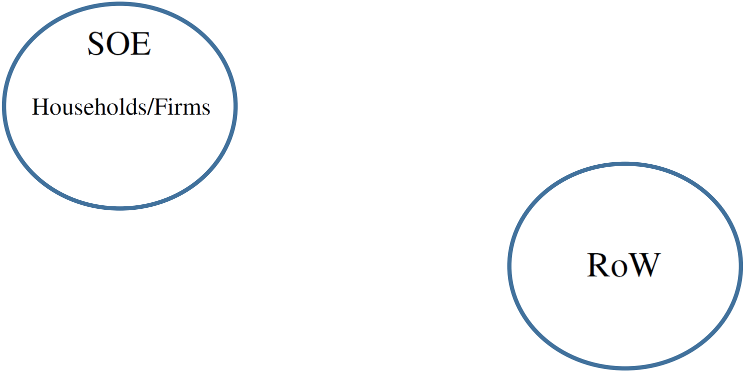
- Review the main arguments of the paper

- Two main points of discussion along the way

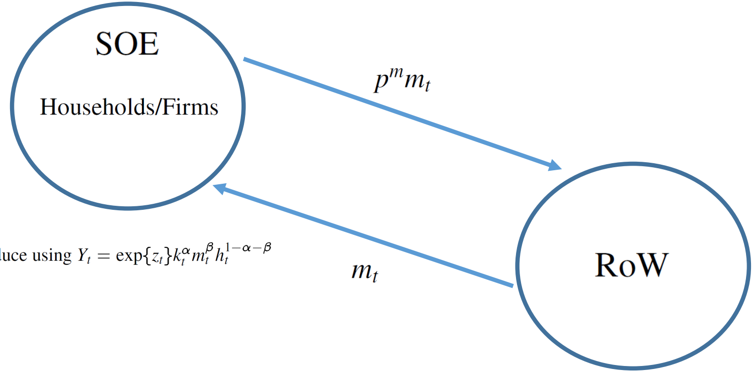
  1. Role of quantitative analysis in this class of models

  2. Scope for other prudential policies coming out from models with collateral constraints

A Prototypical Model

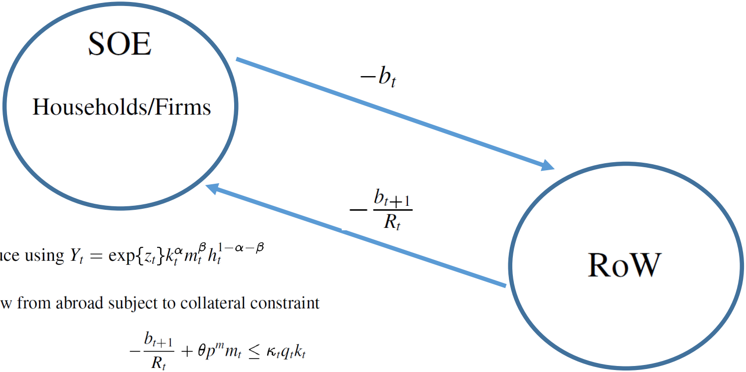


A Prototypical Model



- Produce using $Y_t = \exp\{z_t\} k_t^{\alpha} m_t^{\beta} h_t^{1-\alpha-\beta}$

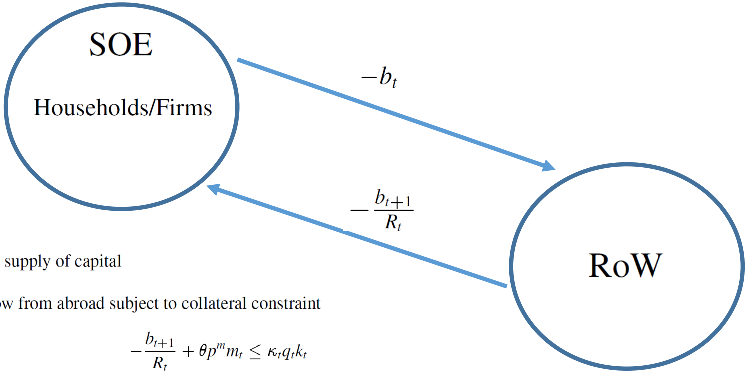
A Prototypical Model



- Produce using $Y_t = \exp\{z_t\} k_t^{\alpha} m_t^{\beta} h_t^{1-\alpha-\beta}$
- Borrow from abroad subject to collateral constraint

$$-\frac{b_{t+1}}{R_t} + \theta p^m m_t \leq \kappa_t q_t k_t$$

A Prototypical Model



- Fixed supply of capital
- Borrow from abroad subject to collateral constraint

$$-\frac{b_{t+1}}{R_t} + \theta p^m m_t \leq \kappa_t q_t k_t$$

AMPLIFICATION

Models with collateral constraints display financial amplification

- Suppose that the collateral constraint tightens (E.g. $\downarrow \kappa_t$)
- Economy can borrow less, but needs to repay $b_t \Rightarrow$ Spending in consumption, intermediate inputs, and capital drops
- Asset prices drop (because of drop in capital demand)
- Value of collateral declines even further
- $\ldots$

