Blockchain and Banque Du Liban

Introductory Presentation to Banque Du Liban

Beirut, January 2020

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CONSENSYS

مصرف لبنان
BANQUE DU LIBAN

Outline

- Intro to Blockchain
- *Blockchain and Central Banks*
- *Relevant Use Cases for BDL*
- *Next Steps*

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What is Blockchain

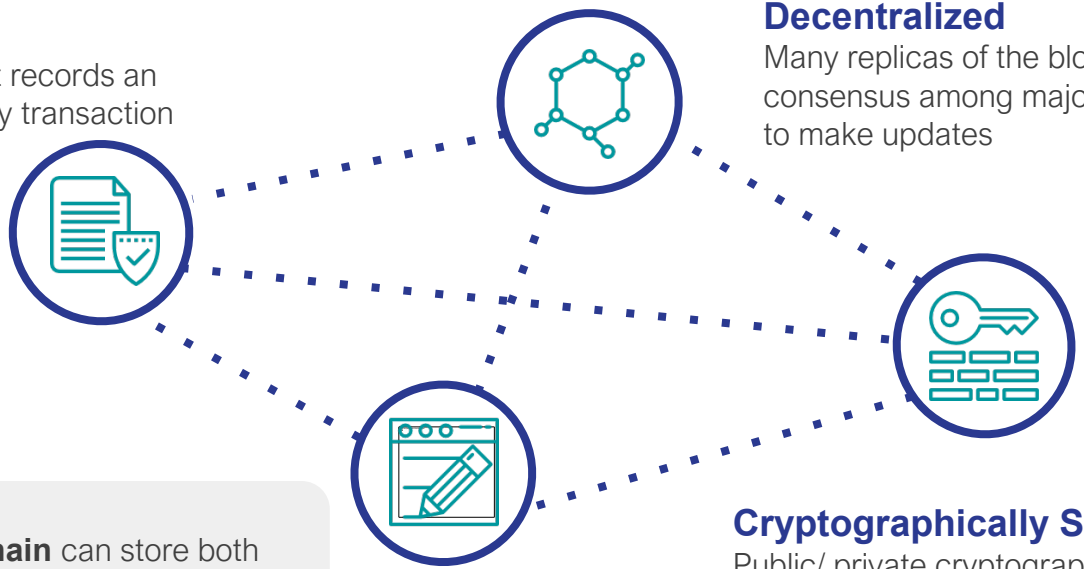
Originally conceived as the underlying protocol of Bitcoin, blockchain technology has since evolved to support a number of applications with the introduction of “smart contracts” in Ethereum

Immutable ledger

Write-once database that records an immutable record of every transaction

Decentralized

Many replicas of the blockchain database where consensus among majority participants is needed to make updates



Smart contracts

The **Ethereum blockchain** can store both data and Smart Contract (“logic”) in the blockchain

Cryptographically Secure

Public/ private cryptography signature technology to create transactions that are impervious to fraud and establishes a shared truth

Public vs. Private?

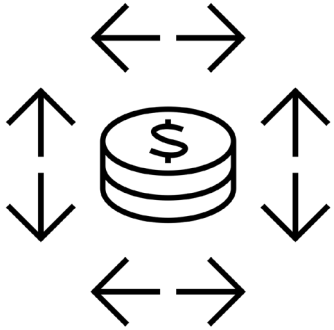
Public (Permissionless)

- Anyone can read/write data
- Transaction processors must invest financially to prevent fraud and spam
- Incentivized by direct economic incentive
- Costs digital currency to process transactions
- Censorship resistant

Private (Permissioned)

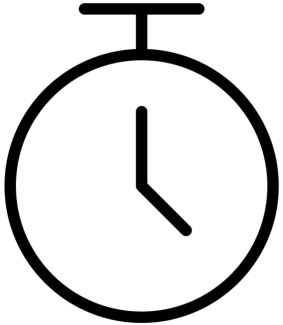
- Private blockchains also known as permissioned
- Designed for rapid application development
- Best suited for prototyping and consortia enterprise
- Participants are known and trusted
- Accountable validators incentivized by reputational risk

Blockchain brings performance improvements across several domains

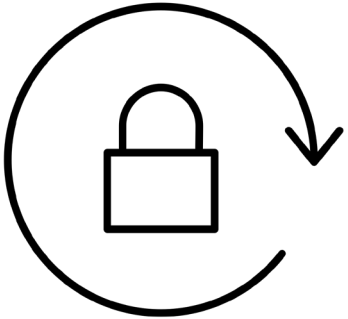


Free up the flow of capital

Lower transaction costs



Speed up processes



Improve security and trust

Blockchain value drivers can be defined across three categories

Blockchain as…	**… a store of proofs**	**…a set of self-executing decisions**	**… the "Internet of Value"**
Main value derived from…	… process simplification and digitization	…automation and decision-making support	… new business models and innovation
			
Description	As a store of proofs, a blockchain enables the **provenance of documents and assets** throughout the journey	Through smart contracts, a blockchain enables **automatic execution** of a set of **encoded conditional actions** that integrate with business transactions	**Token-enabling** blockchains allow for the creation of new business models and more **efficient markets** through **aligned incentives** of market players and the **removal of intermediaries**
Key Blockchain Features	**Immutable System of Records** **Consensus Mechanism** **High Availability, Resilience**	**Smart Contracts** **Oracles**	**Tokens**

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Central Bank Use Cases (1/2)

Central banks (CB) have been among the first class of major financial institutions to experiment and go live with blockchain applications - key themes around efficiency, resilience and financial inclusion

Decreasing Importance

Use Case	Description	Experimenting Institutions
Retail Central Bank Digital Currency	A CB issued digital currency, pegged to the sovereign currency and transactable p2p	Sveriges Riksbank; The Central Bank of The Bahamas; National Bank of Cambodia
Wholesale Central Bank Digital Currency	A CB issued digital currency, used exclusively for in-country or cross-border interbank settlements	Bank of Canada / Banque du Canada; MAS Monetary Authority of Singapore; South African Reserve Bank
Interbank Securities Settlement	A specific use case of the above that facilitates a "delivery vs payment" system for digitized securities	Bank of Japan; National Bank of Cambodia; Bank of England
Payment System BC/ DR	A blockchain application decentralizing the payment system data to act as a natural BC/ DR system	Banco Central do Brasil; Eastern Caribbean Central Bank
Asset Digitization and Securitization	Blockchain can facilitate the creation of cost-efficient and liquid markets for financial instruments	The World Bank IBRD • IDA

Source: World Economic Forum

Central Bank Use Cases (2/2)

Central banks (CB) have been among the first class of major financial institutions to experiment and go live with blockchain applications - key themes around efficiency, resilience and financial inclusion

