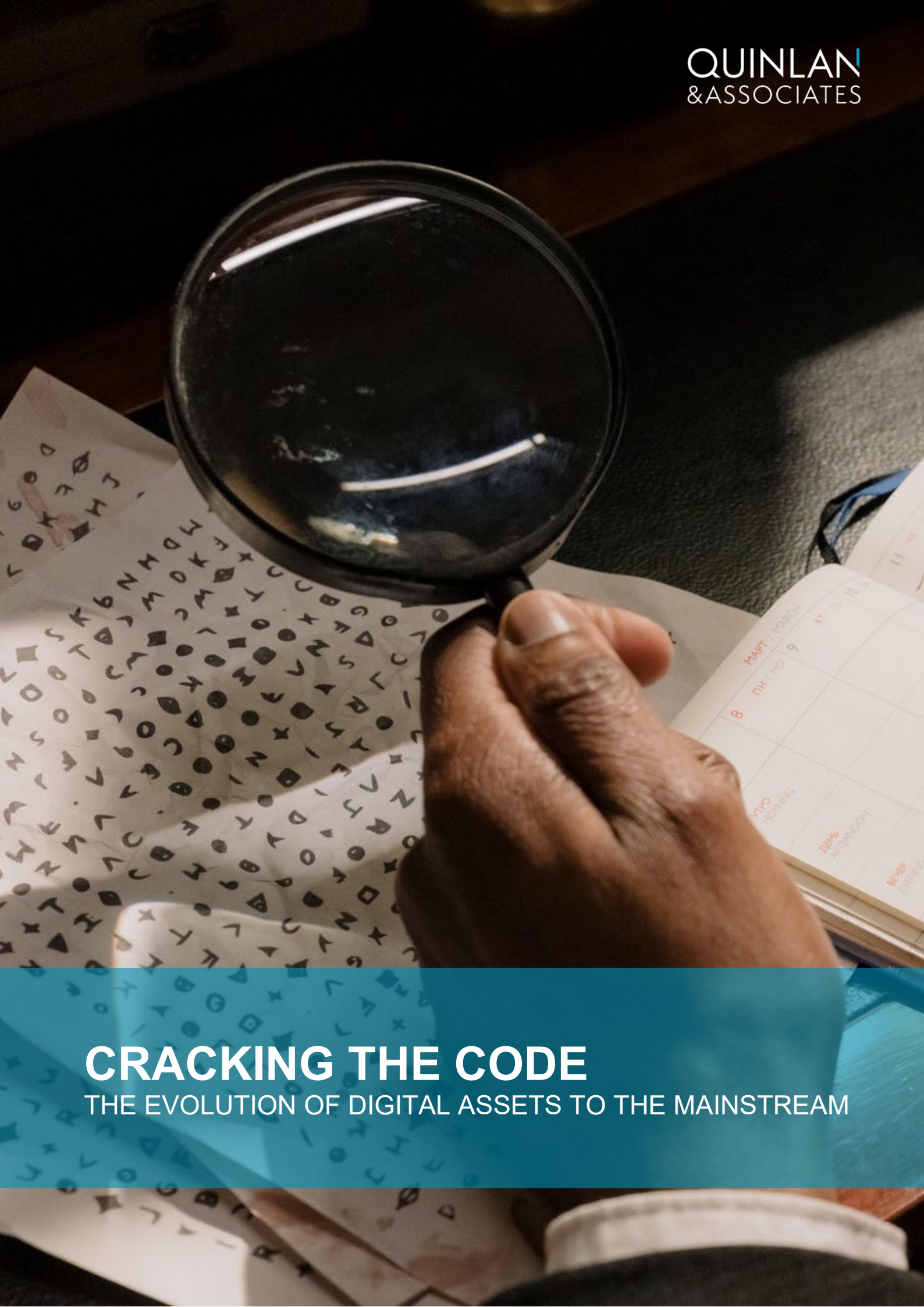
QUINLAN
&ASSOCIATES



CRACKING THE CODE

THE EVOLUTION OF DIGITAL ASSETS TO THE MAINSTREAM

THE AUTHORS

BENJAMIN QUINLAN
CEO & MANAGING PARTNER
BCom (Hons 1) / LLB (Hons), *Macquarie University*

JUSTIN CHUNG
ASSOCIATE
BBA (Hons 1), *Hong Kong University of Science and Technology*

EASHAN TREHAN
SENIOR CONSULTANT
BEng (Computer Science and Finance) (Hons), *University of Hong Kong*

---

dealogic

SPECIAL THANKS

We would like to extend a special acknowledgement to our strategic partner, Dealogic, for working closely with us in providing capital markets data and competitor intelligence in this report.

As a partner to hundreds of firms worldwide, Dealogic provides integrated content, analytics, and technology that helps clients originate the right opportunities, distribute deals to the right buyers, and ensure seamless and transparent consumption of resources.

r3.

OFFICIAL CONSULTING PARTNER

R3 is a leading provider of enterprise technology and services that enable direct, digital collaboration in regulated industries.

As an official consulting partner to the R3 network, Quinlan & Associates has worked extensively with companies in the blockchain and digital assets space, including various digital assets exchanges, blockchain focused venture capital funds, proprietary trading houses, digital asset managers, brokerages, and family offices.

CONTENTS

EXECUTIVE SUMMARY

In 1982, an American computer scientist and cryptographer, David Chaum, introduced the concept of 'blockchain', a new technology capable of delivering a wide array of benefits, including enhanced data integrity and cybersecurity, divisibility, and ultimately, programmability. Fast forward four decades and one application of blockchain that has stood out, in particular, is the birth of 'digital assets'.

While the digital asset ecosystem continues to evolve at a rapid speed, it can be broadly categorised into three key asset clusters: (1) cryptocurrencies (i.e. native and fiat-based cryptocurrencies); (2) security tokens (i.e. tokenised securities / digital securities); and (3) other digital assets (i.e. utility tokens and non-fungible asset tokens). While these new asset classes possess immense potential, many have been marred by controversy, especially in the case of cryptocurrencies. Their relatively nascent nature, together with an immature digital assets landscape, has seen bad actors exploit gaping regulatory arbitrage windows, resulting in a spate of fraudulent activity.

The spotlight being shone on the digital asset universe has, especially in more recent times, drawn the ire of regulators across the globe, who are increasingly clamping down on the space. While growing levels of regulatory scrutiny is narrowing the regulatory arbitrage window, it is also legitimising certain forms of digital assets; chief amongst them, security tokens.

The advent of the security token has brought about with it several advantages, including: (1) greater transparency; (2) dematerialisation; (3) enhanced asset liquidity and capital accessibility; and (4) disintermediation. While adoption levels have been somewhat muted in recent years, we believe security tokens will open the door to a legitimate, well-regulated pathway for institutional investors to participate in the digital asset ecosystem, especially given their restrictive investment mandates and overarching fiduciary duties.

Looking ahead, we expect a growing number of unregulated players to become licensed entities and offer security token products that institutions can comfortably embrace. Recognising the opportunities on offer from security tokens, a number of: (1) traditional exchanges; (2) cryptocurrency exchanges; and (3) digital asset broker / dealers have embarked on a quest to transform into 'security token exchanges', albeit at different speeds and with varying degrees of focus. In response, the ecosystem surrounding these exchanges is also set to evolve, with the ongoing transition from traditional securities to security tokens expected to create clear winners and losers among existing capital market participants.

With an estimated USD 4.1 trillion in listed security token issuance volumes (and USD 162.7 trillion in security token trading volumes) up for grabs by 2030, we see an immense opportunity for players who can ultimately succeed in cracking the code.

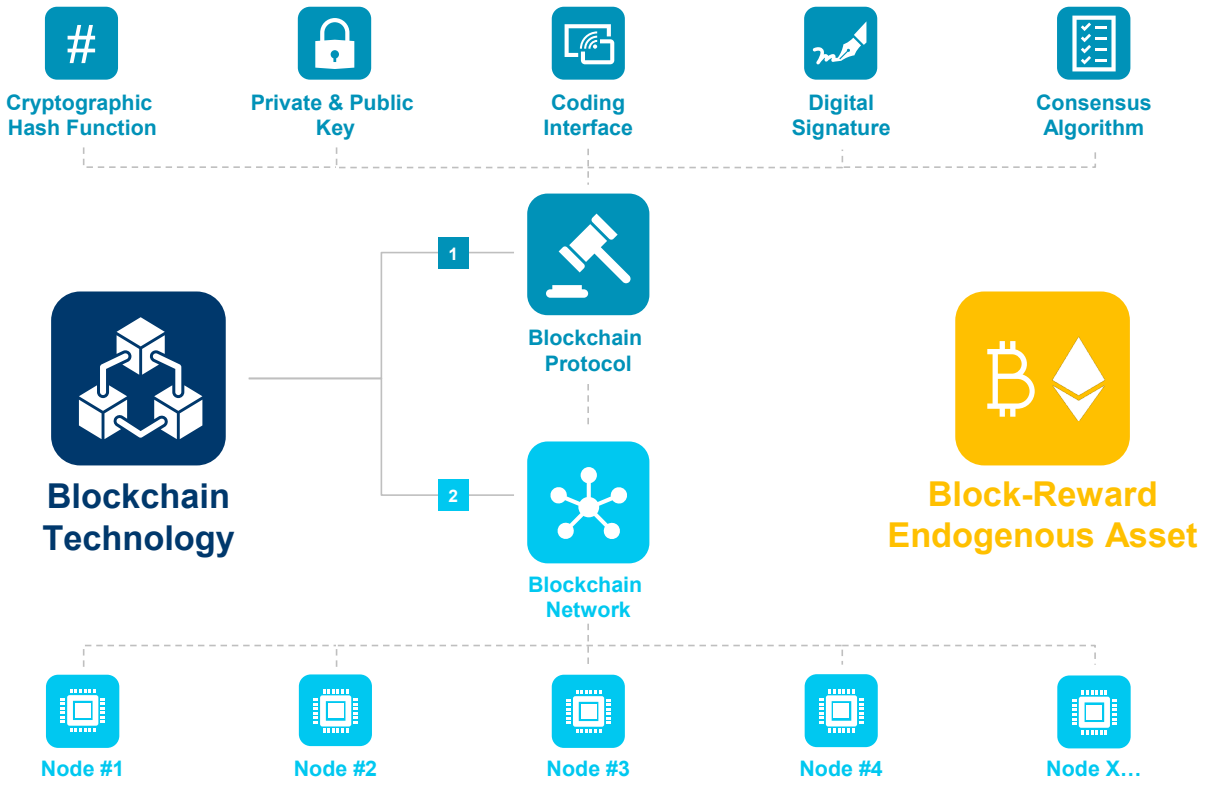
SECTION 1
DEVELOPMENTS IN BLOCKCHAIN

In order to gain a thorough understanding of digital assets, it is critical to first understand the basics of the blockchain technology that underlies them.

