UNIVERSITY of NICOSIA

Session 3.1

Stablecoins

BLOC 611: Introduction to Decentralized Finance

Objectives

- Define and demystify stablecoins
- Provide an overview of market growth, size, and characteristics
- Provide frameworks for categorizing different stablecoins
- Explore some notable stablecoins in each category
- Explore the concept of Central Bank Digital Currencies

Disclaimer: As usual, the inclusion of any particular blockchain project or organisation is for educational purposes only. This should not be construed as an endorsement or investment advice.

Agenda

1. Introduction to stablecoins
2. Market Size and growth
3. Stablecoin classification
4. From stablecoins to central bank digital currencies (CBDCs)
5. Factors for issuing CBDCs
6. The technology of CBDCs
7. Conclusions
8. Further reading

Session 3.1: Stablecoins

1. Introduction to Stablecoins

What are stablecoins? (1/3)

Money has assumed many forms over the ages

- However, 3 main functions remain consistent throughout the years, as money is expected to serve as a:
  - **Medium of Exchange**, or an "item" widely accepted in exchange for goods and services
  - **Store of Value**, or an "item" that retains value over time
  - **Unit of Account**, or a "way" to remunerate the value of goods and services
- Different monies have satisfied the above functions with varying degrees of success, however cryptocurrencies have proven a notoriously sub-par **unit of account,** due to their exchange rate volatility.

Consider the following example:

- This very line was typed on October 8th 2021 – the current price of Ether is $3,643
- What is the price of Ether at the time you are reading this?
- How would prices for goods/services accommodate for this shift, if they were remunerated in Ether?

What are stablecoins? (2/3)

In an attempt to combat these shortcomings, a new form of cryptocurrency emerged

- **Stablecoins**, as the name suggests, aim to address the volatility of digital assets and also introduce a blockchain-native unit of account, all while maintaining most (but not all) of the desirable characteristics of their non-stable cryptocurrency counterparts.

There is no such thing as **a universally accepted measure of "stability"**

- As such, most stablecoins elect to keep their price stable against a fiat currency, most commonly the USD.
- While the USD (or any fiat currency for that matter) is not perfectly stable, it is widely accepted as "stable enough" and in any case more stable than cryptocurrencies.
- In practice price parity with the USD is chosen by most stablecoin deployments for practical reasons. From a technological perspective, there is nothing limiting stablecoins for targeting price parity with other fiat currencies, assets, collections (baskets) of assets and currencies, or even setting their own arbitrary goals – blockchain derivatives are one such example (discussed in week 4).

What are stablecoins? (3/3)

All things considered, a broader definition for stablecoins would be the following:

- A **stablecoin** is a **digital asset** that utilizes one of several technological or financial techniques, or a combination thereof, to maintain a stable price against a set target.

- This **set target** can be the price of any money, real or financial asset, cryptocurrency, combination of the above, and even an arbitrary number.

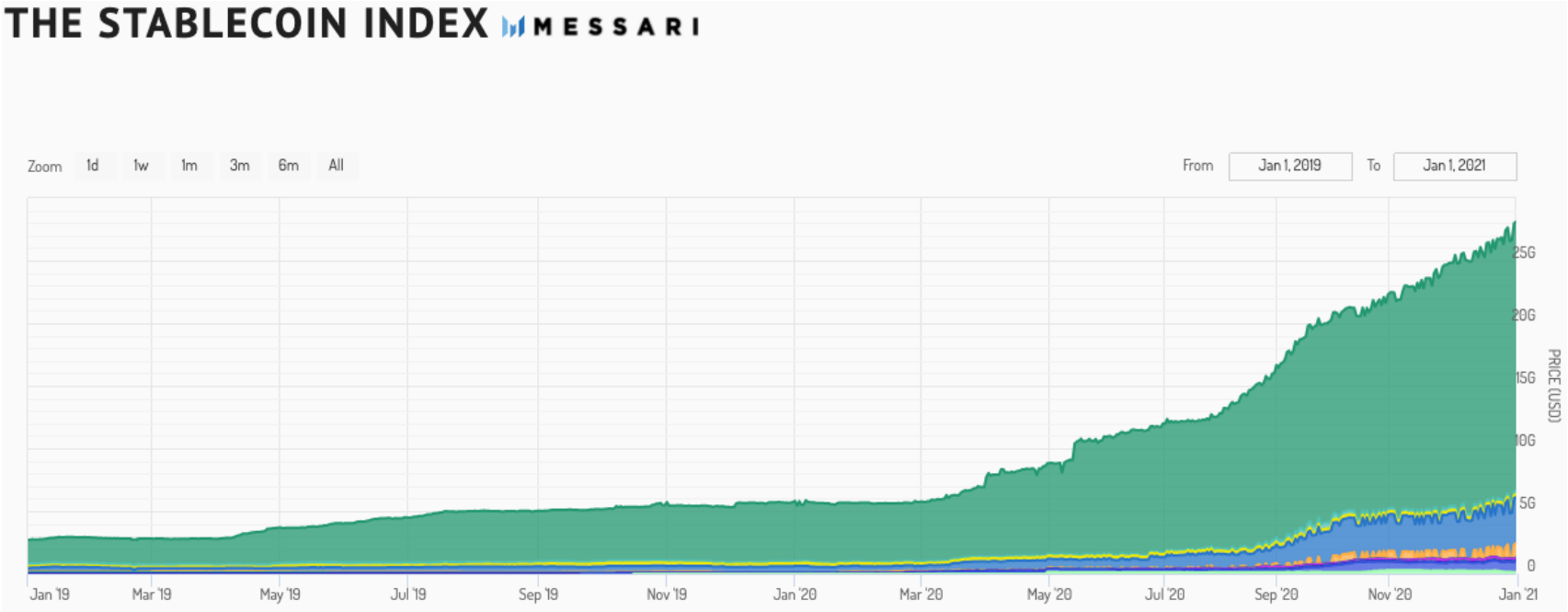
- The goal of (most) stablecoins is to mitigate price volatility in cryptocurrencies, provide a blockchain-native unit of account and even serve as a store of value and medium of exchange.

Session 3.1: Stablecoins

2. Market Size and Growth

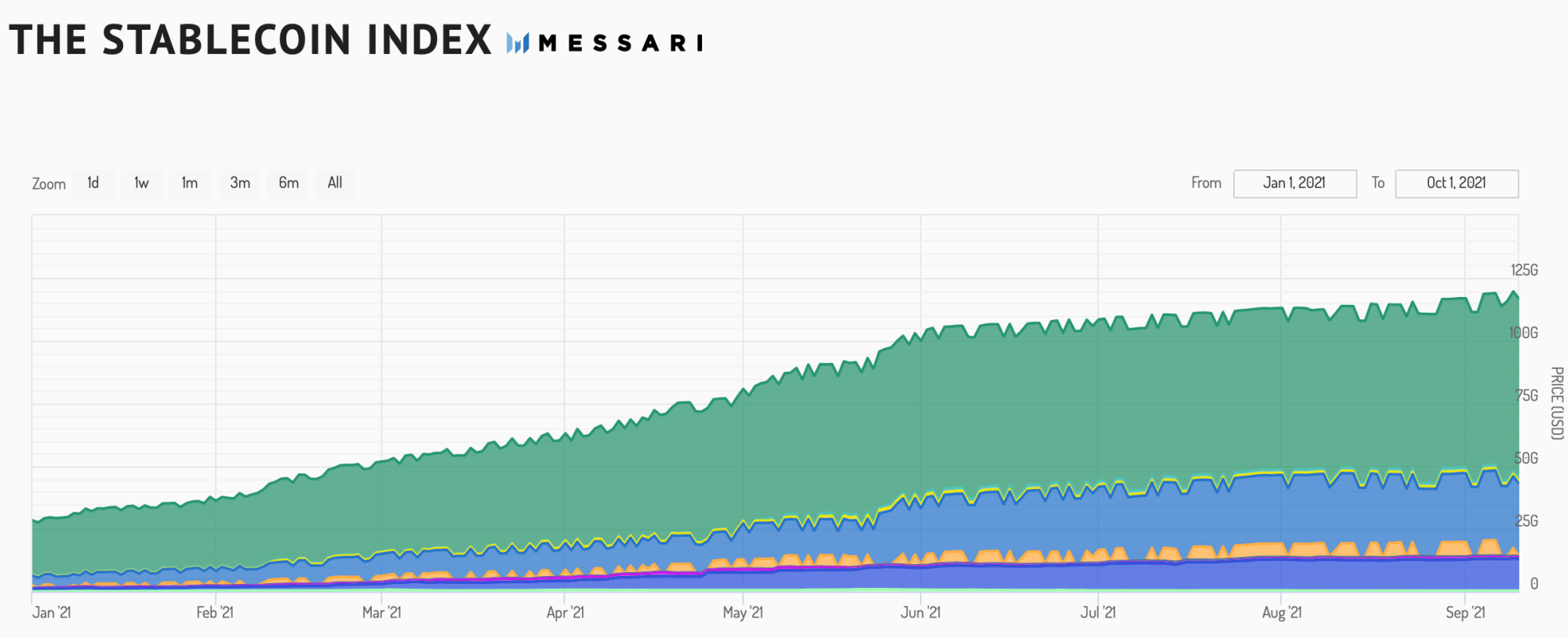
Market size and growth (1/3)

- Interest in stablecoins has only grown over the years. In 2020, following the March 2020 market instability and interest-bearing use cases emerging from the DeFi space, **the demand for stablecoins skyrocketed**.
- Within a year, from January 2020 to January 2021, the collective market capitalisation of the 12 stablecoins included in the Messari index increased by more than **5 times** from **$5 billion to $25 billion**



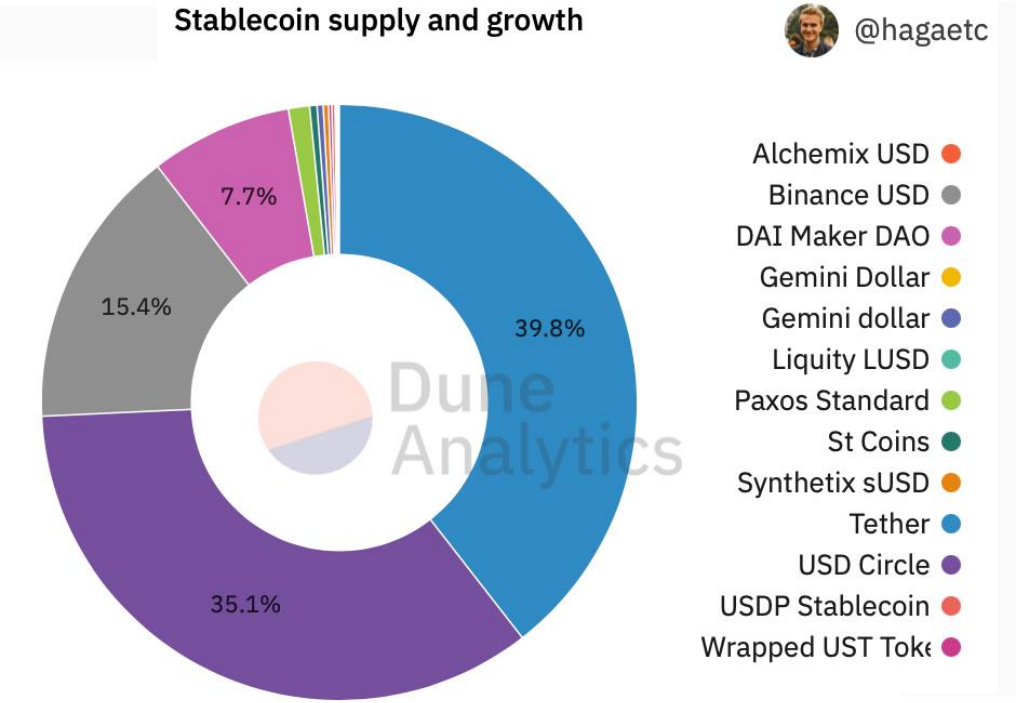
Market size and growth (2/3)

