

Central Bank Digital Currencies – Models and Implications for Payment Infrastructures *

Blockchain from a Central Bank Perspective
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* The views expressed are those of the author and do not necessarily reflect those of the ECB

Digital Currency and Central Banks

- **Money and means of payment** are at the heart of financial markets and wider economy
- The **emergence of new technologies** triggered reflections how payment, clearing and settlement arrangements are designed
- **Digital currencies** are a focal point of attention by market participants, academics and central banks
- Many **central banks** consider whether their current provision of cash and central bank settlement facilities should be complemented by the issuance of central bank digital currencies

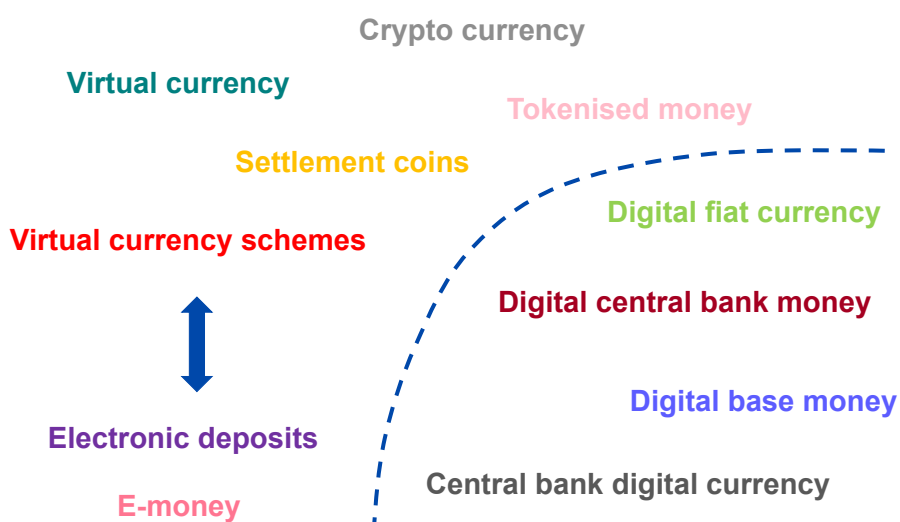
Starting questions

- What is “**currency**”?
 - Store of value, unit of account, medium of exchange (currens)
 - Representation of law and order (nomisma, Wahrung)
- How can currency be converted into **digital form**?
 - From a technical and legal perspective
 - Wide diversity of concepts
- What is the **motivation and role of central banks**?
- What are the **implications and risks**?

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(Central bank) digital currency – terminology issues



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Digital currency – a taxonomy

	Physical currency	Digital deposits	
Central bank	Cash (eg banknotes)	Digital currency	Central bank deposits (eg settlement and reserve accounts)
		Central bank digital currencies	
Commercial bank	Commercial bank notes	Commercial bank digital currencies	Commercial bank deposits (eg transaction accounts)
Other (including non-bank entities and no issuers)	Other issued notes and commodities	Private digital currencies (eg bitcoin)	Non-bank accounts and stored-value records (eg broker-dealer accounts)

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Central bank balance sheet and CBDC

Assets	Liabilities
Monetary outright holdings	Required Reserves
	Central bank digital currency
	Banknotes
Liquidity-providing repos	
Non-monetary assets (FX reserves, gold, IMF credit)	

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Key elements and design features

CBDC key elements:

- **liability of a central bank**
- **digital** form
- denominated in **sovereign currency**

Optional design features:

- **Holders** - *general public or restrictions* (eg to financial institutions) based on central bank policy
- **Records** of transfers and holdings - *on or off the central bank ledger*
- **Transfer mechanism** - *peer to peer or intermediated*
- **Transparency** – *full, limited or anonymity of holders*
- **Availability** - *24/7 or limited*
- **Convertibility** - *into cash and/or central bank deposits*
- **Interest bearing** – based central bank policy

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Central bank digital currency – Possible motivations

Interest of a central bank can vary, as do their *mandates* (eg. smooth functioning of payments, monetary and financial stability, ...):

- Reaction to **declining cash usage** (provision of safe means of payments, alternative to cash and private cryptocurrencies)
 - Promote **cashless society**
 - New instrument to enhance **settlement efficiency**
 - **Financial inclusion** considerations
 - **Control** of domestic currency
 - Inhibit **criminal activity**
 - Additional **monetary policy** instrument (reduce the lower bound on interest rates)
 - Improve **financial stability**
- Balance across objectives?

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CBDC - Implications for central banks



Operational perspective

- Relevance of CBDC for efficient and safe *central bank payments and settlement services*
- Impact on *monetary operations* and *central bank money issuance*



Catalyst/policy perspective

- Supporting *market efficiency* through DvP/PvP in central bank money
- Need for *standardisation and interoperability*, countering fragmentation



Oversight, supervisory and financial stability role

- Impact on *overseen/supervised entities* and their business models as well as on the financial markets at large

Central bank activities

- **Analysis, academic studies or technical experimentation/projects** by most central banks
 - central banks alone/jointly or cooperation with private sector (limits in CB resources, easier to implement, but: ultimate responsibility of CB for maintaining public confidence in currency)
 - variants explored differ depending on motivation (complement or replacement of cash, settlement inefficiencies, interoperability, security issues)
 - interest in exploring CBDC for interbank settlements (or wholesale payments – DvP, FX PvP) and general purpose (or retail - tiered or non-tiered, centralised or distributed) payments
 - relevant issues: technical (scalability, safety, interoperability, maturity of technology) and economical, but also: legal and policy
- **Collaboration on regulatory agenda**

CBDC - Feasibility and risks

- **Technical**
 - Degree of **robustness of possible technologies**
 - **Standardisation** and reference architecture
 - **Cyber risks**
- **Economic**
 - **Monetary policy impact** (cash substitution, interest, seigniorage)
 - **Financial stability** implications (resilience, crisis runs)
 - **Cost-benefit analyses** for CBDCs
 - Impact on **banks business models** (bank deposits, credit provision) and market infrastructure
 - **Acceptance** by users

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CBDC - Feasibility and risks

- **Regulatory and policy**
 - **Private sector vs. public sector** action
 - **Compliance** with supervisory and tax regimes
 - **Privacy** considerations
- **Legal**
 - **Central banks' mandate** to issue digital currency varies across jurisdictions, also depending on design
 - **Legal qualification** of CBDC (discharge of obligations, liability issues, legal tender, ...)
 - **Tax and accounting** treatment

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State of play and outlook

- Proposed CBDC implementations for **wholesale** payments look quite similar to what is used today (but could change in the future, disrupting existing infrastructures)
 - Proposed CBDC implementations for **retail** payments face potential challenges and risks (for bank business models, regulatory requirements, etc.)
 - Alternatives to wholesale CBDC: enhanced RTGS systems, expanding access and opening hours
 - Alternatives to retail CBDC: instant payment services, access to central bank accounts
- ⇒ **Further monitoring and analytical work** is crucial as understanding of CBDC evolves