Key: Amplification stronger the more levered the economy is (the higher b_t)

Role for Financial Policies

Ex-ante interventions ⇒ Imposing restrictions on leverage might be welfare improving because of pecuniary externalities (Lorenzoni, 2008)

- Suppose collateral constraint does not bind today ("normal times")
- Households' optimality condition for increasing debt

$$u'(C_t) = \beta R_t \mathbb{E}_t[U'(C_{t+1})]$$

- Planner's optimality condition for increasing debt

$$u'(C_t) = \beta R_t \mathbb{E}_t \left[U'(C_{t+1}) \underbrace{-\kappa_t \mu_{t+1} \frac{\partial q_{t+1}}{\partial C_{t+1}} \frac{\partial C_{t+1}}{\partial - b_{t+1}}}_{\geq 0} \right].$$

Planner internalizes that higher leverage leads to more sensitive asset prices if constraint binds tomorrow. Households' don't.

Role for Financial Policies

Ex-ante interventions $\Rightarrow$ Imposing restrictions on leverage might be welfare improving because of pecuniary externalities (Lorenzoni, 2008)

- Suppose collateral constraint does not bind today (“normal times")
- Households’ optimality condition for increasing debt

$$u'(C_t) = \beta R_t \mathbb{E}_t[U'(C_{t+1})]$$

- Planner’s optimality condition for increasing debt

$$u'(C_t) = \beta R_t \mathbb{E}_t \left[U'(C_{t+1}) \underbrace{-\kappa_t \mu_{t+1} \frac{\partial q_{t+1}}{\partial C_{t+1}} \frac{\partial C_{t+1}}{\partial - b_{t+1}}}_{\geq 0} \right].$$

Planner internalizes that higher leverage leads to more sensitive asset prices if constraint binds tomorrow. Households’ don’t.

Role for Financial Policies

Ex-ante interventions $\Rightarrow$ Imposing restrictions on leverage might be welfare improving because of pecuniary externalities (Lorenzoni, 2008)

- Suppose collateral constraint does not bind today ("normal times")

- Households' optimality condition for increasing debt

$$u'(C_t) = \beta R_t \mathbb{E}_t[U'(C_{t+1})]$$

- Planner's optimality condition for increasing debt

$$u'(C_t) = \beta R_t \mathbb{E}_t \left[U'(C_{t+1}) \underbrace{-\kappa_t \mu_{t+1} \frac{\partial q_{t+1}}{\partial C_{t+1}} \frac{\partial C_{t+1}}{\partial - b_{t+1}}}_{\geq 0} \right].$$

Planner internalizes that higher leverage leads to more sensitive asset prices if constraint binds tomorrow. Households' don't.

ROLE FOR FINANCIAL POLICIES

Ex-ante interventions $\Rightarrow$ Imposing restrictions on leverage might be welfare improving because of pecuniary externalities (Lorenzoni, 2008)

- Suppose collateral constraint does not bind today ("normal times")
- Households' optimality condition for increasing debt

$$u'(C_t) = \beta R_t \mathbb{E}_t[U'(C_{t+1})]$$

- Planner's optimality condition for increasing debt

$$u'(C_t) = \beta R_t \mathbb{E}_t \left[U'(C_{t+1}) \underbrace{-\kappa_t \mu_{t+1} \frac{\partial q_{t+1}}{\partial C_{t+1}} \frac{\partial C_{t+1}}{\partial - b_{t+1}}}_{\geq 0} \right].$$

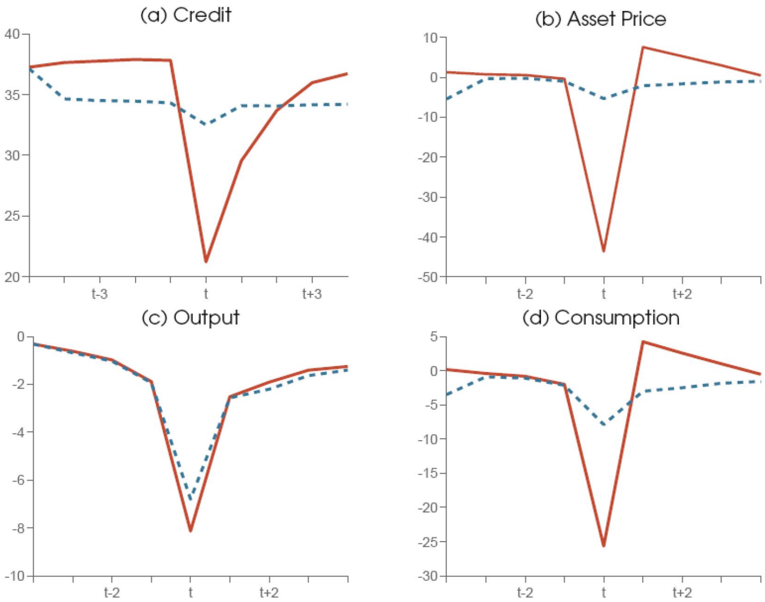
Planner internalizes that higher leverage leads to more sensitive asset prices if constraint binds tomorrow. Households' don't.