Decreasing Importance

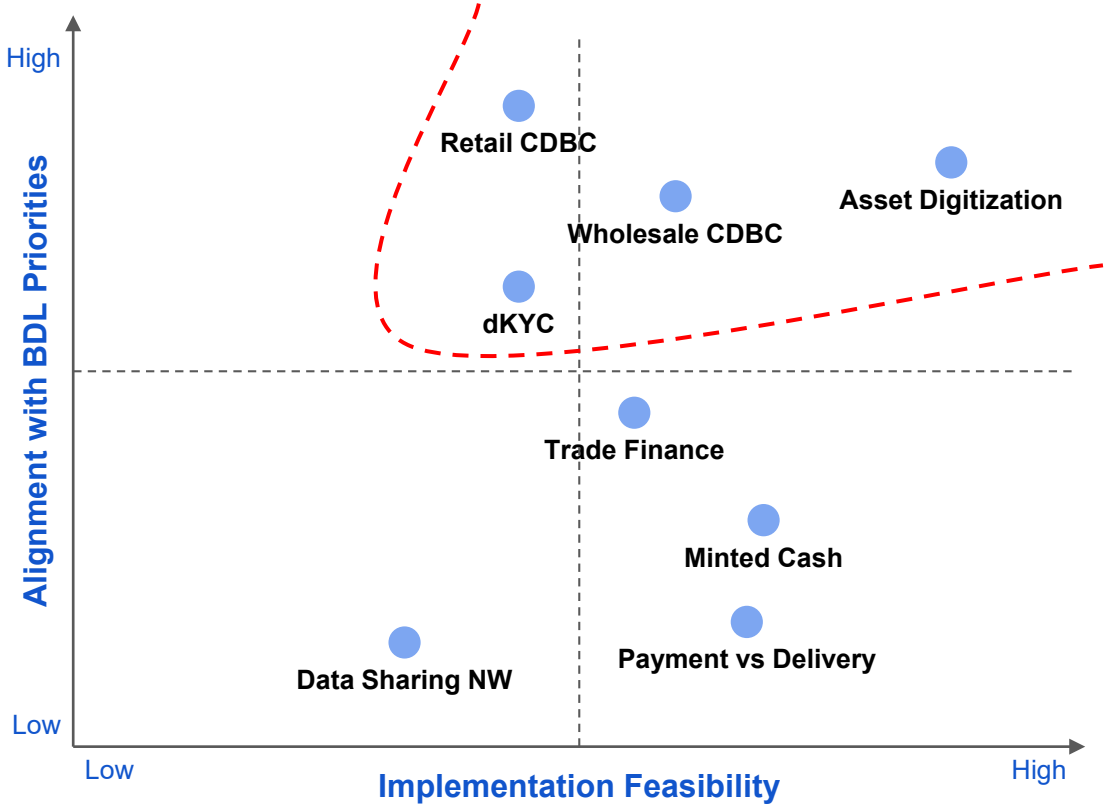
Use Case	Description	Experimenting Institutions
Decentralized KYC and AML	Blockchains can introduce vast efficiencies to KYC and AML through eliminating effort replication	HONG KONG MONETARY AUTHORITY 香港金融管理局
Information and Data Sharing Networks	A blockchain based data exchange for interbank and cross border data sharing	BANCO CENTRAL DO BRASIL
Trade Finance Operations	Blockchains can aid in the optimization of the paper-heavy trade finance operations	HONG KONG MONETARY AUTHORITY 香港金融管理局
Minted Cash Supply Chain	Blockchain can aid in tracking the movement of minted cash from origin to CB custody and banks	
Customer SEPA Identification	Digital identities for the Single Euro Payments Area consumers	BANQUE DE FRANCE EUROSYSTÈME

Source: World Economic Forum

For BDL, we believe use cases around CBDC, dKYC and asset digitization are the most relevant

PRELIMINARY HYPOTHESES

BDL Priorities
Stimulate economic activity
Boost confidence in the financial sector
Safeguard monetary stability
Optimize sector operations (payments, clearing, settlements)
Unlock capital from fixed assets to increase reserves



For BDL, we believe use cases around CBDC, dKYC and asset digitization are the most relevant (cont'd)

PRELIMINARY HYPOTHESES

Priority Use Cases	Why it is Relevant to BDL
Retail Central Bank Digital Currency	• Safeguarding monetary stability through increased BDL sovereignty of money and currencies • Stimulating a digital economy and increased activity • Optimizing BDL cost of currency production
Wholesale Central Bank Digital Currency	• Optimizing sector operations through speeded up interbank payments and gross settlement
Asset Digitization and Securitization	• Unlocking capital from fixed assets to increase BDL reserves • Stimulating economic activity through injection of capital into the economy
Decentralized KYC and AML	• Optimizing sector operations through enhanced KYC and AML processes

- Each of these use cases will benefit BDL separately (more details in subsequent slides)
- Additionally, combining all components together will enable innovative applications, especially around lending and capital market infrastructure which will further stimulate economic activity

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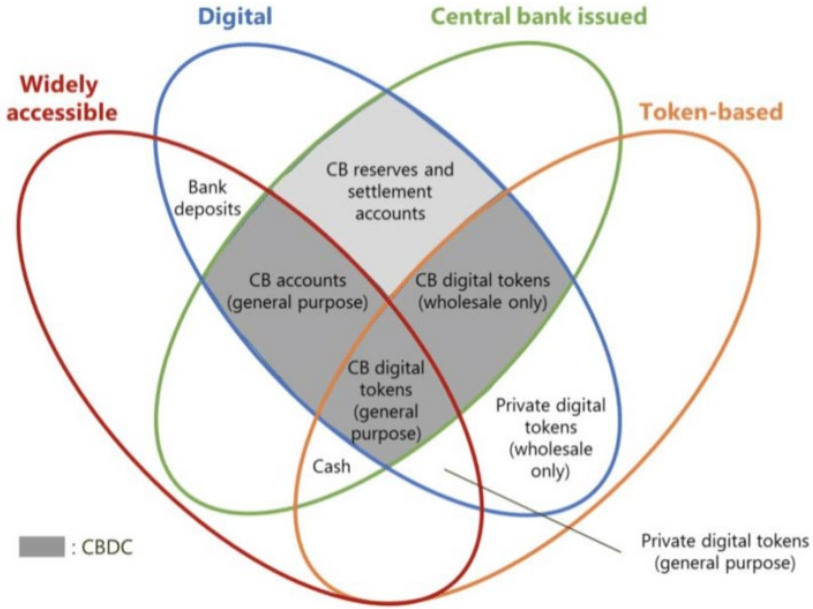
Central Bank Digital Currencies (CBDC) Overview

CBDC is a from of digital currency synthetic digital currency issued by a central bank

