Introduction aux Crypto-actifs, Crypto-monnaies et Monnaies Numériques de Banque Centrale

24 juin 2021

Benoît Sureau, Associé ***Financial Institutions, Risk & Blockchain***
benoit.sureau@pwc.com

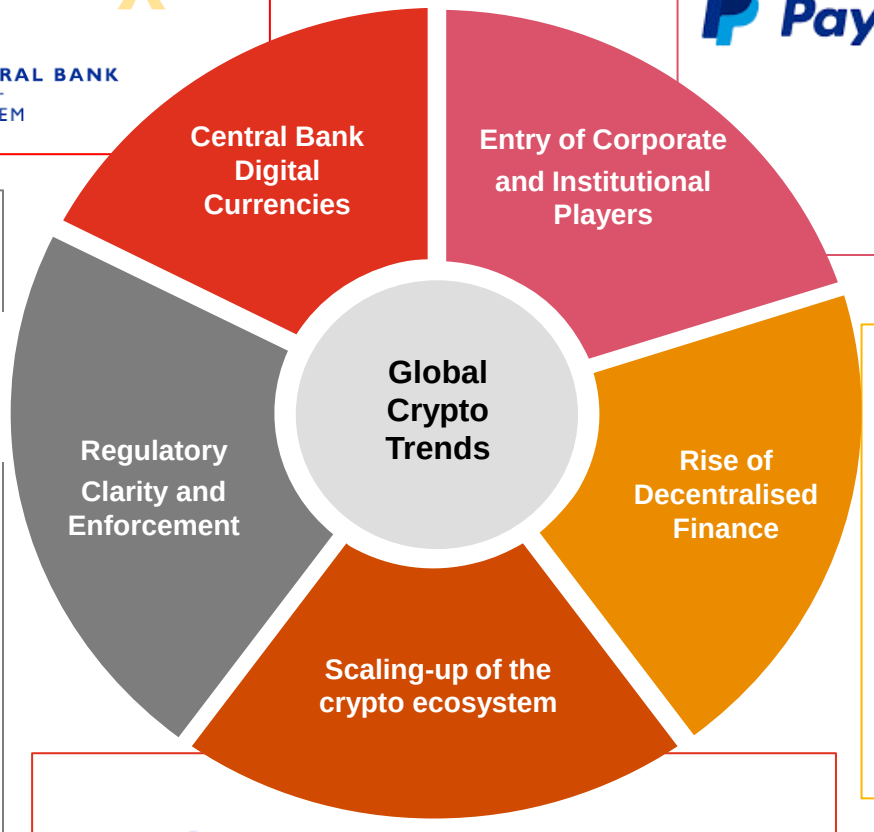
Klara Sok, Senior Manager ***Blockchain Lab***
klara.sok@pwc.com

pwc

AF GAP

5 global crypto trends

Supports digital assets development



Central Bank of The Bahamas · BAKONG · BANQUE DE FRANCE · MAS Monetary Authority of Singapore · 中国人民银行 · EUROPEAN CENTRAL BANK · EUROSYSTEM

diem · The Carlyle Group · Morgan Stanley · lugh · BNP PARIBAS · J.P.Morgan · PayPal · European Investment Bank · The EU bank · Vanguard · SOCIETE GENERALE · Goldman Sachs · WSFS · Santander · DBS

Loi PACTE · Visa ICO · PSAN

AUTORITÉ DES MARCHÉS FINANCIERS · AMF · ACPR · BANQUE DE FRANCE

MiCA · Pilot Regime

European Commission › Strategy › Shaping Europe's digital future › Policies ›

Shaping Europe's digital future

POLICY

Legal and regulatory framework for blockchain

Uniswap · yearn.finance · Curve · Zapper.fi · AAVE · MAKER · Compound

coinbase · BitGo · Ledger

*illustrative only

Crypto-assets use Blockchain as the main technology

Serves as a secure and distributed registry

Distributed Ledger

Every network member has access to the information at the same time

Cryptography

Information integrity and security anchored in a blockchain is based on cryptographic functions

Consensus

Network members mutually verify and confirm transactions on a peer-to-peer basis, without the need of intermediation

Smart contracts

Automated business logic allows counterparties to agree on future paiement terms through the transfer of assets registered on a blockchain

How does it effectively work ?

