



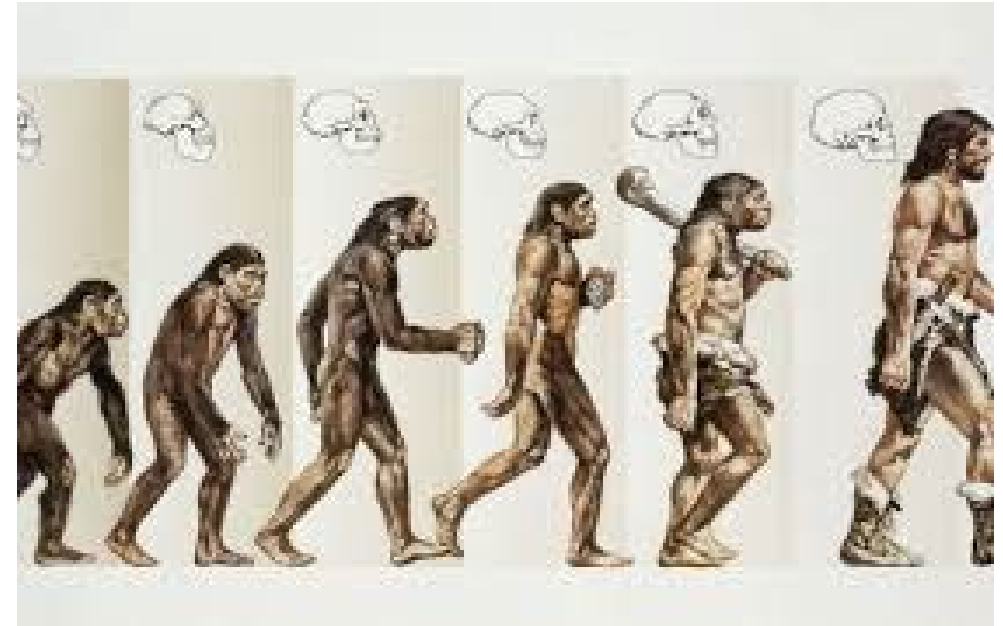
Universität
Zürich^{UZH}

CBDCs architecture

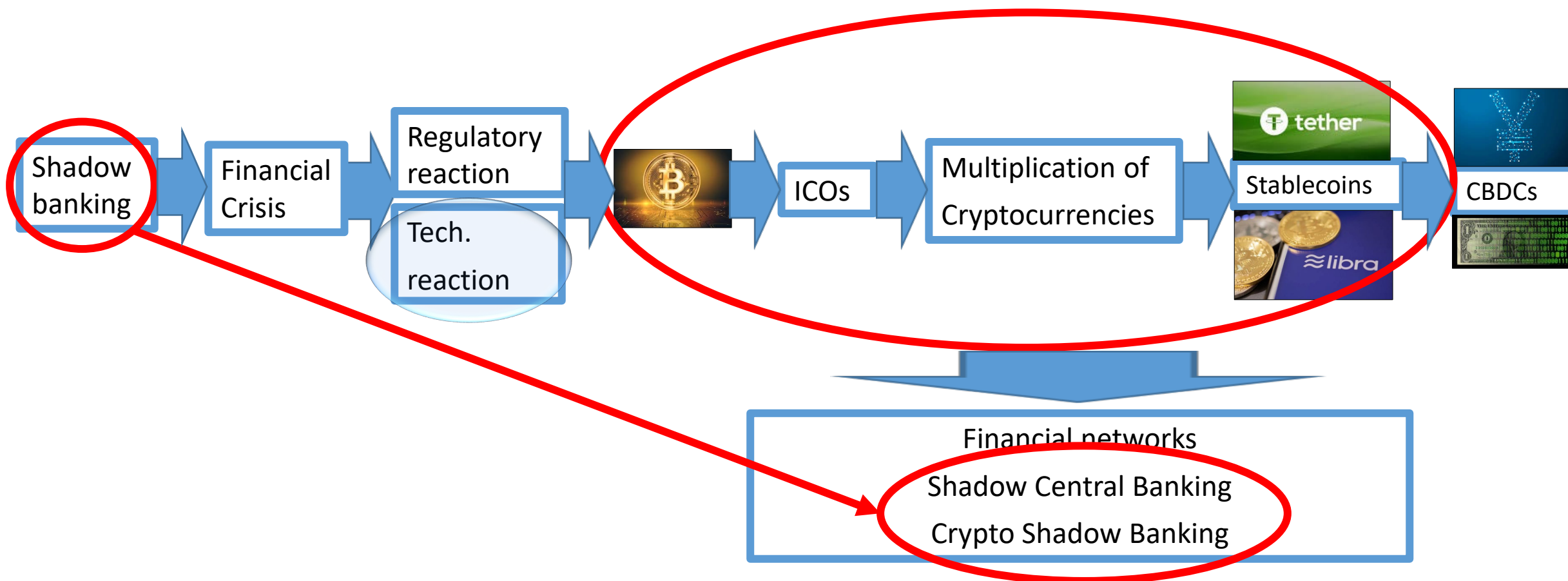
Marco Dell'Erba

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My Usual question: Revolution or Evolution?



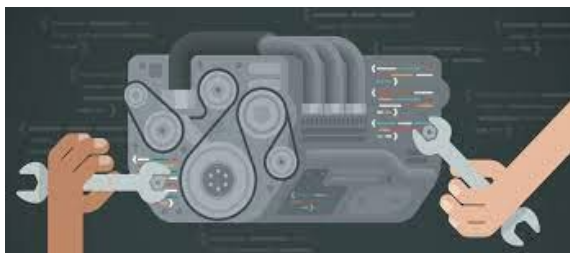
My Usual Answer: Post-Modern Finance?