A Taxonomy of Money



CBDC Highlights

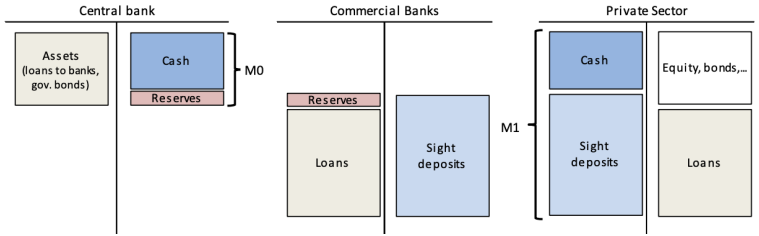
- **Central Bank Issued:** as opposed to crypto currencies
- **Peer-to-peer:** like banknotes
- **Managed personally:** through individual or corporate wallets
- **Purely digital:** like records of deposit accounts or clearing house accounts
- **Can be:**
  - **Universally accessible and token based:** like cash, and used for day-to-day transactions **(retail CBDC)**
  - **Limited to institutions and account based:** and used for settlement operations **(wholesale CBDC)**

Source: Bank of International Settlements

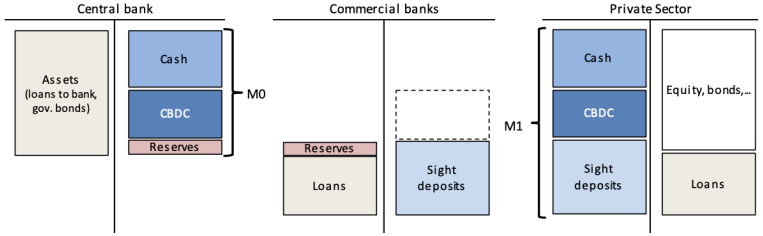
Retail CBDC and the Money Supply

Retail CBDCs impact the money supply directly, namely M1; and moves part of the supply from commercial banks to the Private Sector

Fractional Reserve System Base Case



Fractional Reserve System with CBDC



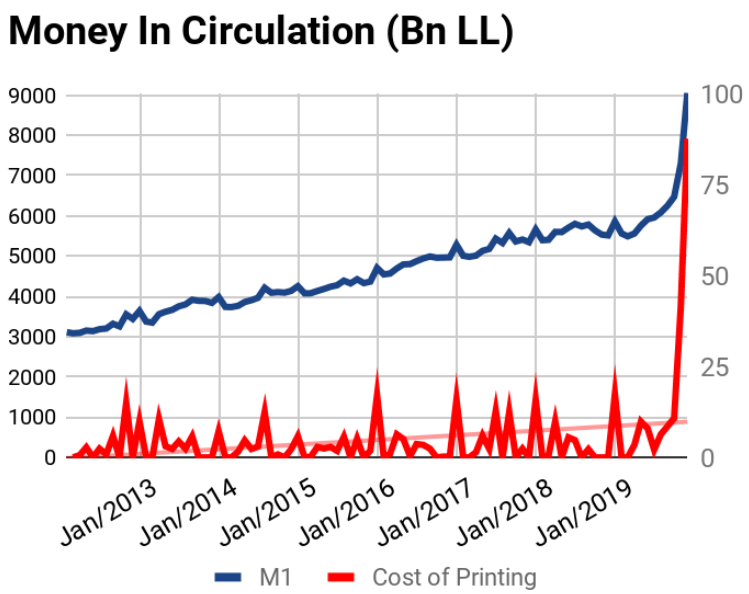
- Within the fractional reserve system, the bulk of the liquid money supply (M1) is held as claims on the commercial banks as sight deposits for the private sector
- The burden of managing the claims falls almost entirely to the commercial banking sector
- The claims on the central bank are only represented by banknotes and required banks' reserves
- With the introduction of a CDBC a portion of the sight deposits, represented by CDBCs, is managed directly by the private sector.
- This stems from the absence for a custodian for the digital currencies, as they reside directly in the wallets of the private sector
- CBDCs held by the private sectors turn into claims on the central bank, whose now acting as a commercial bank

Source: European Parliament

Retail CBDC and Seigniorage Earnings

CBDCs can be used to reduce the cost of money production and increase Seigniorage Income

Lebanese Market M1



Potential Seigniorage Earnings

- Assuming a cost to print of 5% for banknotes in circulation, total cost of printing since 2012 is LL455Bn
- With a CBDC BDL can control the issuance and removal of banknotes (virtual) from circulation at near zero marginal cost
- Seigniorage income can increase by LL455Bn since 2012
- Given the increased issuance of banknotes in 2019, an additional LL 88Bn in seigniorage income could have been generated by using a CBDC

Source: BDL Website

Retail CBDC Other Benefits, and Potential Downsides

A major additional benefit of a retail CBDC is increased velocity of monetary policy; a major risk is banking sector disintermediation

Additional Benefits of Retail CBDC
Reducing the impact of systemic shocks on economic activity through faster money creation
Decrease the reliance on cash for its gradual phase out
Financial inclusion for the unbanked population who only need a smartphone to have access to CBDC
Increased transparency and surveillance ability for money flows
Increased velocity of monetary policies (instant creation and burning of money)

Potential Risks of Retail CBDC
Increased operational risk and costs for the Central Banks (to manage citizen accounts)
Increased systemic risk through cybersecurity vulnerabilities
Lack of Central Bank experience in running commercial operations (e.g. KYC/ AML)
Crowding out of commercial banks through redirection of commercial deposits to the central bank

Source: World Economic Forum

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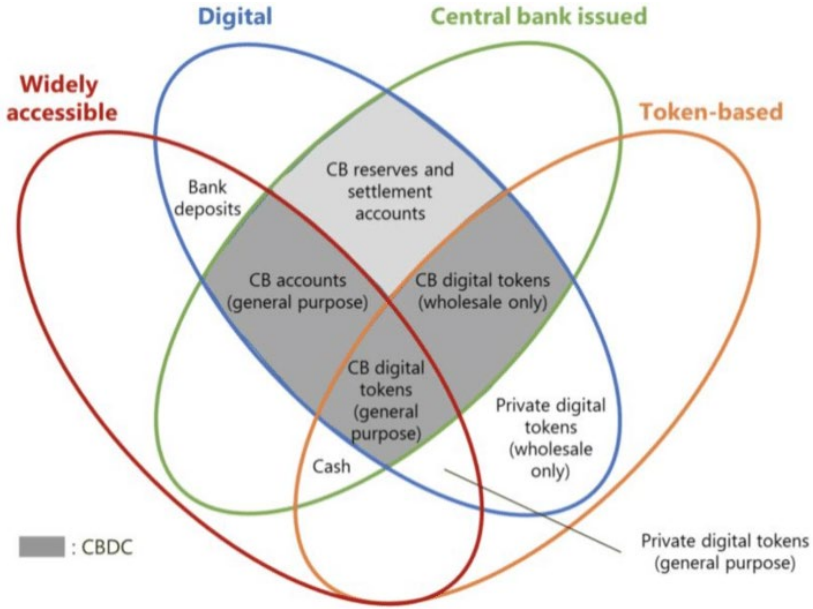

