# Optimal macroprudential policy and asset price bubbles by Biljanovska, Górnicka, and Vardoulakis

Alberto Martin

CREI and Barcelona GSE

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# Overview

- How should macroprudential policy react to asset price bubbles?
- This paper:
  - Develop macro model with financial constraints and bubbles.
  - Explore optimal macroprudential policy.

# A bird's eye view of macropru

- Simple world: Today agents are unconstrained but potential crisis Tomorrow
  - e.g. low productivity, tight financial constraints
- Agents are rational: anticipate likelihood of crisis
- But do not fully internalize effects of their choices on the severity of the crisis
  - Deleveraging $\longrightarrow$ fall in AD $\longrightarrow$ fall in output (AD externalities)
  - Capital sales $\longrightarrow$ fall in price of capital $\longrightarrow$ tight financial constraints (pecuniary externalities)
- Too much borrowing ex ante $\longrightarrow$ need for macropru!

# This paper

- What changes when we introduce (rational) bubbles?
- Firms borrow against market value: fundamental and bubbly components

$$V_t = q_t \cdot k_t + b_t$$

- Main effects:
  - *Extensive margin*: bubbles provide collateral but can burst
  - *Intensive margin*: bubble valuation itself endogenous
- Conceptual/quantitative implications for optimal macroprudential tax

# Skeleton of framework

- Key (simplified) equations:
  - SOE, financing (intra- and inter-period) subject to constraints:

$$financing_t \leq m_t \cdot \left[ \beta \cdot E_t \left( \frac{U_{c,t+1}}{U_{c,t}} \cdot \left( \left[ F_{k,t+1} + q_{t+1} \right] \cdot k_t + b_{t+1} \right) \right) \right]$$

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$$b_t = \left( 1 + m_t \cdot \mu_t \right) \cdot \beta \cdot E_t \left( \frac{U_{c,t+1}}{U_{c,t}} \cdot b_{t+1} \right)$$

where $\mu_t$ is multiplier on borrowing constraint,

$$\mu_t > 0 \Leftrightarrow b_t > \beta \cdot E_t \left( \frac{U_{c,t+1}}{U_{c,t}} \cdot b_{t+1} \right)$$

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# Rationale for macropru and the bubble

- *Standard effect in literature*
  - When deciding $t-1$ borrowing, agents do not internalize effect on $U_{c,t}$ and thus on $q_t$:

$$\downarrow q_t = E_t\left[\frac{U_{c,t+1}}{U_{c,t}\uparrow}\cdot(F_{k,t+1}+q_{t+1})\right]$$

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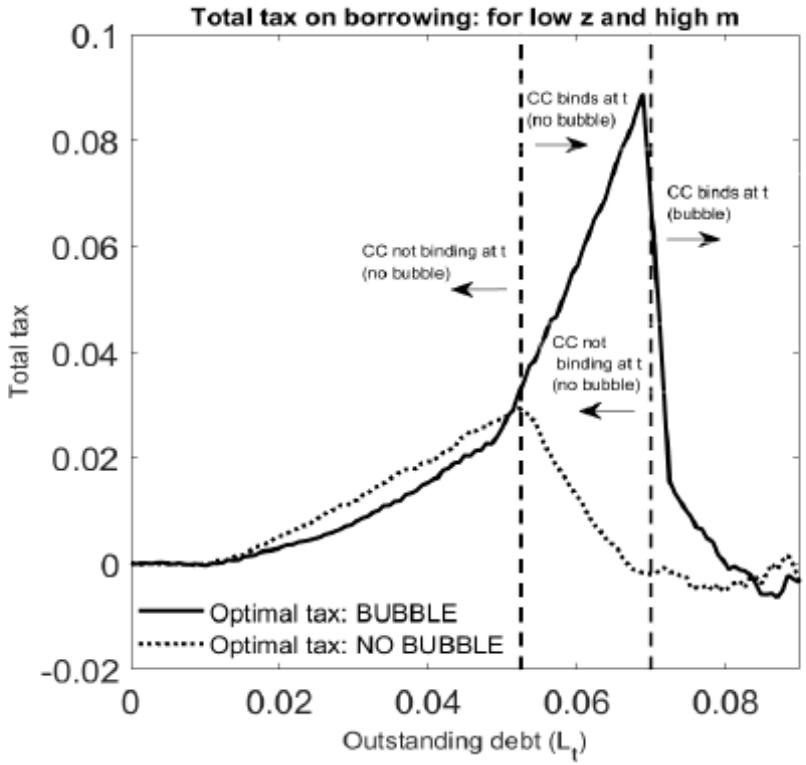
- *Intensive margin:*
  - When deciding $t-1$ borrowing, agents do not internalize effect on $U_{c,t}$ and $\mu_t$, and thus on $E_t\left(\frac{U_{c,t+1}}{U_{c,t}}\cdot b_{t+1}\right)$:
$$b_t = (1+m_t\cdot\mu_t\uparrow)\cdot\beta\cdot E_t\left(\frac{U_{c,t+1}}{U_{c,t}\uparrow}\cdot b_{t+1}\right)$$

