Discussion of “Bubbly Data”

Discussant: Ding Dong (HKUST)

Jan, 2024
Overview

• This paper: data in a rational asset bubble framework a la Miao and Wang (2018) arising due to credit constraint
  
  • Very inspiring and important paper!
Overview

• This paper: data in a rational asset bubble framework a la Miao and Wang (2018) arising due to credit constraint
  • Very inspiring and important paper!

• Data Capital vs. Physical Capital
  1. Non-rival: infinitely usable at a technological level
  2. Contextual: asset values private to data holder (users)
Overview

• This paper: data in a rational asset bubble framework a la Miao and Wang (2018) arising due to credit constraint
  • Very inspiring and important paper!

• Data Capital vs. Physical Capital
  1. Non-rival: infinitely usable at a technological level
  2. Contextual: asset values private to data holder (users)

• Theoretical challenges tackled in the paper:
  1. Nonrivalry: bubble less likely to exist and persist
  2. Specificity: asset less pledgeable

• Discussion today: how to incorporate these two features
## Model Economy

**Nonrivalry:**  \[ I^j = D_{i-1}^y D^j \]

**Contextuality:**  \[ I^j \times \varepsilon^j \]
On Nonrivalry and Network

• This paper: modelled as spillover from raw data bundle sold in previous term:

\[ l^j_t = D^γ_{t-1} D^j_t \]

• alternative setting: data can be sold to and used by multiple firms simultaneously *a la* Jones and Tonetti (2020).

• What could be new about non-rival asset bubble:

1. (Demand shock?) Can the upstream firm benefit from bubble in downstream? (Currently: No, see Figure 4,8)

2. Can entry-and-exit (or other potential arbitrage opportunity) rule out sectoral bubble?

3. Can multiple equilibria arise purely from spillover effect (increasing return to scale)?
On Specificity

• This paper: modelled as idiosyncratic data capital quality shock, giving rise to liquidity premium w. presence of credit constraint:

\[ B_t \leq \xi SDF \ast \bar{V}_t^{j+1}(\nu \Omega_t^j, 0) \]

• \( \nu \) can be endogenous to data specificity: higher specificity, lower \( \nu \), thus bubble less likely to exist.

• Bubbly Data or Bubbly Equity?
  
  • Bubbly data: “For firms subject to tight financial constraint, data is more valuable since it serves as collateral to relax constraint.”
  
  • Bubbly equity: “Bubble more likely to emerge if financial constraint is more relaxed, or data is less pledgeable.”

• This seems a paper on “bubbly equity”.
On Motivation

1. U.S.: Data sector bubble or market bubble? (see appendix)

2. China: How to interpret the policy to recognize data as new type of factor of production? Higher $\psi^e$ or higher $\psi^d$?

Figure 1: Bubbly Episodes Related to the Data Product Sector, US and China
Minor comments

- $\gamma$ is possibly the most important parameter
  - Measured firm-level TFP (denoted as $Z_t^j$) contains true sectoral TFP ($A_\Omega$) + data input + idiosyncratic quality shock ($\epsilon_t^j$)
  - Identification: correlation b/w $Z_t^j$ and lagged observed sectoral TFP
Figure 4
Figure 8: Transition from Bubbleless Steady State

Notes: $\psi^d = 0.5$, $\psi^d = 0.1$, and $\gamma = 0$. Other parameters are shown in Table 1.
S&P Shiller Ratio

Shiller PE Ratio for the S&P 500: \textbf{33.83} (As of 2024-02-01)

- Shiller PE Ratio for the S&P 500