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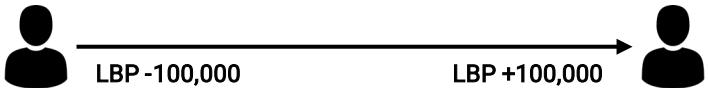
Source: Bank of International Settlements

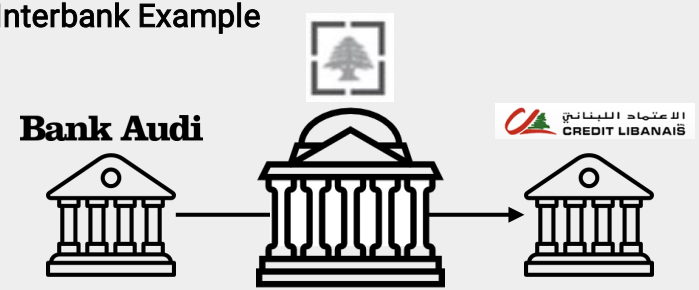
Wholesale CBDC for Interbank Settlements (1/2)

Interbank transfers today are mostly handled by gross settlement through the central bank, they're batched, difficult to maintain, and expensive

Customer-to-Customer Transfer



Interbank Example



Batch Oriented

Transactions are handled in batch and reported to central banks periodically as aggregates

Old & Difficult to Maintain

Legacy infrastructure is expensive to maintain and outdated relative to today's rapidly evolving fintech landscape

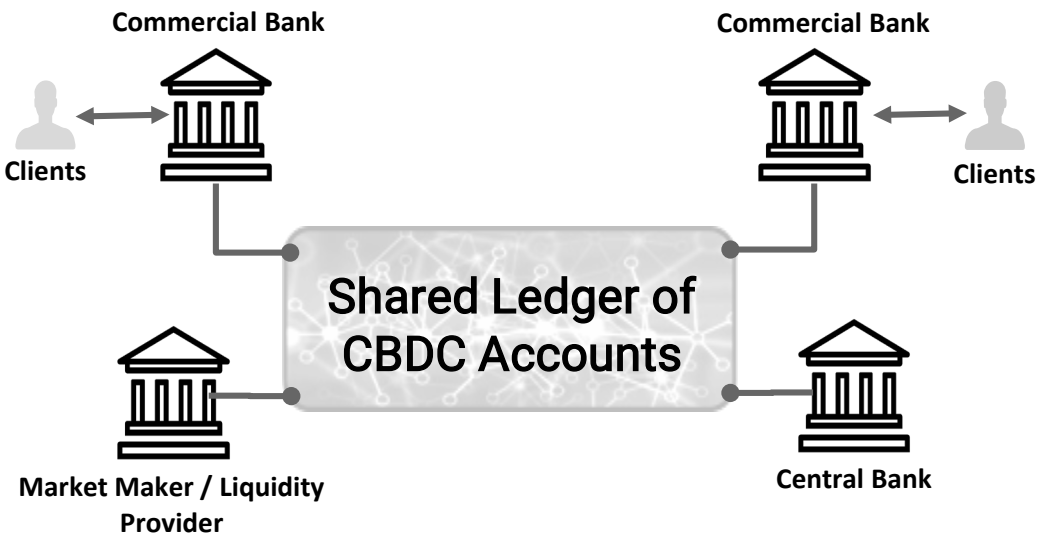
Expensive & Slow

As a result of batch oriented processing and outdated infrastructure, interbank settlements are inherently expensive and slow

Wholesale CBDC for Interbank Settlements (2/2)

A shared, decentralized ledger of the banks' CBDC accounts can simplify interbank settlements, free central bank resources, and free up working capital for banks

Solution



Benefits

- Single version of truth is shared on the decentralized ledger
- Transactions settled in real time are immutable
- Tokenization is (programatically) used to communicate existing systems
- Does not substitute core banking systems - only the rails connecting them

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Regulators and KYC

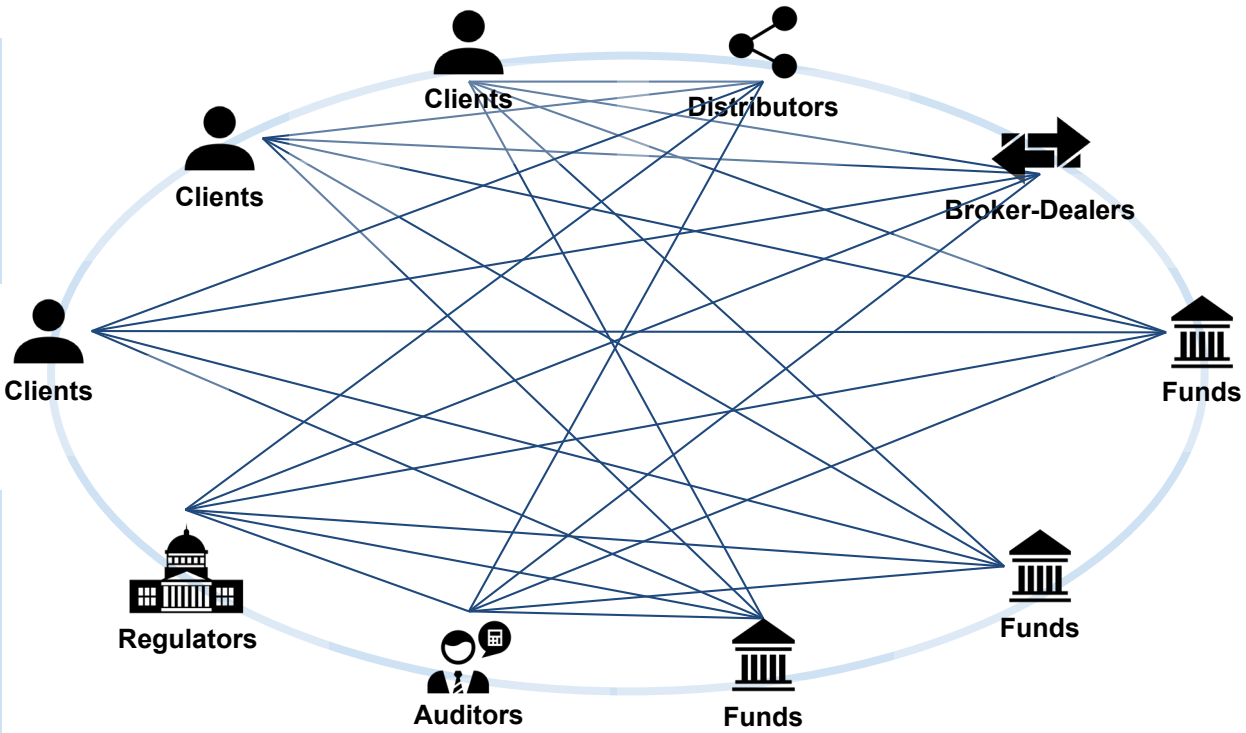
There is increasing regulatory focus on KYC, due to repeated cases of financial fraud and money laundering

