Central Bank Digital Currency in Historical Perspective: Another Crossroad in Monetary History

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CBDC in Historical Perspective: Introduction

- We are at a crossroad in monetary history: advances in technology - digitalization - has led to the development of new forms of money
- Virtual (Crypto) currencies like bitcoin; stable coins like libra/diem and CBDC like the Bahamian sand dollar
- These innovations in M have resonance to earlier major shifts in monetary history
- My overview of the history of monetary transformations suggests that technological change in money is inevitable driven by the financial incentives of a market economy
- Monetary authorities have always had a key role in the provision of currency (outside money) which is a public good
- They have also regulated inside money provided by the commercial banking system
- This held for fiduciary money and will likely hold for digital money
- CBDC will make monetary policy more efficient and if the interest paid on CBDC is used as a policy instrument, the issue of the ELB will be eliminated
- Varying i on CBDC can provide true macro and price stability
- CBDC will have a great impact on the global economy by facilitating international payments.
- It may also transform the international monetary system

Monetary Transformations in History

- Monetary transformations in history are driven by changing tech, changing tastes, econ growth and and the demands to satisfy the functions of M
- M and finance has evolved with human history (Goetzmann 2017)
- Coinage goes back over 2 millennia
- Three transformations set the stage for the current digital transformation

Monetary Transformations in History: Fiduciary/Fiat M

Fiduciary Money:

- New financial technology in the 18C/19 led to convertible bank notes which greatly reduced the resource costs of specie - Adam Smith
- "The gold and silver which circulates in any country can be compared to highway, which, while it circulates and carries to market all the grass and corn of the country, produces not itself a single pile of either. The judicious operations of banking, by providing $\cdots$ a sort of wagon-way through the air, enable the country to convert, as it were, a great part of its highways into good pastures and cornfields, and thereby to increase very considerably the annual produce of its land and labor"
- Commercial banks originated with the goldsmiths of medieval Italy - warehouse certificates for deposited gold led to fractional R banking - convertible bank notes
- The social saving of fiduciary M had to be balanced by the credit risk from potential runs

Monetary Transformations in History: Fiduciary/Fiat M

Fiat Money:

- The rising costs of war finance in the early modern period led to the issue by governments of inconvertible fiat M
- Early e.gs: Riksbank issued paper M to finance the Seven years war, continentals in the American Revolution, early inflation tax, French Revolution, assignats and hyperinflation
- Fiat M had a bad reputation until MA learned the tech to operate credible low inflation fiat M regimes in the late 20C
- CBDC as a social saving over fiat M, may be the next generation in this progression

Monetary Transformations in History: Free Banking

- The record of poorly regulated convertible commercial bank notes was chequered
- Led to the case for government regulation of commercial banking and for a government monopoly of the note issue
- Milton Friedman (1960)
- "So long as the fiduciary currency has a market value greater than its cost of production - $\cdots$ any individual issuer has an incentive to issue additional amounts. A fiduciary currency would thus probably tend through increased issue to degenerate into a commodity standard - there being no stable equilibrium price short of that at which the money value of currency is no greater than the paper it contains. And in view of the negligible cost of adding zeros, it is not clear that there is any finite price level for which this is the case."
- US Free banking 1837 -1863 classic case of instability of free banking
- Record one of instability: frequent failures, fraud, inefficient payments system with notes circulating at a discount (Gorton and Zhang, 2021)
- The high asymmetric costs of a multiple currency system created an inefficient payments system
- Led to reform leading to a more information efficient banknote with creation of national bank notes backed by US government bonds

Monetary Transformations: Free Banking

- Other countries similar experience: GB country banks (Presnell 1956), Switzerland (Baltensperger and Kugler 2017)
- Scotland pre 1844 seen as the exception (White 1984) but Goodhart (1988) attributes its success to an oligopoly, unlimited liability and implicit backing by the BoE as a LLR
- Canada after 1867 and the US post civil war had safe bank notes with establishment of note redemption funds but still the credit risk of bank failures
- In all cases the note issue gravitated towards a CB monopoly
- The information asymmetries of multiple competing currencies led to CB provision of currency
- The present day rise of crypto currencies and stable coins suggests that the outcome may also be a process of consolidation towards a CBDC

Monetary Transformations: Central Banks

CBs evolved to satisfy several important public needs:

1. War finance in the 17C e.g., BoE 1694, Riksbank 1667
2. An efficient payments system to correct deficiencies of multiple competing C e.g., SNB 1907
3. Financial stability to act as LLR e.g., Federal Reserve System 1913
    - Followed lead of the BoE - Bagehot's Rule (1873)

Monetary Transformations: Central Banks

4. Stability in the value of M. BoE learned to operate a mixed currency in the 19C - preserve gold convertibility and provide financial stability
    - Credibility gave it some flexibility to stabilize the economy (Bordo and MacDonald 2012)
    - Other advanced countries followed GB lead
5. Since WWII CBs learned to use countercyclical monetary policy to provide macro stability: full N and P stability
    - Has evolved into flexible inflation targeting based on credibility for low inflation
    - CBDC would follow this tradition with the i on CBDC (positive or negative) as the policy tool to stabilize the economy (Goodfriend 2016)

