The Tokenization Opportunity

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The more organized (and more regulated) world of banks has been looking at the developments in the crypto-economics world and has been speculating on how to bring in some of the efficiencies seen in the crypto-economics world into their own. This document is a technologist's view on what these efficiencies are and how they may be brought into the banking environment.

Four Layers of the Crypto-economics Ecosystem

Crypto-economics has expanded beyond virtual assets. Real world assets such as fiat currencies and gold backed tokens are accessible with the same ease and convenience as virtual assets.

The structure of this ecosystem can be mapped to four layers.

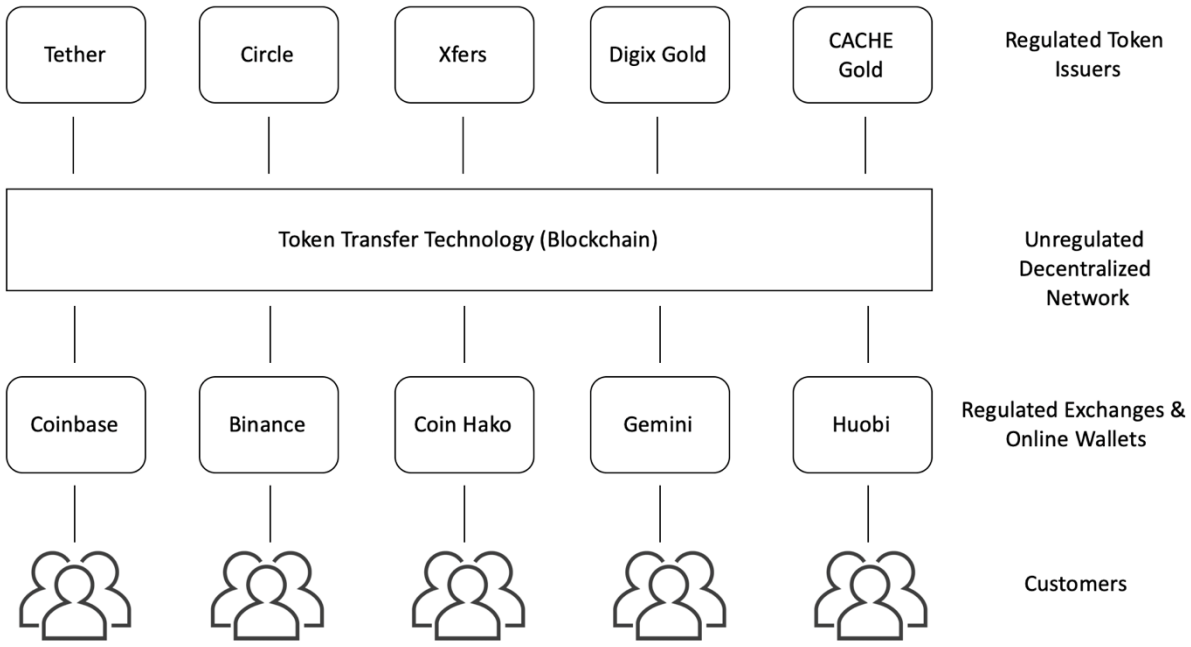

Figure 1: Four layers of the crypto-economics ecosystem

Layer 1: Token Issuers -- Issue and redeem tokens on blockchains. They follow independent processes for maintaining custody of underlying assets. These may range from simply maintaining fiat currency as bank deposits to maintaining physical custody of gold bullion.

Each issuer adheres to their own standards of auditing and reporting while attempting to gain the trust of end users. Each issuer also maintains a different procedure for issuing and redeeming tokens. For example, new tokens may only be issued to a KYC'd entity. Also, only a KYC'd entity may redeem tokens as per limits imposed by the token issuer. Fees for issuing and redeeming tokens may vary based on amounts.

Layer 2: Token Transfer Technology (Blockchain) – Public blockchains such as Ethereum offer a distributed, global platform for token issuance, redemption and transfers. Decentralization assures longevity and censorship resistance.

Layer 3: Regulated Exchanges and Online Wallets – Onboard users after KYC. They ensure safe custody of tokens on behalf of users. They also ensure AML and CFT activities are performed for every transaction.

Layer 4: Customers – Customers "bank" with regulated exchanges and online wallets. They are able to exchange assets on exchange platforms and transfer them to other users globally.

Efficiencies in Crypto-economics

The blockchain, which is an unregulated token transfer layer brings in several efficiencies:

1. Any token issuer can issue tokens on it.

2. Any crypto exchange or online wallet may plug into it in order to hold and globally transfer assets in real time on behalf of their customers.