Real time *information* ***access*** *and* ***transparency*** *that may eliminate the need for reconciliation*

Protects from malicious intrusions *into the network by unauthorized entities*

Facilitates *updates and information* ***validation*** *by network members to ensure the data validity and integrity registered on the blockchain*

Facilitates ***conditional agreements*** *design and enforcement in an* ***automated*** *way*

Tokenization shall bring high value to the financial industry

Namely by enhancing value chain efficiencies and audit trails

EFFICIENCY	• Disintermediation - potentially faster, cheaper and frictionless transactions • Smart contracts may reduce the cost of issuing and administering securities • Possibility to hold fractional ownership of assets • May facilitate corporate actions and collateral management
AUTOMATION	• Smart contract ability to automate multi-party conditional executions in a programmed and automated way should facilitate complex event and flow management. • Native consensus blockchain characteristics highly diminishes the need of reconciliation (e.g. atomic DvP)
DATA TRANSPARENCY	• Transparency regarding transactional data and information around the issuer and the asset characteristics, through enhanced information recording and sharing • High number of standardized data made available by blockchains facilitates the production of aggregated analytical outputs and modelization.
TRACEABILITY	• Chained data structure highly facilitates the management of historical data • Smart contract may ease the traceability of events on the tokenized asset

Tokenization represents a real opportunity for increased transparency, real time management and issuance efficiency

Which assets are concerned?

Potentially, all of them

Traditional financial assets

- Stocks, bonds, and other traditional equities can be represented as tokens
- This could reduce costs through disintermediation and increase returns through easier collateralization like stocks, bonds, and other traditional equities can be represented as tokens

Non-traditional financial assets

- Include assets that have historically been difficult to trade, like shares or revenue rights to VC funds
- This could increase the investors pool and increase the liquidity of traditionally illiquid assets

Non-traditional assets

- Real estate or art, which are illiquid and often prohibitively expensive to own entire units and transfer ownership rights. Fractional shares in token form make these much easier to buy and trade
- This could lead to the “securitization” of currently non-financial assets

Cash

- Private stablecoins
- Central Bank Digital Currencies
- Retail / wholesale applications

Rights and schemes

- They can include revenue share agreements, royalties, voting rights, and synthetic derivatives

Digital Assets overview

A wide range of developments by various types of stakeholders

Cryptocurrencies

Native digital tokens stored in a blockchain and transferable on a peer-to-peer basis

Cryptos: 10 557 Exchanges: 380 Market Cap: $1,315,098,608,772 24h Vol: $132,663,067,298

Source: coinmarketcap.com

Digital Assets

Digital representations of value or rights which may be transferred and stored electronically

Stablecoins

Tokens offering price stability vs. fiat currency or referenced assets

- Backed on fiat currency or on other assets (cryptocurrencies, commodities, fiat currency) ;
- Issued by a decentralised or a centralised actor (in this case private or public)
- Large span of applications : payment, settlement (DvP)

Security tokens

Crypto-assets representing a security providing financial rights (and potentially other types of rights such as voting rights)

Non-fungible tokens

Digital objects on a blockchain

Application tokens

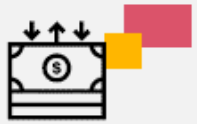
- Utility tokens : *crypto-asset providing digital access to a good or service*
- Governance tokens (DeFi) : *crypto-asset representing voting power on a blockchain project*

Decentralized Finance ("DeFi")

Covers a wide range of applications and offers high innovation potential in financial services digitization

Stablecoins
Digital assets whose price is pegged to the value of the underlying reserve assets to offer a cryptocurrency with little volatility in the price of the coin itself (DAI, sUSD)

Decentralised exchanges
Exchanges that enable users to trade their digital assets peer-to-peer without any centralised intermediaries (Uniswap, SushiSwap, Balancer, IDEX, Loopring, Bancor)



Lending and borrowing
One of the key functions in today's current financial system. With blockchain technology, users are now able to carry out such activities without intermediaries (MakerDAO, Compound)

Insurance
Allows users to get coverage for certain risks (mainly against smart contract failures and the risks related to their deposited crypto assets) without any centralised insurance intermediary (Nexus Mutual)