One of the most common misunderstandings is that the concept of blockchain was developed and implemented to support the global cryptocurrency ecosystem. While it is true that cryptocurrencies accelerated the global awareness and adoption of the technology, many are unaware that the concept of blockchain – a technology that maintains trustworthy information through a peer-to-peer network – was first introduced in 1982 by David Chaum, an American computer scientist and cryptographer, with cryptocurrencies being just one of its possible applications.

Underpinning blockchain technology are two key pillars, namely: (1) a blockchain network and (2) a blockchain protocol. The network consists of a group of computers (commonly referred to as nodes) that maintain a decentralised ledger which records information (e.g. transaction, medical history, invoice, etc.) and provides the computation power required by the decentralised system. The protocol, on the other hand, is a governing principle that helps maintain the blockchain network, which includes a cryptographic hash function, private & public key, coding interface, digital signature, and consensus algorithm (e.g. Proof-of-Work, Proof-of-Stake, etc.) (see Figure 1).

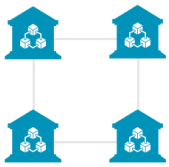
FIGURE 1: TWO PILLARS OF BLOCKCHAIN TECHNOLOGY



Source: Quinlan & Associates analysis

There are three primary types of blockchain, excluding hybrid (which is not mutually exclusive): (1) public blockchain; (2) consortium blockchain; and (3) private blockchain (see Figure 2)

FIGURE 2: THREE TYPES OF BLOCKCHAIN



	Public Blockchain	Consortium Blockchain	Private Blockchain
Description	Blockchain network where the entire ledger is accessible by anybody for reading and writing to participate in transactions and consensus	Network governed by multiple parties, where decision-making and collaboration can occur across different entities	Platform for internal networking where only one organization has authority, only used by those within that single organisation
Node Participation	• Anyone	• Selected Entities	• Single Entity
Blockchain Control	• No one (Theoretically)	• Consortium	• Single Entity
Permission	• Not Required	• Semi-Required	• Required
Block Reward	• Required	• Not Required	• Not Required
Immunity			
Cyber Attacks	✓	-	✖
Data Manipulation	✓	-	✖

✓ High - Moderate ✖ Low

Source: Quinlan & Associates analysis

A public blockchain is a fully decentralised network that is operated and maintained by unrelated nodes with voluntary participation and a common underlying objective. To maintain this network, the protocol is configured to provide a financial incentive to encourage participation from nodes, as without nodes, there can be no functioning blockchain. This financial incentive, known as “block reward”, is provided in the form of an asset that is endogenous to the blockchain. Bitcoin (“BTC”) is the paradigm example of an endogenous asset being provided as a block reward, which is now commonly referred to as cryptocurrency.

A private blockchain consists of a network and protocol that are operated by a common enterprise / entity, while a consortium blockchain is one that is overseen by a group of organisations with the same objective and vision. For instance, Ripple runs on a private blockchain that is operated by a single entity – Ripple Labs, while R3 Corda on the other hand uses a consortium blockchain that is set-up, managed, and operated by a group of financial institutions and technology companies. Although a consortium as well as private blockchain could also circulate an endogenous asset, providing a block reward is not required of them, as the nodes are operated centrally, i.e., there is no need for them to invite others to participate and therefore no need to provide an incentive.

As a result, the need for an endogenous asset and the provision of a block reward is dependent on the type of blockchain being utilised. Therefore, it cannot be considered as a necessary ingredient of the technology itself, given that the endogenous asset (i.e. the block reward) is separable from the technology. We see this as an important characteristic to understand, as many people believe them to be inseparable, which is not true. As such, when the technology is distinguished from cryptocurrency, which is only one application of it, it becomes clear that there are many benefits of blockchain that can help improve business operations across multiple industries, not just within the cryptocurrency space.

THERE ARE MANY BENEFITS OF BLOCKCHAIN THAT CAN HELP IMPROVE BUSINESS OPERATIONS ACROSS MULTIPLE INDUSTRIES, NOT JUST WITHIN THE CRYPTOCURRENCY SPACE

THE EVOLUTION OF BLOCKCHAIN

BLOCKCHAIN 1.0 – INFORMATION KEEPING BLOCKCHAIN TECHNOLOGY

The concept of BTC, a peer-to-peer electronic cash system leveraging blockchain technology, was first introduced in 2008 by an unknown person or group of persons, termed Satoshi Nakamoto, in response to widespread anger towards – and a growing distrust of – traditional, centralised financial institutions, especially in the aftermath of the Global Financial Crisis ("GFC").

BTC is recorded and transferred on its own blockchain network and protocol. One of the weaknesses of this protocol, however, is that the scalability of its usage is limited to transactional purposes (living up to its use case as a "peer-to-peer electronic cash system"). In essence, the BTC blockchain only keeps trustworthy 'transaction' information on its distributed ledger / blockchain, with the protocol ensuring that there is no double spending of an asset. This first generation blockchain with limited capability and scalability is commonly referred to as "Blockchain 1.0".

BLOCKCHAIN 2.0 – PROGRAMMABLE BLOCKCHAIN TECHNOLOGY

The industry entered a new chapter when Vitalik Buterin and Gavin Wood introduced their new blockchain protocol called Ethereum in 2013, received crowdfunding in 2014 using their new native cryptocurrency, and then finished developing it in 2015.

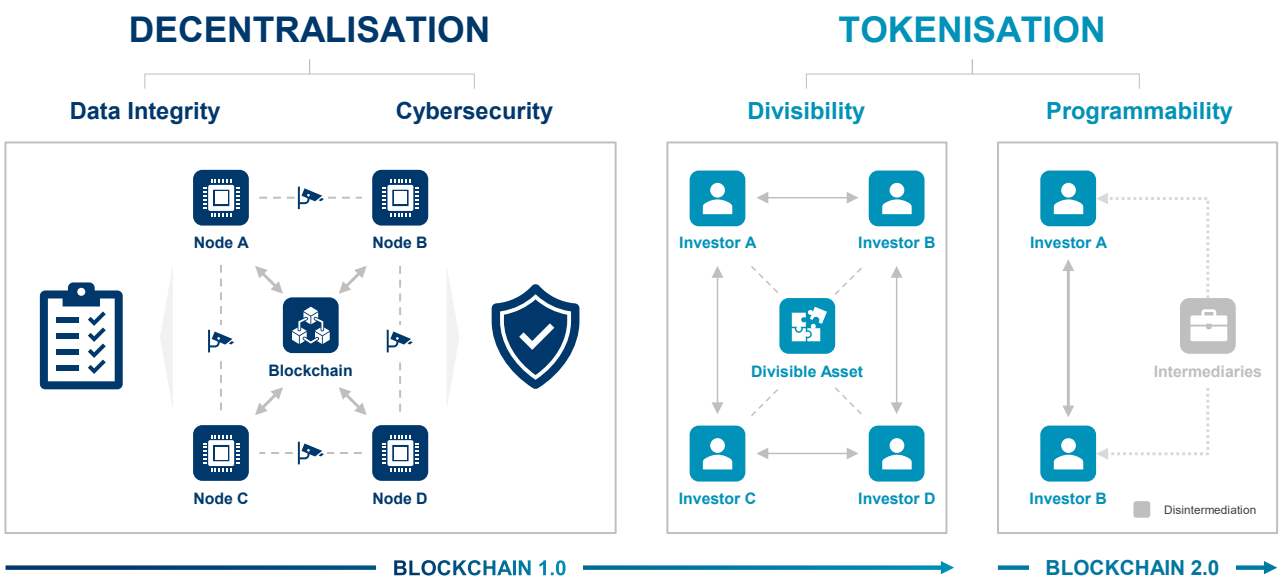
As of 2021, Ethereum has become the most widely adopted blockchain network for its industry-wide applicability and scalability, with its flagship feature, smart contracts, being added to the new blockchain protocol. This feature allows transactions to be programmed with binding conditions and automatically execute when these pre-defined conditions are fulfilled.

To illustrate via a simple example, a vending machine is a smart contract in physical form: pay the money (pre-defined condition), choose a drink (transaction start), and receive the product immediately (transaction finish). With this new feature that addresses the key limitation of Blockchain 1.0, Ethereum opened up a new era for blockchain adoption. The programmable blockchain, which was introduced by the Ethereum blockchain, is now commonly known as "Blockchain 2.0".

BENEFITS OF BLOCKCHAIN TECHNOLOGY

At its core, we see three key benefits that blockchain technology can deliver via decentralisation and tokenisation: namely, (1) improved data integrity; (2) enhanced cybersecurity; and (3) fractionalisation (i.e. divisibility). The arrival of Blockchain 2.0 provided a foundation to supercharge the technology even further, by enabling programmability (see Figure 3).

FIGURE 3: DECENTRALISATION & TOKENISATION



Source: Quinlan & Associates analysis

DECENTRALISATION

DATA INTEGRITY AND CYBERSECURITY

The trustworthiness of information exchanged between unknown parties has traditionally been assured via centralised institutions, whereby data consumers rely on credible intermediaries to provide a “rubber stamp” of trust. In today’s world, consumers and institutions still largely rely on intermediaries to help maintain, verify, and reconcile a wide range of information, especially in the financial services industry.

