How do private digital currencies affect government policy?

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We have the first global currency crises since the invention of private digital currency.

Analysis: Emerging market currency crisis could lead to broader economic trouble.

Karin Stroehecker, Ritvik Carvalho
Digital currencies, most prominently Bitcoin, circulate alongside unstable fiat currencies.
Main Finding 1:

**Digital currencies enhance citizen welfare**

- **Risk Reduction**
  Non-positive correlation with local economic risks provides investors with a diversification opportunity

- **Restained Monetary Policy**
  The difficulty of excluding digital currencies from the market reduces gains from seigniorage, thereby inducing lower inflation
Main Finding 2:

Digital currencies encourage local investment

• **Diversification**
  Digital currencies serve as a hedge asset, thereby facilitating investment in high-risk economies

• **Credible Commitment**
  Digital currencies facilitate a credible commitment to disciplined monetary policy, thereby enhancing expected returns from local investment
Main Finding 3:
Digital currencies may be desirable for corrupt sovereigns

- **Local Investment**
  Increased local investment yields higher tax revenue (holding tax rates constant)

- **Welfare Gains**
  Governments may extract some of the welfare gains via increased tax rates
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Centralized digital currencies

- **Public**
  - Many investigating, few implementing
    - E.g. Sweden, Ecuador, Venezuela
  - Narrowing of banking system,
    - Similar to Chicago Plan of 1933
  - Central bank retains monopoly power
  - Can alter ledger or rules to defeat private choice

- **Private**
  - Easier to regulate companies than individuals
  - History of numerous shutdowns
    - E.g., Liberty Reserve
  - Stablecoins, such as Tether, interact with traditional banking system
Decentralized digital currencies

- Often politically motivated
  - E.g., Nakamoto and Bitcoin

- Rules-based monetary policy, implemented by decentralized consensus

- Can only be suppressed by closing extraterritorial nodes
  - Compare Bit Torrent

- Capital control resistant
  - Bearer instruments, with no recognition needed from legal system
  - Similar to gold, cigarettes, shells, etc.
  - Requires user to control private key
Related literature

• Central banks and digital currency
  Raskin and Yermack (2016), Bordo and Levin (2017),
  Fung and Halaburda (2017)

• Digital currency return properties
  Yermack (2015), Dyhrberg (2016a, 2016b), Liu and
  Tsyvinski (2018), Hinzen (2018)

• Digital currency economic design
Model

• Two agents
  - Government
  - Citizen

• Three assets
  - Local productive capital
  - Unproductive capital
  - Private digital currency (if permitted)

• Two dates (i.e., agents are short-lived)
Model: Assets

• Local productive capital
  - Taxable
  - Proxy for local investment

• Private digital currency
  - Untaxable (reflects enforcement difficulty)
  - Non-positively correlated with local economy

• Unproductive capital
  - Zero real return
Model: Government

\[ \text{max (E[Tax revenue] + E[Seigniorage])} \]

- \( t = 0 \)
  - Government decides whether to permit private digital currency
  - Government sets tax rate for local investment

- \( t = 1 \)
  - Government sets inflation rate
  - Government consumes
Model: Citizen

\[
\max (E[R_p] - 0.5 \text{Var}[R_p])
\]

• \( t = 0 \)
  - Citizen invests among available assets
    • Local productive capital
    • Unproductive capital
    • Private digital currency (if permitted)

• \( t = 1 \)
  - Payoffs realized
  - Citizen pays taxes; faces inflation
  - Citizen consumes
Model: Monetary policy \( (t = 1) \)

Seigniorage = Money Growth $\times$ Real Money Demand

- Higher inflation directly increases seigniorage
- Higher inflation indirectly lowers seigniorage revenue by lowering real money demand
- Interior optimal inflation rate (Cagan, 1956)
Model: Monetary policy \((t = 1)\)

- Private digital currency strengthens the negative effect of inflation on local fiat money demand by creating an outside option.

- Outside fiat cannot fill identical role, because traditional fiats are easier for governments to restrict.

- Private digital currency enables credible commitment by the sovereign to (more) restrained monetary policy.
Model: Fiscal policy \((t = 0)\)

Tax Revenue =
Tax Rate \times Local Investment Return

- Higher tax rate directly increases tax revenue
- Higher tax rate indirectly lowers tax revenue by discouraging local investment
- Private digital currency serves as alternative asset and therefore restrains fiscal policy
Model: Regulatory policy \((t = 0)\)

- **Digital currency as a complement to local investment**
  - Permitting digital currency facilitates diversification which encourages local investment

- **Digital currency as a substitute for local investment**
  - Permitting digital currency enables citizens to substitute away from local investment

- Digital currency is not taxable, so government optimizes based on revenue extracted from local investment
Results: Citizen welfare
Results: Local investment
Results: Government welfare
What if private digital currencies were better designed?

- Higher productivity (Cong, Li and Wang 2018)

- Lower volatility (Saleh 2018)
Results: Government welfare
Results: Citizen welfare
Conclusions

• Private digital currencies may improve welfare in some emerging market economies

• Selfish governments may wish to permit trading of private digital currencies

• Our results highlight the need for work on the economic design of private digital currencies