



EUROPEAN CENTRAL BANK

EUROSYSTEM



# Digital innovations in the area of market infrastructures and payments - 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 innovations and the financial sector

- **Virtual («crypto») currencies** were at the forefront of recent technological developments
  - ⇒ Separation of **assets** (e.g. Bitcoin) and **technology** (e.g. Blockchain)
  - ⇒ Attention fluctuated from the **payments proposition** to the **technical arrangements** and back to the payment dimension
- **Digital innovations** are a focal point of attention by financial market participants, academics, authorities and central banks
- The **emergence of new technologies** triggered reflections how financial market transactions should be **designed and regulated**

# Digital innovations and financial market infrastructures

- **Digital innovations have the potential to induce change across the value chain**
  - Issuance, trading, payments, clearing and settlement
  - Data and identity management as well as regulatory reporting
  - Transfer of assets, record of ownership and asset services
- **Pressure on business models, risk management and regulation**
  - Challenges to the intermediary function of FMIs
  - Market entry of new (unregulated) entities
  - Changing user expectations in terms of speed, cost, transparency
- **Various possible scenarios**
  - Disintermediation by peer-to-peer networks or bigtech platforms
  - Usage of new technology by legacy FMIs to improve internal efficiency
  - New FMIs offering DLT based services

# Implications for central banks

## **Monetary policy and service provider role**

- assessing potential of digital innovations for efficient and safe central bank infrastructure services for settlement of payments and securities
- assessing impact on monetary operations and central bank money issuance

## **Catalyst role**

- facilitating private sector efforts to improve market efficiency
- promoting work on standardisation and interoperability, countering the risk of silos and proprietary solutions

## **Oversight, supervisory and financial stability role**

- assessing possible impact of technology adoption on overseen/supervised entities and their business models and the financial markets at large
- adapting central bank frameworks for data collection and handling

## Central bank activities

- **Understand and monitor fintech developments** and their potential impact on financial institutions and markets
- **Analyse** the potential use of innovations (including blockchains, distributed ledgers, and digital currencies) within the central bank e.g. through **research or technical experimentation**
  - alone/jointly or cooperation with private sector
- **Support** fintech innovation by expanding central bank services and establishing promotion policies (e.g. **accelerators, sandboxes**)
  - improving monitoring of developments and gaining understanding vs. competition issues/picking winners, capacity limitations, liability issues
- **Review** framework for **regulation, supervision and oversight** (domestic/international)

# Focus of global regulatory standard-setting bodies

Global standard-setters and FSB have established dedicated workgroups/work programmes:

- **Sectoral and cross-sectoral analysis and evaluation**

- security and operational (cyber) resilience of products and services
- regulatory compliance (AML / TF), privacy and data secrecy
- impact on regulated services and entities
- impact on financial intermediation and market architecture
- wider impact on financial stability

- **Assessment of need for global regulatory guidance**

- **Information sharing and coordination** between global standard-setting bodies to avoid inconsistent policy views across committees

## Regulatory guidance – 2017 CPMI analytical framework

- Guidance on **understanding the arrangement (scope)**
  - Functionality and nature of the arrangement
  - Key factors for an effective implementation
- Potential implications for **efficiency, safety and the broader financial markets**

Efficiency	Safety
Speed of end-to-end settlement Costs of processing Reconciliation (speed, transparency) Credit and liquidity management Automated contract tools	Operational and security risk Settlement issues Legal risk Governance Data management and protection
Broader financial market implications	
Connectivity issues and standards development Financial market architecture (actors, markets, regulators) Broader financial market risks (micro- and macro-level)	

## Some key issues going forward

### For traditional and new FMIs and infrastructure service providers

- **Automatisation and resilience** (automated execution of processes, smart contracts)
- **Process integration** (ability for DvP, nexus to central bank money)
- **Network effects** (technical standardisation, avoiding fragmentation)
- **Governance** (rules/protocols, control of access, risk management)
- **Regulatory compliance** (support KYC, AML, regulatory reporting, but also: consumer protection, data secrecy and privacy rules)

⇒ Continued relevance in the financial sector for FMI-like services

## Some key issues going forward

### For authorities

- Regular review of adequacy of regulatory standards (“tech neutrality”, **functional approach**)
  - **Avoidance of competitive advantages** for newcomers or incumbents by applying different requirements for the same risks (proportionality)
  - **“Observer nodes”/SupTech** could enhance monitoring of FMIs and facilitate oversight activities, but may create moral hazard
  - Possible **need to rethink certain legal concepts** (formation of contracts, finality, DvP, etc.)
- ⇒ Need of relevant knowledge within regulators and overseers to comprehensively understand technology, underlying protocols/codes, and to adequately assess their functioning

# Demand for improvements in payments

- **Faster execution of transfers and enhanced convenience**

user expectations push towards 24/7 solutions, immediate execution, mobile or internet integration

- **Broader access to safe settlement asset**

as non-banks are becoming more important actors in the payment space, they are seeking access to central bank money and settlement accounts

- **Adapt to tokenisation of securities**

if securities become tokenised, then money settlement might need to follow the movement and bring “cash on ledger”

- **Enhancing efficiency in cross-border transactions**

lowering of costs, reduction of settlement times, extension of operating hours, adherence to international messaging standards and improvement of international interoperability