KYC Today: a Tedious Process

KYC process today involves multiple stakeholders, with no centralized access to relevant information

Clients
• Every client provides duplicate documentation to multiple parties
N x M x Docs

Regulators / Auditors
• Audits slow and expensive
• Slow adoption following regulatory change



Broker/Dealers
• Barrier to entry for new participants
• Reduces availability of products
• Hard to ensure compliance
• Reduces market liquidity

Funds
• Onboarding new clients labour intensive, expensive and time consuming

KYC Pain Points

Both customers and service providers face specific challenges in KYC, along with security and privacy issues

Customer Challenges

Repeat onboarding: KYC process needs to be repeated for each new client application, leading to process redundancy and duplication efforts

Processing Delay: companies spend~ 26 days to complete kYC process, resulting in client's application delays

Lack of ability to share customer approvals across institutions

Varying verification levels: no standardized verification process due to bank-specific compliance with laws and regulation, increasing in complexity

Service Provider Challenges

Customer acquisition costs, for new KYC application: unable to use data from other banks, leading to higher onboarding costs

Compliance / due diligence risks if no appropriate KYC, leading to legal and financial sanctions

Data cleansing and integrity: siloed / duplicate data due to multiple KYC applications per clients - lack of data accuracy and consistency

Lack of accurate watchlists and monitoring due to poor interoperability of KYC systems amongst financial institutions

Security & Privacy Challenges

Data privacy requirements: banks required to follow number of best practices for storing and accessing KYC data across jurisdictions (GDPR)

Cyber-attacks and identity theft due to users' PII online: need for secure database in place to protect customer's information

Customer consent: customers have lack of transparency and control regarding use of personal data shared for KYC process

KYC Pain Points' Implications

Current challenges are detrimental to costs and customer experience, but create opportunity for Distributed KYC-as-a-Service (dKYC)

Implications

Financial institutions globally spend an average of **$60mm** a year on KYC, with 10% of FIs spending > **$100mm***

An average of **68** employees work on KYC within each FI

Average client onboarding time is **24 days** and increasing 20% annually. Over 2 months for 30% of clients

Recent regulatory infringements caused banks to pay up to **$2Bn** in fines

Opportunity

- Reduction of resourcing costs related to KYC
- Improved customer onboarding experience
- Greater transparency and auditability of the end to end process
- Enhanced regulatory compliance

dKYC as a Service

Blockchain technology can support dKYC-as -a-Service

Blockchain value-add applicable for KYC, making it an ideal platform to solve pain points

Reduced Cost

- Mutualizes platform cost across participants
- Smart contracts reduce manual processing, re-work and processing errors

Technical Advantages

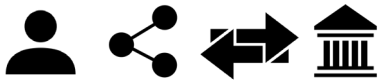
- Built in security and encryption
- Easy scaling and addition of new platform participants
- Integration with existing or 3rd party applications
- High availability of technology infrastructure

Reduced Risk

- No single point of failure due to distributed nature of database
- Security and encryption built into the core of the platform
- Non-repudiability and immutable audit trail reduces risk of fraud

Increased Speed and Customer Satisfaction

- New client documents and data shared immediately with all participants (subject to permissioning)
- Clients have a single view of multiple onboarding processes



Solves Customer & Service Provider Challenges

- Digitally native i.e., easily portable, representation of identity, document validation and authorisations with transparency & trust for all participants
- Decentralized ledgers provide a permissioned, single source of truth for all network participants, eliminating duplicated effort

Solves Security & Privacy Challenges

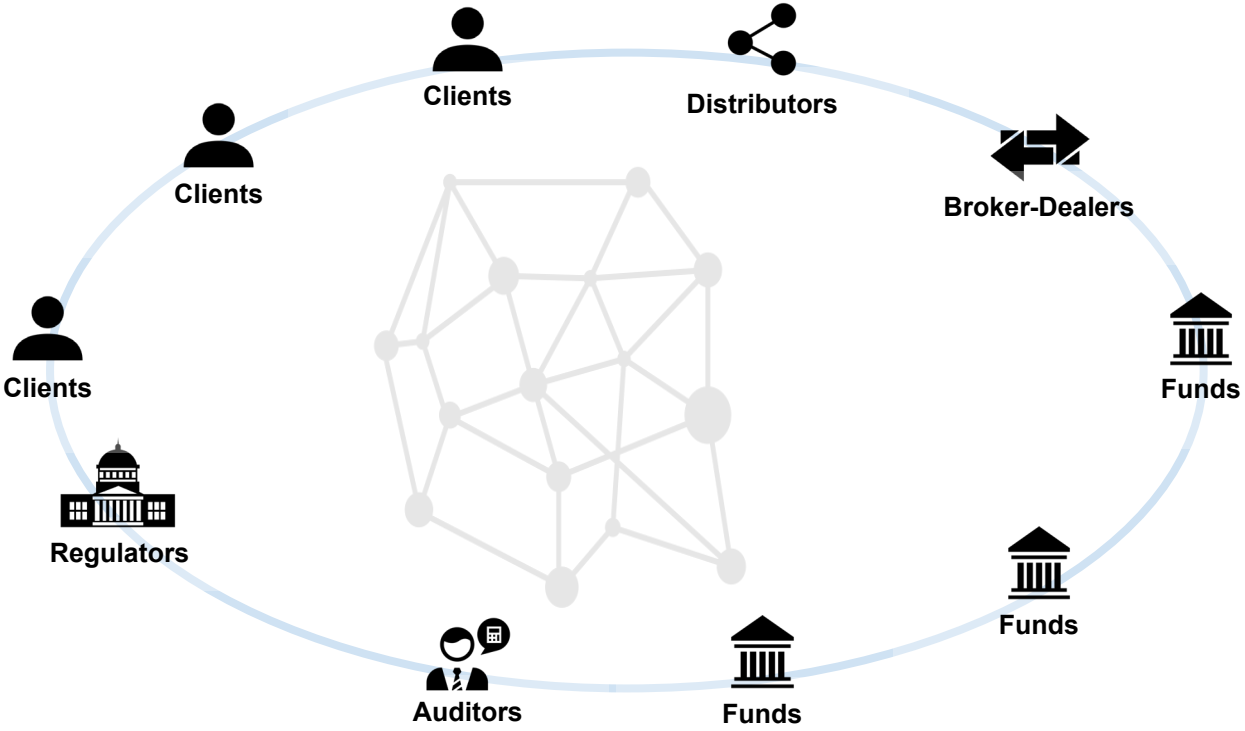
- Selective disclosure removes siloing of information and maintains client control of privacy
- Cryptographic properties provide integrated, auditable compliance without additional overhead

dKYC and Blockchain

A blockchain based dKYC resolves the spaghetti problems with classic KYC

Clients
- Transparency of underlying positions
- Streamlined onboarding & management