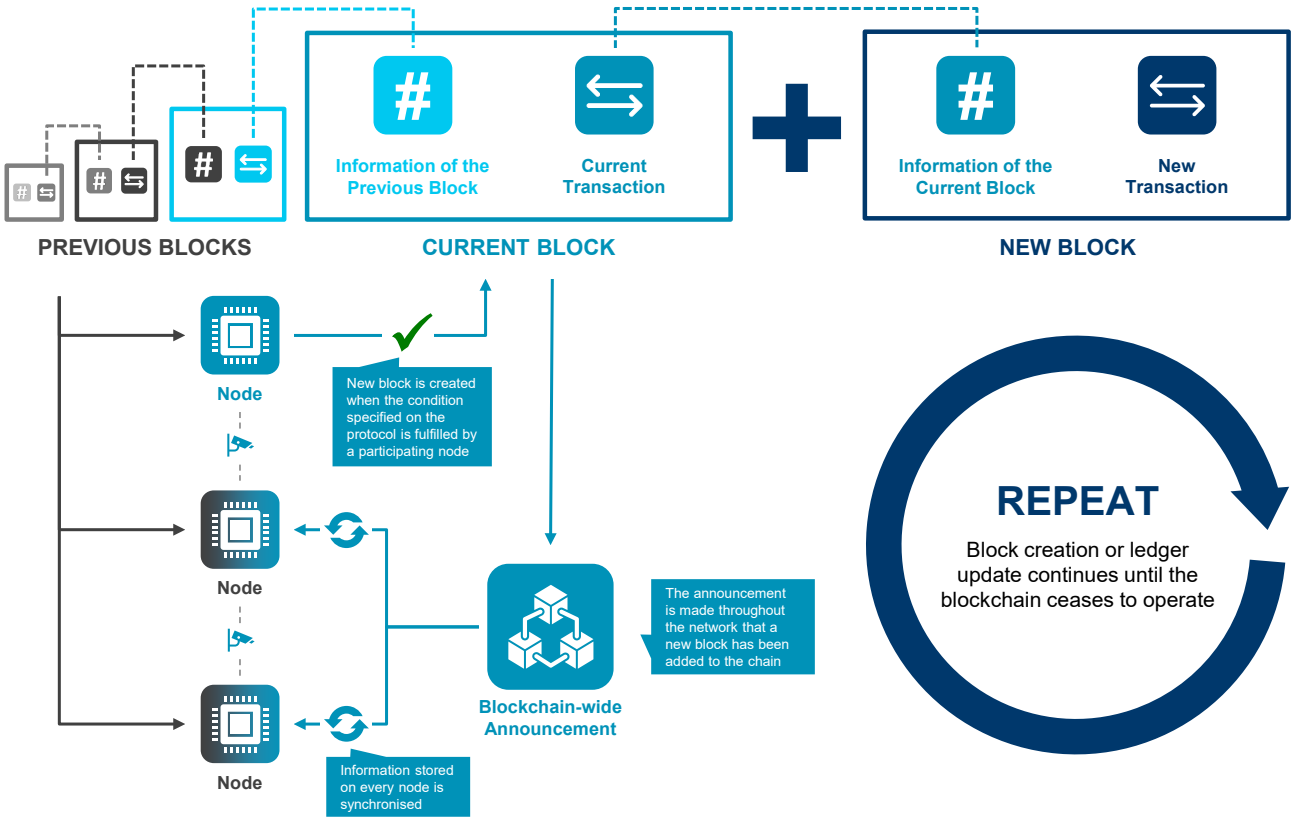
Blockchain technology can help maintain a single source of truth in a decentralised fashion, with a consensus algorithm being programmed into the blockchain protocol. The underlying mechanics may be very technical and hard to digest, but to put it simply, each device in the network maintains a ledger that can be updated only when the concerned update is broadcasted throughout the network after pre-defined conditions set by the protocol are fulfilled.

BLOCKCHAIN TECHNOLOGY CAN HELP MAINTAIN A SINGLE SOURCE OF TRUTH IN A DECENTRALISED FASHION

Each node also acts as a standalone watchdog to identify any conflicting information or unauthorised changes through cross-validating information with other participating devices. If there is any manipulation of information stored on the node, then the dominant ledger built into the consensus algorithm will stay as the single source of truth, while the inconsistent ledger will no longer be considered as a part of the network.

In addition, each ledger partially contains information of the previous ledger, utilising it as a unique identifier. Thus, if there are any malicious attempts to tamper with past records, all subsequent ledgers will also be tampered with, which will not be authorised by the protocol. As such, the ledger update mechanism makes blockchain immune to external cyberattacks that aim to manipulate past and/or present information (see Figure 4).

FIGURE 4: BLOCK / LEDGER INTERDEPENDENCY



Source: Quinlan & Associates analysis

TOKENISATION

DIVISIBILITY

For an asset to be recorded, maintained, and transacted on a blockchain network, it must be converted into a blockchain compatible form through a process called 'tokenisation'. Assets that are tokenised and traded on blockchain can be fractionalised without having to go through sophisticated and laborious administrative processes, such as a stock split.

For example, Bitcoin ("BTC") and Ether ("ETH") are blockchain native endogenous cryptocurrencies that are inherently tokenised, allowing them to be fractionalised into multiple decimal points. At present, the smallest denomination of BTC that can be traded is one 'Satoshi', with 1,000,000,000 Satoshi's representing one BTC; in the case of ETH, the smallest denomination is a 'Wei', with 1,000,000,000,000,000,000 Wei's representing one ETH (see Figure 5).

FIGURE 5: DENOMINATION OF NOTABLE CRYPTOCURRENCIES

bitcoin

Denomination	in Satoshi	in USD
Satoshi	1	0.0004
Microbitcoin	100	0.0381
Millibitcoin	100,000	38.13
Centibitcoin	1,000,000	381.33
Decibitcoin	10,000,000	3,813.27
Bitcoin	100,000,000	38,132.73

ethereum

Denomination	in Wei	in USD
Wei	1	0.000000000000002
Kwei	1,000	0.000000000002308
Mwei	1,000,000	0.0000000023079
Gwei	1,000,000,000	0.0000023079
Twei	1,000,000,000,000	0.0023079
Pwei	1,000,000,000,000,000	2.3
Ether	1,000,000,000,000,000,000	2,307.9

Source: Coinmarketcap (5 August 2021), Bloomberg (5 August 2021), Investopedia, Quinlan & Associates analysis

PROGRAMMABILITY

A smart contract's core power stems from token-level programmability. In short, this means that transaction conditions can be configured in such a way that the contract automatically executes when pre-defined conditions are fulfilled. This capability is widely considered as revolutionary in today's financial markets, as real-world transactions and settlements typically require sophisticated verification and authentication processes, utilising considerable time and resources.

For example, content creators on social media platforms (e.g. YouTubers or streamers) must wait for months before receiving their paycheques, as the platform operators must go through rigorous verification and accounting procedures to net and settle payments from platform users and advertisers. If the smart contract is configured to pay content creators based on pre-defined conditions, such as content consumption or watching a set number of advertisements, the netting and settlement process can be removed altogether, allowing content creators to get paid immediately without any operational latency.

CONCLUSION

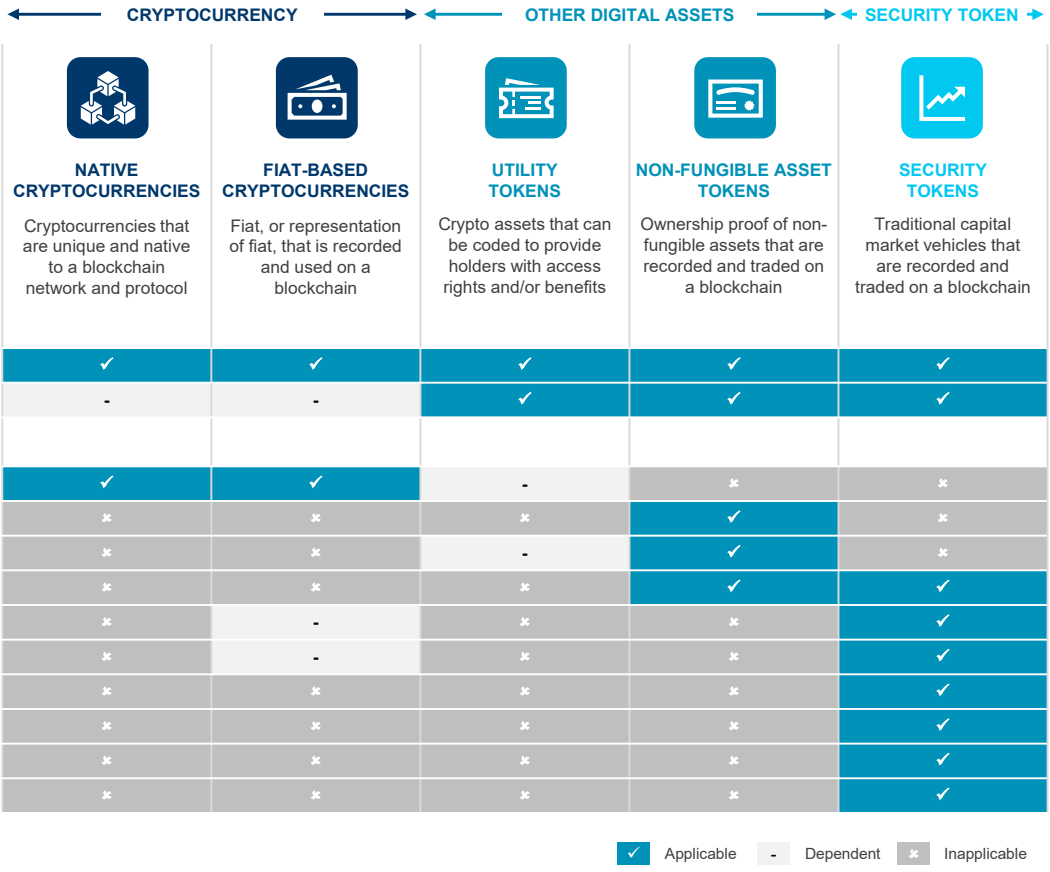
The smart contract protocol allows information to be stored in a more trustworthy and secure manner, while enabling the automatic execution of an agreement when pre-defined conditions are fulfilled, thereby improving transactional efficiency and also reducing costs.