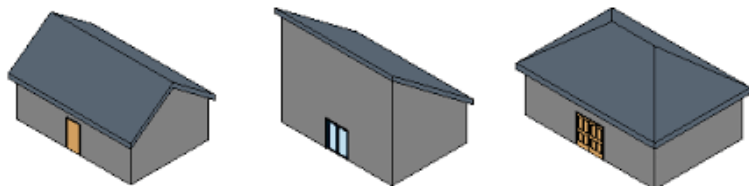
An additional consideration: Transformation and Integration



The Dimensions of CBDCs Architecture



Public, permissioned and private DLT
(see e.g. Moser et al.)



R-CBDCs vs W-CBDCs



CBDCs



Stablecoins

- A w-CBDC does not change the 2-tier banking system
- Available to parties having accounts with central bank
- Immediate finality on interbank transfers & cross-border payments, relying on a P2P system
- Tokenization of such money that can be issued on DLT

➤ r-CBDC a form of digital cash issued by the central bank.

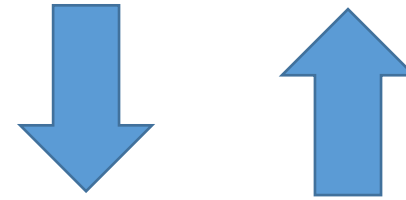
- Wider use cases than a w-CBDC.

➤ More disruptive?

- **A threat to commercial banks:** r-CBDC remove primary source of funding, which in turn could lead to financial instability.
- Contra: competition from an r-CBDC would force commercial banks to adapt by offering an improved service to their customers.



Centralization



Decentralization

CBDCs



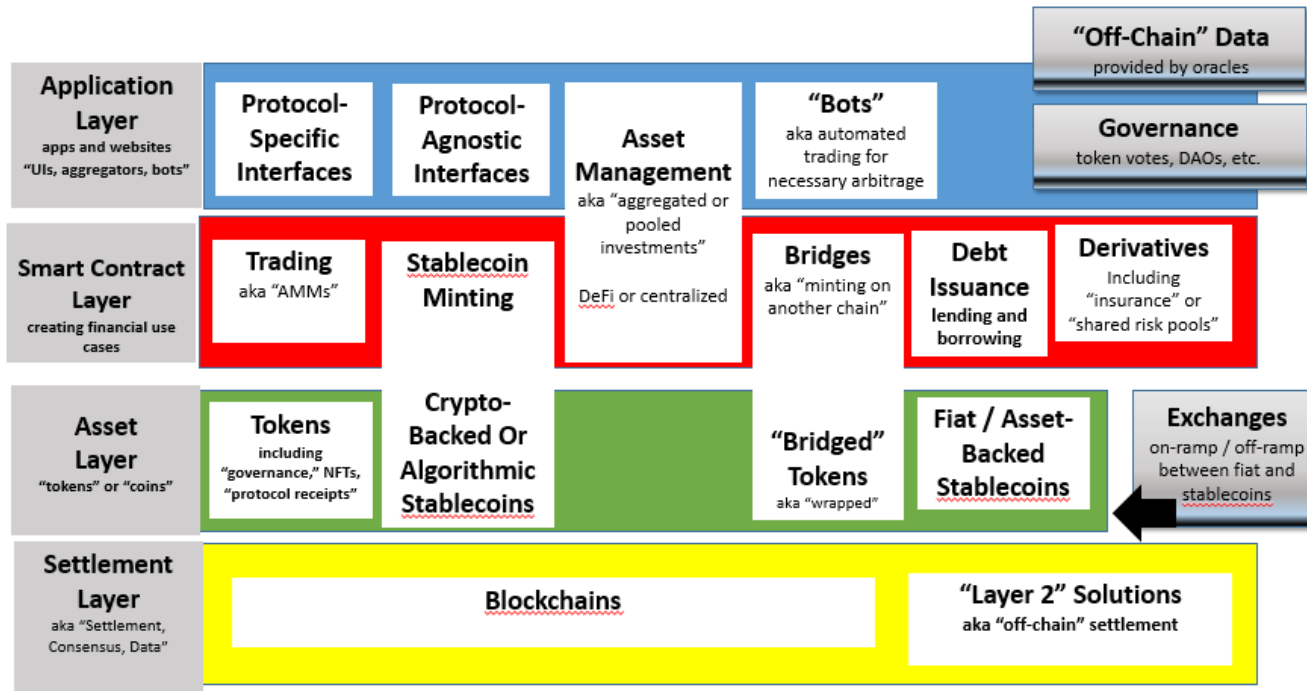
DeFi



Regulation

Money/Currency

DeFi



**Fully
Operational
with Stablecoins**

**In Principle
Independent
from CBDCs**

From ICOs to Tokenized Assets

Tokenized money

Tokenized Assets (NFTs)

More Broadly: Crypto Assets Tokenization



Digital Securities



ICOs & Tokens



“CBDC is not about the Big Brother of central banks threatening the free world of decentralized finance. Rather it could be about providing further tools to help make DeFi successful and sustainable.”