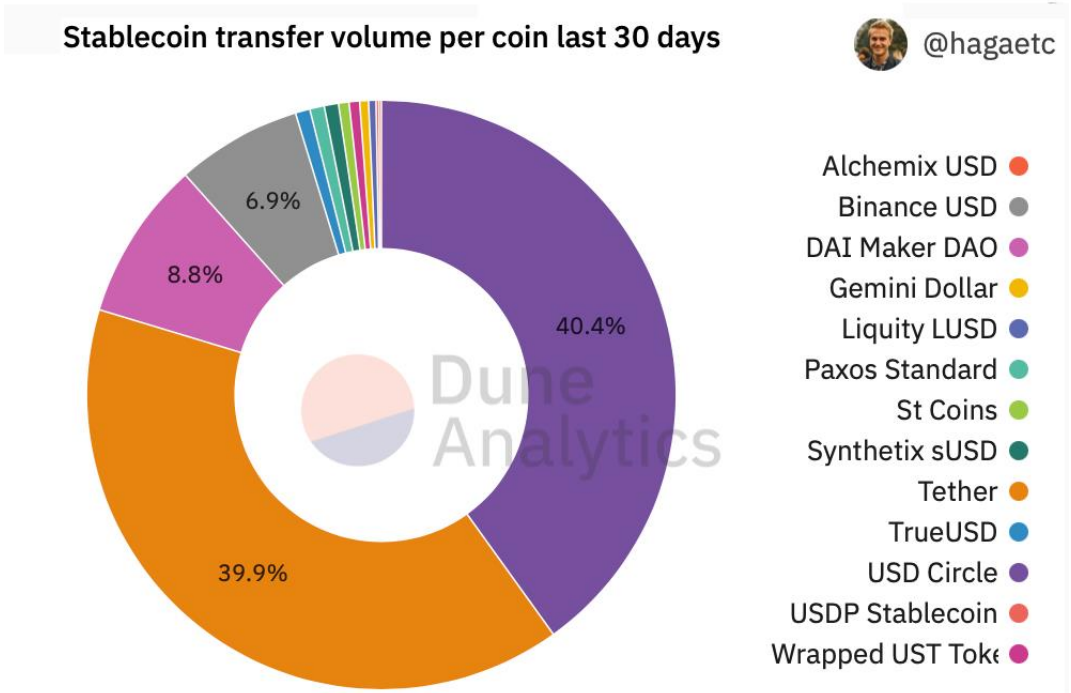
- Since then, the market capitalisation has increased again by a factor of **almost 5 times to over $110 billion**



Market size and growth (3/3)

The key players by market capitalization and transfer volume are: **USDT**, **USDC**, **BUSD**, and **DAI**





Session 3.1: Stablecoins

3. Stablecoin Classification

Classifying Stablecoins (1/2)

- As we have discussed, stablecoins use a **variety of techniques to minimize volatility**
  - There are stablecoins pegged to fiat currencies, commodities such as gold, and baskets of assets
- Stablecoins also **fall into a spectrum when it comes to their degree of decentralization**
  - Some stablecoins are decentralized and others are maintained by centralised custodians
- Some stablecoins rely on technology, and others on market forces and incentives to maintain their peg
- There are a number of different ways to categorise different stablecoin deployments, but mostly concentrate around their decentralization level and mechanisms for achieving price parity against the target:
  - **Degree of (de)centralization: custodian or centralized** vs **non custodian or decentralized**
  - **Mechanism: collateral backed** vs **reserve backed** vs **algorithmic** vs **mix**

Decentralized vs Custodial

- Come with many of the usual benefits and drawbacks of centralized deployments discussed in the first week. They are **efficient** but:
  - Centrally controlled
  - Prone to censhorship
  - Lack transparency & auditability
- However, in contrast to banks or fintech, they are open for everyone to participate*

- Come with many of the usual benefits and drawbacks of decentralized deployments discussed in the first week. They are are inefficient, but:
  - Transparent
  - Censorship resistant
  - Open for everyone to participate

*for the most part – see here

Custodial vs Decentralized Stablecoins

Custodial Stablecoins:

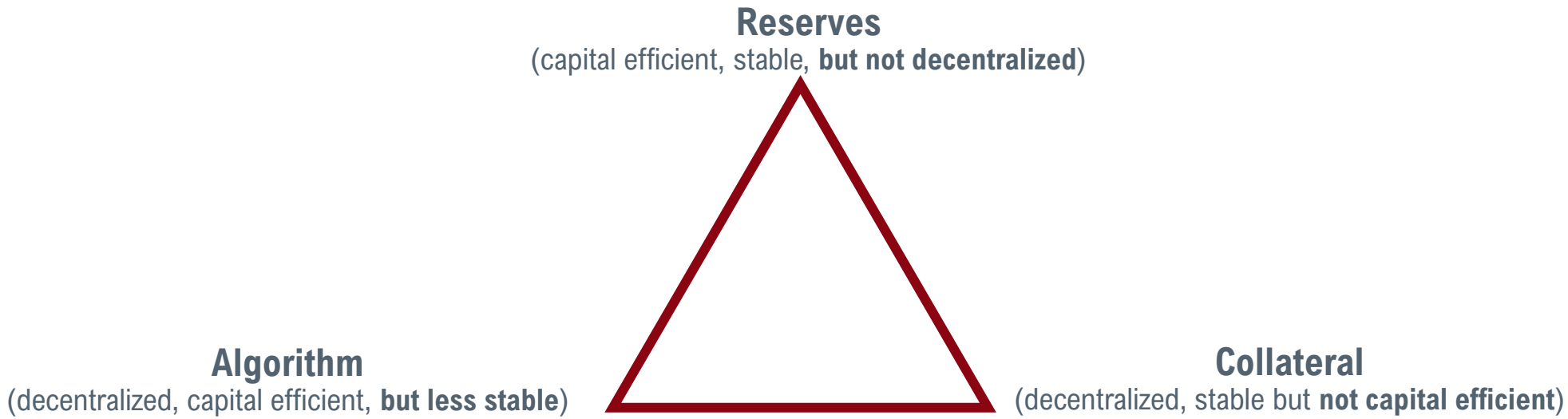
- In custodial stablecoins, centralized entities maintain off-chain collateral, such as money and money equivalents, bonds, or commodities. Stablecoins represent an on-chain version of the reserve assets.
- Holders of the digital token have a **claim against the custodial assets**, which maintains the peg. Custodial stablecoins introduce coin holders to counterparty and censorship risks related to the off-chain assets and economic risks of the capital assets. That is why custodial stablecoins are also called IOU stablecoins.

Decentralized Stablecoins:

- Non-custodial or decentralized stablecoins utilize economic and technological techniques implemented through smart contracts to maintain price stability.
- Many decentralized stablecoins resemble traditional risk transfer instruments, such as collateralized debt obligations (CDOs)

Classifying Stablecoins (2/2)

- Stablecoins can be further segmented to **Reserve-based**, **Collateral-based**, and **Algorithmic** depending on the mechanism used to achieve price stability. There can also be combinations.
- As we hinted to in the previous slide, custodial stablecoins for the most part, utilize reserves
- Decentralized stablecoins, on the other hand, mostly utilize collateral or algorithms
- Each mechanism comes with its own advantages and drawbacks, forming a trilemma, as shown below:



Reserve Stablecoins

To understand the concept of reserve stablecoins, we will look at the example of Tether (USDT)

- Tether is by most metrics the most popular custodial stablecoin
- It maintains its peg to the USD through a 1:1 reserve system. In essence, Tether is holding the equivalent of $1* for each unit of circulating Tether (USDT). This concept is also known as **exogenous collateral**, since the USD is not a blockchain-native asset.
- In essence Tether works in the following way:
  1. Bob deposits 1 USD to Tether's bank account
  2. Tether mints (creates out of thin air) and sends 1 USDT to Bob's address
  3. Bob can return the 1 USDT in exchange for the USD
- The benefits/drawbacks of this approach are the following:
  - It is a straightforward method of maintain a peg against a target price
  - Because it is centralized, USDT users need to trust that tether is actually backing USDT with valuable assets
- Other popular reserve stablecoins include: USDC, True USD, Binance USD, Gemini Dollar

*In reality, each USDT is not backed by USD, but by a collection of assets. This is part of the controversy around Tether.

Collateralized Stablecoins

To understand the concept of reserve stablecoins, we will look at the example of DAI and MakerDAO

- DAI is a collateralized stablecoin originally backed by Ether (but since expanded to other cryptos). MakerDAO is a Decentralized Autonomous Organization (DAO)* governing the issuance of DAI
- Collateralized stablecoins, such as DAI, are akin to reserve stablecoins, however instead of being backed by **exogenous assets**, such as USD, they use blockchain-native, or **endogenous assets**, i.e., cryptocurrencies
- Users essentially **"borrow DAI into existence":**
  1. Bob deposits $150 in ETH to a MakerDAO vault (smart contract) as collateral
  2. In exchange Bob receives $100 worth of DAI, or 100 units of DAI in his wallet
  3. Bob can pay back the 100 DAI to receive his ETH
- DAI is essentially a blockchain-based Collateralized Debt Obligation (CDO)
- While backing stablecoins with fiat is straightforward, the price of cryptocurrencies fluctuates dramatically. The overcollateralization system described above serves as a buffer, in the event of large price shifts
  - In this example, in case the value of the deposited ETH falls below $150, Bob's position would be wholly or partially liquidated (sold in the open market) to ensure that DAI maintains its target price.

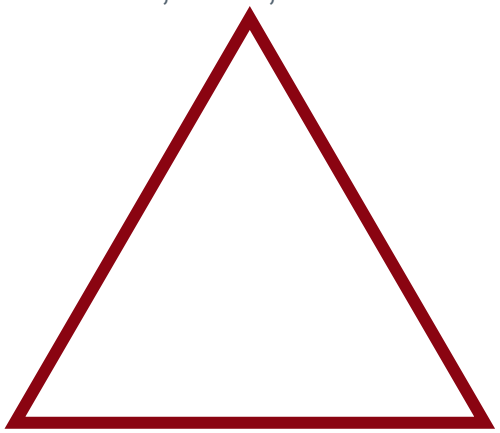
*more on DAOs in a later week

Collateralized Stablecoins (continued)

- MakerDAO is governed through a token call Maker (MKR)
  - MKR holders are responsible for governing the protocol predominately by determining the accepted collaterals and setting the stability fee (or interest rate for minting DAI).
  - The stability fee is akin to how a central bank influences demand for money by setting interests in a corridor system.
- The benefits/drawbacks of this approach are the following:
  - It is keeping in par with the decentralized ethos of DeFi
  - However, it is highly **capital inefficient** due to overcollateralization. The question then becomes, why even mint DAI in the first place?
- We will answer this question and provide more information on liquidations in the next session.

Algorithmic Stablecoins (1/3)

Reserves
(capital efficient, stable, but not decentralized)



Algorithm
(decentralized, capital efficient, but less stable)

Collateral
(decentralized, stable, but not capital efficient)

- As we have established, custodial stablecoins are effective, as they rely on reserves for maintaining their peg. However, as centralized deployments they come with many of the risks and pitfalls of TradFi.
- On the other hand, stablecoins that rely on collateral, are decentralized, but capital inefficient, due to their reliance on overcollateralization.
- Algorithmic stablecoins represent an attempt at an optimal solution.

Algorithmic Stablecoins (2/3)

Algorithmic stablecoins aim to provide a capital efficient and decentralized way of achieving price stability. To do so, they don't rely on reserves (exogenous) or collateral (endogenous), but instead, deploy **algorithms that influence the demand/supply of the stablecoin**.

- The logic of algorithmic stablecoins is simple. Using USD as example peg, the following must hold:
  - If the price of the stablecoin = $1, then do nothing
  - If the price of the stablecoin > $1, then increase the supply (to decrease the price of each stablecoin)
  - If the price of the stablecoin < $1, then decrease the supply (to increase the price of each stablecoin)

Most algorithmic stablecoins use one of the following techniques to achieve this:

- **Rebase Model**: The rebase models work by directly influencing the supply of the entire stablecoin. Based on the formula presented above, the circulating supply expands or contracts during a rebase, thereby influencing the value of each unit of the stablecoin.
- **Seigniorage Model**: The seigniorage model works by introducing an incentive system to manage the supply and price of the stablecoin through market forces. The incentives come in the form of coupons bought and sold in the native stablecoin, or other token native to the application (think of bonds).