As a result, the applicability of the protocol has been experimented across many different industries around the globe. As engaging in transactions under sophisticated contractual obligations is more prevalent in the financial services industry, many financial institutions are also actively exploring the use of blockchain in building new and better types of investment vehicles.

SECTION 2
THE DIGITAL ASSETS UNIVERSE

Recent years have seen a plethora of financial products being launched based on the smart contract functionality of blockchain. While considered by many to be extremely complex, we believe that the entire digital assets universe, as it stands today, can be broadly broken down into five key categories (see Figure 6).[1]

FIGURE 6: DIGITAL ASSET UNIVERSE



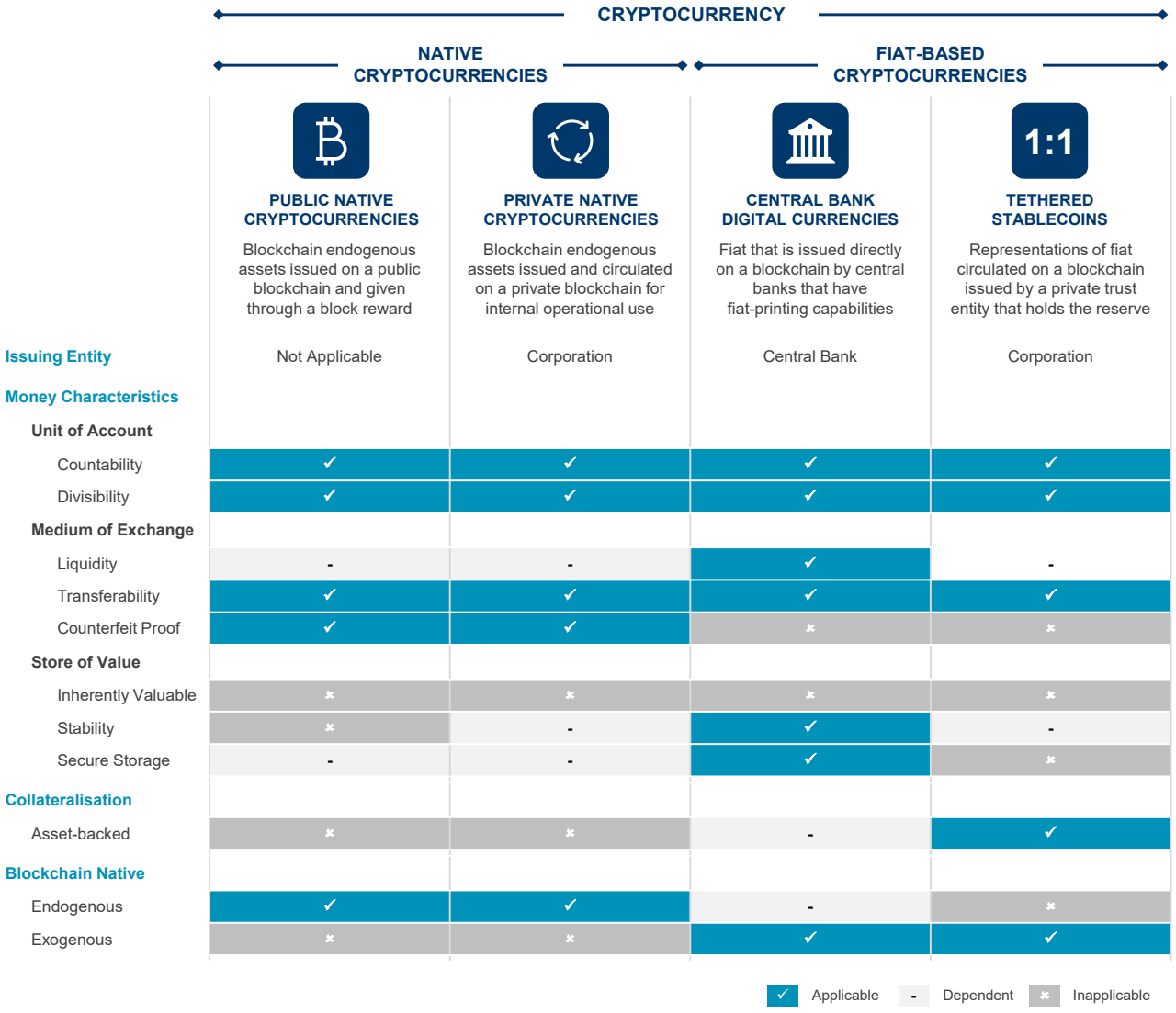
Source: Quinlan & Associates analysis

[1] Note: it goes without saying that the world of digital assets is still in the midst of a period of intense exploration, which will see entrepreneurs continuously studying new applications for blockchain technology in the capital markets industry. Although dissonance and confusion will likely continue in the short-term, the industry is certainly moving in the right direction to alleviate these short-term pitfalls.

Money / currency has, for centuries, been required to meet a specific set of criteria to be recognised by economists as useful. This includes acting as a: (1) unit of account; (2) medium of exchange; and (3) store of value.

According to this set of criteria, native cryptocurrencies and fiat-based cryptocurrencies can broadly, albeit to different degrees, be classified as cryptocurrencies (see Figure 7).

FIGURE 7: TYPES OF CRYPTOCURRENCIES



Source: Quinlan & Associates analysis

The key difference between the two categories of cryptocurrencies: (1) native cryptocurrencies; and (2) fiat-based cryptocurrencies, is whether they are collateralised by fiat. For instance, a native cryptocurrency, such as BTC and ETH, is not backed by any asset, but rather valued and maintained on the basis of collective trust. On the contrary, fiat-based cryptocurrencies are typically backed by a widely accepted form of currency (e.g. USD, CNY, JPY, etc.)

NATIVE CRYPTOCURRENCY

The non-collateralised nature of native cryptocurrencies makes them prone to considerable price volatility. This is the biggest reason why native cryptocurrencies are not unanimously considered as a currency by the general public.

There are two types of native cryptocurrencies: (1) public native cryptocurrencies (i.e. native on a public blockchain) and (2) private native cryptocurrencies (i.e. native on a private blockchain). Although the functional use case for both is the same – to transfer value from one party to another, these assets differ in terms of their public availability and legal implications.

Public native cryptocurrencies, such as BTC and ETH, are available to the mass market and based on a public blockchain network and protocol. Private native cryptocurrencies, on the other hand, are native on a private blockchain, that is controlled and operated by a centralised entity and therefore highly susceptible to ledger manipulation. As such, private cryptocurrencies are typically unavailable to the public and usually used for internal business purposes to tackle operational inefficiencies.

A notable example of a private native cryptocurrency is JPMorgan's cryptocurrency, JPM Coin, which uses the Quorum blockchain,[2] an open-source blockchain protocol that is designed for enterprise use under a private blockchain network. The bank has been using the native cryptocurrency for its wholesale banking business, helping clients to transfer money with JPMorgan.[3]

THE NON-COLLATERALISED NATURE OF NATIVE CRYPTOCURRENCIES MAKES THEM PRONE TO CONSIDERABLE PRICE VOLATILITY

[2] Reuters, 'ConsenSys acquires J.P. Morgan's blockchain platform Quorum', August 2020, available at: https://www.reuters.com/article/us-jpmorgan-consensys-quorum-idUSKBN25L1MR
[3] J.P. Morgan, 'What is JPM Coin?', February 2021, available at: https://www.jpmorgan.com/solutions/cib/news/digital-coin-payments

FIAT-BASED CRYPTOCURRENCY

Another category of cryptocurrencies is fiat-based cryptocurrencies, of which there are two key types: (1) private corporate issued fiat-backed cryptocurrencies (commonly known as tethered stablecoins); and (2) central bank issued fiat-backed cryptocurrencies (commonly known as central bank digital currencies ("CBDCs").

Both types have a common aim of providing a circulating currency that is pegged to fiat, to encourage transactions via blockchain. However, despite their similarities, a tethered stablecoin is a representation of fiat in the form of a certificate of deposit (i.e. stablecoins provide indirect exposure to fiat). Therefore, a stablecoin can neither act as legal tender for fulfilling payment obligations, nor can its 1:1 backing be legally guaranteed. USD Tether ("USDT") and USD Coin ("USDC") are two prime examples of tethered stablecoins.

On the other hand, CBDC is legal tender and fiat itself, instead of a representation of fiat. The e-CNY or digital renminbi ("e-RMB") is an example of an operational CDBC, which kicked-off its development after being approved by the People's Bank of China ("PBOC") in 2017, and was officially launched for testing in 2019.[4] Other countries have also been actively seeking to explore and adopt their own CBDC, such as Singapore, which has launched two key projects: Ubin and Dunbar.[5]