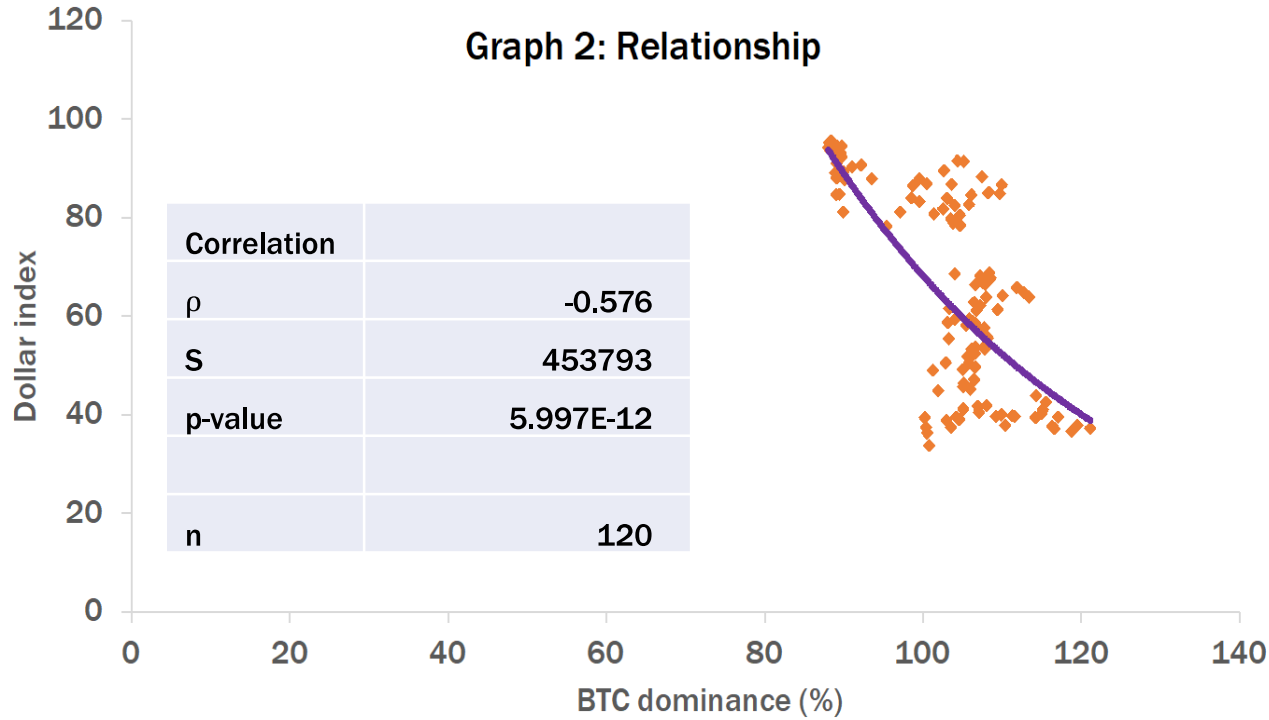
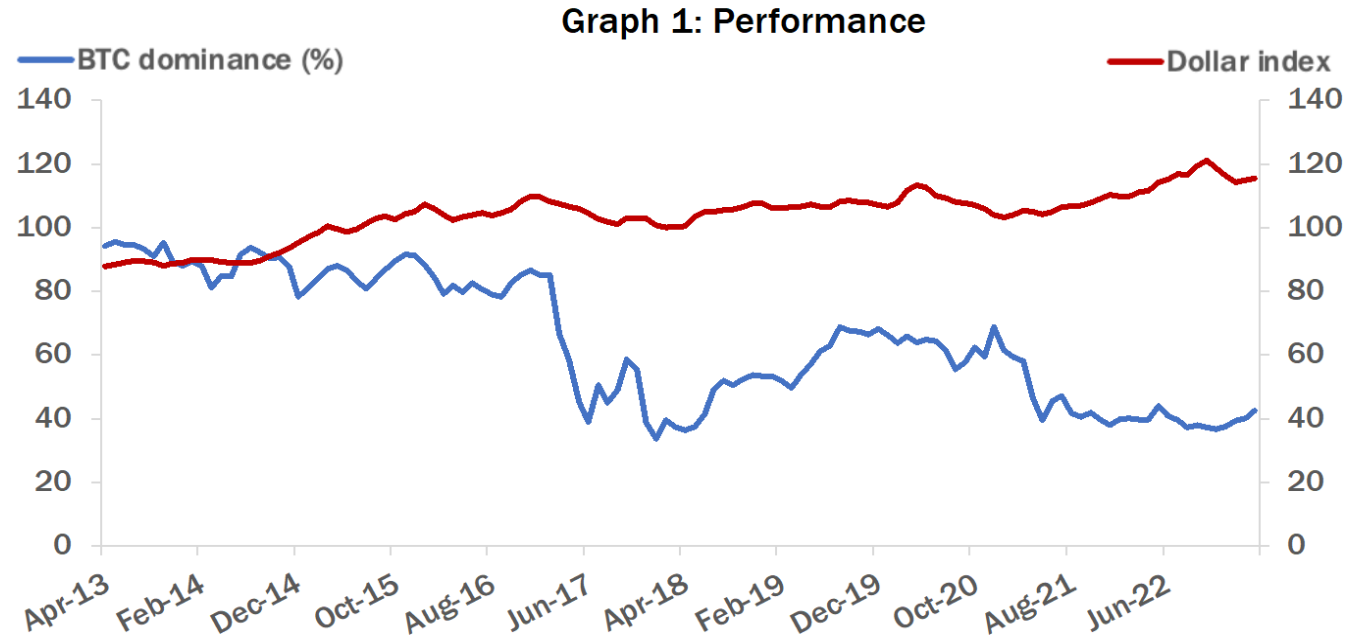


State Vs. Market Debate

CONFIDENCE

Graph 1 shows measures of confidence in BTC vs. USD.