## Focus on “stablecoins” and CBDC

- The value of **crypto-assets** is inherently unstable due to lack of accountable party
- Demand for a stable asset recorded on distributed ledgers sparked discussion around **central bank digital currencies (CBDC)**
- Private sector launched **stablecoins** as a potential new type of asset that aspires to bringing stability in volatile crypto-assets market and in payment platforms often based on new technologies (such as DLT)

## Central bank digital currency – Possible motivations

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

- Reaction to **declining cash usage** (provision of safe means of payments, alternative to cash and private cryptocurrencies) or active promotion of a **cashless society**
- New instrument to enhance **settlement efficiency**
- **Financial inclusion** considerations
- Inhibit **criminal activity** or **control** of domestic currency
- Additional **monetary policy** instrument (reduce the lower bound on interest rates) and tool to improve **financial stability**

# CBDC - 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 wholesale only)
- **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 / limits or caps
- **Interest bearing** – dependent on central bank policy

# Stablecoin arrangements

- Payment token arrangements can be classified based on several characteristics:
  - Denomination: in fiat currency or in its own denomination
  - Backing: in deposits or other types of reserves and claims, or in central bank money
  - Type of claim: direct claim on funds or contractual rights
  - Authorised holders: from any person to supervised financial institutions only
  - Transfer system: from unrestricted blockchain to traditional payment system

Example	Denomination	Backing	Type of claim	Authorised holders	Transfer system
USC (project)	Several currencies	1:1 CeBM held in RTGS account	Claim on funds held with central bank	Participating banks	Finality payment system
TetherEUR (live)	Own but pegged 1:1 to EUR	(Allegedly) fully backed by reserves (composition unclear)	Claim on the issuer	Public	Ethereum unrestricted blockchain
JPMorgan Coin (pilot)	USD	1:1 CoBM held at JPMorgan	Claim on the issuer	JPMorgan corporate clients	Restricted blockchain operated by JPM
Libra (project)	Own	Fully backed by a reserves held at custodian banks	Indirect claim via service provider	Public	Level 1: Libra restricted blockchain Level 2: Books of the service providers

## Key implications of CBDC (CPMI-MC 2018)

- **Legal considerations from a central bank perspective** - e.g., legal basis to issue, legal qualification, legal tender status, finality
- **Anonymity and privacy** - trade-offs between legitimate interest in privacy and money laundering and financing of terrorism concerns
- **Efficiency** – e.g. possible cost reductions and/or indirect efficiency gains vs. disrupting existing channels, financial inclusion potential
- **Operational aspects** – e.g. technical maturity, governance, cyber security, interoperability
- **Financial stability risks** - systemic bank runs, disintermediation
- **Monetary policy implications** - interest-bearing CBDC as monetary policy tool, narrow banking
- **Cross-border effects** – e.g., increased risk of currency substitution and/or faster shifts in holdings between different currencies

# Considerations around wholesale stablecoins

**At the core, these are payment systems/arrangements**

**Issues around general organization and risk management**

- Sound legal basis (for asset, arrangement, operator)
- Governance
- Liquidity risk
- Operational risk
- Transparency and regulatory compliance

**Central bank implications**

- Role of the central bank and impact on central bank services and functions
- Impact on wider payment ecosystem and market structure
- Ability to oversee new arrangements, including cross-border
- Impact on monetary policy and liquidity provision

## Considerations around (retail) stablecoins

**Retail stablecoin ecosystems**, in particular if designed **global**, may be **complex** – payment system at core, but additional elements, e.g. reserve funds, wallet provision

- **Potential benefits** – e.g. cost reduction, speed, financial inclusion, less volatility if sound stabilisation mechanisms
- **Need for legal certainty and clarity** – e.g. about the rights of holders and obligations of issuers and other relevant parties
- **Challenges for public policy, oversight and regulation**
  - *AML/CFT, consumer and data protection, cybersecurity, tax compliance, fair competition, financial stability, monetary policy*
  - **Regulatory perimeter** (same risks – same regulation) - many risks may be addressed within existing regulatory frameworks, some may need additional review
  - Case for **close global cooperation** of authorities and standard-setting bodies

# Digital tokens vs incremental change – Trade offs

<i>Demand for improvement</i>	<i>Case for digital tokens</i>	<i>Incremental change to traditional rails</i>
Broadening access	Wider adoption, potentially to large corporates	Widening direct access to RTGS
Efficiency in cross border payments	24/7 usability	Longer operating hours and adoption of ISO20022
Adapt to tokenisation	Token design could fit in future tokenised platforms	Payment system upgrades

## Some key issues going forward

- **Various design choices** and forms of stablecoins and CBDC are possible, with significant differences between wholesale and retail
  - Digital money raises old questions about direct **access to central bank liabilities** and the **structure of financial intermediation**
  - Digital money could bring potential **benefits**, but also poses **risks and challenges**, including fundamental legal and regulatory issues, both domestically and globally
  - **Central bank money** remains the ultimate **safe and neutral settlement asset**, the choice of other settlement assets requires further assurances e.g. concerning **safety** and **liquidity**
- ⇒ Any steps towards the possible launch of a stablecoin or CBDC should be subject to **careful and thorough consideration by all relevant stakeholders**