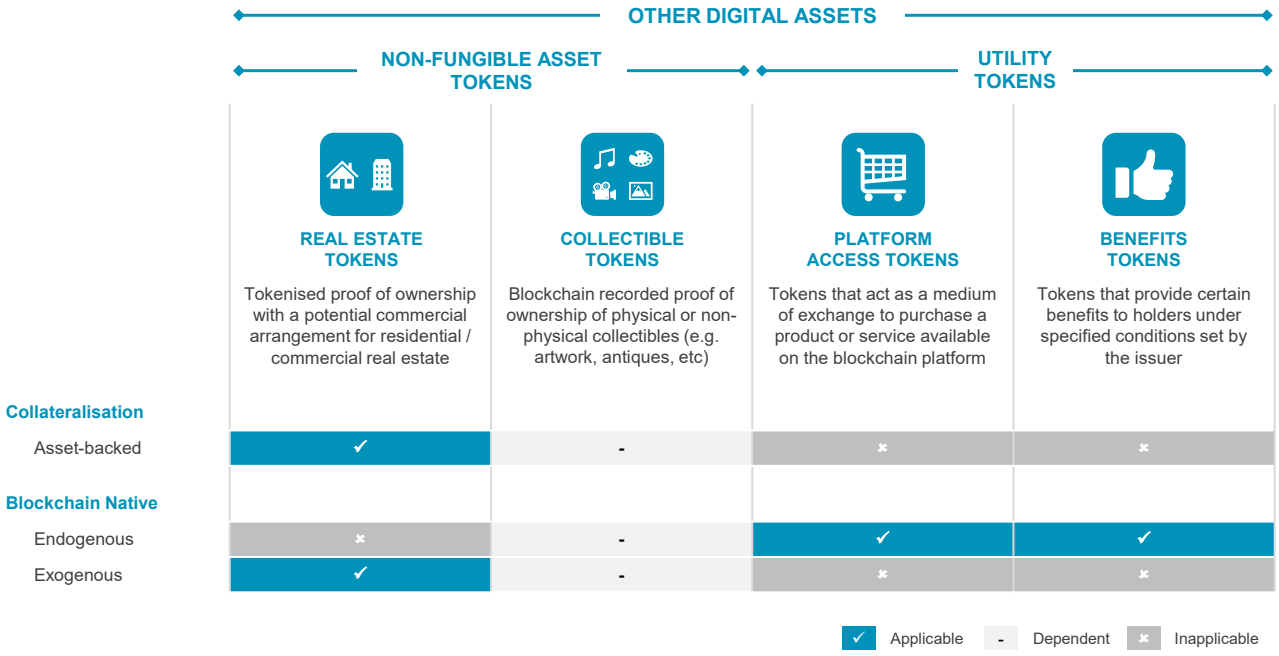
A STABLECOIN CAN NEITHER ACT AS LEGAL TENDER FOR FULFILLING PAYMENT OBLIGATIONS, NOR CAN ITS 1:1 BACKING BE LEGALLY GUARANTEED. ON THE OTHER HAND, CBDC IS LEGAL TENDER AND FIAT ITSELF, INSTEAD OF A REPRESENTATION OF FIAT

[4] The People's Bank of China, 'Progress of Research & Development of E-CNY in China', July 2021, available at: http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf
[5] Bank of International Settlement, 'Project Dunbar: international settlements using multi-CBDCs', September 2021, available at: https://www.bis.org/about/bisih/topics/cbdc/wcbdc.htm

OTHER DIGITAL ASSETS

There are numerous other digital assets that do not fall under the categories of cryptocurrencies or security tokens, which include: (1) non-fungible asset tokens and (2) utility tokens (see Figure 8).

FIGURE 8: OTHER TYPES OF DIGITAL ASSETS



Source: Quinlan & Associates analysis

NON-FUNGIBLE ASSET TOKENS

Non-fungible tokens ("NFTs") aim to tokenise assets with non-fungible characteristics, i.e., those assets that are unique and non-divisible. These largely comprise of real estate or collectibles (e.g. art, videos, photos, etc.).

Despite the widespread use of the term 'NFT', we find it to be somewhat misleading, as the non-fungible characteristic is applicable at the asset-level, but not necessarily at the token-level. For example, the NFT artwork that was sold for USD 69 million by Mike Wilkelmann via auction house Christie's was for an underlying artwork that is non-fungible. However, the token itself can be inherently fractionalised through tokenisation process, and thus could be argued to be fungible. Thus, instead of using the term NFT, this report will use the term "non-fungible asset token" and the corresponding asset name to minimise any potential confusion.

There are two broad types of non-fungible asset token: (1) real estate tokens and (2) collectible tokens. In its simplest form, a non-fungible asset token represents proof of uniqueness that is tokenised, recorded, and traded on a blockchain.

REAL ESTATE TOKENS

Real estate tokens are used to provide ownership rights of, and exposure to, real estate, by representing ownership in a transaction (including bilateral and multi-lateral transactions) between parties (excluding trusts and funds).

It is important to note that while there are other forms of tokenised investment vehicles that deal in real estate, they cannot be categorised as real estate tokens if they provide exposure to an investment / holding entity and not the underlying real estate directly. For example, 'Aspen Coin' issued by St. Regis Aspen Resort is widely regarded as a real estate token, however given that it represents exposure to the holding entity and not the underlying real estate asset itself, it is more appropriate to view it as an equity or fund / trust token, rather than as a real estate token.[6]

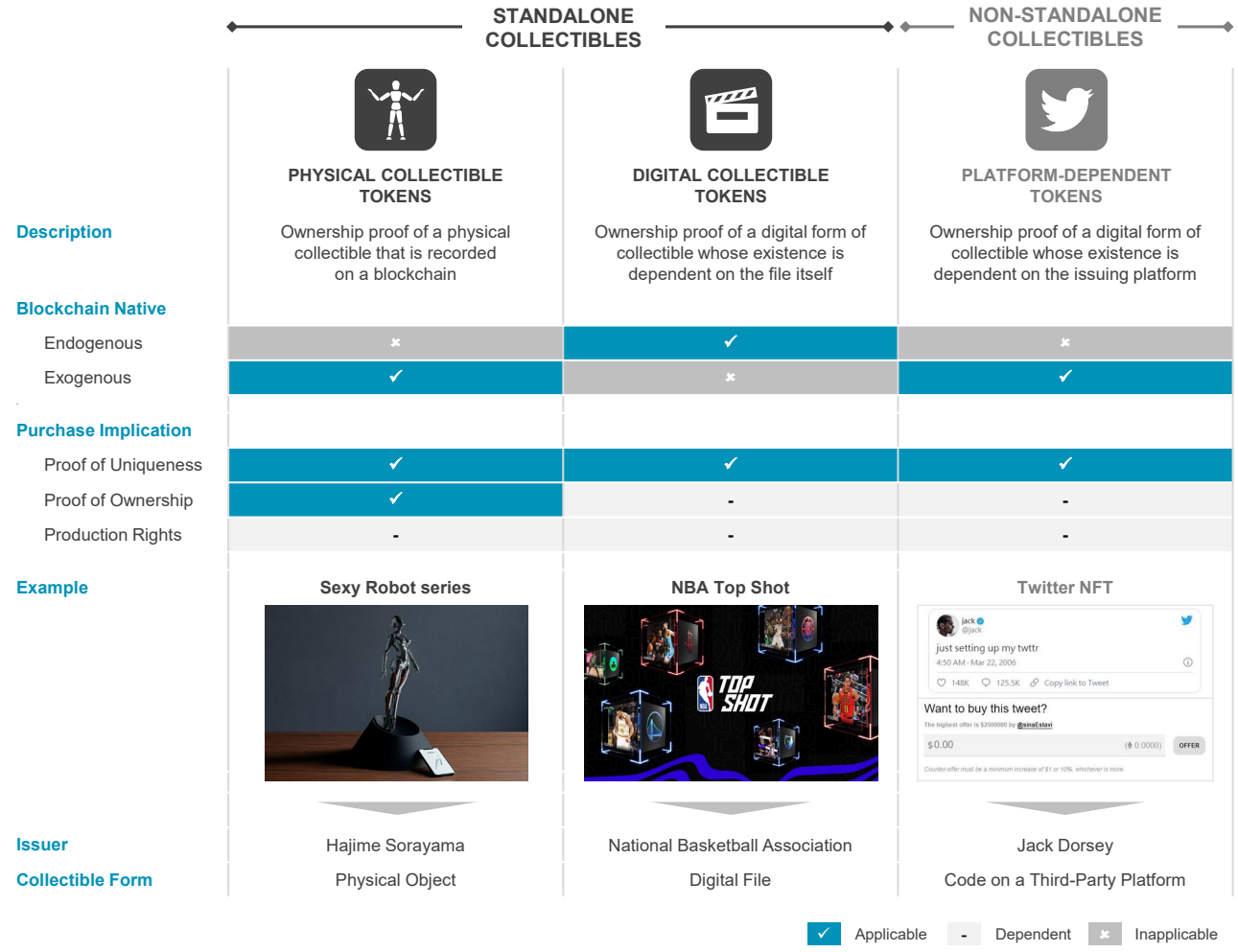
DESPITE THE WIDESPREAD USE OF THE TERM 'NFT', WE FIND IT TO BE SOMEWHAT MISLEADING, AS THE NON-FUNGIBLE CHARACTERISTIC IS APPLICABLE AT THE ASSET-LEVEL, BUT NOT NECESSARILY AT THE TOKEN-LEVEL

[6] St Regis, 'Aspen Coin', available at: https://aspencoin.io/

COLLECTIBLE TOKEN

One of the hottest digital assets that is being created and traded in today's economy is a collectible token, which can be grouped into standalone and non-standalone collectibles. There are three types of collectible tokens, including: (1) physical collectible tokens; (2) digital collectible tokens: and (3) platform-dependent tokens (see Figure 9). All three essentially offer a proof of uniqueness and/or ownership of the underlying asset that is recorded and traded on blockchain.

FIGURE 9: TYPES OF COLLECTIBLE TOKEN



Source: Hajime Sorayama, NBA, Twitter, Lexology, Quinlan & Associates analysis

A physical collectible token is one in which the proof of ownership of a physical asset is recorded and traded on a blockchain, granting certain rights to the owner. An example of a physical collectible token is 'Sexy Sculpture Floating', designed and produced by Hajime Sorayama. Instead of having physical proof of ownership, the artist placed a near field communication ("NFC") chip in each sculpture, which can be scanned by a phone to direct the person to a blockchain that stores the proof of ownership of the physical object. The object and the proof are separable, meaning the owner would have to transfer the tokenised ownership to the next owner upon sale.

The second type of collectible token is a digital collectible token, which is currently one of the most widely traded digital assets. A digital collectible is unique, as it is endogenous to blockchain, making the collectible and the proof of uniqueness inseparable. The National Basketball Association ("NBA") Top Shot is a prime example of a digital collectible token, containing a short clip of a basketball game highlight, that allows fans to purchase NBA licensed video highlights. The owner of a digital collectible token is granted certain rights specified in the token, such as viewing rights to the underlying video.