Graph 2 Graph 2 shows a negative correlation between the two measures (note the curvature of the purple line).

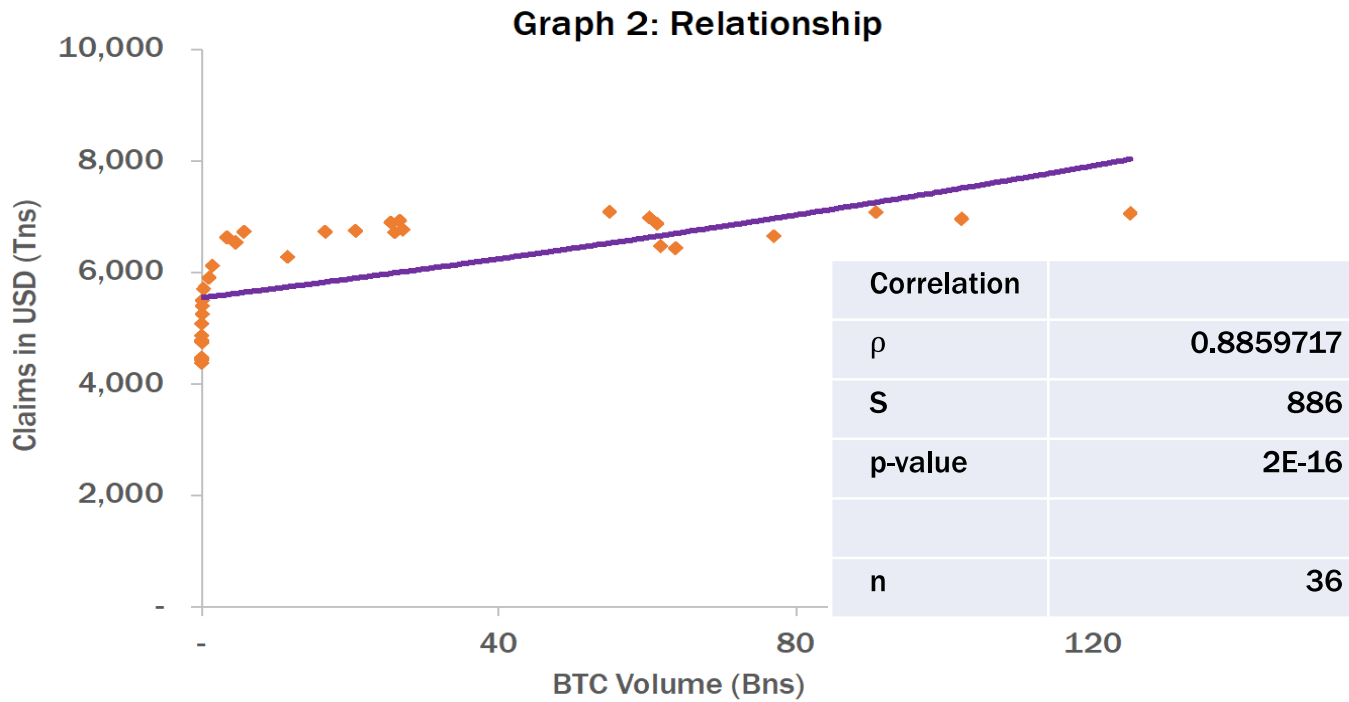
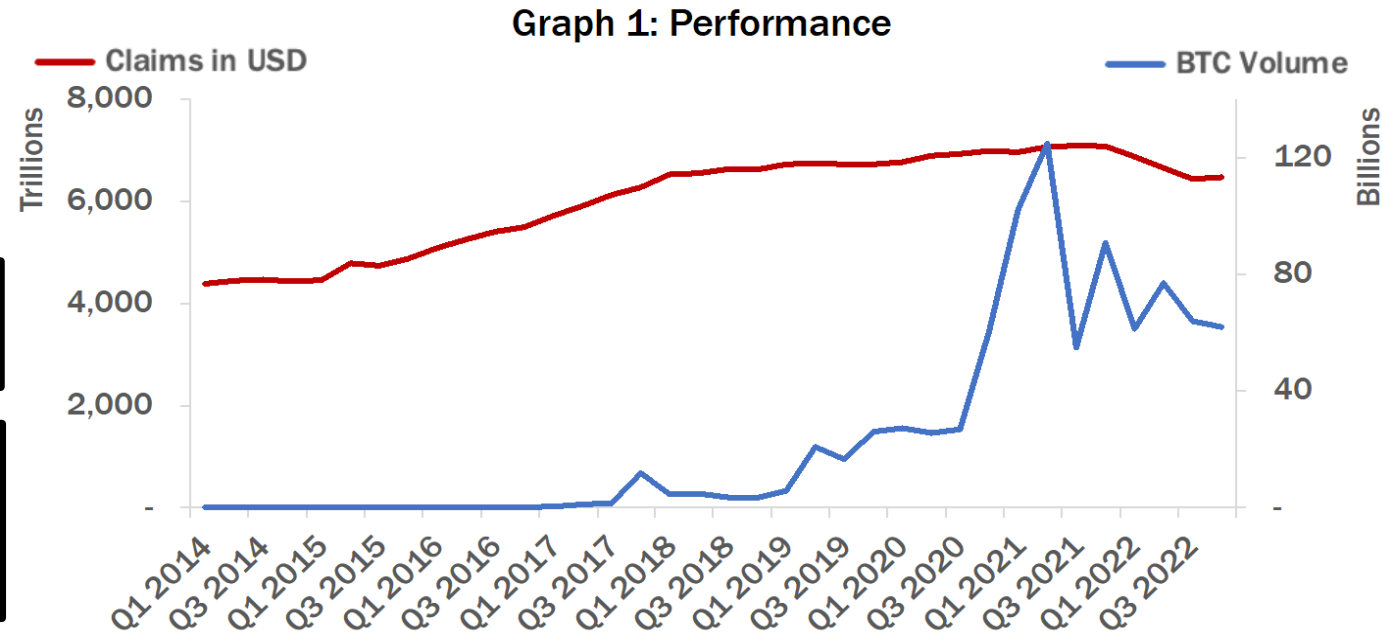