3. Exchanges and online wallets need not have a direct relationship with any token issuer.

4. The speeds at which tokens can be transferred is the same for all tokens.

5. Token transfers can happen 24x7x365.

Inefficiencies in Banking World

1. Assets are held with custodians. Transacting parties need to have accounts with custodians to transact with assets.

2. When assets are exchanged or when a basket of assets held by several custodians is moved, the speed at which different assets are transferred is different. Some assets may change hands in real time, some with a delay of T+1, T+2 or T+3. This results in an elongated clearing phase and also introduces settlement risk in the system.

As a result of these inefficiencies, there is a strong reliance of reconciliation frameworks which is additional expense. The banking world has been looking at the crypto-economics world to address these inefficiencies.

Efficient Value Transfers between Banks

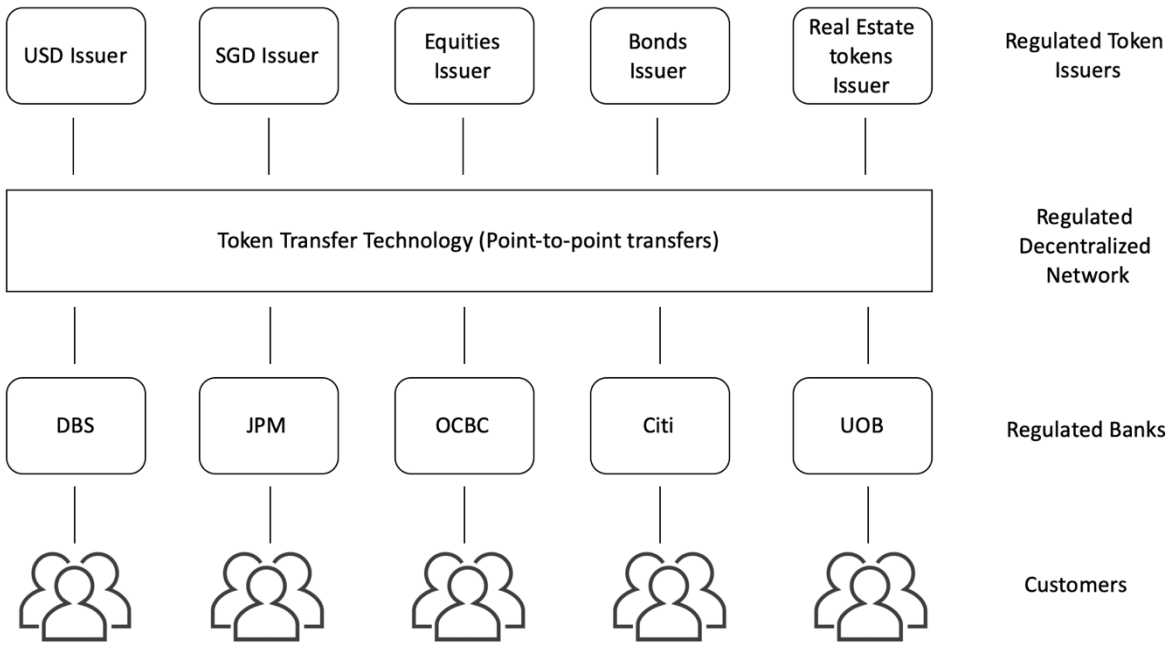

Figure 2: Tokenization can make value transfers more efficient between banks

If we impose the same 4-layer structure in the banking context, we can drive out the inefficiencies noted in the above section. The main concern is with the token transfer technology. Around 2015, blockchains were considered an appropriate technology for inter-bank value transfers. These claims were immediately sidelined because of confidentiality concerns. Blockchains rely on over replication of data. Security of value transfers is guaranteed by over replicating transactions and by a multitude of validator nodes independently performing double-spend prevention and arriving at consensus on the results of the computation. The more benign “DLT” was then proposed as a solution. Proponents of DLT insisted that data should only be replicated where there’s a need for it to be replicated. Unfortunately, this means that there is no departure from present day designs at all. Often, fanciful lingo is applied to explain traditional and extremely well-known design approaches.

One Time Spend Machine

Figure 3: Point-to-point inter-bank value transfers with the One Time Spend Machine.

The banking world has been on the lookout for an appropriate token transfer technology. Half Epsilon One Time Spend Machine (OTSM) is this technology. A network of OTSMs allows for point-to-point inter-bank value transfers of tokenized assets. Token issuers may issue assets on this network and these assets can flow in a point-to-point manner between banks. This is achieved by re-solving double-spend prevention in a different manner. OTSM is capable of performing localized double-spend prevention.

Legal Framework

Every electronic value transfer system is accompanied by a legal framework that governs it. An appropriate framework will be required to guarantee that tokens on the network represent beneficiary interest in underlying asset maintained by the token issuer.

Vision

Today, SGD payments can be made from phone apps by simply knowing the recipient's phone number. Imagine scaling this in two directions. First, a number of tokenized assets in addition to SGD may flow through the same interface. Second, consider expanding the reach of recipients globally. A global network of banks that support tokenization can enable this use case. Of course, a more institutional version of the same use case is also possible.