The final type of collectible token is a platform-dependent token. The existence of such a token is dependent on the existence of the platform itself. The USD 2.9 million sale of Twitter CEO Jack Dorsey's first tweet is an example of a platform-dependent token. To draw an example in the real world, it is akin to a collector purchasing a sculpture that is fixed to a specific museum, which contains the ownership proof and places the collector's name beside the sculpture. Linking this back to the example the previous example, the museum (i.e. Twitter) is open to the public and the sculpture (i.e. Jack Dorsey's Tweet) is accessible to anyone at any point in time. In the case of this Tweet, the token could be used as a status symbol (or 'bragging right') by having the owner's name tagged below the post for everyone to see.

Although all three types of collectible token serve as proof of uniqueness of the underlying asset, they do not necessarily provide ownership rights or exclusive access to – or copy / production rights of – the underlying asset to the purchaser. For instance, in the case of NBA Top Shot, the ultimate ownership of the copy / production rights remains with the NBA, meaning that owners of the tokens are restricted from making copies or monetising the underlying clips of highlights.[7] Therefore, since the access and/or copy / production rights depend on the original issuer, interested purchasers must carefully study and understand purchase implications on a case-by-case basis.

[7] Lexology, 'Bought an NBA Top Shot NFT? What Did You Actually Buy?', July 2021, available at: https://lexology.com/library/detail.aspx?g=6d4d1894-f8cb-4640-b764-b7771a8b77cb

UTILITY TOKEN

Another digital asset that has been somewhat controversial – and arguably primarily responsible for driving widespread negative perceptions of the cryptocurrency industry – is the utility token.

There are two commonly observed types of utility tokens, including: (1) platform access tokens, which are used like e-money to purchase certain goods or services that are available on the platform, and (2) benefits tokens, which under certain conditions provide promised benefits from the issuer to the token holders. Some tokens could provide both platform access and benefits at the same time.

Timicoin ("TMC") and Golem ("GNT") are two notable examples of platform access tokens. TMC is used to access healthcare / medical information on a health information exchange, where the coin is consumed to extract the requested data from the network. GNT provides a platform where the processing power of high-performance processors is shared and offered through a decentralised network. GNT is used to access the memory needed to perform memory-intensive tasks.

ANOTHER DIGITAL ASSET THAT HAS BEEN SOMEWHAT CONTROVERSIAL – AND ARGUABLY PRIMARILY RESPONSIBLE FOR DRIVING WIDESPREAD NEGATIVE PERCEPTIONS OF THE CRYPTOCURRENCY INDUSTRY – IS THE UTILITY TOKEN

Huobi Token ("HT") on the other hand, is an example of a benefits token, which offers token holders a discount on trading fees based on volumes traded and ownership amounts of the utility token. In the case of very basic users, with neither high trading volumes nor high ownership of HT, they are charged maker and taker fees of 20 basis points ("bps"). For users who are active traders on the platform and have high ownership of HT, the platform charges as little as 0.97 bps and 1.93 bps for maker and taker fees, respectively (see Figure 10). Interestingly, HT could also double up as a platform access token, as it can be used as a method of payment across the ecosystem. [8] This overlapping proposition is one of the reasons that makes utility tokens unique and hard to draw a parallel comparison with traditional peers.

FIGURE 10: UTILITY TOKEN CASE STUDY – HUOBI TOKEN

Huobi

User Classification (Level)	**Trade Volume** (30-day Average)	**Huobi Token** (Holding)	**Maker Fee** (Tiered Pricing)	**Taker Fee** (Tiered Pricing)
Basic Level 1 – Base Case	-	-	0.2000%	0.2000%
Pro Level 1	≥ 1,000 BTC	≥ 2,000 HT	0.0362%	0.0462%
Pro Level 2	≥ 1,500 BTC	≥ 2,000 HT	0.0294%	0.0420%
Pro Level 3	≥ 5,000 BTC	≥ 2,000 HT	0.0294%	0.0378%
Pro Level 4	≥ 10,000 BTC	≥ 2,000 HT	0.0252%	0.0336%
Pro Level 5	≥ 15,000 BTC	≥ 2,000 HT	0.0224%	0.0308%
Pro Level 6	≥ 20,000 BTC	≥ 2,000 HT	0.0210%	0.0294%
Pro Level 7	≥ 40,000 BTC	≥ 2,000 HT	0.0168%	0.0252%
Pro Level 8	≥ 80,000 BTC	≥ 2,000 HT	0.0126%	0.0210%
Pro Level 9	≥ 150,000 BTC	≥ 2,000 HT	0.0097%	0.0193%
	User Classification	**Benefits Condition**		**Benefits Result**

Source: Huobi, Quinlan & Associates analysis

[8] CoinMarketCap, 'What Is Huobi Token?', July 2021, available at: https://coinmarketcap.com/alexandria/article/what-is-huobi-token-ht

SECURITY TOKEN

A security token is simply a tokenised version of a financial security, i.e., a traditional capital markets security that is recorded and traded on a blockchain (see Figure 11). It is important to make a distinction between a security token and traditional capital markets securities that use digital assets as the underlying.

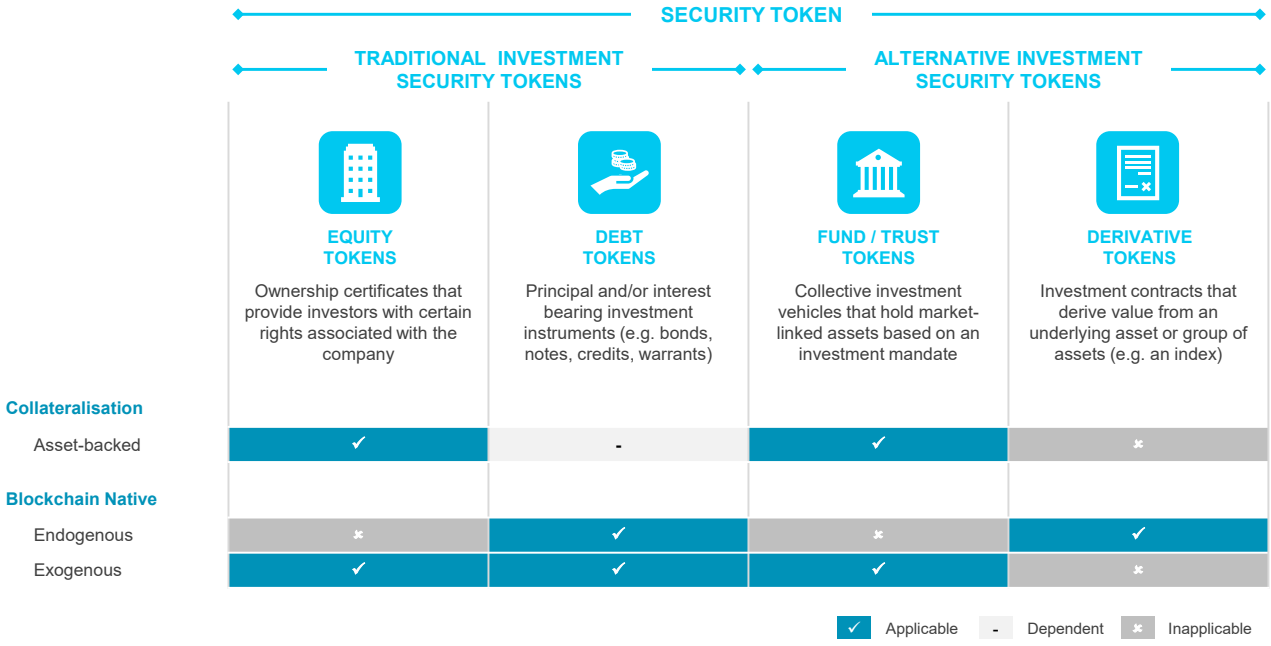
For instance, cryptocurrency exchange traded funds ("ETFs") could be non-tokenised collective investment vehicles with cryptocurrencies as the underlying asset. Another example would be cryptocurrency derivatives offered by exchanges like FTX, BitMEX, and CME, which are traditional derivatives contracts with cryptocurrency price-tracking capabilities that are both recorded as well as traded off-chain (e.g. perpetual futures).

FIGURE 11: SECURITY TOKENS

Source: Quinlan & Associates analysis

Security tokens can be broadly categorised into two categories: (1) traditional investment securities (which include equity and debt securities) and (2) alternative investment securities (which include funds / trusts and derivatives contracts) (see Figure 12).

FIGURE 12: TYPES OF SECURITY TOKENS



Source: Quinlan & Associates analysis

EQUITY TOKEN

tZERO is an Alternative Trading System ("ATS")-licensed distributed ledger platform launched by the internet retail company Overstock, which is regulated by both the SEC and FINRA. tZERO's equity token – TZROP – is publicly available for trading (see Figure 13).

FIGURE 13: CASE STUDY – TZERO

TZROP
Description

tZERO

tZERO is a distributed ledger platform launched by the internet retail company Overstock, that has been designated as an alternative trading system ("ATS") and is regulated by the Securities and Exchange Commission ("SEC") and Financial Industry Regulatory Authority ("FINRA").

1 **PRIVATE PLACEMENT**
TZROP preferred equity security tokens were issued in a private placement in August 2018

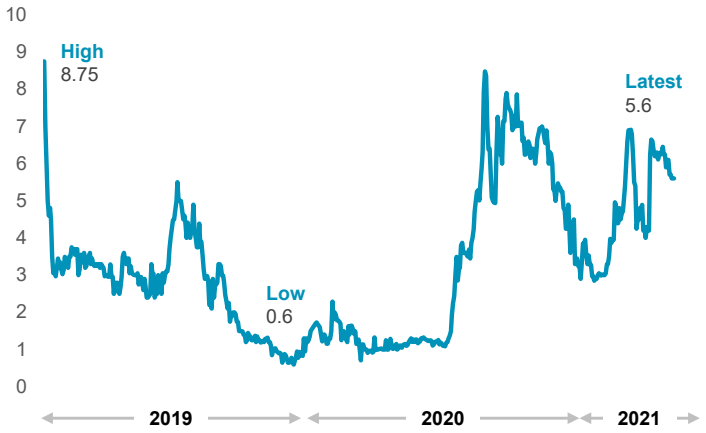
2 **ACCREDITED INVESTORS**
The security tokens were made available to accredited investors starting from January 2019

3 **RETAIL (NON-ACCREDITED) INVESTORS**
In August 2019, the security tokens were made available to be resold to non-accredited investors as well

Token Benefits

Revenue Sharing
Quarterly dividend worth 10% of adjusted gross revenue

TZROP Price
Jan 2019 – Apr 2021, USD



DETAILS

Security Type
Revenue Share Token

Token Protocol
ERC-20

Issuance Platform
tZERO

Soft Cap
USD 50 million

Source: businesswire, Security Token Group, Security Token Market, Quinlan & Associates analysis

tZERO initially offered its equity token to select institutional investors in the form of a private placement in August 2018. In January 2019, TZROP was listed on the company's trading platform, where the security was made available to accredited investors. Half a year later, in August 2019, the security was made available to retail investors. The security promised its holders that it would share 10% of adjusted gross revenues with them and is coded to distribute the promised amount through the token – leveraging the earlier discussed Blockchain 2.0 capability.