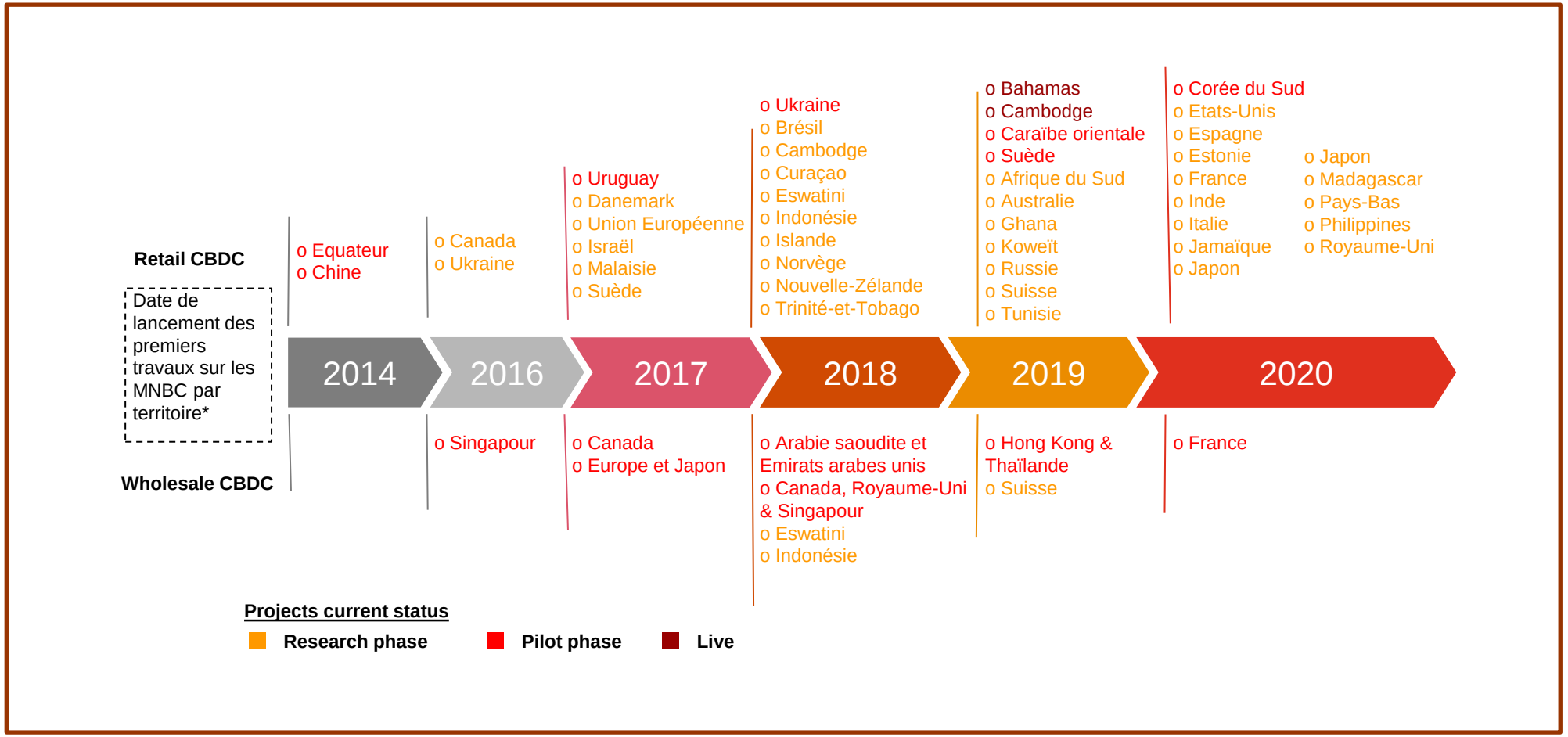
Derivatives (Synthetic assets)
Contracts whose value is derived from the performance of underlying assets. Cryptocurrency-based synthetics allow users to trade the values of various assets on the blockchain network without having the

DeFi aggregators
These aggregators connect to the various protocols, allowing users to get the optimal yield/market rates for their transactions and creating more efficient markets in the DeFi ecosystem (yEarn Finance, Harvest Finance, ValueDeFi)

DeFi provides an open access to peer-to-peer (disintermediated) financial applications