# Quantitative implications

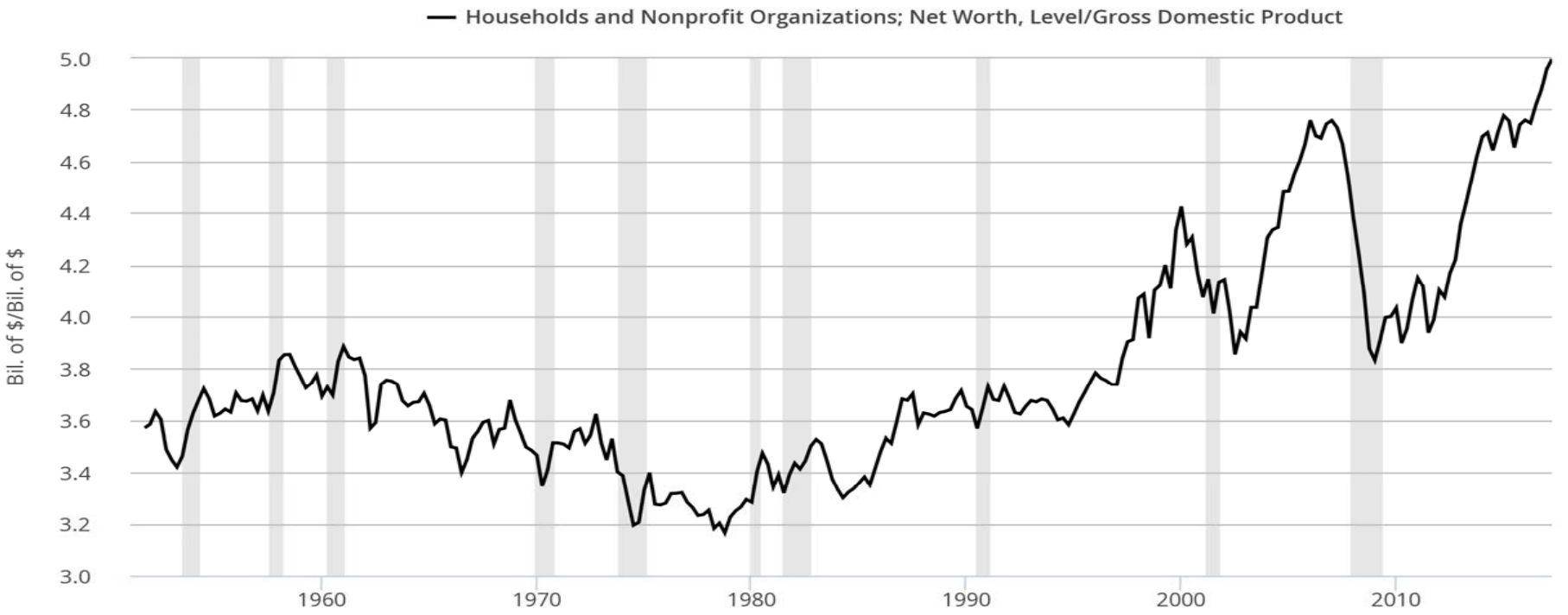
- Net effect of bubbles on macroprudential tax depends on debt level



# General reaction

- Welcome connection between bubbles and macroprudential literatures
  - We live in a world of asset price booms and busts
  - Important to understand implications for macropru
- My comments:
  - Paper is not an easy read
  - Focus on general/robust insights
  - Do they apply only to bubbles?