DEBT TOKEN

The DBS Digital Bond is an example of a debt token, issued by the Development Bank of Singapore ("DBS") on the DBS Digital Exchange ("DDEx"). Priced at SGD 15 million, the bond carries a 0.6% coupon rate, with a 6-month long tenor, and was issued via private placement.[9]

FUND / TRUST TOKEN

In 2017, the first tokenised quantitative cryptocurrency fund was launched by Protos Asset Management ("Protos"), via one of the world's first tokenised securities, called PRTS. Protos, which also provides professionally managed portfolios of cryptocurrency assets and DeFi networks, recently received a Letter of Intent ("LOI") from DeFi Technologies that is looking to acquire it.[10]

However, it is notable that such fund / trust token issuers typically do not actually issue shares in the fund in a token form, instead, the token issued represents various forms of contractual interests (e.g. right to distributions from the fund, etc.), with the fund itself as the counterparty.

DERIVATIVES TOKEN

Antimatter offers on-chain financial derivatives, called perpetual options, that can be traded and created on its own platform. For instance, Antimatter recently launched 'on-chain' long put options and short put options, under the symbols – '-ETH($C)' and '-ETH($C)S', respectively.[11]

A SECURITY TOKEN IS SIMPLY A TOKENISED VERSION OF A FINANCIAL SECURITY, I.E., A TRADITIONAL CAPITAL MARKETS SECURITY THAT IS RECORDED AND TRADED ON A BLOCKCHAIN

[9] DBS, 'DBS advances asset digitalisation strategy with first Security Token Offering on DBS Digital Exchange', May 2021, available at: https://www.dbs.com/newsroom/DBS_advances_asset_digitalisation_strategy_with_first_Security_Token_Offering_on_DBS_Digital_Exchange

[10] Hedgeweek, 'https://www.hedgeweek.com/2021/08/16/304956/defi-technologies-acquire-protos-asset-management', August 2021, available at: https://www.hedgeweek.com/2021/08/16/304956/defi-technologies-acquire-protos-asset-management

[11] Antimatter Finance, 'Introducing AntiMatter's first product Perpetual DeFi on-chain Put ETH Option launching before April 1st', February 2021, available at: https://antimatterdefi.medium.com/introducing-antimatters-first-product-perpetual-put-eth-option-launching-before-april-1st-161a1dc4288b

PURCHASE IMPLICATIONS

There are two key groups of factors that need to be considered when investing in digital assets that are typically taken for granted in the traditional investment world, namely: (1) financial (i.e. return-related expectations) and (2) legal (i.e. investor rights, protections, etc.), which vary widely across the spectrum of digital assets (see Figure 14).

FIGURE 14: IMPLICATIONS ACROSS DIGITAL ASSETS

	FINANCIAL IMPLICATIONS		LEGAL IMPLICATIONS				
	Financial Return	Direct Asset Exposure	Tax Obligations	Statutory Rights	Investor Protection	Issuer Obligations	Legal Tender
Cryptocurrency							
Public Native Cryptocurrencies	✓	✓	-	✗	-	✗	✗
Private Native Cryptocurrencies	-	✓	-	✗	-	-	✗
Tethered Stablecoins	✓	✗	-	-	-	-	✗
Central Bank Digital Currencies	✓	✓	✓	✓	✓	✓	✓
Other Digital Assets							
Real Estate Tokens	✓	✓	✓	✓	✓	✓	✗
Collectible Tokens	✓	✓	-	-	-	-	✗
Platform Access Tokens	✓	✓	-	✗	✗	✗	✗
Benefits Tokens	✓	✓	-	✗	✗	✗	✗
Security Token							
Equity Tokens	✓	✓	✓	✓	✓	✓	✗
Debt Tokens	✓	-	✓	✓	✓	✓	✗
Fund / Trust Tokens	✓	✗	✓	✓	✓	✓	✗
Derivatives Tokens	✓	✗	✓	✓	✓	✓	✗

Key Gap ✓ Applicable - Dependent ✗ Inapplicable

Source: Quinlan & Associates analysis

Apart from CBDCs and tethered stablecoins, most investors purchase digital assets expecting returns, either in the form of capital appreciation or cash (e.g. dividends). The source of these returns may be driven by direct or indirect asset exposure, depending on the nature of the specific digital asset in question. For example, tethered stablecoins, some debt tokens, and derivatives tokens provide indirect asset exposure, while other digital assets, such as equity tokens and real estate tokens, offer direct asset exposure.

In terms of legal implications, regulators have been slow to establish guidelines, while those that exist are not standardised across jurisdictions. This is especially the case with cryptocurrencies and other digital assets, particularly with respect to: (1) tax obligations; (2) statutory rights; (3) investor protection; (4) issuer obligations; and (5) legal tender status. As a result, investors may be prone to exploitation under investment regimes that lack sufficient safeguards. For example, some utility tokens provide security-like benefits (e,g. dividends, votes, etc) on a goodwill basis without any legal obligations and protections. Without proper regulatory oversight, ill-intentioned issuers can easily take advantage of digital asset investors.

Recognising that digital assets are likely here to stay, regulators around the world have been actively studying and exploring potential regulatory frameworks to provide a safe digital assets environment for investors to participate in.

THERE ARE TWO KEY GROUPS OF FACTORS THAT NEED TO BE CONSIDERED WHEN INVESTING IN DIGITAL ASSETS THAT ARE TYPICALLY TAKEN FOR GRANTED IN THE TRADITIONAL INVESTMENT WORLD, NAMELY: (1) FINANCIAL AND (2) LEGAL

SECTION 3
REGULATORY DEVELOPMENTS

The United States ("US") securities watchdog, the Securities and Exchange Commission ("SEC"), recently announced the creation of a legal / regulatory framework to protect investors from potential actions of fraud, theft, and manipulation, which are frequently associated with digital assets market activities (see Figure 15).

FIGURE 15: THE US POSITION ON DIGITAL ASSETS / SECURITIES

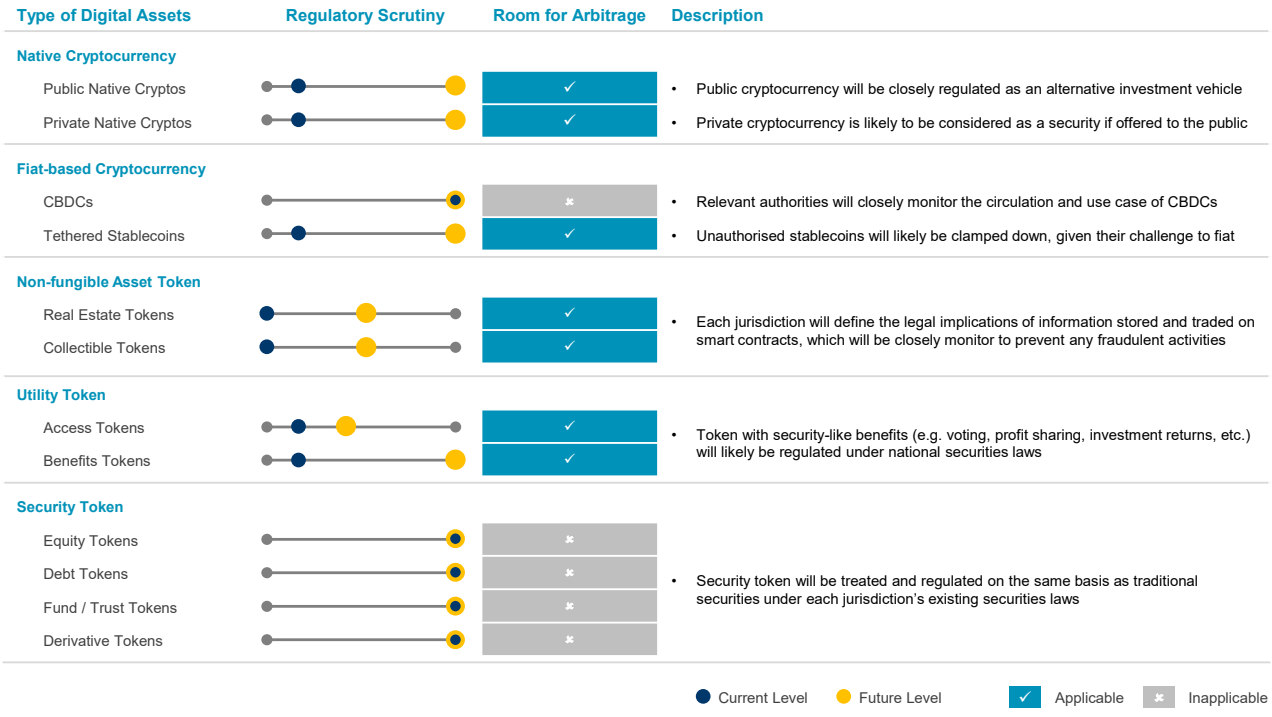
KEY TAKEAWAY	DETAILS
SEC / CFTC will intervene	• Create statutory definitions for digital assets and digital asset securities and provide the SEC with authority over digital asset securities and the CFTC with authority over digital assets;
SEC / CFTC will create rules together	• Provide legal certainty as to the regulatory status for the top 90% of the digital asset market (by market capitalization and trading volume) through a joint SEC / CFTC rulemaking;
Digital assets must be registered	• Require digital asset transactions that are not recorded on the publicly distributed ledger to be reported to a registered Digital Asset Trade Repository within 24 hours to minimize the potential for fraud and promote transparency;
Digital assets are subject to BSA	• Explicitly add digital assets and digital asset securities to the statutory definition of "monetary instruments," under the BSA, formalizing the regulatory requirements for digital assets and digital asset securities to comply with anti-money laundering, recordkeeping, and reporting requirements;
CBDC and stablecoin are not the same	• Provide the Federal Reserve with explicit authority to issue a digital version of the U.S. Dollar, clarify that digital assets, digital asset securities and fiat based stablecoins are not U.S. legal tender, and provide the U.S. Treasury Secretary with authority to permit or prohibit US Dollar and other fiat-based stablecoins;
Digital assets are new type of assets	• Direct the FDIC, NCUA and SIPC to issue consumer advisories on "non coverage" of digital assets or digital asset securities to ensure that consumers are aware that they are not insured or protected in the same way as bank deposits or securities; and,
Proper licensing regime is coming soon	• Require legislative recommendations from FinCEN, SEC and CFTC to provide clarity on dividing lines between who must register as a money services business versus who must register as a securities or commodities exchange.