A growing interest for CBDC

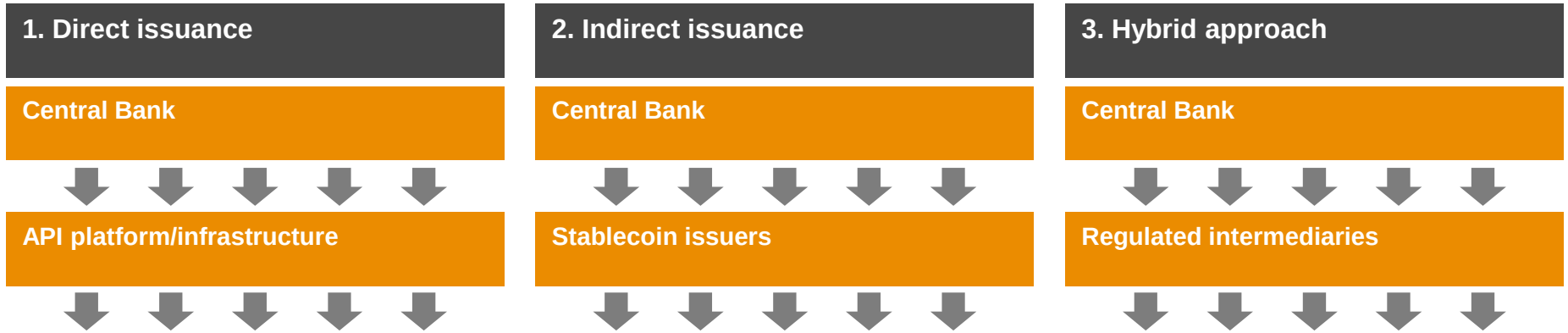
More than 86% of central banks experiment



[1]Source: BIS. Please note that project dates are based on the first publication date of the related report, as provided by BIS. When there is an ongoing or completed pilot, a is marked on the right side of the country flag by a star. Flags without stars indicate that Central Banks are on the stage of research studies. More information concerning the determination of pilot could be found in 'Rise of the central bank digital currencies: drivers, approaches and technologies', BIS working paper, No 880, August by Auer, R, G Cornelli and J Frost (2020).

Retail CBDC

Retail CBDC shows different models with their own peculiarities and characteristics that establish the **role and functions of the actors** participating in the system:

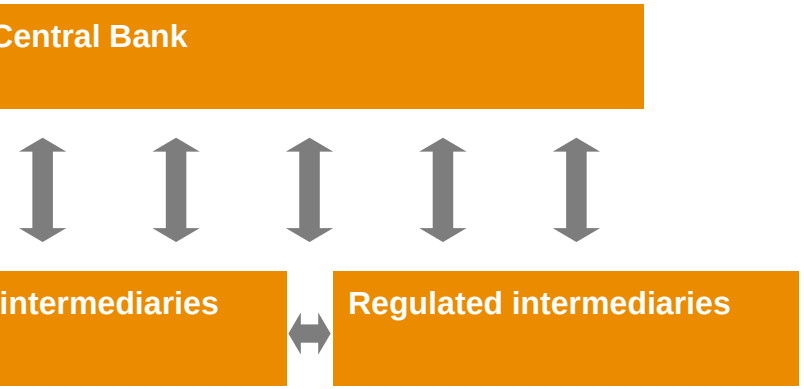


	1. Direct issuance	2. Indirect issuance	3. Hybrid approach
	The Central Bank would build a tech platform with CBDC functionality which allows private sector firms to connect and provide customer-facing services.	CBDC issued by issued (e.g., non bank FinTechs) – similar to narrow banking (no lending, 100% liabilities covered by reserves at central bank and focused on facilitating payments).	CBDC issued to regulated intermediary who then distribute to the public. The counterparty risk remains towards the Central Bank that issues the CBDC.
Claim	Claim against Central Bank	Claim against Stablecoin Issuers	Claim against Central Bank
Distribution	Central Bank issues CBDC to the public	Stablecoin Issuers issue CBDC to the public	Central Bank issues CBDC and Intermediaries distribute to the public
Operations	Central Bank onboard (KYC) and handles retail payments	Stablecoin Issuers onboard (KYC) and handles retail payments	Intermediaries onboard (KYC) and handles retail payments
Balance Sheet	Central Bank records retail balance	Stablecoin Issuers record retail balance	Both Central Bank and Intermediaries record retail balance