Broker/Dealers
- Faster sales
- Happier clients
- Expanded product range



Regulatory
- Immutable records of client data & actions
- Real-time transparency

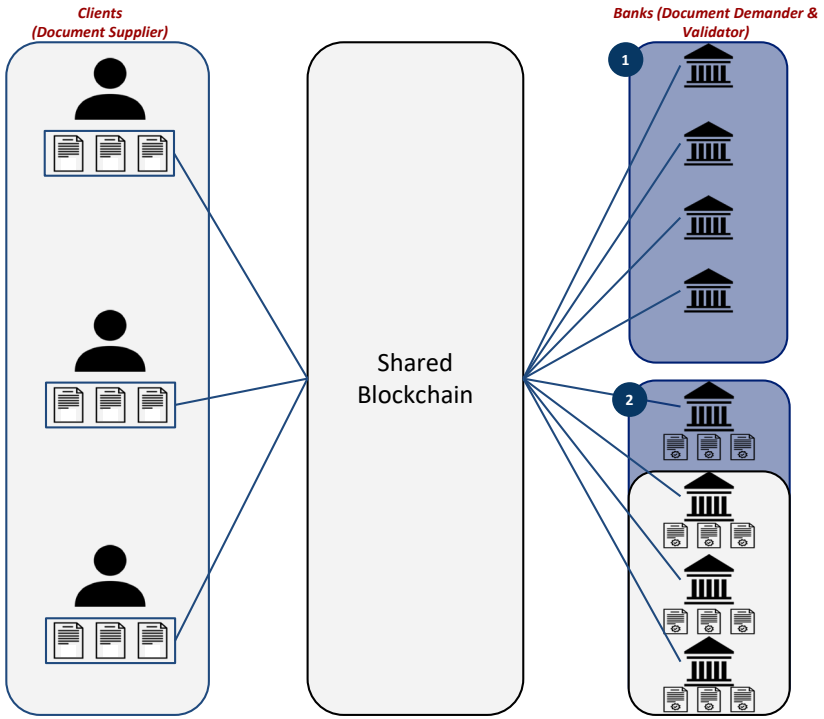
Funds
- Reduced onboarding & distribution costs
- Improved accuracy of client records, shareholders

Target state: one distributed, cryptographically secured database accessible by all relevant parties while providing regulatory transparency

Two models of operations for a dKYC platform exist

Decentralized workflow management tool or consortium document validation

KYC Platform



KYC Usage

1) Decentralized Workflow: KYC as workflow management tool; document validation left to banks when onboarding new clients - but participants share documents

Pros

- Elimination of a middle-man institution
- Decreased centralization risk
- Clients only provide documents once

Cons

- Redundancy in doc. validation: same doc. to be validated multiple times
- Increased operating cost of onboarding and maintaining user system
- Bank-specific compliance with laws and regulation, increasing complexity
- Low impact: replicates existing KYC process with advanced technology

2) Consortium Document Validation: Documentation & validation of a client by one member feeds into validation process for other members

Pros

- Consortium of similar institutions to share KYC and compliance incentives
- Controlled platform access enhances network security
- Banks reduce cost of onboarding and maintaining users
- Cost savings due to economies of scale
- Restricted network to accelerate transactions speed

Cons

- Compliance with laws and regulation may be complex
- Requires cross-industry cooperation
- Ultimate responsibility for the KYC process remains with individual banks

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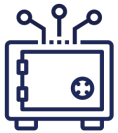
Asset digitization is the transformation of products/services, assets, and/or securities into a digital form



Digital assets and securities are digital representations of a traditional asset or security such as equity, debt, commodities, and other derivative investment vehicles.

Investors are able to purchase and custody digital assets on a brokerage platform - similar to a traditional investable asset.

There are benefits to both issuers and investors, including reduced administrative burdens as well as lower resistance for asset liquidation

Asset digitization on the blockchain - tokenization - has the potential to unlock massive liquidity in traditionally illiquid asset classes...

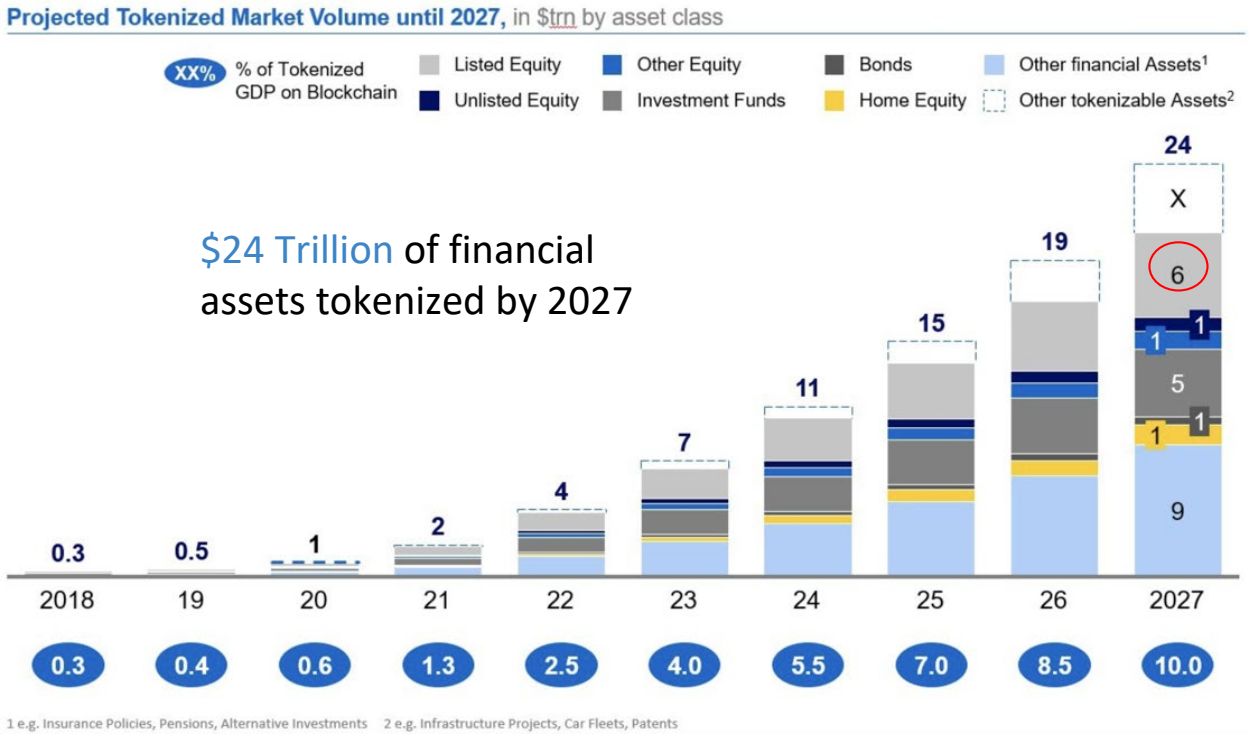
Asset Descriptions	Estimated market size
Equity & Bonds	$388 Trillion*
Derivatives	$544 Trillion to 1.2 Quadrillion
Invoices	$3 Trillion
Private Equity	2.8 Trillion AUM**
Collateralized loan obligations (CLOs)	$0.6 Trillion (US only)
Real estate	$217 Trillion