The Case for CBDC

Key factors driving CBs interest in establishing a CBDC

1. CBDC would be the 21C version of Adam Smith's social saving of fiduciary M
    - It would reduce the cost of issuing and operating physical C between 0.5 and 1.0% GDP
    - By direct peer to peer interface via access to the CB's balance sheet CBDC would reduce monopoly rents earned by commercial banks in operating the payments system (Andolfatto 2019)
    - Barrdear and Kumhof (2016) CBDC could increase GDP in the US by up to 3% of GDP

The Case for CBDC

2. Digitalization has reduced the use of cash to very low levels in several countries, e.g., Sweden, Norway
    - A CBDC could provide a payments media which has virtually all the attributes of cash and be safer
    - It could allow CBs to better perform their M policies
3. A CBDC could improve financial inclusion for underbanked groups, especially important for LDCs. Could also be used to make fiscal transfers
4. A CBDC could head off the threat to monetary sovereignty from stable coins which could satisfy all the functions of M
5. A CBDC would provide a secure, reliable C, free from the dangers of fraud, hacking, ML, etc.

The Case for CBDC

- The basic case for CBDC defined as an asset in electronic form that serves the basic functions of M - with universal access and legal tender - goes back to the classical economists
- Basic argument that currency is a public good which should be provided/regulated by the government Friedman and Schwartz (1986)
- "We continue to believe that the possibility that private issuers can $\cdots$ provide competitive, efficient and safe currencies with no role for governmental monetary authorities remains to be demonstrated"
- CB provided M satisfies the 3 functions of M as:
  1. a unit of account which serves as a measure of real value like a yardstick
  2. a medium of exchange– M transactions exhibit very strong network externalities
  3. a store of value—CB M is not subject to default risk

The Case for CBDC

A CBDC would also satisfy the 3 functions of M (Bordo and Levin 2019) by providing:

- An efficient MOE. Instant clearing and settlement on the CBs platform would involve negligible cost per transaction
- A secure store of value. An interest bearing CBDC with the same rate of return as on other short-term risk-free assets would provide minimal opportunity cost
- A stable unit of account - would facilitate the planning of economic actors

Implementation of CBDC in the Real World

What is the best way forward in implementing CBDC? A number of design questions are being considered by CBs and others

1. **Should CBDC be wholesale or retail?**
    - Improvements are already underway in the wholesale clearing mechanism moving them in the direction of instant and virtually costless RGTS
    - The real controversial issue is over retail CBDC
    - Should CBs provide digital C with virtually all of the features of cash to the public or should this be left to the private sector?
    - The public good aspect of C argues strongly in favor of either direct provision or at least close supervision and regulation by the government

Implementation of CBDC in the Real World

2. Whether CBDC should be token based or account based

- The argument for tokens is that they are most cash-like and they would be anonymous.
- The downside is that they could be stolen or lost and they could be used for money laundering etc.
- Account based systems are viewed as more secure but at the cost of some privacy, as exists at present with the ID requirements for opening a bank account
- They would be practically instantaneous and not costly

Implementation of CBDC in the Real World

3. Retail CBDC Deposits: Accounts at the CB or private FIs?

- Accounts at the CB is eminently feasible but the private sector has a comparative advantage at financial innovation so in advanced countries a two tiered or public private arrangement is likely preferable
- Designated FIs could offer CBDC accounts to the public
- They could serve as a conduit for the CB (Tobin 1987)
- Would hold corresponding amount of funds in segregated R accounts at the CB, e.g., BoE payment interface companies
- Related to Simons (1936) Friedman (1960) Chicago Plan. Commercial banks would be split into narrow banks and I banks
- Other public/private arrangements using private sector FIs knowhow in digital tech possible

Implementation of CBDC in the Real World

4. CBDC and possible disintermediation

- Concern by many that introduction of account based CBDC would lead to disintermediation from the commercial banking system, since CBDC accounts which are a direct liability of the CB would be more secure than non CBDC accounts
- Disintermediation could raise funding costs and banks may become more prone to runs
- Considerable research suggests that disintermediation could be offset by CB balance sheet policy or by restricting CBDC holdings or by tiering interest rates on CBDC and non CBDC accounts (Keister and Sanchez 2019, Brunnermeier and Niepelt 2019, Kumhof and Noone 2018, Bindseil 2020)
- Moreover CBs have adequate lines of defense to deal with runs: sup/reg; Deposit Insurance; LLR

Implementation of CBDC in the Real World

5. Security and Other issues

- CCBs devoting considerable efforts to security issues: AML and KYC
- CBs also considering whether to technically implement CBDC based on a centralized platform or decentralized ledger (DLT) based on blockchain
- Concern over changes to laws and regulations with respect to CBDC, e.g., legal tender (Siklos 2019)