Example: Ampleforth

Ampleforth

- **Ampleforth** utilizes a **rebase Model** to keep its price stable. It is an elastic supply token with non-dilutive characteristics. This means that the total number of AMPL in circulation changes, but in that process every AMPL holder keeps the same percentage of the total supply of AMPL.

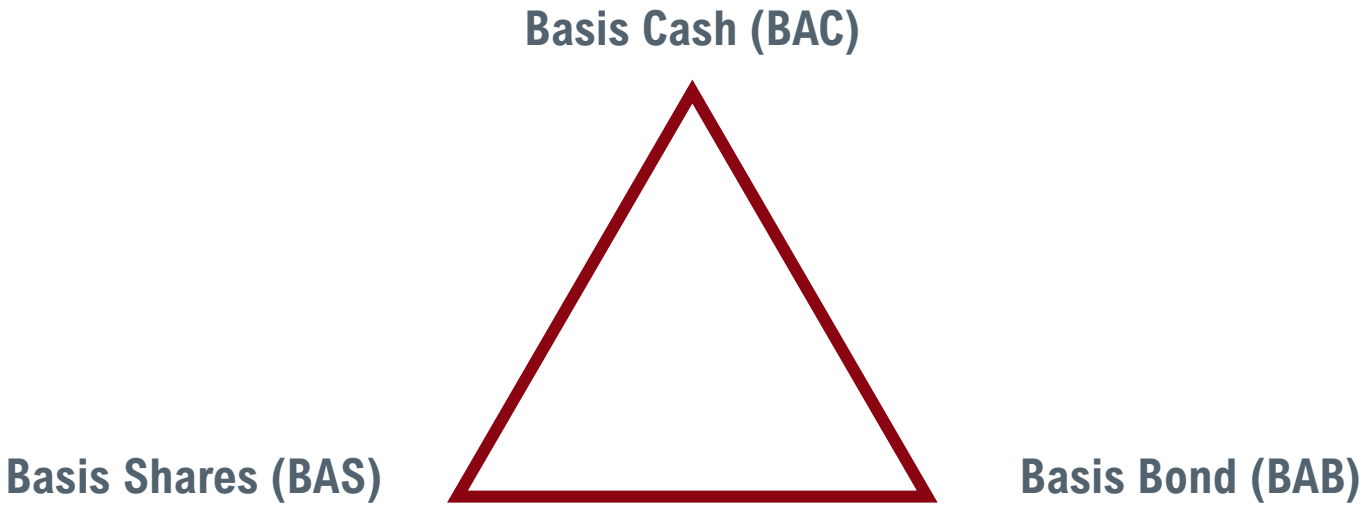
- Ampleforth exists in 3 states: **Equilibrium**, **Expansion**, and **Contraction**. Every 24 hours, the entire circulating supply of AMPL changes, for example:
  - If the price of AMPL is trading above the target of $1, supply expands
  - If the price of AMPL is trading below the target of $1, supply contracts
  - If price of AMPL is trading at $1, nothing happens

- From a user's perspective, the number of tokens in each wallet changes, whereas the value remains (hopefully) stable.

Example: Basis Cash

Basis Cash uses a **seigniorage** model to keep its price stable, **utilizing combination of 3 tokens**.

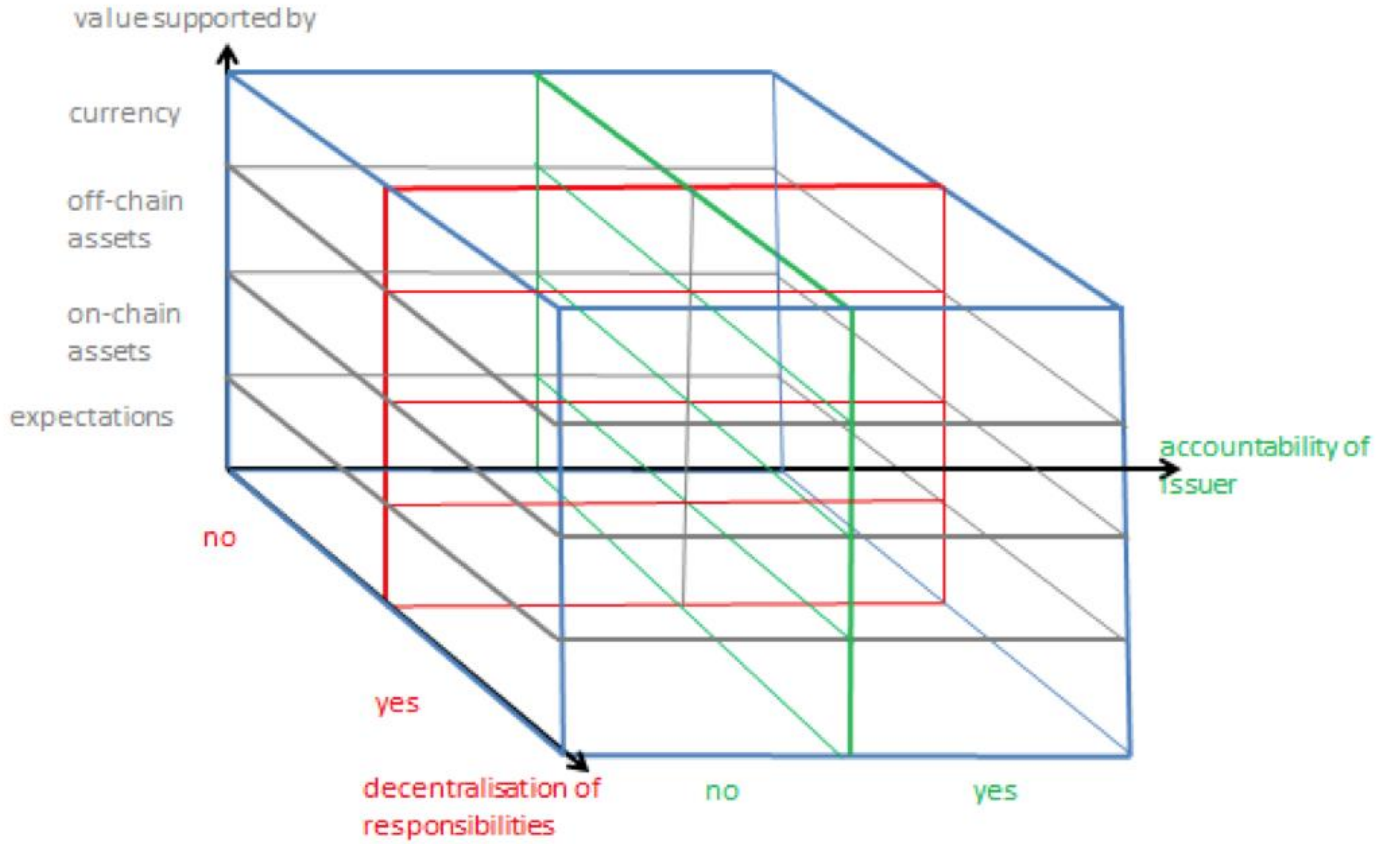
- The basis cash (BAC) – Which is the network's stablecoin
- The basis shares (BAS) – Which is both a governance token, and also represents a claim on newly minted BAC (hence the term **seigniorage**, which is the profit derived from the difference between the **value** of money and the **cost** to produce it, which is essentially 0 in blockchain).
- The basis bond (BAB) – Which can be thought as a premium share, and represent a priority claim on new BAC



Basis Cash (continued), Empty Set Dollar

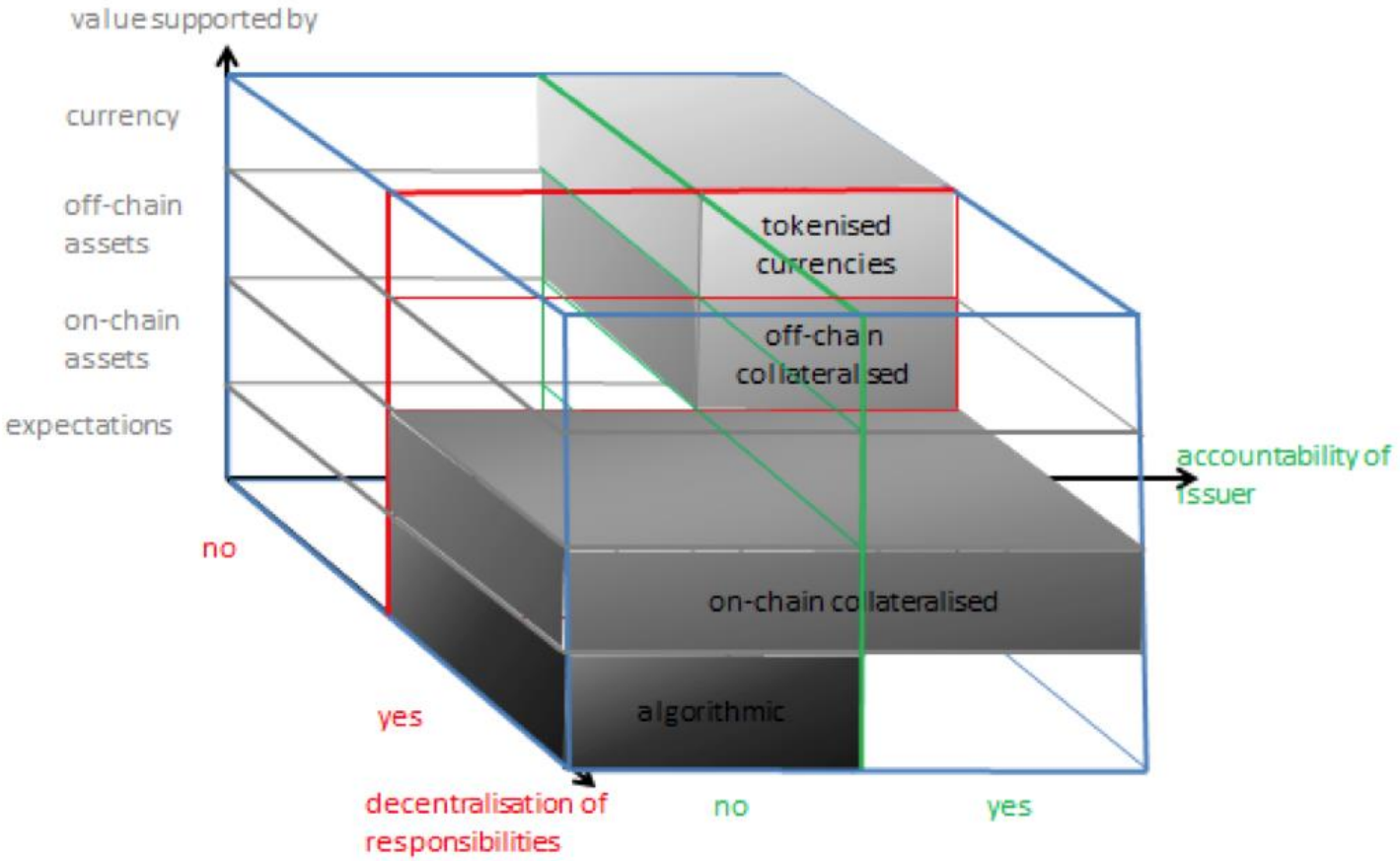
- **Basis.cash** exists in 3 states:
  - If the price of BAC is trading above the target of $1, new BAC is minted for shareholders (BAB and BAS stakers).
  - If the price of BAC is trading below the target of $1, users can spend BAC to buy BAB. This removes BAC from circulation and pushes the price up. Why buy BAB? The next time BAC goes > $1 BAB holders are paid first in the newly minted tokens, and BAS holders are paid last.
  - If the price of BAC is trading at $1, nothing happens.
- The Empty Set Dollar works in a similar way, but utilizes two tokens instead of three:
  - Those are the stablecoin, Empty Set Dollar or ESD
  - When price goes above the target, ESD holders can stake their ESD to receive part of the newly minted tokens that are used to drive prices back down.
  - When the price goes below the target, ESD holders can burn their tokens, in exchange for coupons. Coupons represent a claim on future ESD and are sold at a discount.
- Both systems operate very similarly to discount bonds or call options with a strike price of slightly > $1.
- As we discussed in the Stablecoin trilemma, neither BAC, nor ESD have been particularly successful in maintaining a peg.