An intermediate negative correlation exists between confidence in BTC vs. USD - implying substitute candidate relationship.

CENTRALIZED RESPONSE?

Graph 1 shows measures of 'consumption' of USD vs. BTC.

Graph 2 shows a strong correlation between the two (also curved purple line), but with a small number of observations.



This indicates an early sign that CBs match BTC consumption with increased USD claims.

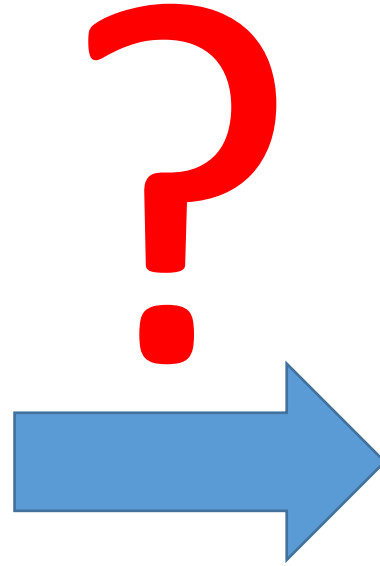




Celsius

VOYAGER

Additional Unsolved Question



Hypothesis: SVB had no direct link to FTX

BUT

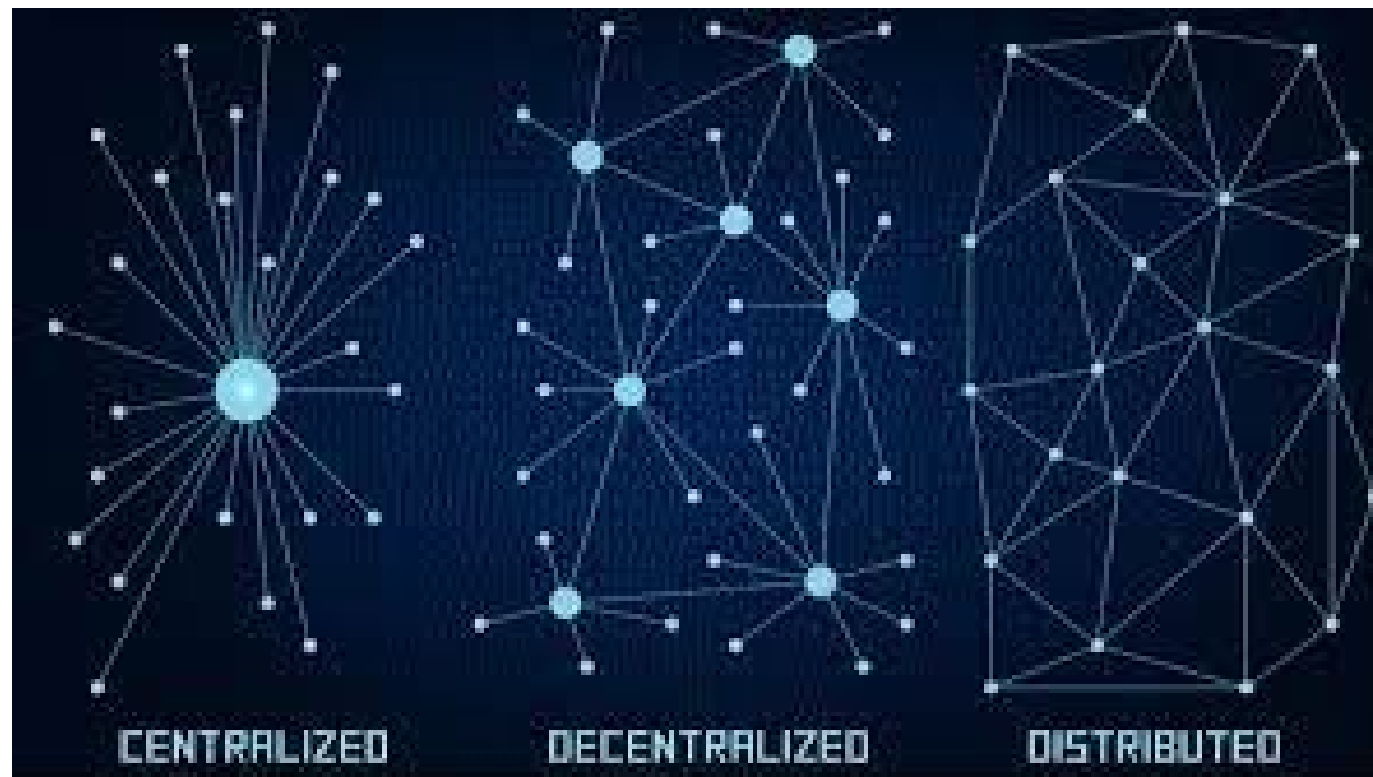
Depositors (tech startups, crypto firms and VCs) started burning their cash reserves to run their businesses after VC funding dried up

Post-Modern Finance?

