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

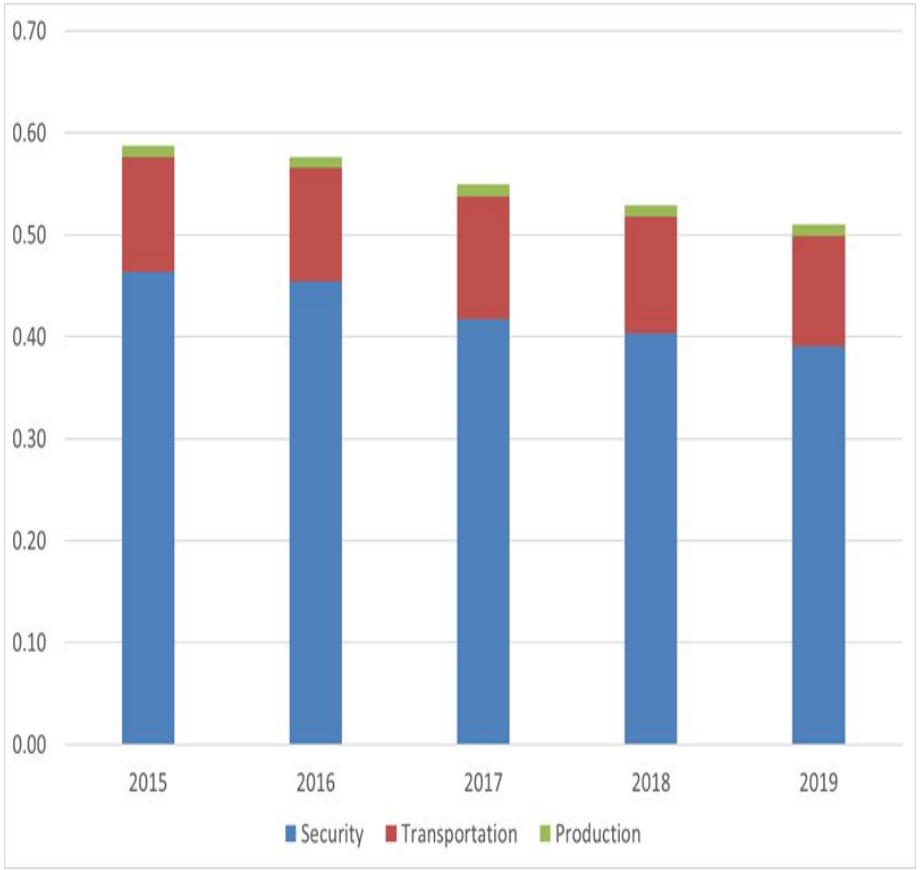
- Means of payment choice model, as Agur, Ari and Dell'Ariccia (2019)
- Monopolistic Competition of banks as in Andolfatto (2018)
- Populated by (heterogeneous) households, banks, firms, and a central bank.
- Only one period
- Households choose between {cash, deposits, CBDC],
  - care about:
    - Interest 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 = $\theta \in [0, 1]$

Model - ii

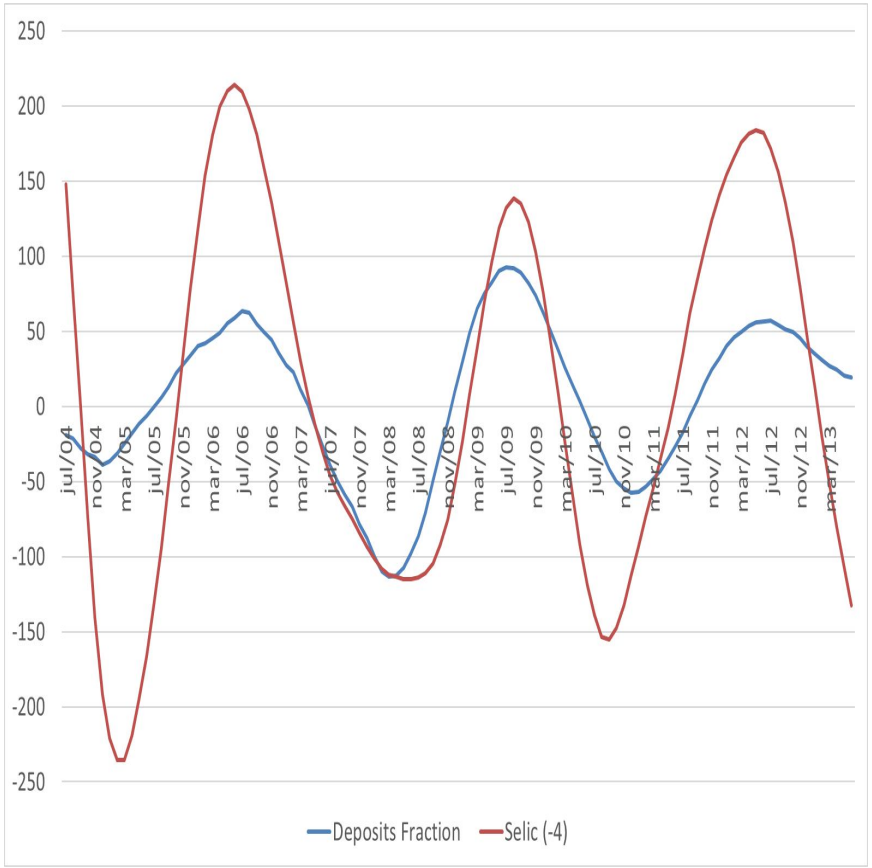
- Banks:
  - N identical banks, play Cournot
  - Take supply of deposits (households) and demand for loans (firms) as given
  - Take rI (interbank rate) as given
  - Choose rD (deposit rate) and rL (loan rate) to maximize profit
  - Liquidity-Coverage-Ratio constrain, minimum reserves-to-deposit ratio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