Another way of thinking about stablecoin types



Source: ECB: In search for stability in crypto-assets: are stablecoins the solution?

Think: where would you put Tether, DAI, Ampleforth, etc?



Source: ECB: In search for stability in crypto-assets: are stablecoins the solution?

Indicative issues with stablecoins (volatility)

Think of the categories that the most volatile stablecoins fall under!

Source: CoinGecko Q1 2021 Report

Indicative issues with stablecoins (decentralized)

Project	When	Event
Dai	December 2018	Deleveraging feedback leads to Dai trading at above 1 USD
Dai	March 2020	Deleveraging feedback leads to Dai trading at above 1 USD
Dai	March 2020	Collateral liquidation auctions settle at 0 DAI due to illiquidity and network congestion
bitUSD	Winter 2018-19	Broken peg, broken settlement due to low collateralization
Steem Dollars	December 2018	Broken peg, haircut in redeemability due to system debt level
NuBits	Summer 2016	Crisis of confidence
NuBits	March 2018 - ongoing	Crisis of confidence, equity position unable to absorb enough supply

Source: Stablecoins 2.0: Economic Foundations and Risk-based Models

Indicative issues with stablecoins (custodial)

Project	When	Event
Synthetix	June 2019	Error in FX price feed made KRW price skyrocket
Nuo Network	June 2019	Link token price cannot be correctly read due to single point of failure
Terra	July 2019	Price of Luna/KRW pair on Coinone exchange is manipulated
bZx	February 2020	wBTC price on Uniswap was pumped by margin trading on bZx
bZx	February 2020	sUSD price on KyberSwap and Uniswap manipulated

Source: Stablecoins 2.0: Economic Foundations and Risk-based Models

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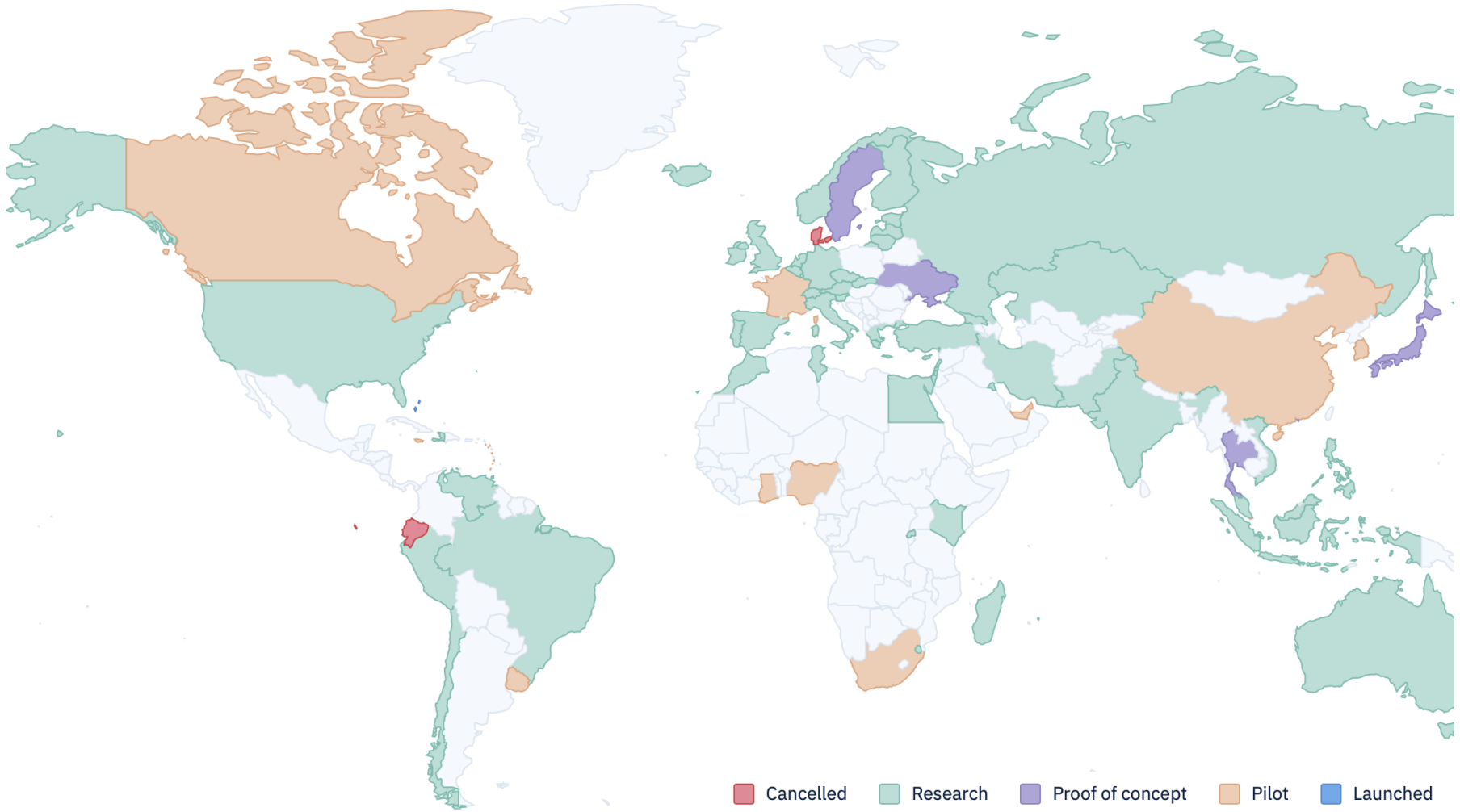
4. From stablecoins to Central Bank Digital Currencies (CBDCs)

Introduction to CBDCs

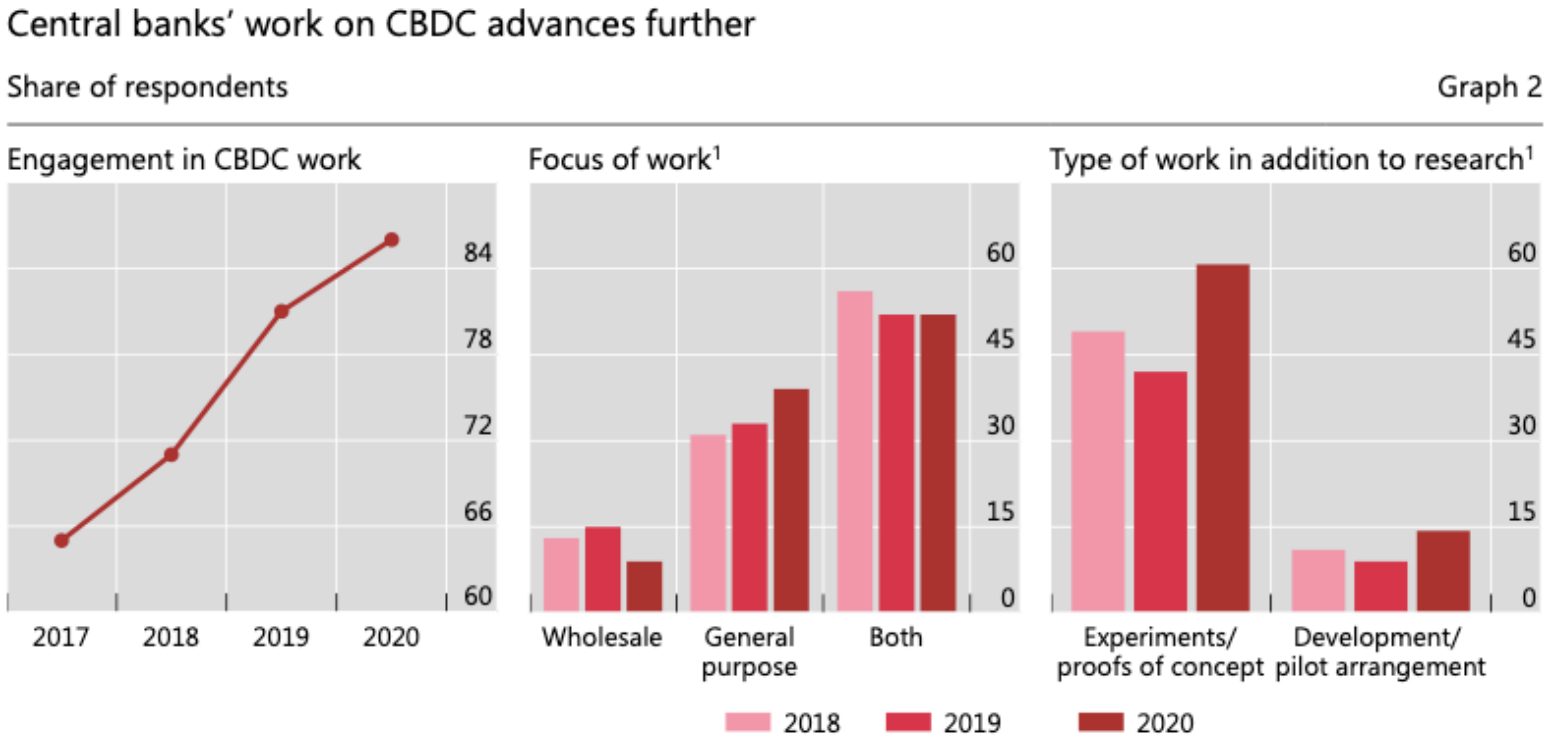
- The **decentralised nature** of stablecoins and general **lack of interoperability** with existing payment systems and the banking sector, limited their reach to blockchain-native use cases, and made their universal acceptance problematic and legally ambiguous.
- An alternative emerged in the form of **custodial, centralized stablecoins**, issued by established companies, such as Facebook and JP Morgan, with hope that they could use their existing network to foster adoption.
- Facebook's **Diem** (formerly Libra) has been widely followed. It was meant to operate as a payment method across a suite of products and services offered by Facebook and its partners. Importantly, it came with the promise of onboarding approximately 2 billion Facebook users to "crypto"
- At the same time, China started exploring the issuance of its own, national stablecoin.
- Very quickly, other nations announced plans to issue their own version of a national stablecoins, which became known as **Central Bank Digital Currencies.**
- What started as a small blockchain experiment, quickly evolved into a global arms race for being first to market

The CBDC Landscape (as of October 2021)



Source: CBDCtracker.org

The CBDC Landscape (continued)



[1] Share of respondents conducting work on CBDC.