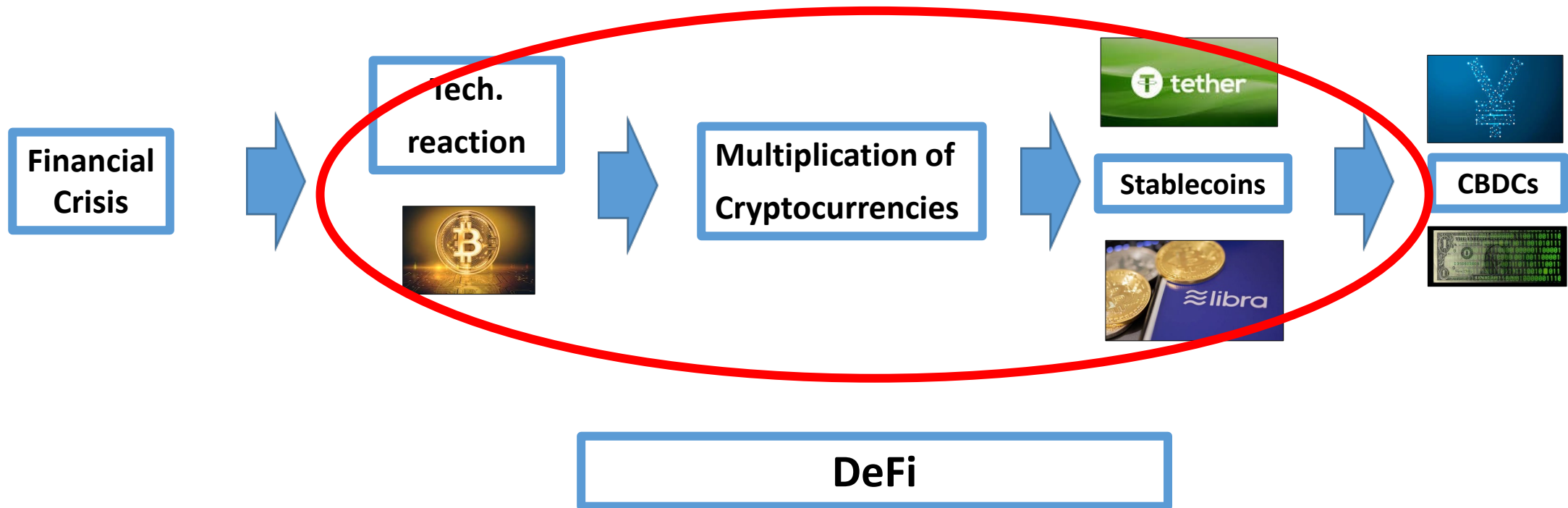
Financial
Crisis



Tech.
reaction



Post-Modern Finance?



The Privatization of Currencies

- The role of technology
- An escalation in the strenght of the initiatives
 - E-money
 - Pre-Bitcoin digital currencies (based on cryptography)
 - Bitcoin



- **Stablecoins**

- 3 categories: on- & off-chain; alg.
- Private experiments
 - JPMCoin
 - Libra Coin



Perfect cryptocurrency

Medium of exchange

Store of value

Unit of account

Stablecoins

➤ Stable cryptocurrencies:

- Maintain a stable value against a target price, generally US dollars.
- They generally combine
 - liquid collateral (such as gold or US dollar) or algorithmic mechanisms of stabilization
 - Management of the supply to incentivize to trade the coin for no more or less than \$1.

➤ Regulatory Approaches:

- **Global Payment Systems**
- **Commercial Bank Money**
- **Money-Market Funds**

Stablecoins in the cryptoeconomy

- **Generally:** bridging the gap between real and tokenized worlds
- **Medium of exchange:**
 - Traditional cryptocurrency:
 - the expectation of continuous growth in the value of Bitcoin and the spectacular fluctuations of other alt-coins encouraged the trend of holding these assets to speculate.
 - Incentive to keep cryptocurrencies in view of an appreciation in value rather than circulating them: Cryptocurrencies' volatility generates uncontrolled risks for businesses
 - Stablecoins:
 - Cut off speculative actions makes them more apt to be used as a means of exchange.
 - Contribute to widespread adoption, unlocking mass-adoption for day-to-day businesses.
 - Increase the degree of certainty, in particular for short-term cash reserves and revenues.