Benefits of Asset Digitization

- **Unlocked liquidity** potential from the open and borderless nature of digital assets
- **Reduced cost** of asset issuance, ownership and trading
- **Improved risk management** using asset metadata, asset ratings, and market data oracles
- Network-based asset registry
- **Standardized asset representation** in the form of tokens
- **Streamlined fractionalization and securitization**
- Rules for asset transfer encoded in token contract
- Single source of truth of asset ownership and transfer
- Legally enforceable asset ownership
- Streamlined digital asset custody
- Streamlined connectivity to trading infrastructure

Source: Reuters.com, money.visualcapitalist.com * Global Equity + Total Debt = $173 Trillion + $215 Trillion,
**McKinsey Global Private Markets Review 2018

It is estimated that by 2027, $24 trillion of these assets will be tokenized



Source: World Economic Forum

Research and surveys from institutions such as the World Economic Forum (WEF) project that up to 10% of the global Gross Domestic Product (GDP) will be stored and transacted with the help of blockchain technology by 2025–27.

Estimated tokenized asset market of **~$24trn of financial assets in 2027**:

- Includes only the measured asset classes. Does not extend to unmeasured or unidentified tokenization use cases of intangible assets (e.g. patents, usage rights)

Finance heavyweights are taking notice...

JPMorgan, Goldman Sachs, Others Trial Blockchain Technology For Debt Issuance

J.P.Morgan

Blockchain, News | April 20, 2018
By: Maricel Custodio

JPMorgan Chase, Goldman Sachs and other large firms have tested a new blockchain platform for issuing financial instruments.

The trial, which seeks to streamline origination, settlement, interest rate payments, and other processes, was conducted with a number of participants, including the National Bank of Canada, Pfizer, Legg Mason's Western Asset, and other investors in the certificate of deposit.

Leaseum mise sur la blockchain pour vendre son fonds immobilier en parts digitales

FINANCE

La start-up devrait bientôt commercialiser un nouveau fonds… sous la forme de security tokens de 1 dollar, ayant vocation à être cotés.

Alexandre Counis
@alexandrecounis
— Correspondant à Londres

Ce pourrait être le nouveau « hit » dans l'univers des cryptomonnaies. Leaseum, une start-up créée à Londres par quatre Français, devrait ouvrir fin octobre-début novembre la commercialisation de son nouveau fonds immobilier… sous la forme de security tokens. Des parts que les investisseurs pourront acheter auprès du gestionnaire d'actifs de manière numérique, dans des conditions de liquidité améliorées grâce à la technologie blockchain.

Bourses régulées

A l'origine du projet, un ex-structureur de chez Citibank (Michael Abib), un ex-directeur des ventes de produits structurés chez Natixis (Lior Abehassera), un des cofondateurs du site de meubles Made.com (Julien Callede) et Steve Sillam, passé par la banque puis par l'immobilier avant de devenir directeur général de Leaseum. Lorsqu'il commence à s'intéresser aux cryptomonnaies, il y a environ deux ans, celui-ci se forge une conviction : face à la folle volatilité de ces outils, il faut chercher à les adosser à des actifs tangibles, qui génèrent des revenus, si possible dans un univers régulé.

Il choisit rapidement d'adosser des security tokens à un sous-jacent d'actifs immobiliers. Leaseum compte récolter dans les trois à six mois qui viennent 250 millions de dollars auprès d'investisseurs institutionnels ou de particuliers « accrédités », pour commencer ensuite à investir dans un portefeuille de bureaux et d'immeubles d'habitation à New York.

Concrètement, les investisseurs pourront entrer en achetant des parts classiques ou des tokens pour un prix fixé à 1 dollar l'unité. L'avantage ? Ces tokens ont vocation à être cotés : sur des marchés régulés spécialisés sur les security tokens (tZero ou Open sont prêts à se lancer), sur des marchés de cryptomonnaies classiques (Coinbase ou Poloniex devraient se diversifier vers les tokens régulés) ou sur des Bourses régulées traditionnelles (le Nasdaq, la Bourse de Londres et le Swiss Stock Exchange ont déjà annoncé qu'ils voulaient coter des tokens).

Trois des quatre Français à l'origine de la start-up Leaseum. De gauche à droite : Steve Sillam, Michael Abib et Lior Abehassera. *Photo Leaseum*

Accréditations

Résultat : là où ils sont traditionnellement « lockés » 5 ou 10 ans avant de pouvoir ressortir des fonds classiques, les investisseurs pourront céder leurs titres numériques à tout moment, sans avoir à demander au gérant de leur trouver un acheteur. *« Ils pourront se reporter au registre public dressant la liste de tous les propriétaires de tokens*, explique Steve Sillam. *C'est toute la force de la block-*

Tout le monde ne pourra pas acheter les tokens. *« L'administrateur de notre fonds s'occupera de vérifier l'identité de chaque acheteur*

> L'objectif est de distribuer, à compter du premier semestre 2019, des dividendes trimestriels avec un rendement annuel net de 6 à 7 %.

tokens des règles de transfert codées qui n'autoriseront leur vente qu'auprès d'acquéreurs figurant sur une liste blanche. » Si un investisseur perd sa clef numérique ou se fait voler ses tokens, il n'aura qu'à se présenter à Leaseum pour faire valider son identité, faire annuler les tokens perdus et en faire émettre de nouveaux.

L'objectif de Leaseum est de distribuer, à compter du premier semestre 2019, des dividendes trimestriels grâce aux loyers encaissés, avec un rendement annuel net de 6 à 7 % soit, en incluant à terme la

BLOCKCHAIN INFRASTRUCTURE

China's Bank Of Communications Issued $1.3 Billion Securities With Blockchain Technology

JOSHUA MORRIS · SEPTEMBER 29, 2018 · 11:30 PM

Business

JPMorgan To Tokenize Gold Bars

Umar Farooq, JPMorgan's Head of Blockchain Initiatives, recently said in an interview that the banking giant will be 'tokenizing' gold bars on the Ethereum network. The assets will be represented on Quorum, JPMorgan's enterprise blockchain built on Ethereum.