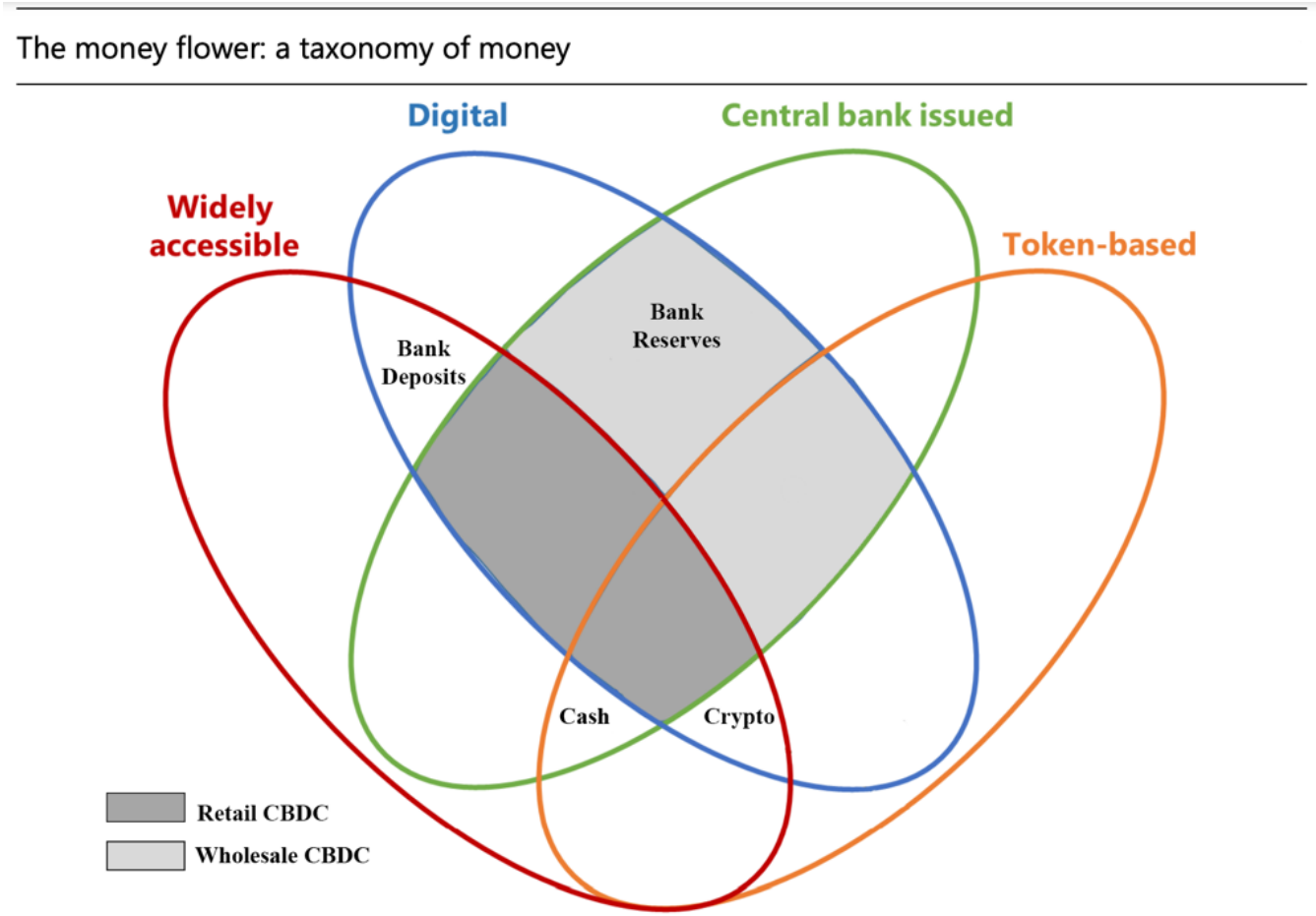
Source: BIS central bank survey on CBDCs.

CBDCs Defined

Simply put, **CBDCs are a digital form money, issued by a central bank**. In that sense, they are not an entirely novel concept. Most commercial banks are required to hold a minimum amount of cash, as well as deposits with the central bank in the form of **reserves**. Reserves satisfy the above definition of CBDCs

- In reality, the **novelty** of CBDCs relies **on two primary factors**:
  - Nature of liability: the extent to which the CBDC is made available to the private sector.
  - Nature of technology: novel technologies that will enable new capabilities.
- In terms of the nature of the liability of CBDCs, there two primary versions:
  - **Wholesale CBDCs**, which pertain to the expansion of the reserve model to include other legal entities besides commercial banks (e.g., financial institutions, pension funds). In such a model, a CBDC would be reserved for commercial banks and other institutions appointed by the central bank to facilitate payments, remittances, and even the settlement of other financial instruments.
  - **Retail CBDCs**, which are a form of legal tender denominated in the national currency, to fulfil the necessary functions of money, serving as a medium of exchange, store of value, and unit of account, all while constituting a liability of the central bank and asset of the private sector, meaning individuals, households and businesses

Retail and Wholesale CBDCs



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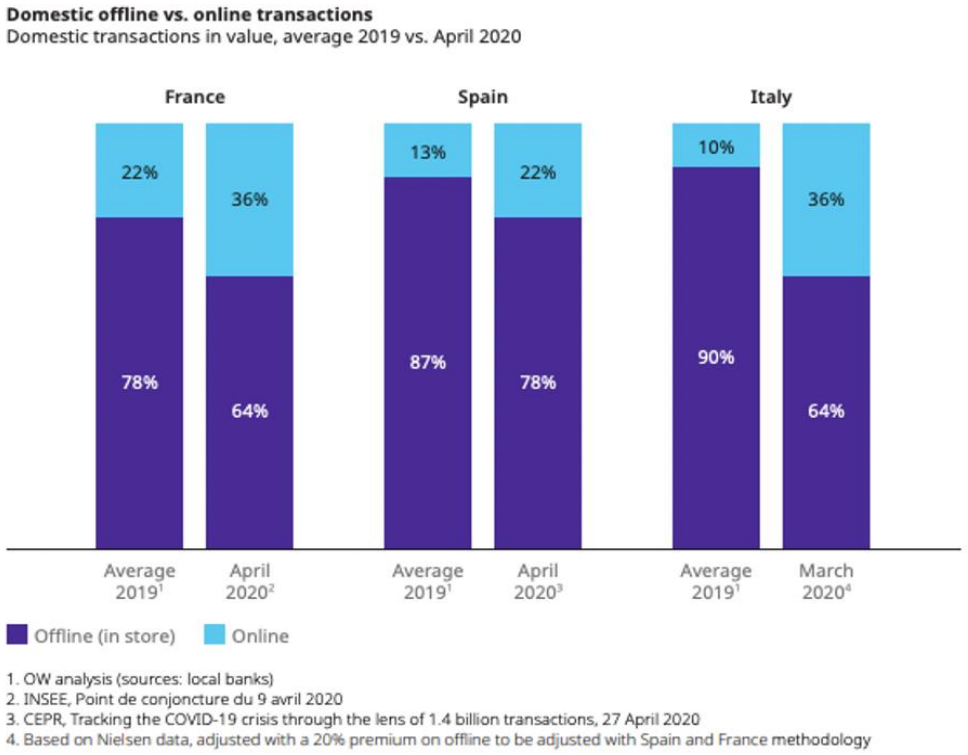
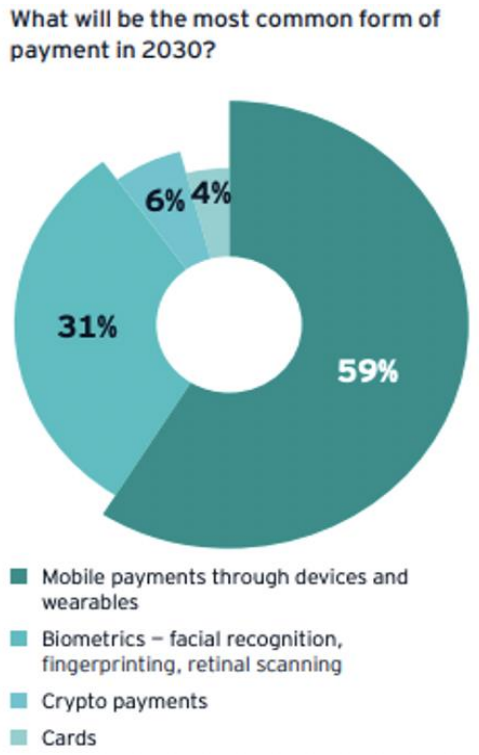
5. Factors for issuing CBDCs

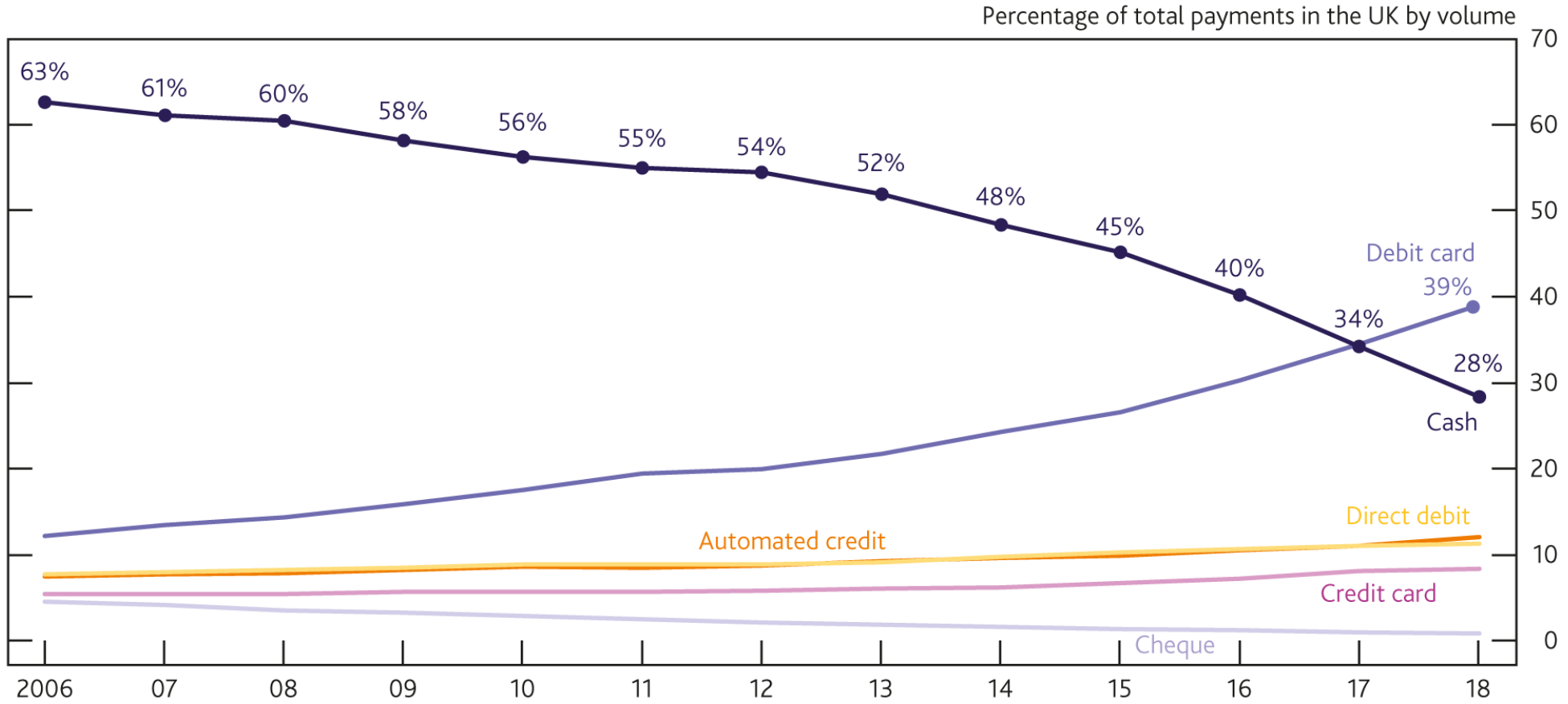
Indicative factors for issuing CBDCs

- **Payment efficiency and security:** Every new iteration in payment systems comes with the promise of marginal improvements in payment speed, efficiency and security.
  - The world is transitioning into a new era of digital payments, a trend accelerated by the COVID-19 pandemic.
  - With the shift from cash to electronic transactions the robustness of payments relies increasingly on credit and debit card networks.