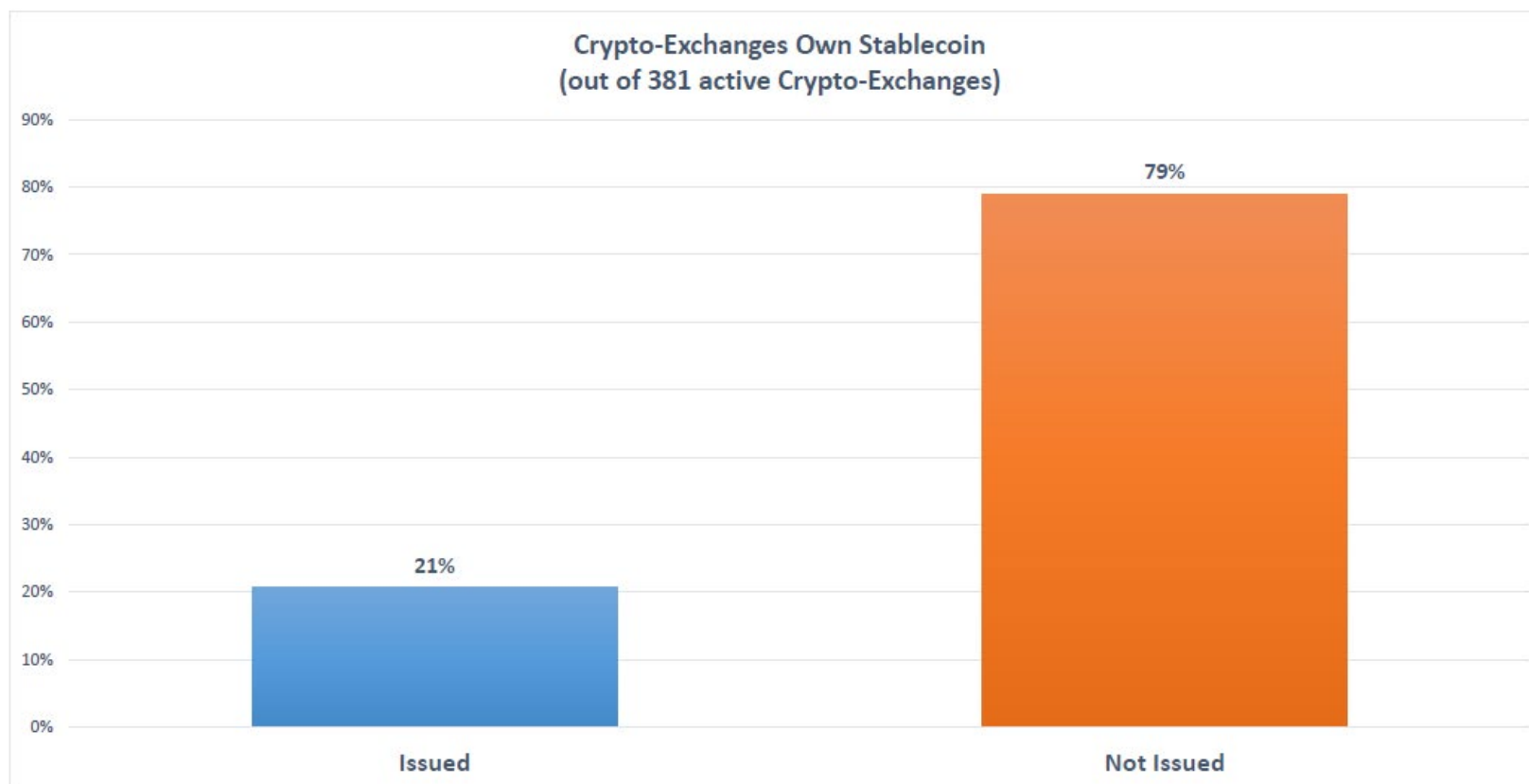
Stablecoins in the cryptoeconomy

- **Unit of account**

- short term: digitized unit of account by being pegged to national units of account
- long term: independent units of account
- a more reliable performance measurement to better analyze the intrinsic value of a project separating it from the fluctuations of any cryptocurrency

- **Store of value**

Stablecoin Issuance



PwG, OCC, FDIC : Report on Stablecoins

- “Reliance of stablecoin arrangements on digital asset trading platforms (e.g., to enable customers to convert stablecoins into national currency, and to facilitate arbitrage mechanisms), such that **a failure or disruption to the digital asset trading platform could threaten the stablecoin;**”
- “Reliance of digital asset trading platforms on stablecoins (e.g., to facilitate transactions on the platform/store reserves), so that **a failure or disruption of the stablecoin could threaten the digital asset trading platform**”
- “**Excessive leverage** facilitated by use of stablecoins as collateral on unregulated or non-compliant trading platforms”
- “**Interlinkages** between tr. platforms & stablecoins, including in platforms’ ownership of stablecoins (potential co-mingling with customer funds)”



11 September 2019 [Press release](#) [FinTech](#) [2019](#)

FINMA publishes 'stable coin' guidelines

The Swiss Financial Market Supervisory Authority FINMA today publishes a supplement to its ICO guidelines outlining how it treats so-called 'stable coins' under Swiss supervisory law. FINMA has seen a steady increase in the number of 'stable coin' projects since 2018. In this context, FINMA confirms that it has received a request from the Geneva-based Libra Association for an assessment of its Libra project under Swiss supervisory law. FINMA gives here an initial indication of how it would apply the relevant Swiss regulation.

Among projects based on blockchain technology, FINMA has observed an increase in the number of projects to create so-called 'stable coins' since mid-2018. The aim of such projects is mostly to minimise the fluctuations in value typical of payment tokens such as Bitcoin by backing the tokens with assets such as fiat currencies, commodities, real estate or securities. In the supplement to its Guidelines on Initial Coin Offerings (ICOs), FINMA is today publishing information indicating how it will assess such 'stable coins' within its supervisory remit under Swiss supervisory law.

Classification of 'stable coins' under Swiss law

Swiss financial markets regulation is principle-based and technology-neutral. FINMA's treatment of 'stable coins' under supervisory law follows the existing approach taken to blockchain-based tokens: the focus is on the economic function and the purpose of a token ('substance over form'). In ruling on concrete projects, FINMA will follow the proven principle of 'same risks, same rules' as well as the specific features of each case.