CBDC and Monetary Policy

- CBDC could improve monetary policy by using the interest rate on CBDC as a policy tool
- Following Goodfriend (2016), allowing the interest rate on CBDC to go negative, along with a reduction in cash holding, would eliminate the ELB as a constraint on monetary policy (Bordo and Levin 2017)
- Using the i on CBDC as the policy tool would obviate the use of QE Forward Guidance which has not performed as well as M policy pre the GFC, and would reduce and simplify CBs balance sheets and move back towards a "bills only" policy

CBDC and Monetary Policy

- i on CBDC could also move from the current floor system back to a corridor system (Meaning et al 2018)
- i on CBDC as a policy tool could improve the transmission mechanism, especially the lending channel (Barrdear and Kumhof 2019, Williamson 2018, Meaning et al 2018, IMF 2020)
- i on CBDC could improve LLR and financial stability
- i on CBDC could be used to foster true price stability, and a P level target (Bordo and Levin 2017)

CBDC and Open Economy

CBDC has important implications for the open economy

1. **CBDC could greatly improve cross border payments which at present are done through an elaborate network of correspondent banks and is very costly and slow (IMF 2020, Gorton 2021)**
    - With digitalization, payments could be done almost instantly.
    - It would create a social saving similar to the first trans Atlantic cable in 1866 (Garbade and Silber 1978)
    - Some stable coins promise to arrange peer to peer payments through their established networks
    - However were stable coin providers to dominate these arrangements they could threaten monetary sovereignty and be subject to credit risk

CBDC and Open Economy

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- But sovereign CBDCs would need to make arrangements for interoperability with their foreign counterparts.
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CBDC and Open Economy

2. **A system of CBDCs which closely linked together the monetary and payments systems of different countries could lead to an amplification of the spillover effects of domestic monetary policy on other countries**
    - SOEs could face threats to their monetary policy independence from shocks in larger economies working through uncovered arbitrage between the i on CBDC (Mehl et al 2020)
    - Spillover effects from M shocks could amplify e movements
    - This could be mitigated by following rule-like policies and M policy coordination (Bordo and Schenk 2017)

CBDC and Open Economy

3. **CBDC and stable coins could lead to currency substitution (dollar digitalization) and threaten dollar dominance**
    - This could impact the monetary sovereignty of SOEs, especially those with weak M and fiscal institutions
    - According to Brunnermeier, James and Landau (2019) stable coins like libra/diem based on extensive global networks, if credibly backed by safe assets could compete with official currencies a la Hayek (1976)
    - Effective currency competition (cc) could occur because of the ability of stable coins to separate the functions of money
    - Such stable coins could challenge dollar dominance because of the superiority of their networks (based e.g., on Facebook)

CBDC and Open Economy

- But CC from private platforms could run into the problems of interoperability and coordination that plagued multiple competing currencies in the 19C
- Like then, information asymmetry would make the case for CBDC
- A system of interconvertible CBDCs would eliminate the imperfect substitutability of private digital C (Eichengreen 2019)
- The key reason the dollar is the dominant C, as was sterling before it is
- Its economic and political power , extensive trade and payments networks, deep and liquid fin markets and track record of stable and credible M policy that took decades to create.
- It seems far fetched that a stable coin or even a CBDC from China , which lacks these attributes, could supplant it in the foreseeable future.

Lessons from an Historical Perspective

Four key lessons follow from the historical perspective on the case for CBDC

1. **Technical change in money/financial innovation is inevitable driven by the financial incentives of a market economy. It can be traced through history**
    - It is seen in the development of banks and fiduciary money, in central banking and monetary policy
    - The timing of adoption of these technologies is influenced by large shocks: wars, Great Depression, Covid pandemic

Lessons from an Historical Perspective

2. **Government has a key role in the provision of money. Outside M is a public good. It is necessary for the CB to provide it**
   - This holds for fiat M and digital C
   - The ability to provide fiat/digital C depends on the credibility of the issuer
   - If that falters currency competition from other CBDCs or stable coins will erode monetary sovereignty
   - The private sector is most efficient at providing inside M as long as there is an impartial government authority to maintain financial stability
   - This holds for digital deposits

Lessons from an Historical Perspective

3. **CBDC will revolutionize monetary policy if the i on CBDC is used as the policy rate**
   - If the ELB is eliminated, as cash becomes obsolete or is reduced by charging variable fees on holding it, then i on CBDC could always maintain macro and financial stability
   - Regardless of the ELB i bearing CBDC could greatly simplify the CB balance sheet, and move back to a simpler more efficient framework that existed pre GFC
   - And provide a more efficient transmission mechanism

Lessons from an Historical Perspective

4. **CBDC is a global innovation**. It will revolutionize international payments like the first Atlantic cable did in 1866
    - It will also exacerbate currency substitution and will require international monetary cooperation
    - CBDC/stable coins will challenge the IMS
    - The fundamentals leading to C domination are unlikely to change but digitalization will accelerate shifts driven by them, as did occur in the 20C when the dollar eclipsed the pound

- **Digitalization in money and finance is the future**
- **CBs need to be a part of it and need (alongside private sector FIs) to provide digital currency to effectively fulfill their public mandate**