Harbor / Convexity Properties: Real Estate on the Blockchain: $20 Million Sale 'Tokenizes' Student Residence

31,733 views | Oct 3, 2018, 09:00am

A First For Manhattan: $30M Real Estate Property Tokenized With Blockchain

23.10.2018

Erste Group and ASFINAG successfully launch Europe's first entirely blockchain-based capital markets issuance

- Newly developed permissioned blockchain platform used for the issuance of a Schuldscheindarlehen
- Transaction marks the first time such an instrument has been issued without a traditional paper-based process occurring in parallel
- Blockchain-based platform offers improved speed, lower operational risk and greater transparency
- Platform's open architecture allows the future integration of additional banks and platforms
- Wiener Städtische Versicherung, DONAU Versicherung and Hypo Vorarlberg underline their role as first-mover investors by participating in the issuance

Austria to use Ethereum Blockchain in €1Billion Bond Issuance

Nicholas Say on September 28, 2018 / 0 Comments
Post Views: 2,487

PRESS RELEASE | August 23, 2018

World Bank Prices First Global Blockchain Bond, Raising A$110 Million

… as are regulators, who are developing new frameworks to monitor the space

- The **SEC** recently published a **Crypto Token Framework** for digital assets
- The framework is a set of guiding principles to allow issuers to understand whether a digital asset falls unders SEC purview and how to evaluate it
- Standard securities laws are applied to digital assets that fit the framework

- The Securities and Futures Commission of **Hong Kong** has also set a set of guiding principles to help determine if a digital asset falls under the **Securities and Futures Ordinance**
- Assets fitting the ordinance are subject to the full force securities law

- The **Swiss** regulator, FINMA, created a new framework for digital assets rather than subjecting them to traditional securities laws
- The new laws are a hybrid of traditional laws with added KYC and AML controls

- Similar to FINMA, the Monetary Authority of **Singapore** released a **Guide to Digital Token Offering** in 2018
- The guide offers a comprehensive set of rules and examples for handling digital assets

- The **Central Bank of Bahrain** has two ongoing initiatives for crypto assets: release of regulatory framework, **the Crypto-asset Platform Operations**; trail creation of **Bitcoin Regulatory Sandbox** to allow digital asset-based companies to operate within the country

- No clear guidance in the **UAE** yet
- Both ADGM and DFSA however provide access to fintech companies that meet a set of criteria to operate with regulatory sandboxes

- Malta Financial Services Authority (MFSA) formed **Maltese Digital Innovation Authority (MDIA)** to audit and license crypto-related business
- 3 bills approved by MFSA/ MDIA including **Virtual Financial Asset Act, acts as regulatory framework for ICO and STO related matters**

- Primary financial regulatory in Luxembourg is the **Commission de Surveillance du Secteur Financier (CSSF)**
- Passed **Bill 7363** to provide legal framework for financial market participants issuing securities using blockchain technology

- The Cayman Islands Monetary Authority (CIMA) has not yet developed specific regulation for the digital assets space, ICOs and STOs
- Current review of sector to study how existing regulatory framework can be used - while environment remains favorable for private offerings

- **Financial Market Authority** of Liechtenstein (MFA) has developed Tokens and **Trustworthy Technology Service Providers Act ("Blockchain Act")**
- Aims at laying foundations for the token economy by regulating underlying concepts rather than specific applications

Different private asset classes have varying degrees of tokenization difficulty and value potential; ConsenSys is active across all of them

	Value Creation Potential	Current Blockchain Activity	Difficulty Level Today	ConsenSys Assets / Projects
Real Estate	**High** - syndication and collateral	**High** - Realblocks, Harbor, etc	**Low** - out of the box capabilities	Meridio and beyond / non-US secondary market
Structured Finance	**High** - reusable templates, additional services	**Medium** - indicated as a focus for bank POCs - post-trade	**Medium** - complex inter-co flows	ConsenSys Private Chain Offering
Municipal Bonds	**Medium** - relevance for infrastructure / govt smart cities funding	**Low**	**Medium** - complex inter-co flows	ConsenSys Private Chain Offering
Private Equity	**Medium** - new liquidity, fundraise, corp actions	**Low**	**Medium** - dividends, regs, etc	LiquidShare, CapBridge 1exchange
Derivatives	**Low** - post-trade	**Low**	**High** - complex connectivity to existing systems	ConsenSys Private Chain Offering

Raising funds across these classes takes one of two general forms; Security tokens or utility tokens

Issue Type	Assets That Could Be Tokenized		Considerations	

Security	Existing Assets	• Issuers can create tokens that represent ownership in existing developed assets of varying scale, such as:
		  ▪ The entire company similar to a share issuance
		  ▪ A specific asset (e.g., residential rental property)
		  ▪ A bundle of assets
			Ownership Rights	• **Two** options exist for the rights held by the token holders
				  ▪ **Outright Ownership:** In this setup, the token holders are full owners of the underlying assets (or fractions of the assets) with all the legal implications of such ownerships (e.g., custody over a title deed for a residential unit)
				  ▪ **Ownership of Economic Benefits:** In this setup, the token holders only own rights to future economic benefits of the assets (e.g., a fraction of the rental income)

	Projects Under Development	• Issuers can create tokens that represent ownership in projects that are not yet developed • This issuance is used as part of the financing process for these new projects - analogous to off-plan selling for residential units		

Utility	Existing Assets	• Issuers can create tokens that represent access rights to an existing asset, such as:
		  ▪ An amusement park
		  ▪ A movie theatre
		  ▪ A means of transport
			Capital Raises	• As utility tokens only represent access rights to an asset, the scale of a utility token sale has to be significantly larger to finance large capital projects (e.g., a $100M+ development)
				• Issuers have to create right incentive mechanisms to ensure a sale is successful, which can take the form of:
				  ▪ Heavy discounts
				  ▪ Non-fungible tokens that take on additional value from scarcity (e.g., digital fanfare, cryptokitties)

	Projects Under Development	• Issuers create tokens that present future access rights to projects under development to secure financing for those projects		

BDL Asset Digitization

BDL has a large fixed asset portfolio as well as attractive income generating businesses that can be digitized to generate liquidity

BDL Fixed Asset Portfolio

BDL Fixed Assets (In LL Bn)

Source: BLOMInvest

BDL Owned Businesses

MEA
Middle East Airlines - Air Liban

CASINO DU LIBAN

Asset Digitization Benefits

BDL can generate liquidity to stimulate the economy without relinquishing control of the assets

Generate Liquidity

- ***By creating digital representation of BDL's assets and selling on public digital exchanges***
- ***The return of the sales can be injected directly into BDL's reserves or used for economic stimulus and currency stabilization***
- ***The generated reserves can be used to support a BDL issued CBDC***

Maintain Ownership

- ***The digital assets (tokens) can be designed not grant the buyers ownership of BDL's assets***
- ***Instead the token holders hold rights to profits generated by the assets for a pre-set duration***
- ***After the expiry of the preset duration, the tokens are burned (destroyed) and profit rights return to BDL***

Outline

- *Intro to Blockchain*
- *Blockchain and Central Banks*
- *Relevant Use Cases for BDL*
- **Next Steps**

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Next Steps

- Hold a workshop with BDL IT team to validate BDL priorities and ambitions, and present relevant use cases
- Prioritize use cases into a blockchain roadmap for BDL
- Submit to BDL a proposed scope for the implementation of blockchain solutions, potentially around
    - Issuance and management of digital currencies/ stable tokens
    - Design and development of a dKYC blockchain network
    - Deployment of an asset digitization platform