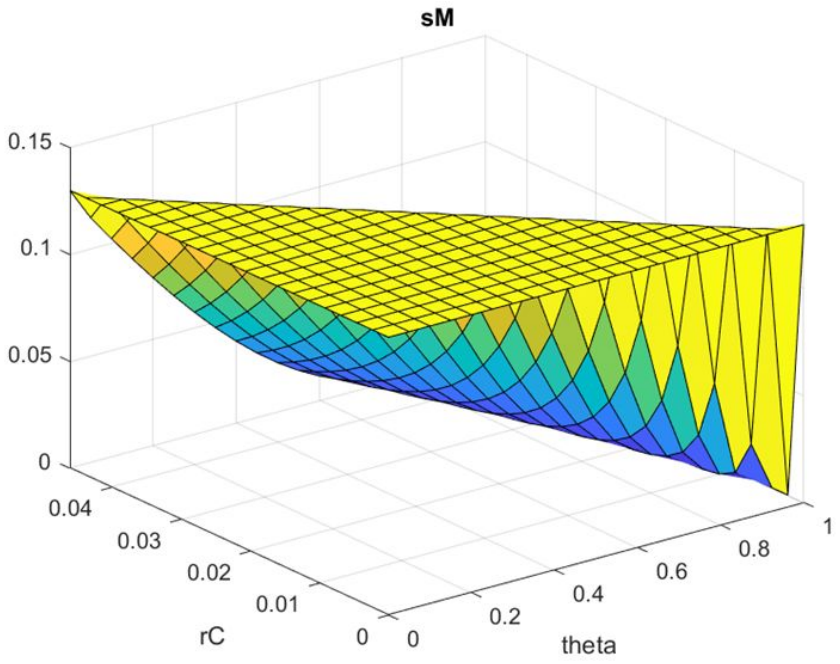
- Deposit volume depend on rD

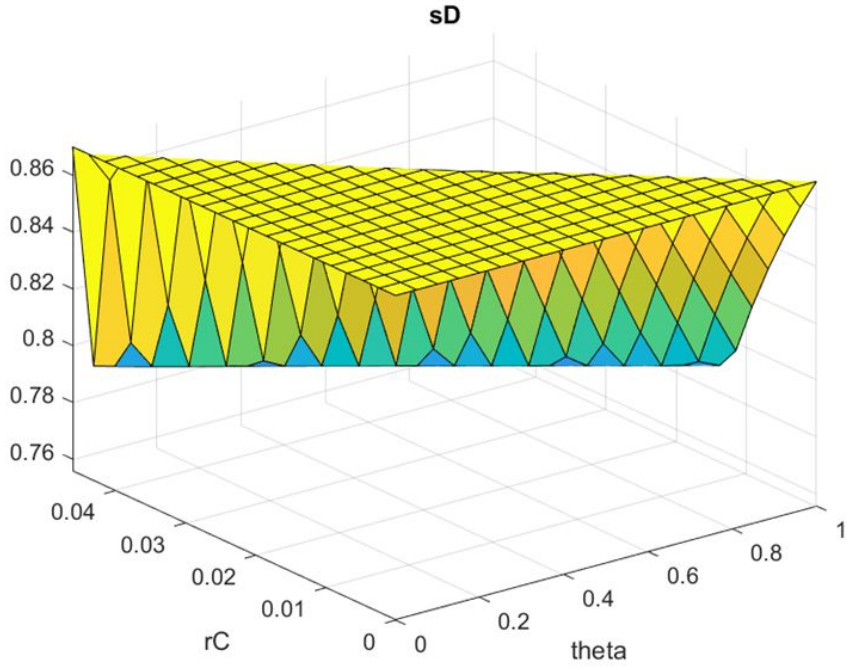


Results - i

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

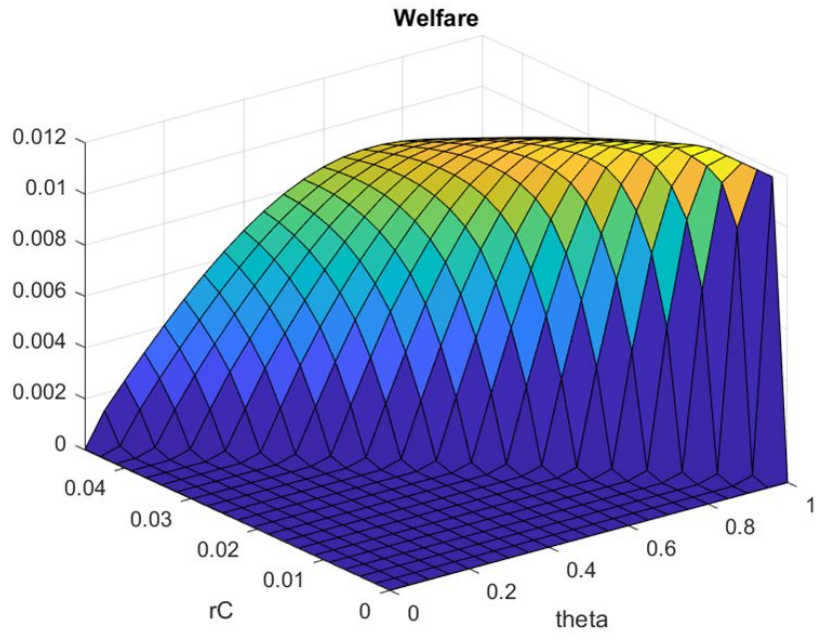