Role for Financial Policies

Ex-post interventions $\Rightarrow$ Mitigating restrictions on leverage might be welfare improving

- If constraint binds today, incentives to relax it
- How? Depends on the model at hand
  - Transfer from one sector to another
  - Subsidizing debt

Crisis Dynamics with and without optimal policy



Challenges for policymakers

1. Optimal policies are complex
   - Trade-off between taxing and subsidizing credit
   - Simple rules (e.g. constant capital requirement) may do more harm than not
2. Policies might not be credible (Bianchi and Mendoza, 2016)
   - Asset prices depend on future discounted value of dividends
   - In crises time, policy-makers have incentives to announce future policies that would boost asset values. Those policies might not be optimal ex-post
3. Issues of coordination between monetary and financial authority

Point 1: Theory and Measurement

- Models with occasionally binding constraints hard to analyze numerically (global methods required, curse of dimensionality)

- Implication: Models often stylized, might be a constraint for measurement

- Question: is there a role for a less structural approach?

- In this class of models, general formulas for optimal financial taxes as known functions of Lagrange multipliers and price elasticities. Can we use them as sufficient statistics? (Chetty, 2008)

  - Multipliers can be computed as wedges from asset prices (Garleanu et al., 2012; Bocola, 2016)

  - Can we measure price elasticities?

- Advantage: calculations more robust

Point 1: Theory and Measurement

- Models with occasionally binding constraints hard to analyze numerically (global methods required, curse of dimensionality)
- Implication: Models often stylized, might be a constraint for measurement
- Question: is there a role for a less structural approach?
- In this class of models, general formulas for optimal financial taxes as known functions of Lagrange multipliers and price elasticities. Can we use them as sufficient statistics? (Chetty, 2008)
  - Multipliers can be computed as wedges from asset prices (Garleanu et al., 2012; Bocola, 2016)
  - Can we measure price elasticities?
- Advantage: calculations more robust

Point 1: Theory and Measurement

- Models with occasionally binding constraints hard to analyze numerically (global methods required, curse of dimensionality)
- Implication: Models often stylized, might be a constraint for measurement
- Question: is there a role for a less structural approach?
- In this class of models, general formulas for optimal financial taxes as known functions of Lagrange multipliers and price elasticities. Can we use them as sufficient statistics? (Chetty, 2008)
  - Multipliers can be computed as wedges from asset prices (Garleanu et al., 2012; Bocola, 2016)
  - Can we measure price elasticities?
- Advantage: calculations more robust

Point 1: Theory and Measurement

- Models with occasionally binding constraints hard to analyze numerically (global methods required, curse of dimensionality)
- Implication: Models often stylized, might be a constraint for measurement
- Question: is there a role for a less structural approach?
- In this class of models, general formulas for optimal financial taxes as known functions of Lagrange multipliers and price elasticities. Can we use them as sufficient statistics? (Chetty, 2008)
    - Multipliers can be computed as wedges from asset prices (Garleanu et al., 2012; Bocola, 2016)
    - Can we measure price elasticities?
- Advantage: calculations more robust

Point 1: Theory and Measurement

- Models with occasionally binding constraints hard to analyze numerically (global methods required, curse of dimensionality)
- Implication: Models often stylized, might be a constraint for measurement
- Question: is there a role for a less structural approach?
- In this class of models, general formulas for optimal financial taxes as known functions of Lagrange multipliers and price elasticities. Can we use them as sufficient statistics? (Chetty, 2008)
  - Multipliers can be computed as wedges from asset prices (Garleanu et al., 2012; Bocola, 2016)
  - Can we measure price elasticities?
- Advantage: calculations more robust

Point 2: Other Prudential Policies

- Paper focuses on management of credit booms/busts
- Emerging markets have historically pursued several other policies to reduce the likelihood of financial crises
  - Accumulation of foreign reserves (Obstfeld, Shambaugh and Taylor, 2010; Ainzemann and Lee, 2008)
- Models with collateral constraints offer a rationale to these types of prudential policies too
- Here is an example from Bocola and Lorenzoni (2016)