# United States: Household Net Worth / GDP




Sources: BEA, Board of Governors

fred.stlouisfed.org

myf.red/g/fzbw

# Paper is not always easy to follow

- Combines complex frameworks (Mendoza-Bianchi/Miao-Wang)
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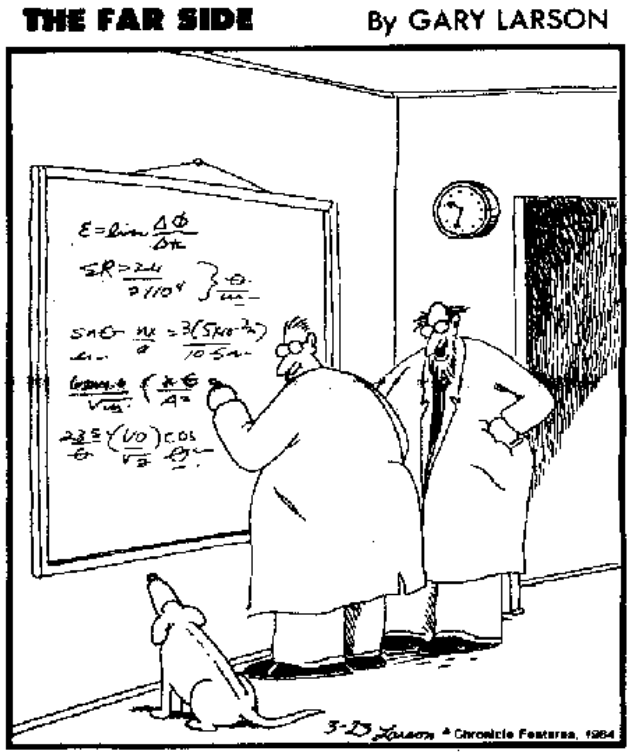


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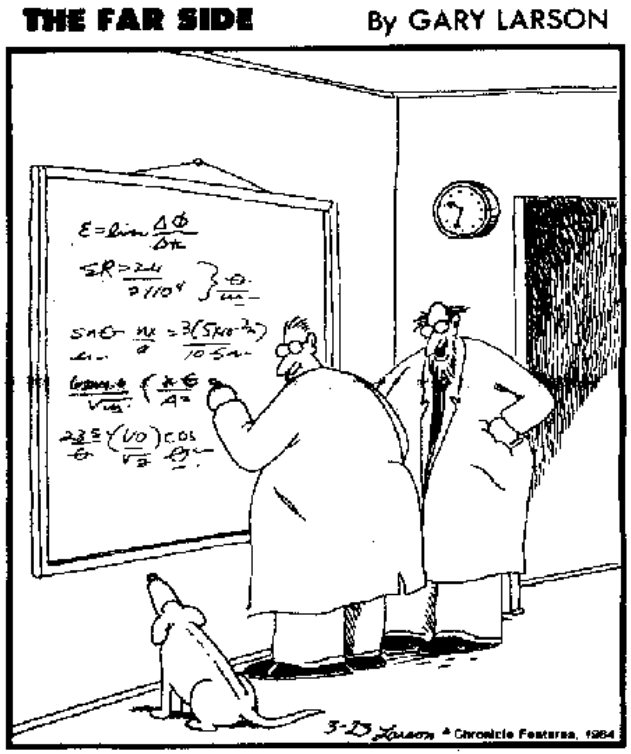


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- My advice: sharpen robust insights/messages

# What I fully buy: extensive margin

- Bubbles...
  - provide collateral: relax constraints, reduce need for macropru
  - but they can burst!: source of crises, increase need for macropru
- Very natural result, extends beyond specific modeling of bubbles
  - Natural interaction between bubbles and stock of debt
  - Bubble correlation to productivity and/or financial shocks
- Questions:
  - To what extent are quantitative results driven by extensive margin?
    - ★ Decompose tax into intensive and extensive margin
  - Does it rely on bubbles? (e.g. what changes if these are Lucas trees?)

# What I buy (understand) less

- Results in this literature tend to be sensitive to *borrowing constraint*:

$$financing_t \leq m_t \cdot \left[ q_t \cdot k_t + \beta \cdot E_t \left( \frac{U_{c,t+1}}{U_{c,t}} \cdot b_{t+1} \right) \right]$$

  - Rationale: if default, lenders seize firm and resell it next period
  - But borrowing is from foreigners (interest rate $R$)
    - ⋆ Why use domestic SDF to discount future value of firm?
  - What would change is borrowing is backed by current value of firm?

# What I buy (understand) less

- *Intensive margin*: externality on $b_t$ similar to traditional one on $q_t$
  - But $b_t$ is a state variable
  - Not sure why $E_t\left(\frac{U_{c,t+1}}{U_{c,t}} \cdot b_{t+1}\right)$ changes with $U_{c,t}$

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$$\overline{b_t} = (1 + m_t \cdot \mu_t) \cdot \beta \cdot E_t\left(\frac{U_{c,t+1}}{U_{c,t} \uparrow} \cdot b_{t+1} \uparrow\right)$$

  - Crucial difference between bubble and fundamental assets (e.g. trees)
  - Of course, $U_{c,t}$ also affects growth between $t-1$ and $t$
    - ★ But for this, equilibrium selection is key

# Final remarks

- We live in a world of asset price booms and busts
- How do they shape optimal macroprudential policy?
  - Asset booms provide collateral ($\downarrow$ macropru) but they may end ($\uparrow$ macropru)
  - Extensive margin very convincing, intensive margin less so...
- Does it matter whether booms/busts are driven by bubbles or not?