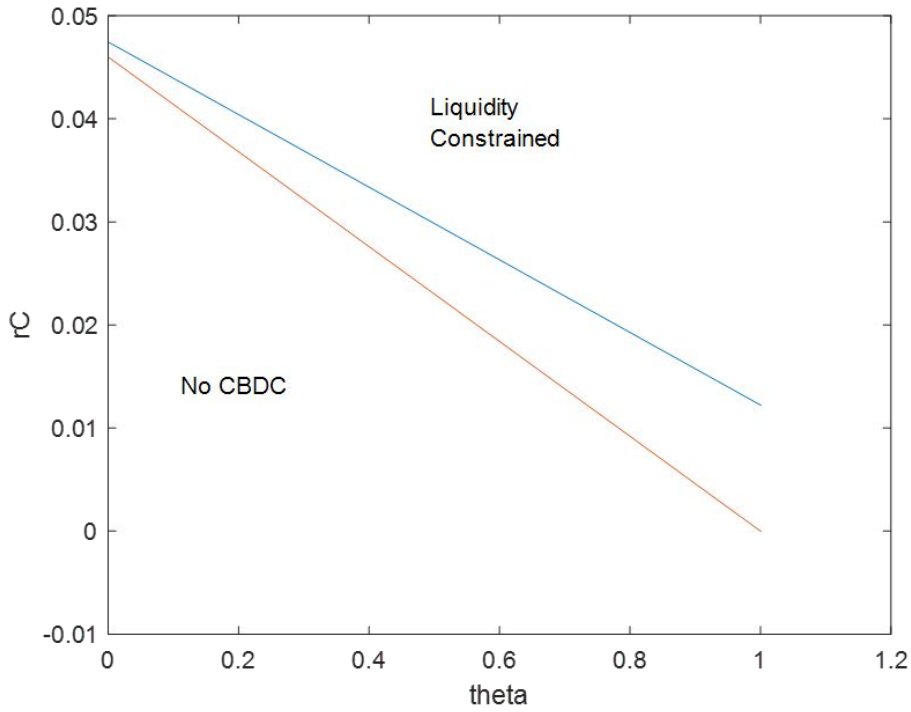


Results - ii

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 θ 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 (rI) changes with time, thus rC 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)?