Central Bank Digital Currencies
- Promises and Challenges

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Central Bank Digital Currencies (CBDC)

What is a „CBDC“?

- Technological definition: A digital payment instrument
- Legal definition: A liability of the **Central Bank**, denominated in the national unit of account
- Retail feeling: A cash equivalent

Distinguish: **Private** stablecoin pegged to an underlying

What is a „CBDC“ – Part 2: wholesale...

Example use case for w-CBDC: dollar payment from Eurozone resident to US resident

Steps in current situation

- Client A's bank
- Correspondent bank
- Client B's bank

Eurozone bank has USD account at US correspondent bank
- Limited to central bank opening hours
- Slow because of intermediate steps: multiplication of messages and processes
- Blocked funds at intermediate banks

Steps with wholesale CBDC

- Client A's bank
- Client B's bank

Wholesale USD CBDC is provided by US chartered banks, but can be held by broader set of banks
- Not limited to opening or market hours
- Instant transfer of USD w-CBDC held by Eurozone bank to target bank
- No blocked funds, much reduced intra-system counterparty risks

What is a „CBDC“ – Part 2: ... v retail

Source:
What is a „CBDC“ – Part 3: direct v indirect

**Direct CBDC**
(digital banknotes/central bank accounts/single-cell/central bank cryptocurrency)

- CBDC is a claim on central bank
- Intermediaries or central bank on board (KYC)
- Central bank handles retail payments

**Indirect CBDC**
(synthetic/two-tier/multi-cell)

- ICBDC is a claim on an intermediary
- Intermediaries onboard (KYC) and handle retail payments
- Central bank handles wholesale payments
What is a „CBDC“ – Part 4: token v account-based

Accounts: “I am, therefore I own”

I am A. Transfer 1 from my account to C’s account

Execute if A’s identity can be verified (in person or via device/code)

ID of A

Digital tokens: “I know, therefore I own”

Transfer 1 from address A to address C

Private key A encrypts: Encryption “b5...60a3245d2516f7”

Public key A verifies that private key A was used to encrypt

Execute if public key A shows that digital signature is correct

In an account-based CBDC (left-hand side), ownership is tied to an identity, and transactions are authorised via identification. In a CBDC based on digital tokens (right-hand side), claims are honoured based solely on demonstrated knowledge, such as a digital signature.

Source:
https://www.bis.org/publ/qtrpdf/r_qt2003j.pdf
Promises of CBDC – better than card payments, better than cash?

• Consumer:
  – Quick, easy and costless access across borders
  – Efficient payment systems, smart contracts
  – Trust in the state v trust in private actors

• Merchant: Same, plus: no fees
→ It has to be legal tender!
Challenges of CBDC

• Consumer: Privacy in lawful exchanges
• Regulator: Anti-Money-Laundering, Counter-Terrorist Financing, but also tax evasion and more: can be at odds with privacy
• Central Banks: International competition