'Stable coins' can vary greatly. The requirements under supervisory law may differ depending on which assets (e.g. currencies, commodities, real estate or securities) the 'stable coin' is backed by and the legal rights of its holders (see the overview provided in the supplement to the ICO guidelines, appendix 2). Money laundering, securities trading, banking, fund management and financial infrastructure regulation can all be of relevance.



Regulation on Markets in Crypto-Asset (MiCAR)

- Start: an attempt to respond to the Libra project, therefore likely motivated by some sort of political concerns raised by that project.
- Purpose:
 - A proper regulatory framework for crypto-assets and CASP.
 - Enhance legal certainty for trading activities in this area, thereby creating the basis for fostering innovation and strengthening both consumer protection and financial stability in European markets.
- MiCAR does not cover crypto-assets related to financial instruments (in particular security tokens), deposits, structured deposits and securitizations.

MiCAR: Key Definitions

**asset-referenced
token**

**electronic
money token**



**Other Crypto-
Assets**

Significance

Asset-Referenced Token

- A “**type of crypto-asset that purports to maintain a stable value by referring to the value of several fiat currencies that are legal tender, one or several commodities or one or several crypto-assets, or a combination of such assets**”.

Stablecoins backed by a basket of currencies

Algorithmic stablecoins could be characterized as “other crypto-assets”.

E-money token

- **“a type of crypto-asset the main purpose of which is to be used as a means of exchange and that purports to maintain a stable value by referring to the value of a fiat currency that is legal tender”.**
- USDC (issued by Circle and backed by U.S. dollars) & multiple single currency pegged Libra Coin as they emerged in the second version of the Libra white paper.
- Issuers: authorized as a credit institution or an electronic money institution.
- Holders of e-money tokens shall have “a claim on the issuer of such e-money tokens”, and if such e-money tokens do not fulfill this condition, they shall be prohibited.
- Issuers issue e-money tokens at par value and on the receipt of fund, and “redeem, at any moment and at par value, the monetary value of the e-money tokens held to the holders of e-money tokens, either in cash or by credit transfer” (if requested by the holders)
- Redemption conditions in the crypto-asset white paper

DeFi Regulations





Centralization

**Transition towards
Decentralization**

**Fully Implemented
Decentralization**

Fully Implemented Decentralization



Shadow Central Banking & CBCDs Scenarios

Scenario 1

Shadow Central
Banking Replacing
the Current
Central Banking
System



Scenario 2

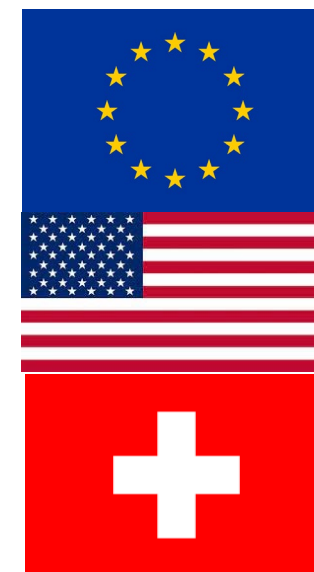
Reducing or
Eliminating
Shadow Central
Banking

Banning Shadow Central
Banking



Scenario 3

Co-Existence of
CBDCs & Private
Currencies



Thank you!

Requirements for asset-referenced tokens Issuers.

- A prior authorization granted by NCA + a White Paper.
- Fulfill specific requirements:
 - **financial solidity** (including own fund requirements, obligation to hold reserve of assets also for implementing stabilization mechanisms)
 - **sound corporate governance** (disclosure arrangements, conflict of interest, custody of the reserves and investment of the reserve assets).
 - **Reserves into segregated custody** at credit institutions as well as investment firms or crypto-asset service providers.
 - **Invest the reserve assets in liquid financial instruments**

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Significance

- **This different status of “significance”**
 - major concerns: financial stability and monetary policy and sovereignty on the side of the European Union as well as European member states.
- Strengthening specific regulatory requirements in an attempt to mitigate these systemic risks.
- Specific parameters trigger the significance in both cases, and the European Banking Authority (EBA) is in charge of evaluating the applicability of such parameters to specific cases.

- Parameters,
- (a) the size of the customer base of the promoters of the asset-referenced tokens, the shareholders of the issuer of asset-referenced tokens or of any of the third party entities referred to in art. 30(5), point (h); (b) the value of the asset-referenced tokens issued or, where applicable, their market capitalisation; (c) the number and value of transactions in those asset-referenced tokens; (d) the size of the reserve of assets of the issuer of the asset-referenced tokens; (e) the significance of the cross-border activities of the issuer of the asset-referenced tokens, including the number of member states where the asset-referenced tokens are used, the use of the asset-referenced tokens for cross-border payments and remittances and the number of member states where the third-party entities referred to in art. 30(5), point (h), are established; (f) the interconnectedness with the financial system.

Obligations

- **Significant asset-referenced** tokens have to:
 - “adopt, implement and maintain a remuneration policy promoting sound and effective risk management and that does not create incentives to relax risk standards”.
- **Specific obligations in relation to liquidity,**
 - “assess and monitor the liquidity needs to meet redemption requests or the exercise of rights by holders” of such assets
 - establish, maintain and implement a liquidity management policy and procedures, in order to meet liquidity concerns under normal and liquidity stressed scenarios.
- **For significant e-money tokens:** additional requirements:
 - custody of the reserves and their investments, as well as those provided for issuers of significant asset-referenced tokens.