Declining use of cash in the UK



Source: Bank of England - https://www.bankofengland.co.uk/paper/2020/central-bank-digital-currency-opportunities-challenges-and-design-discussion-paper

Indicative factors for issuing CBDCs (continued)

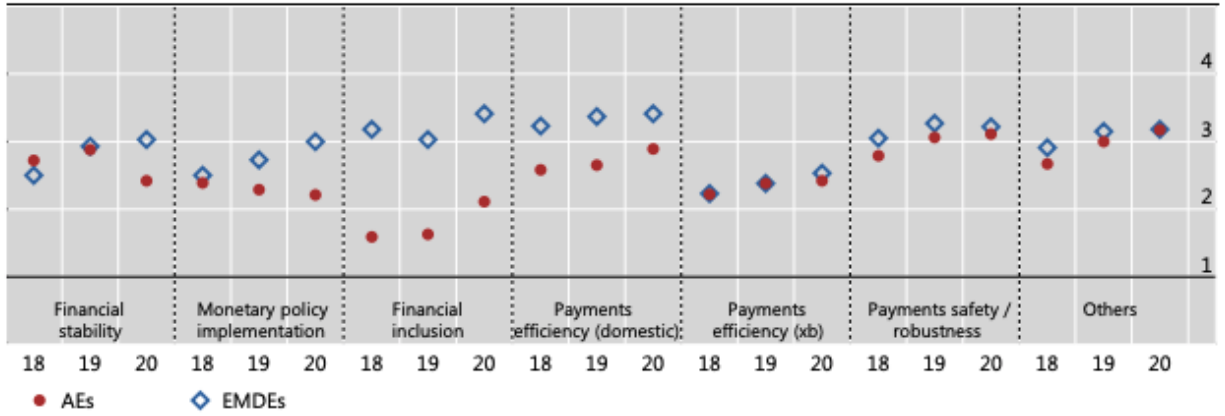
- Depending on its characteristics and infrastructure, a CBDC can support the resilience and efficiency of the payments system by expanding services previously reserved for the commercial banking system to the wider private sector. In addition, a CBDC tied to real-life identities could also increase payment security and prevent money laundering and terrorist financing
- **Financial Inclusion:**
  - In a scenario where cash is gradually phased out, a substitute of cash is critical to ensure that the most vulnerable parts of our societies are not deprived of access to the economy
- **Financial Sovereignty:**
  - Central banks face two distinct types of risks
    1. Monetary policy inefficiencies: Since the Great Recession of 2008, central banks have had to resort to rather unconventional methods, such as and quantitative easing, which proved less effective than initially planned
    2. Rising competition from alternatives developed in the private sector.
  - CBDCs
- **Futureproofing of Economies:**

Source: BIS survey on CBDCs

Motivations for issuing a retail CBDC

Average importance

Graph 3

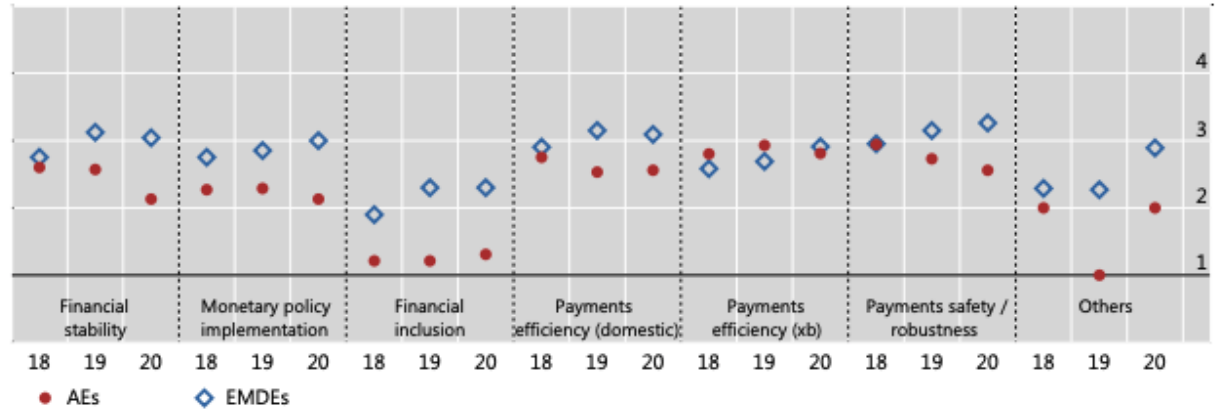


(1) = "Not so important"; (2) = "Somewhat important"; (3) = "Important"; (4) = "Very important".

Motivations for issuing a wholesale CBDC

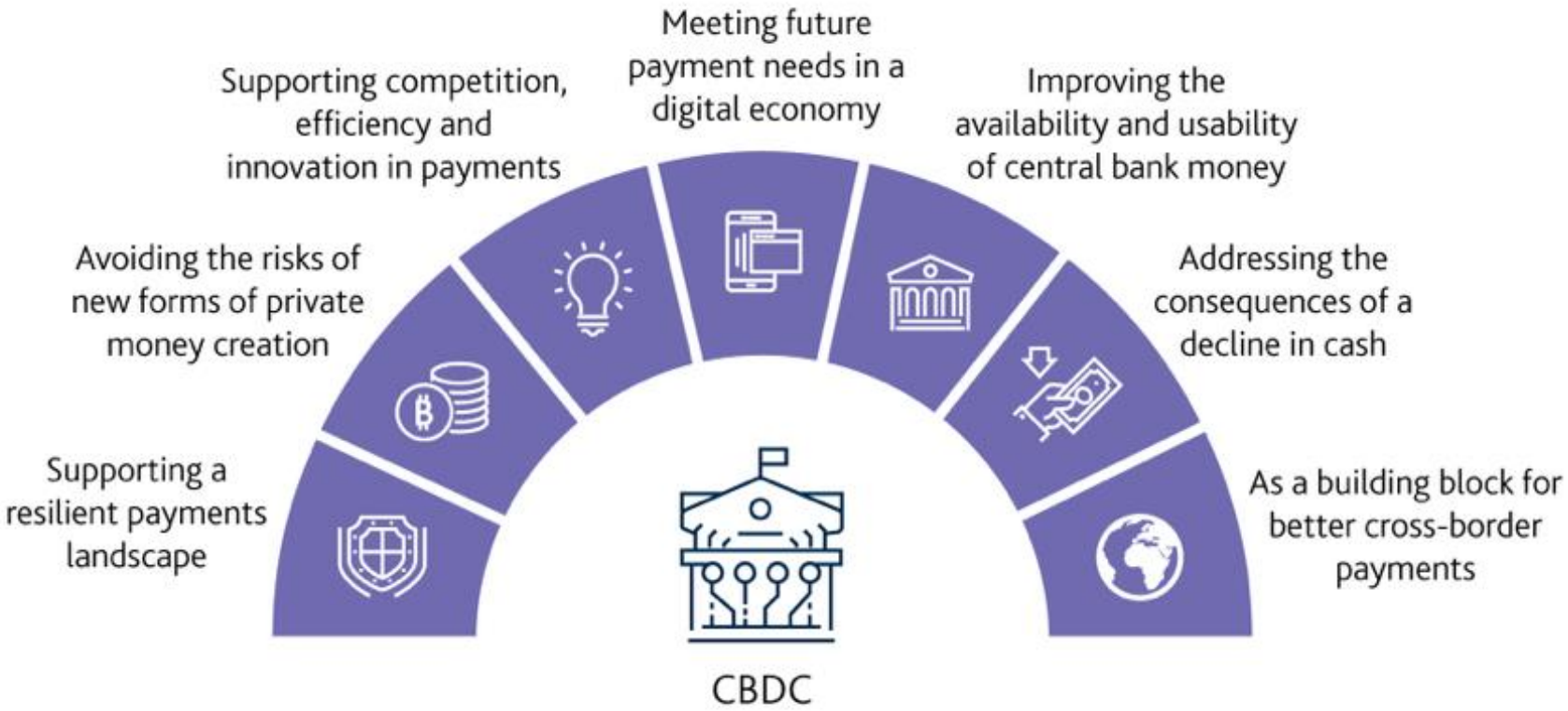
Average importance

Graph 4



(1) = "Not so important"; (2) = "Somewhat important"; (3) = "Important"; (4) = "Very important".

Factors for issuing CBDCs according to the BoE



Source: Bank of England - https://www.bankofengland.co.uk/paper/2020/central-bank-digital-currency-opportunities-challenges-and-design-discussion-paper

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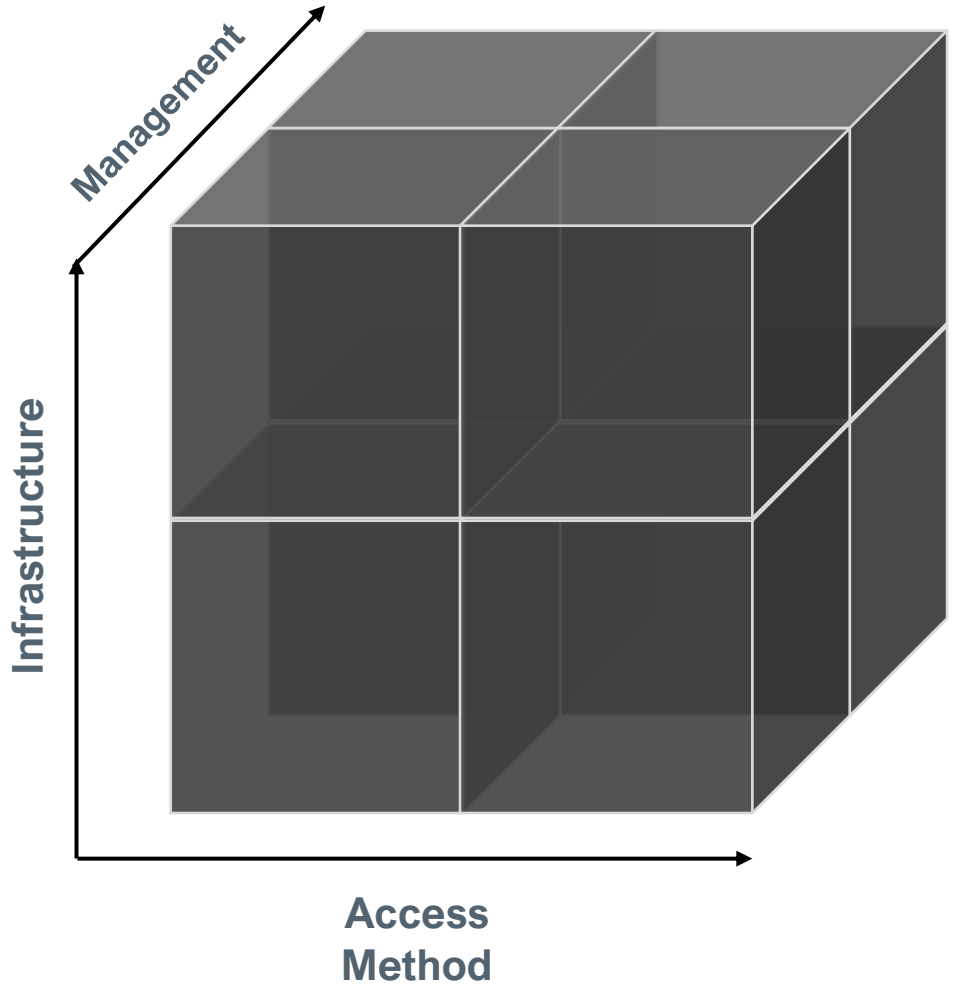
6. The technology of CBDCs

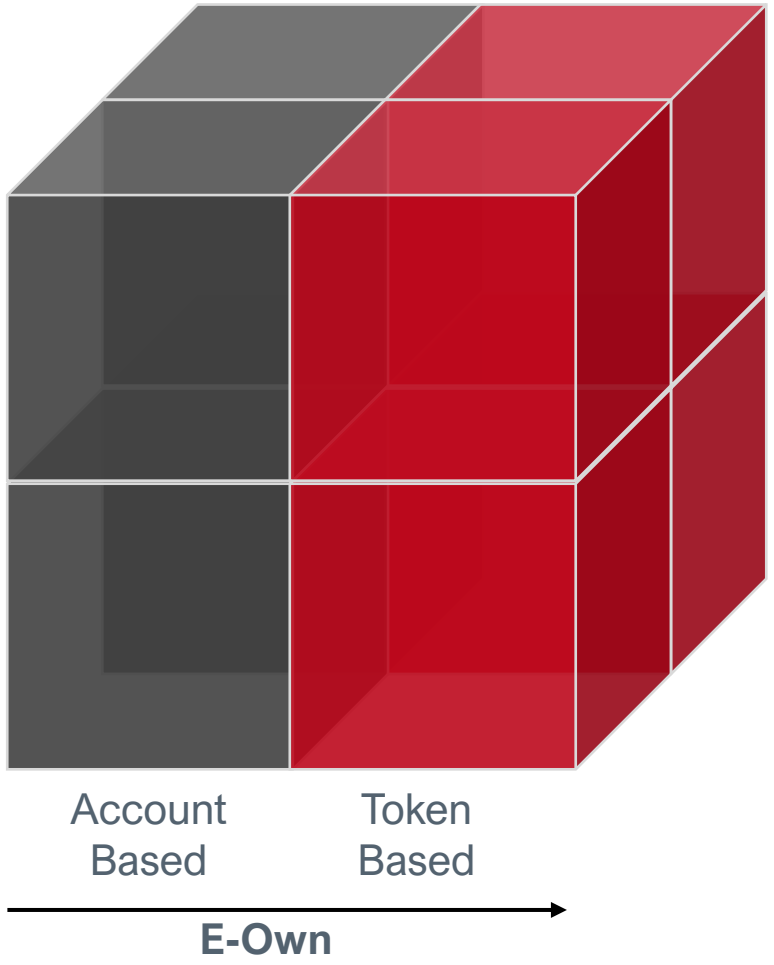
The CBDC design space

- The state of CBDC research is still **exploratory**
- There is a notable **lack** of **universally accepted principles** on the **best design options**.
- Nevertheless, 3 areas have emerged as the most important:
  1. **Access Method**
  2. **Infrastructure**
  3. **Management Scheme**
- Each area comes with two basic alternative options that we explore in the next slides