Wholesale CBDC

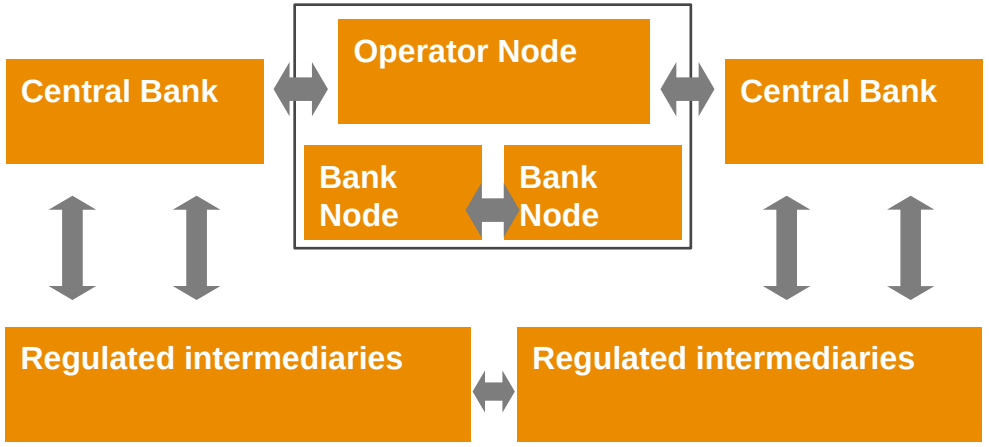
CBDCs can expand the functionalities of existing currency, making several payments use cases more efficient. There can be several CBDC implementation models. A first driver is the choice of the perimeter: **Wholesale or Retail**

1. National



Used for domestic payments.
Allows to improve on existing RTGS systems

2. Cross border



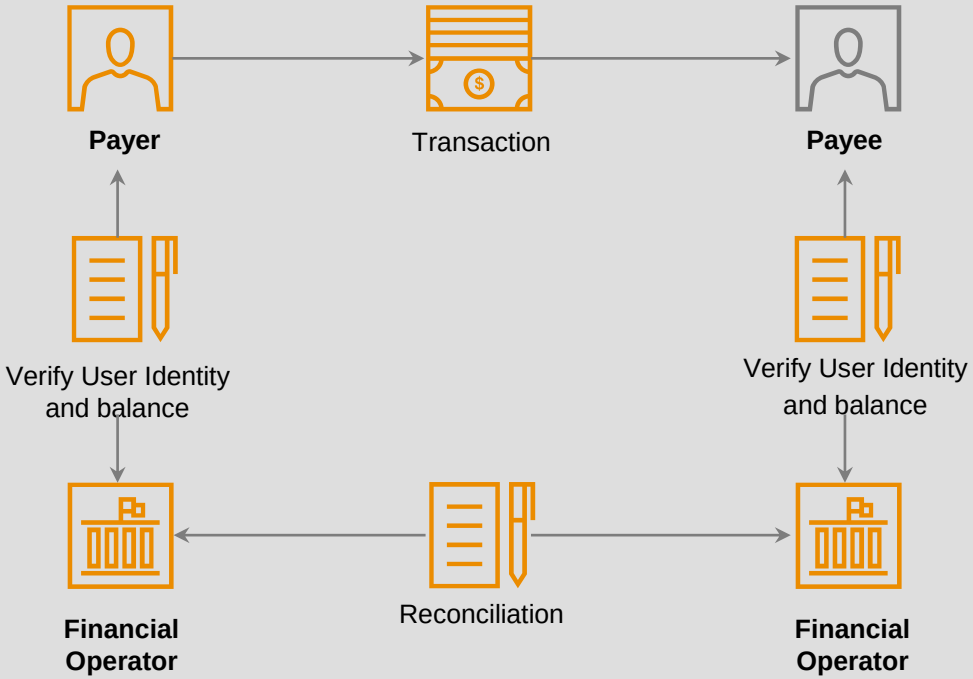
Used for cross-border transactions between national wholesale CBDC systems. A corridor network is created with an operator node run jointly by both central banks that issues depositary receipts used for the cross-border settlement between the bank nodes of the participating banks

CBDC accessibility

Despite of the specific model, a CBDC design could take in consideration two different specific **accessibility approaches**:

Account based – Ownership is linked to an identity

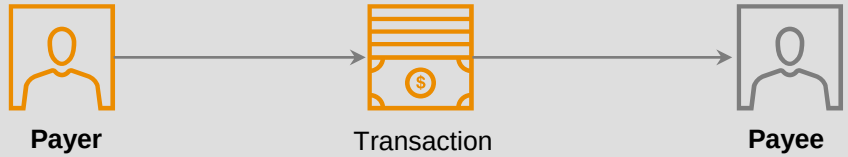
Using an identity, counterparties can verify the owner of the account and it's balance. A transaction is an update of payer and payee balance.



