Digital Currencies: What Does the Future Hold?
IMFS Policy Webinar zu Digitalwährungen

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The Future
This talk: general remarks plus taste of my research

1. The battlefield.
2. Private cryptocurrencies:
   a. Bitcoin and Blockchains.
      - Schilling-Uhlig, “Currency Substitution Under Transaction Costs”.
   b. The Crypto Currency Market Place.
   c. Big Players: e.g. Facebook.
      - Benigno-Schilling-Uhlig, “... Impossible Trinity”.
      - Uhlig-Xie, “Parallel Digital Currencies and Sticky Prices”.
3. Central bank digital currencies:
   - Pros and Cons.
      - Fernández-Villaverde - Sanches - Schilling - Uhlig, “CBDC: Central banking for all?”
      - Schilling - Fernández-Villaverde - Uhlig, “CBDC: when Price and Bank Stability Collide”.
1. The battlefield

- Privately issued cryptocurrencies:
  - New technology: the blockchain.
  - Today: several thousand cryptocurrencies.
  - Entry by “big players:” FaceBook for now.

- Central bank digital currencies:
  - Response to the competition of private cryptocurrencies.

- Traditional means of payments:
  - Cash.
  - Deposit accounts.
  - Credit cards.
  - PayPal.
  - Fast retail payment systems.

- Key issue: privacy vs criminal activity. KYC, “know your customer”.
2a. Bitcoin and Blockchains.

- New technology! Smart contracts, NFT (“non-fungible token”).

Data: www.coinmarketcap.com
What determines the Bitcoin price?

- Bitcoins are intrinsically worthless. But: useful for transactions.
- Just like fiat currency! “Bubbles”: \( P > NPV(\text{Dividends}) = 0 \).
  - Model of endowment economy with two competing, but intrinsically worthless currencies (Dollar, Bitcoin).
  - “Fundamental pricing equation”. Special case: **Bitcoin price is martingale**, i.e. the expected future price is the current price.
  - Specific goods can be bought with Bitcoin, others with Dollar.
2b. The Crypto Currency Market Place: by Market Cap

Source: coin360.com, 2021-05-24
2c. Big Players: e.g. Facebook

- **Libra:**
  - Originally to be issued by a FaceBook-led consortium in 2020.
  - permissioned blockchain digital currency.
  - backed by a basket of financial assets: e.g. regular currencies (50% US $, 18% Euro, 14% Yen, 11% Pound Sterling, 7% Singapore $), U.S. treasuries.
  - Fierce resistance by regulators, and now “dead”.

- **Diem (or Libra 2.0):**
  - Moved from Switzerland to U.S. to get regulators on board
  - Dollar-backed stable-coin.
  - More sophisticated blockchain, phased approach.
  - Close competitors already exists: Tether, Paypal.

More players to come? JP Morgan, EIP? Amazon, Walmart? **Probably.** Technology is simple and attractive. What can be done will be done.
Digital currency: private competition to central banks.

  - Focus on “medium of exchange” role of money.
  - Bare-bones model of two countries and three currencies.
    - Two national currencies (n.c.), issued by the two central bank.
    - One global currency (g.c.). Perfect substitute in either country to n.c.
  - If nat currency drops in value rel to global; it will not be used.
  - Main result 1: mon. pol. synchronization or n.c. is no longer used.
  - Main result 2: if g.c. is “asset backed,” narrow range for mon pol.

- Uhlig-Xie, “Parallel Digital Currencies and Sticky Prices,” draft.
  - Focus on “unit of account” role of money.
  - New Keynesian model, two currencies, one issued by central bank.
  - Firms set sticky prices in one of the two currencies.
  - Main result: martingale exchange rate fluctuations create new source of macro uncertainty. Challenge to central bank!

- Upshot: large privately issued cryptocurrencies will be competition and headaches for central banks.
3. Central bank digital currencies
Powell, May 20th, 2021: “possibility of issuing a US CBDC”

CBDC research and pilots around the world

BS = The Bahamas; ECCB = Eastern Caribbean Central Bank; HK = Hong Kong SAR; JM = Jamaica; SG = Singapore. The use of this map does not constitute, and should not be construed as constituting, an expression of a position by the BIS regarding the legal status of, or sovereignty of any territory or its authorities, to the delimitation of international frontiers and boundaries and/or to the name and designation of any territory, city or area.


Source: https://www.bis.org/publ/work880.htm
Central bank digital currencies

- Tokens or accounts? Hybrid or just CB? Coexistence with cash?
- **Accounts: have happened before:** In 1900, the *(Banco de España)*, with 58 branches held 68% of total financial assets and 75% of all checking accounts in Spain.
- Households may no longer need retail bank deposit accounts.
  - Could be good! Financial inclusion. No bankruns.
  - BIS, Oct 2020: “A CBDC could promote more resilient, efficient, inclusive and innovative payments.”
- **Disintermediation Threat:**
  - Without deposit accounts, retail banks can no longer intermediate..
  - ... unless CB funds retail banks: “pass through”, Brunnerm. - Niep.
  - With that, will versions of conventional bank run concerns return?
  - BIS, Oct 2020: “Introducing a CBDC could have financial stability implications that would need to be assessed and managed carefully. ... potential for digital bank runs in times of stress and ... , longer-term consequences for bank funding.”
CBDC: Central banking for all and Spending runs

  - For CBDC to compete with private deposits, CB must indirectly engage in the same intermediation.
  - CBDC more attractive in a bank run. CB may become monopolist.
  - Central bank can always deliver on its nominal obligations.
  - But: CB runs can happen: spending run on available goods.
  - Key Result: **CBDC Trilemma**

- Implement social optimum, no runs, threaten inflation.
- Keep prices always stable: no runs, inefficient (“Vollgeld”).
- Keep prices mostly stable: efficiency, but runs may happen.
4. An Assessment

- The currency landscape is changing dramatically.
- Bitcoin has shown that privately issued currencies are possible.
- Technology is simple and attractive: smart contracts, NFTs, etc.
- Crypto market cap already similar to currency in circulation for US.
- Big players, foreign countries are interested, will introduce.
- Central banks face competition, will have to act: CBDC.
- Privacy concerns: not just criminals value privacy.
- Private crypto-currencies will continue to exist and flourish.
- Technological possibilities still at infant stage. NFT app, anyone?
- Challenges to monetary policy, financial stability and regulation.
- But: do not be afraid! This will improve our lives.