Point 2: Other Prudential Policies

- Paper focuses on management of credit booms/busts
- Emerging markets have historically pursued several other policies to reduce the likelihood of financial crises
  - Accumulation of foreign reserves (Obstfeld, Shambaugh and Taylor, 2010; Ainzemann and Lee, 2008)
- Models with collateral constraints offer a rationale to these types of prudential policies too
- Here is an example from Bocola and Lorenzoni (2016)

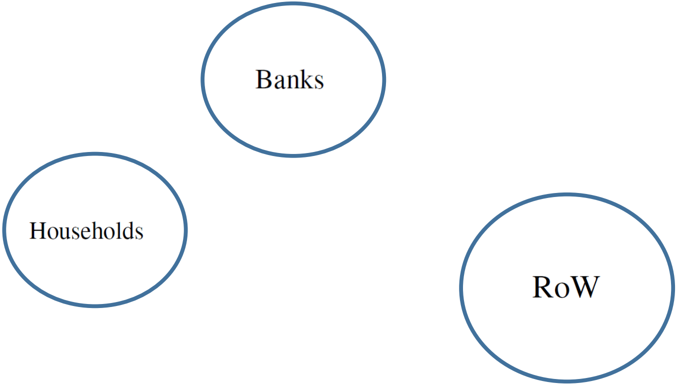
Point 2: Other Prudential Policies

- Paper focuses on management of credit booms/busts
- Emerging markets have historically pursued several other policies to reduce the likelihood of financial crises
    - Accumulation of foreign reserves (Obstfeld, Shambaugh and Taylor, 2010; Ainzemann and Lee, 2008)
- Models with collateral constraints offer a rationale to these types of prudential policies too
- Here is an example from Bocola and Lorenzoni (2016)

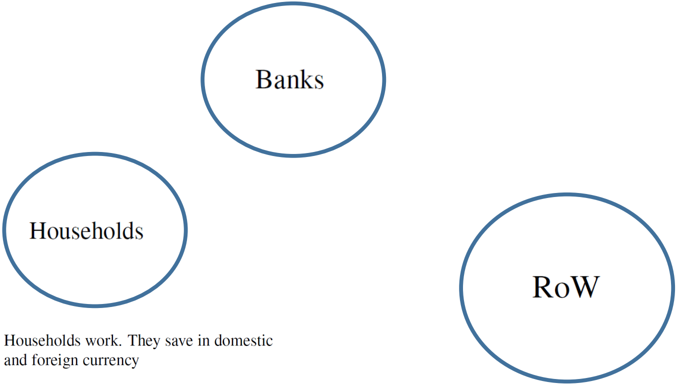
Point 2: Other Prudential Policies

- Paper focuses on management of credit booms/busts
- Emerging markets have historically pursued several other policies to reduce the likelihood of financial crises
  - Accumulation of foreign reserves (Obstfeld, Shambaugh and Taylor, 2010; Ainzemann and Lee, 2008)
- Models with collateral constraints offer a rationale to these types of prudential policies too
- Here is an example from Bocola and Lorenzoni (2016)

A SOE with a Financial Sector



A SOE with a Financial Sector



- Households work. They save in domestic and foreign currency

A SOE with a Financial Sector

Banks

- Banks borrow in domestic and foreign currency
- They accumulate capital and run production
- They are subject to a collateral constraint

Households

- Households work. They save in domestic and foreign currency

RoW

A SOE with a Financial Sector

Banks

- Banks borrow in domestic and foreign currency
- They accumulate capital and run production
- They are subject to a collateral constraint

Households

- Households work. They save in domestic and foreign currency

RoW

- RoW can lend to domestic banks only in foreign currency

Capital Flights and Banking Crises

Model generate a two phase self-fulfilling crisis

1. Households switch their savings from local to foreign currency
2. Banks, forced to issue foreign currency debt, become subject to the possibility of crises

Mechanism:

- Amplification leads to multiple equilibria in credit markets: a good one, and a bad one (banking crisis)
  - Bad equilibrium more likely if banks have foreign currency debt (currency depreciates when constraint binds)
- Ex-ante, households have precautionary motive to save in foreign currency if they anticipate a crisis in the future
  - Foreign currency assets are good hedge for crisis

Which policies avoid these crises?

What policies can be used by a Central Bank backed up with limited fiscal resources to avoid bad equilibrium?

1. Ex-ante accumulation of foreign reserves
   - Helps operation of lending of last resort in a crisis (domestic currency depreciates in bad times)
   - Complements to households' choices: if sufficient amount of reserves accumulated, households happy to save in local currency, banks can borrow in domestic currency
2. Managing the exchange rate
3. Taxing holdings of foreign currency
4. …

Conclusion

- Important literature, full of relevant insights for policymakers
- Two main comments
  1. Theory and measurement
  2. Analysis of additional policy instruments
- Looking forward to see further progress in this area!