This type of accessibility resembles the systems we use today for sending digital payments. Main benefits of this approach: **simplify institutions backoffice operations** via standardization

Token based – Ownership is linked to a proof

Using Public Key Cryptography, it is possible to verify digital signatures to execute and verify transfer. A transaction is a change of ownership (keypair) of a specific unit of account.



Via the use of PKI and encryption, it is possible to verify that a digital signature is correct.

This type of accessibility resembles very much the possession of cash. Main benefits of this approach: **financial inclusion** (unbankable users) and **cash handling costs reduction**

CBDC as new monetary instrument

There is no one best CBDC model out of all, but it should depend on the socio-economic context of the reference country. The **model should guarantee flexibility** to **adapt effectively to several monetary policies** and it must take into account the **risks associated** with different financial scenarios.

CBDC as a tool of monetary sovereignty and a response to crypto-currencies, private coins and foreign CBDCs.

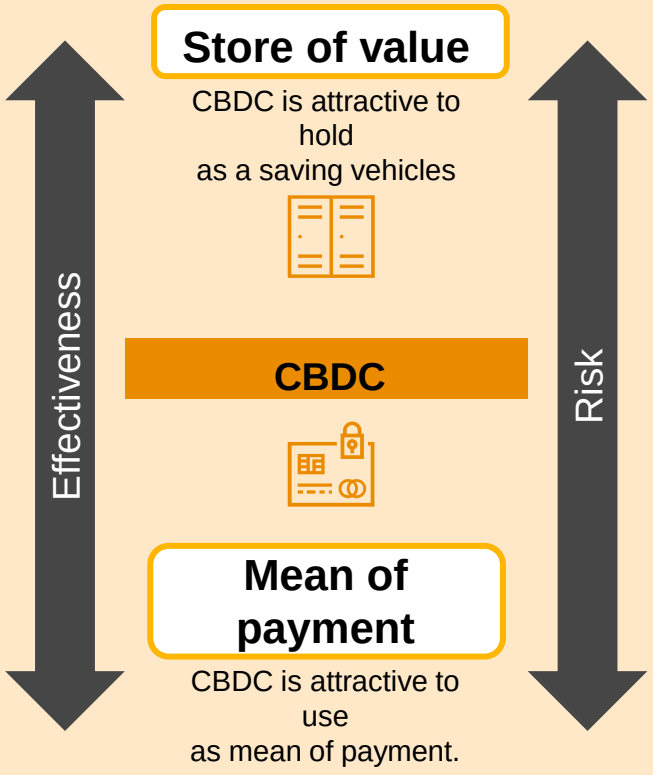
.

Retail CBDC

- Can contribute to modernize the current monetary system and increase **financial security**
- Can contribute to **bridge the gap with the unbanked**
- May brings higher assurance on **tax collection**

Wholesale CBDC

- Can facilitate **interbank payments.**
- Can facilitate the use of central bank money within market infrastructures for **financial instrument settlement.**



Associated risks that Central Bank and financial institutions have to challenge depending on the CBDC purpose

Retail CBDC

- CBDC would attract deposits away from the banking system potentially impacting **liquidity.**
- Foreign use could lead to **substitution** of the local currency and political **instability**
- **Competition with E-Money** if CBDC becomes more convenient
- **Fiduciary money value chain to be disrupted** if retail CBDC gains traction over coins and bills

