Central Bank Digital Currency in Brazil

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Benefits and Costs of CBDC

• Eliminates cash (costly due to security and transportation)
• Financial inclusion (digital payment tools at considerably lower costs than traditional bank accounts)
• Lower barriers to entry for new firms in the payments sector, foster innovation, increase competition among banks.
• Compete with private digital currency initiatives which could eventually undermine monetary policy
• Reduce the consumer deposit demand, and thus lower bank lending to the general economy.
• Increase the risks of system-wide bank runs.
• “Full-fledged CBDC requires Central Banks to interface with customers, build front-end wallets, monitoring transactions, and being responsible for anti-money laundering and countering the financing of terrorism."
Model - i

• Means of payment choice model, as Agur, Ari and Dell’Ariccia (2019)
• Monopolistic Competition of banks as in Andolfatto (2018)
• Populated by (heterogeneous) households, banks, firms, and a central bank.
• Only one period
• Households choose between \{cash, deposits, CBDC\},
  - care about:
    • Interest remuneration
    • Anonimity (motivated by tax evasion) – heterogeneous preferences
• Means of Payments
  – Cash: no remuneration, anonymity = 1
  – Deposits: interest rate rD, anonymity = 0
  – CBDC: interest rate rC, anonymity = \theta \epsilon [\theta, 1]
Model - ii

- **Banks:**
  - N identical banks, play Cournot
  - Take supply of deposits (households) and demand for loans (firms) as given
  - Take rI (interbank rate) as given
  - Choose rD (deposit rate) and rL (loan rate) to maximize profit
  - Liquidity-Coverage-Ratio constrain, minimum reserves-to-deposit ratio

- **Firms**
  - Demand capital, taking rL as given

- **Central Bank**
  - Choose CBDC \{rC, \theta\} to maximize welfare, assume cash use is costly
  - Take rI interbank rate as given (that is, monetary policy is given)
  - Plays before others
Calibration to Brazil

• Cash costs about 0.5% of GDP

• Deposit volume depend on rD
If CBDC attractive (remuneration and anonymity) than it reduces cash and thus its cost for society

But it also reduces deposits, which reduces loans (liquidity constraint of banks) and output
Results - ii

There is an optimum frontier (combination of rC and θ) that can do “both”
- reduce cash and do not reduce loans (liquidity constraint binds)
Conclusions

CBDC has potential to significantly improve welfare

But there are serious implementation challenges

• Anonimity $\theta$ is not easily measured and changed. Central Bank constrained to choose very low anonymity (anti-money laundering and combating the financing of terrorism).

• Programable money, Internet of Things may affect demand for CBDC, making it too attractive (even if not anonymous)

• Monetary policy ($r_I$) changes with time, thus $r_C$ also needs to change, in order to adjust demand for CBDC

• Possible to reduce cash holdings without posing risks to banks (fast payment system, like PIX, with programmable features)?