Discussion of:

The Coming Battle of Digital Currencies

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Big question

- How will the international monetary system evolve in the digital age?
  - what role will cryptocurrencies play? CBDCs?
  - how will the transition to this future play out?
- Focus on a dynamic game between two countries
  - each currently issues a (non-digital) currency
  - pre-crypto: equilibrium where each has some "market share"
    - country A is dominant (for fundamental reasons)
- Study effect of two changes:
  - competition from a new type of (crypto) currency
    - becomes more useful over time through adoption
  - countries have the option to issue CBDC
    - requires costly effort; increases usefulness of their currency

Some interesting answers

- The future is digital (by assumption)
  - the crypto currency is useful; will have (growing) market share
  - both countries will eventually introduce CBDC
- Interesting patterns along the *transition* to this digital future
  - growth of cryptocurrency has asymmetric effects on the two currencies
    - always decreases market share of A
    - but can *increase* market share of B (for a while)
  - asymmetric incentives to introduce CBDC
    - "pecking order": country B may move faster or slower than country A
  - introduction of any CBDC decreases the value of the cryptocurrency
    - but the size of the effect may be larger for country B
  - dynamics are non-linear, and often non-monotone

Outline

- Sketch the model
  - without CBDC
  - with CBDC
  - aim: understand source of the asymmetries, results
- Comments:
  1. CBDC and intermediation
  2. synthetic vs. real
  3. monetary policy
  4. broader competition

Model sketch 1: no CBDC

- 2-period OLG
- Representative household has endowment 1 when young
  - only desires consumption when old
  - saves by holding a portfolio of three currencies: A, B, and C

$$m_t^A + m_t^B + m_1^C = 1$$

- Utility: $$U = c_{t+1} + \alpha v(m_t^A) + \beta v(m_t^B) + \gamma_t v(m_t^C)$$

where $$c_{t+1} = \rho_t^A \, m_t^A + \rho_t^B \, m_t^B + \rho_t^C \, m_t^C$$

equilibrium returns reflect inflation, etc.
depend on $\boldsymbol{m} = (m_t^A, m_t^B, m_t^C)$

- Asymmetry: ρ_t^A and ρ_t^B are different functions of $\boldsymbol{m}$
  - interpretation: reserve currency affects costs of country *B*

Rise of crypto

- Suppose crypto becomes more useful

starts increasing

$$U = c_{t+1} + \alpha v(m_t^A) + \beta v(m_t^B) + \gamma_t v(m_t^C)$$

where $c_{t+1} = \rho_t^A m_t^A + \rho_t^B m_t^B + \rho_t^C m_t^C$

- As household shifts into currency C, m_t^A and m_t^B tend to decrease
  - if ρ_t^i were fixed, m_t^A and m_t^B would decrease in proportion
- Nominal money supplies fixed → increases inflation
- Asymmetric effect:
  - higher inflation in currency A can decrease fiscal costs of country B
    - lower need for inflation tax → ρ_t^B can *increase*
- Result: market share of currency B can increase (for a while)

Model sketch 2: CBDC

- Each country can introduce a domestic CBDC
- Choose costly effort level $e \rightarrow$ determines arrival rate of CBDC
- Benefit:

increases usefulness of currency

$$U = c_{t+1} + \alpha v(m_t^A) + \beta v(m_t^B) + \gamma_t v(m_t^C)$$

(amount of increase depends on γ_t)

- Objective: maximize discounted sum of $(m_t^i - \text{effort}^2)$ over time
  - goal of CBDC is to gain (or maintain) market share
    - recall: overall market size is fixed at 1
- Incentive to introduce CBDC depends (roughly) on Δm_t^i
  - small if m_t^i is close to 1 (currency is very dominant)
  - … or would remain close to 0 (currency is very weak)
  - strongest incentive is for a currency somewhere in between

"pecking order"

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1) CBDC and intermediation

- Introducing CBDC in country A makes holding m^A more attractive

$$U = c_{t+1} + \alpha v(m_t^A) + \beta v(m_t^B) + \gamma_t v(m_t^C)$$

increases

- What does m^A represent?
  - physical currency (dollar bills)?
  - or broader money, including bank deposits, govt. debt, etc.? ⇐
- It is clear why CBDC would make currency more attractive
- Why would it make holding broad money more attractive?
  - USD bank deposits are more useful if I can convert them to a US CBDC for some transactions?

⇒ I would like to understand the rationale here better

Implication:

- One concern about CBDC: disintermediating banks
  - if funds are shifted out of bank deposits into the CBDC …
  - … increases bank funding costs, lending rates
    - see Andolfatto; Keister & Sanches; Chiu et al., others
- Here: introducing a U.S. CBDC makes USD deposits more attractive
  - relative to EUR deposits, say
  - could *decrease* U.S. bank funding costs, lending rates
- Interesting counterpoint to the usual concern
  - how strong is each effect? which would dominate?
  - would U.S. banks benefit? or USD deposits overseas?

seems worth thinking about

2) Synthetic vs. real

- A CBDC issued by the Federal Reserve increases α

$$U = c_{t+1} + \alpha v(m_t^A) + \beta v(m_t^B) + \gamma_t v(m_t^C)$$

- A fully-regulated stablecoin backed 100% by T-bills … increases γ?
  - this arrangement is sometimes called a "synthetic CBDC"
- Are synthetic and real CBDC equivalent …
  - in the model?
    - if m_t^C is backed by m_t^A, does the $\uparrow \gamma$ have the same effect as $\uparrow \alpha$?
  - in reality?
    - 2020 Report from BIS and 7 central banks: "Synthetic CBDC is not CBDC"
    - (I did not understand the logic)

does the model help illuminate this issue?

3) Monetary policy

- The nominal supply of each currency is fixed
- Implication: a decrease in demand for currency A (due to crypto, say)
  - … causes the value of currency A to fall (inflation/devaluation) …
  - … which makes holding the currency even less attractive

vicious cycle

- Active monetary policy would prevent this cycle
  - if central bank targets inflation, for example, …
  - it will *decrease* the money supply when m_t^A decreases, leaving P^A unchanged
- Model does not allow the central bank to change the money supply
  - a form of fiscal dominance?
- Is this assumption important?
  - what would change if central banks followed a different policy?

4) Broader currency competition

In a similar vein:

- The rise of cryptocurrency makes existing currencies worse
  - because of the inflation effect described above
- Alternative story: competition from crypto could *discipline* monetary/fiscal authorities
  - suppose country A needs to maintain a particular share m_t^A
  - might have to lower inflation rate in response to competition from crypto
- Focus here is on digital adoption (CBDC), of course, but …
- Would it be interesting to allow currencies to compete …
  - … with crypto and with each other…
- … along other dimensions as well?

Conclusion

- Interesting paper!
- Shows: rich dynamics along the transition to the digital future
- Many issues for further thought