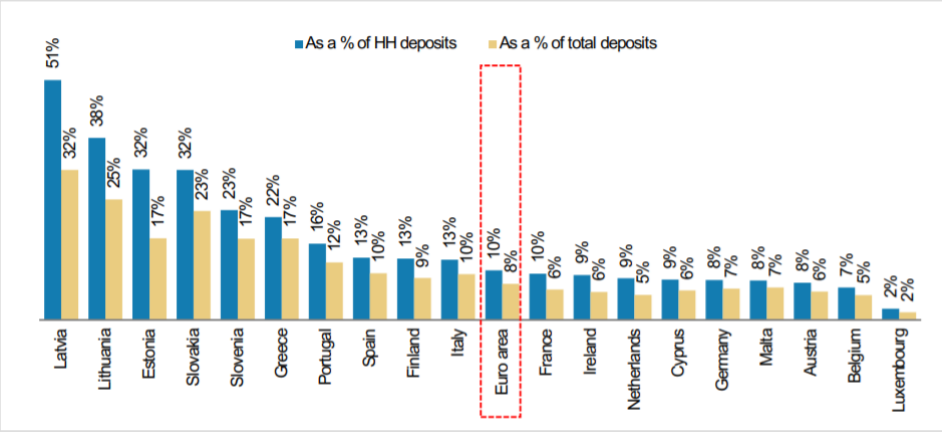
Retail CBDC may transform financial intermediation chains and impact financial system, depending on organizational design choices and access globally.

CBDC development could impact banks' liquidity

Euro area deposits estimated to be potentially reduced by 7-8 % by Morgan Stanley

Scenario 1

All euro area citizens above the age of 15 will want to hold €3,000 in digital euros

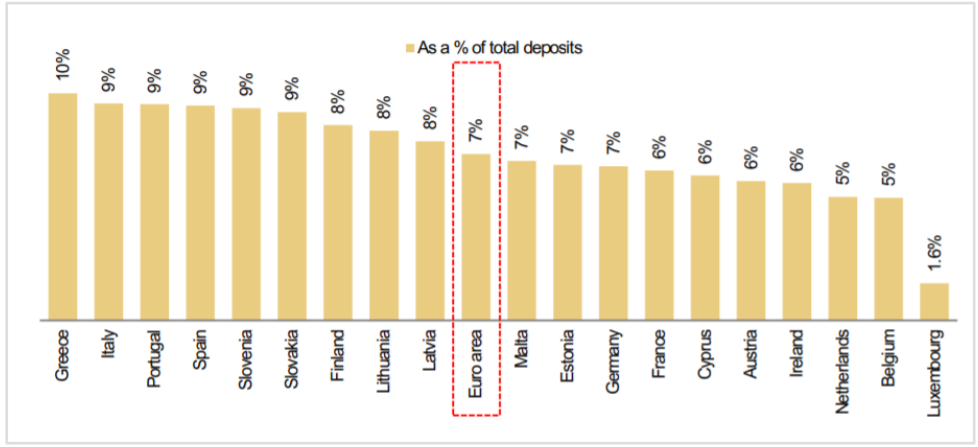


Euro-area total deposit reduced by 8%

- Increase the loan-to-deposit ratio (LDR) from 97% to 105% (banks in smaller countries could be more impacted than the average)

Scenario 2

More realistic and homogeneous scenario : ~10% of households' deposits are converted into digital euros



Euro-area total deposit reduced by 7%

Differences between the countries in both scenarios explained by €3,000 which represent 30% to 50% of total household deposits in small countries compared to 12% in average Euro-zone

Source: Morgan Stanley, « Digital Euro: Rationale and Implications », June 7th 2021

Contacts

Benoît Sureau

Partner Financial Services, Risk and Blockchain
benoit.sureau@pwc.com
Tél. : +33 (0) 1 56 57 40 45 | Mobile :+33 (0) 7 72 37 33 32

Klara Sok

Senior Manager Blockchain Lab
klara.sok@pwc.com
Tél. : +33 (0) 1 56 57 89 28 | Mobile :+33 (0) 7 72 37 33 32

Pour aller plus loin…

Focus sur les développements blockchain en France

- Enjeux et opportunités que représente la blockchain pour l'écosystème français
- Résultats d'une enquête complète auprès d'entreprises du secteur (« *pure players* ») et d'entreprises « traditionnelles »
- Analyses croisées de la part d'experts du domaine (AMF, ACPR, Banque de France, ADAN, Caisse des Dépôts et des Consignations, pure players et grandes entreprises)

Monnaies Numériques de Banque Centrale

- Analyse des grandes tendances à suivre sur le développement des monnaies numériques de banque centrale
- Baromètre de maturité des différents territoires sur le sujet
- Description des dix projets les plus avancés dans les applications de détail et interbancaires

Merci !

pwc.com