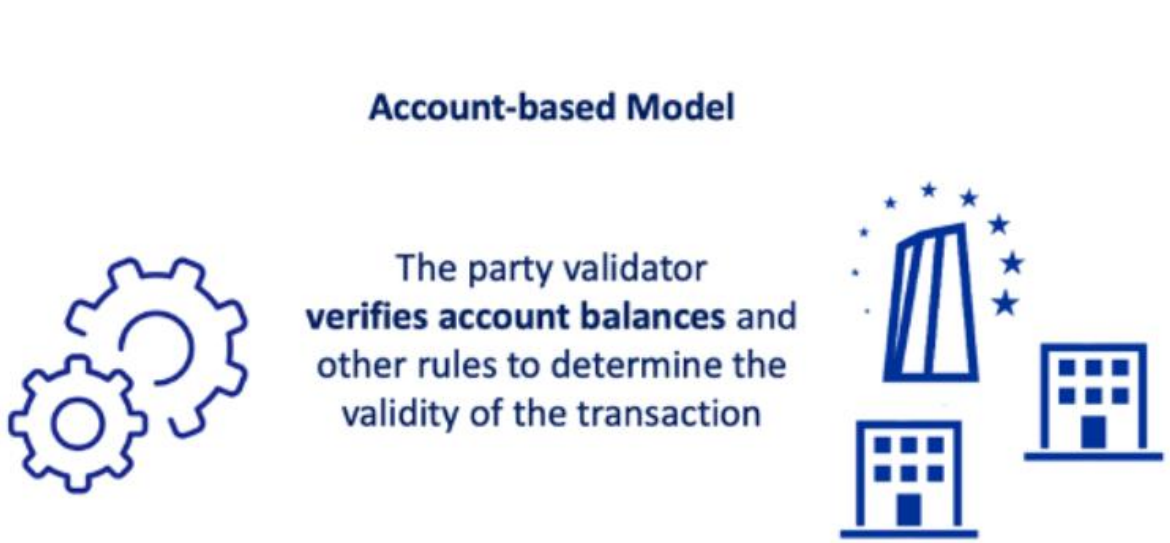


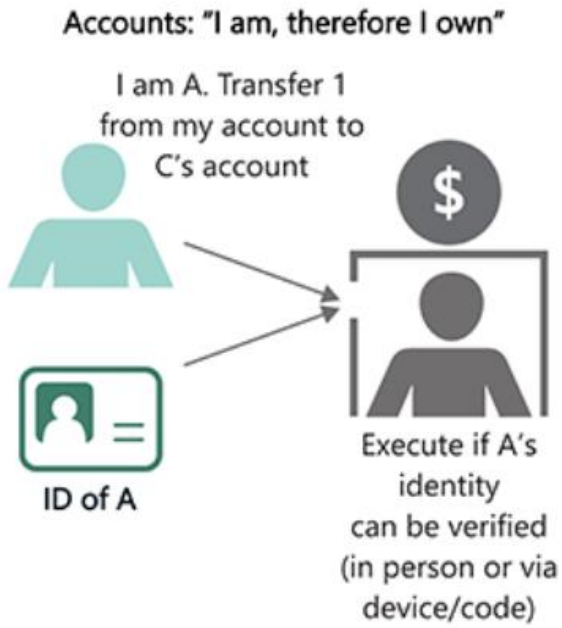
The Access method

- Determines ownership of value and transaction authorisation.
- Here we have the alternatives of an **Account** or **Token** (UTXO) Based system.
  - **Tokens** promoted as privacy preserving
  - **Accounts** as minimaly disruptive
- In practice No material difference between **account** and **token** based options
- Due to:
  - Nature of digital technologies
  - Permissionless nature of ledger
  - AML/KYC regulations
  - Especially for high-value transactions



The account model





The token (UTXO) model

Token Based Model

The third party validator **verifies UTXOs** and other rules to determine the validity of the transaction

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

Understanding UTXOs

UTXO stands for Unspent Transaction Output

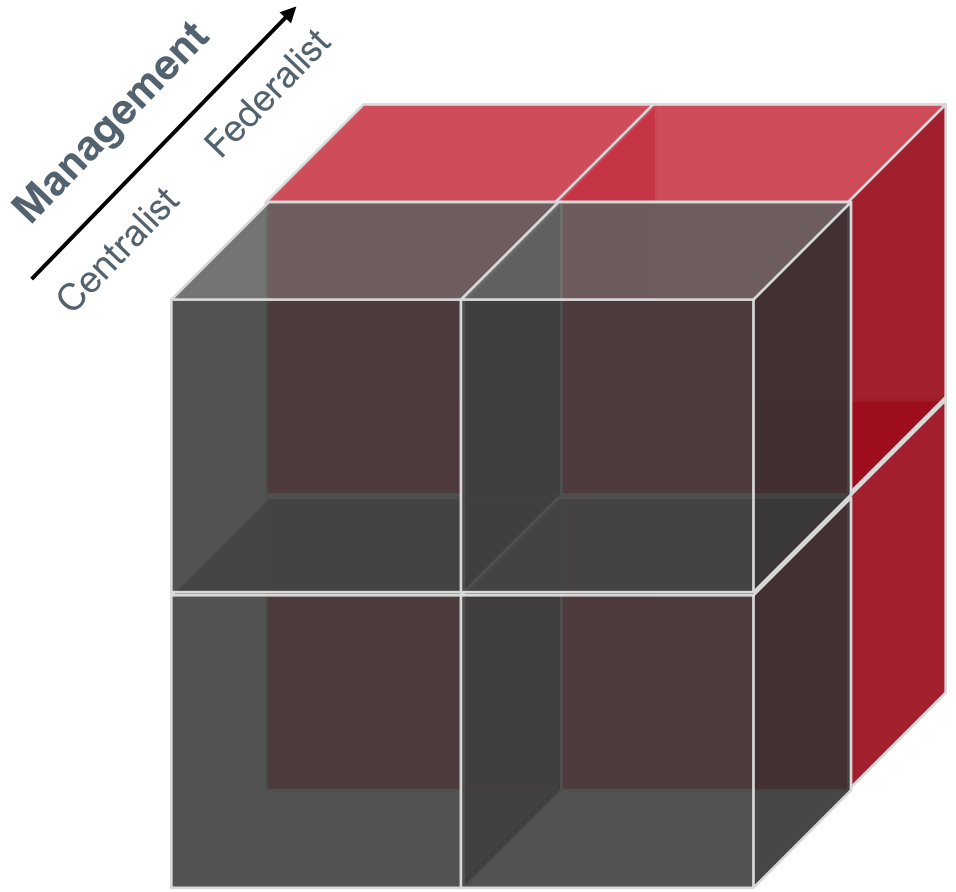
Each UTXO represents a certain amount of value. When a UTXO is **spent**, **new** UTXOs are **created in its place that can be spent again later**.

This is analogous (but not identical) to how change received after purchasing a good or service with cash can be spent on some other good or service.

- Consider the example of Bob who hands over a €20 bill at Maria's coffee shop in exchange for a latte.
- Assuming that the cost of the latte is €5, Maria shall end up with the €20 bill and Bob will receive €15 in change, **for an effective value transfer of €5**.
- Similarly, in a token-based system, Bob's UTXO representing €20 of value would be destroyed first, and then new ones would be created.
  - **One for Maria** with a total value of €5, representing the payment
  - **And one for Bob** worth €15, representing the change.

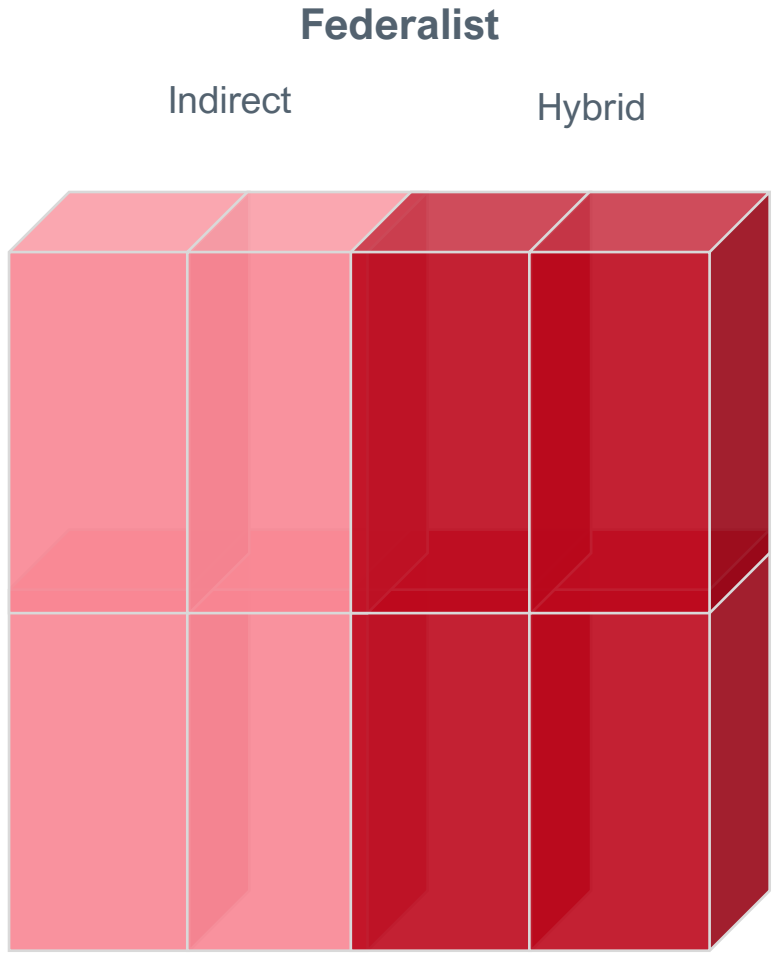
Management Scheme

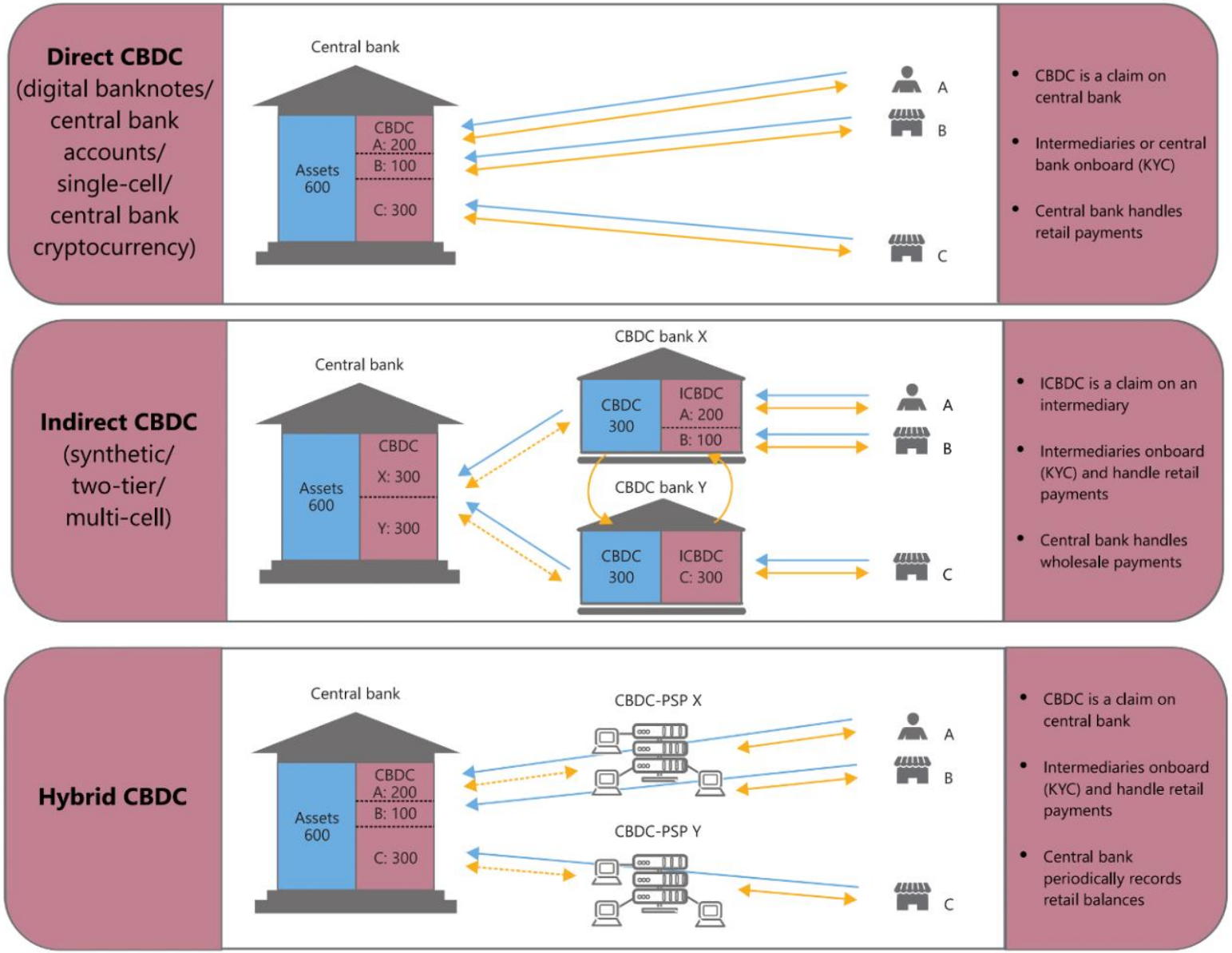
- Determines
  - Nature of **CBDC as a liability/asset**
  - Responsibility - customer relationships
  - Responsibility - infrastructure management
- **Centralist** or **Federalist**.
  - **Centralist** invovlves only the Central Bank.
  - **Federalist** involves other entities too.
- **Federalist** options are arguably more attractive than **Centralist** for reasons that relate to:
  - Market neutrality
  - Customer relationship management
  - Cost management



Management Scheme (continued)

- **Hybrid vs Indirect vs Centralist**
  - Indirect, reinvention of existing system
  - Hybrid, overall best approach
- Each different option comes with implications for
  - Consumer protection
  - Role commercial banking sector
  - Effectiveness of monetary policy
  - Credit and Money Creation

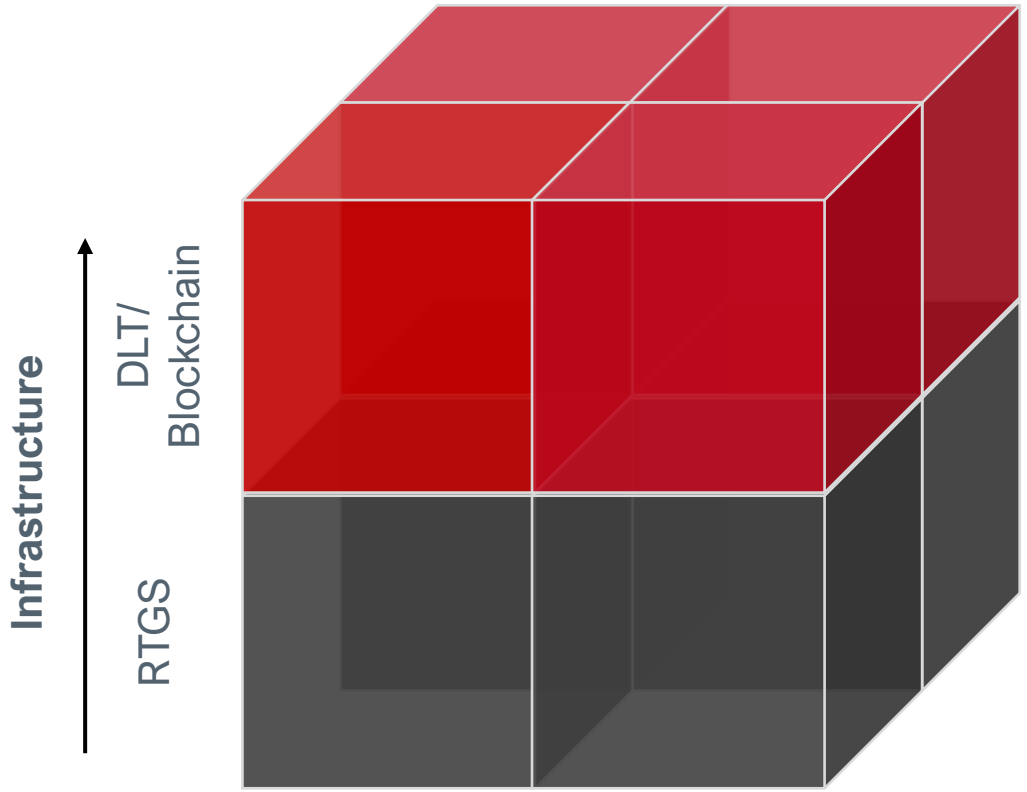




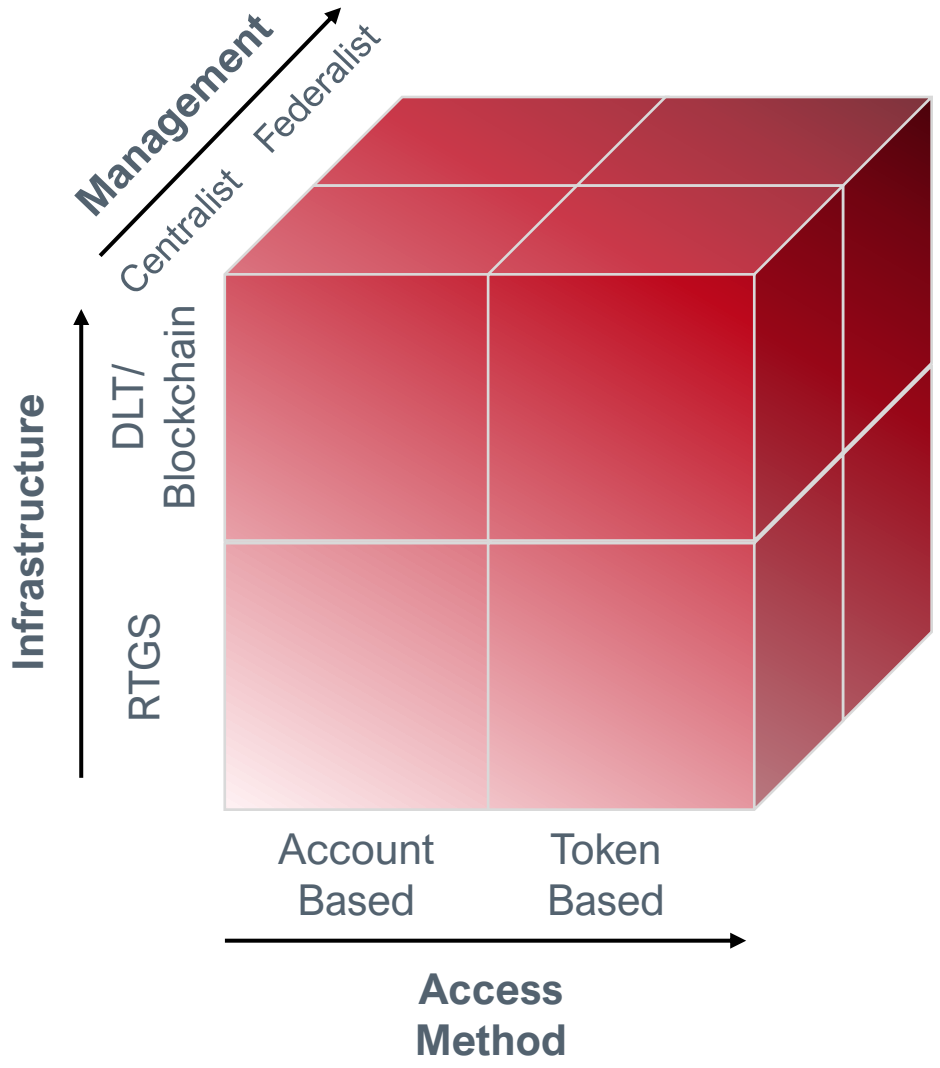
Source: BIS, *Auer and Böhme, 2020*

Infrastructure

- Determines where transactions and state transitions occur.
- **RTGS** or **Blockchain**.
  - **Blockchain** promoted for futureproofing
  - **RTGS** as minimaly disruptive
- In practice this is a debate of cost vs features.
  - Blockchains can offer:
    - Native programmability
    - Smart contracts
    - Interoperability with crypto
    - Some feature parity with DeFi
  - But compared to RTGS they are:
    - Unproven
    - More expensive to implement
    - Harder to integrate with existing regulations and systems



The CBDC Design Space



CBDC risks

1. **Robustness of novel technologies - Cyber threats and single points of failure**
   - Blockchains are a relatively new concept, while they have proven reliable, their large-scale deployment in the form of the underlying infrastructure for money, might reveal drawbacks. CBDCs run the risk of either opting for established technologies, which might result in underwhelming
2. **Lack of privacy and surveillance**
   - The use of digital technologies produces digital fingerprints, that are hard to minimize, let alone eliminate. In a permissioned setting, blockchains are but a a system of precise control of those digital fingerprints. There is growing concern around the role of CBDCs as tools for surveillance. You can see an overview of that here and here (timestamped).
3. **Systemic risk and destabilization**
   - Through the potential disintermediation of commercial banks, and ban-runs to “quality”
4. **Complex systems fail in complex ways**
   - Research is still ongoing on the monetary impact of CBDCs, and the methods to mitigate that.

Source: https://www.diplomaticourier.com/posts/the-risks-of-central-bank-digital-currencies

Session 3.1: Stablecoins

7. Conclusions

Conclusions

- In this session, you have learned about stablecoins, their market size and growth, as well as their different types, and the unique advantages and disadvantages of each approach.
- You also learned about how stablecoins gave rise to CBDCs.
- You have been introduced to CBDCs, the factors that motivated their issuance, their technological design options and how they can pose a threat to economies and societies.

Session 3.1: Stablecoins

8. Further Reading

Further Reading

Stablecoins:

- A quick classification of cryptocurrency consensus types
- Hayek Money: The Cryptocurrency Price Stability Solution
- A note of Cryptocurrency Stabilisation: Seigniorage Shares
- Empty Set Dollar: A Game Theoretical Approach to Elastic Stablecoins

CBDCs:

- The technology of retail central bank digital currency
- The macroeconomics of central bank issued digital currencies
- E-krona (see reports)
- Central Bank Digital Currencies and a Euro for the Future

In preparation for the guest lecture:

- More on Celo
- Influencing the Velocity of Central Bank Digital Currencies
- Shaping the Future of Digital Currencies

Tip: Clicking while pressing Ctrl key opens a new tab in Chrome browser on non-Apple devices

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Questions?

Contact Us:

Twitter: **@mscdigital**
Course Support: **defi@unic.ac.cy**
IT & Live Session Support: **dl.it@unic.ac.cy**