Note: The Securities and Exchange Commission ("SEC"); Commodity Futures Trading Commission ("CFTC"); Bank Secrecy Act ("BSA"); Central Bank Digital Currency ("CBDC") Federal Deposit Insurance Corporation ("FDIC"); National Credit Union Administration ("NCUA"); Securities Investor Protection Corporation ("SIPC"); Financial Crimes Enforcement Network ("FinCEN")
Source: Digital Asset Market Structure and Investor Protection Act, Quinlan & Associates analysis

The Digital Asset Market Structure and Investor Protection Act lists out a comprehensive set of upcoming changes to the digital asset space, which include: (1) regulatory bodies officially intervening in market activities; (2) defining CBDCs differently from fiat-based stablecoins (e.g. USDT, USDC, etc.); (3) requiring proper registration of digital assets; and (4) suggesting a licensing regime for the asset broker, dealer, and exchange.[12]

This fresh stance on digital assets / securities by the SEC will no doubt lay the groundwork for other regulators across the globe to launch their own set of guidelines or formal regulations to safeguard domestic market participants. As a result, we see the regulatory arbitrage window continuing to narrow, albeit to varying degrees, depending on the specific digital asset in question (see Figure 16).

FIGURE 16: REGULATORY ARBITRAGE WINDOW



Source: Quinlan & Associates estimates

[12] The US Congress, 'Digital Asset Market Structure and Investor Protection Act', July 2021, available at: https://beyer.house.gov/news/documentsingle.aspx?DocumentID=5307

PUBLIC NATIVE CRYPTOCURRENCIES

In Hong Kong, the Securities and Futures Commission ("SFC") has highlighted its concerns with respect to investing in cryptocurrencies, including: (1) a lack of legal framework to protect Hong Kong retail investors who have lost money through various scandals; (2) their potential to be abused for criminal activities, such as money laundering and terrorism financing, given the anonymous nature of virtual asset transactions; and (3) the potential for market abuse, due to the absence of proper regulatory oversight.

To address these concerns, the SFC has stated its intention to ban Hong Kong domiciled and registered cryptocurrency exchanges / brokers from offering their trading services to retail investors. Moreover, all virtual asset service providers ("VASPs") will need to be licensed (see Figure 17).

FIGURE 17: SFC REGULATORY POSITION

ENHANCE AML / CTF

The non-traceability and anonymity of transactions may aid money laundering and terrorist financing

REDUCE MARKET ABUSE

With no proper regulatory oversight, there have been many cases of traditionally unacceptable market practices

PROTECT INVESTORS

There is no legal framework to protect Hong Kong retail investors involved in virtual asset trading

Theme	Description
Licensing	• ***Platforms are now required to apply and acquire HKSFC Type 1 and Type 7 licences***
Regulatory Sandbox	• Licensed platforms will be placed under the SFC's regulatory sandbox
Supervision	• All licensed virtual asset trading platforms will now fall under the SFC's supervision
Regulatory Reporting	• A monthly business report must be submitted to the SFC (second week of each month)
Audit Requirements	• Exchanges must hire an independent firm to submit an annual review report to the SFC
Due Diligence	• Stringent due diligence of assets must be conducted before their listing and trading
Market Making	• Market-making activities for liquidity should be conducted by an independent third-party
Capital Requirements	• Exchanges must possess liquid assets worth at least 12 months of operating expenses
Cold Wallet	• At least 98% of assets under custody must be kept in cold wallets and partially insured
Hot Wallet	• The maximum 2% of assets that can be kept in hot wallets must be fully insured
Investors	• ***Only professional investors ("PIs") (Net worth > HKD 8m) are allowed to trade virtual assets***
Trading Limit	• Each and every client account must be assigned a trading limit and position limit
Trade Settlement	• Institutional, professional clients can be allowed to make intraday settlements at best

OPT-IN REGIME 2019 → **MANDATORY** 2020

Virtual Asset Exchange | Investors | Critical Changes

Source: Quinlan & Associates publication – End of the Opt-in Era

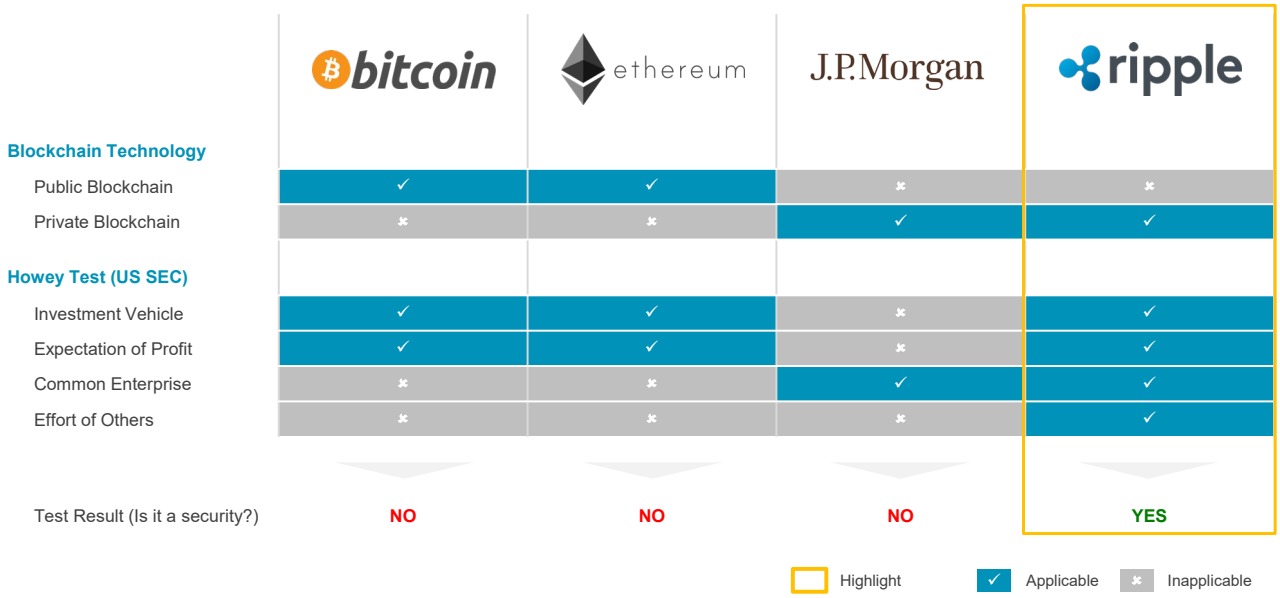
This radical regulatory clampdown on digital assets by the SFC has not been well received by retail investors, given their high level of interest in cryptocurrencies and the fact that only high net worth individuals ("HNWIs") and institutions can now access this seemingly lucrative investment opportunity. However, we believe that this stance is unlikely to be a permanent one, with the SFC expected to adopt a more liberal view on investor access, once it has 'tested the waters'. Regardless of their ultimate position, it is becoming clear that regulators, whether they proactive or reactive, are closely monitoring the digital assets space, including public native cryptocurrencies.

PRIVATE NATIVE CRYPTOCURRENCIES

The regulation of private native cryptocurrencies remains in flux. However, the recent controversy surrounding Ripple ("XRP"), a private native cryptocurrency circulating on a blockchain that is owned and operated by Ripple Labs, provides some insight into how the regulatory environment for this digital asset class may evolve in coming years.

According to the US SEC's Howey Test, which was designed to test whether an asset qualifies as a security, XRP checks all the four required elements, namely: (1) the investment of money; that is issued by a (2) common enterprise; where investors have a (3) reasonable expectation of profits; that is driven by (4) the efforts of others (see Figure 18). As a result, in December 2020, the SEC charged two Ripple Labs executives for the offence of offering unregistered securities.

FIGURE 18: HOWEY TEST ON PUBLIC VS PRIVATE NATIVE CRYPTOCURRENCY



Source: J.P. Morgan, Ripple, Quinlan & Associates analysis

As at the time of writing, there is an ongoing lawsuit between Ripple Labs and the SEC, with Ripple Labs arguing that XRP is not a security, but rather a medium of exchange.[13] We believe that the outcome of this case will be crucial as it will set a strong legal precedent with regard to how private native cryptocurrencies will be both defined and regulated in future.

While both public and private blockchain have their respective risks, creating a non-collateralised asset out of thin air that is issued on a private blockchain, which is controlled and operated by a single issuing entity, appears very risky. In the case of a public blockchain, a '51% Attack' – a hypothetical situation where a single participant contributes more than 51% of computational power – is the ultimate nightmare, as information stored on the blockchain can theoretically be manipulated by the participant. In the case of a private blockchain, it is already 100% controlled and operated by a single entity, with the issuer possessing complete control to manipulate any blockchain-based asset's information. We see this as one of the key – and growing – areas of concern for regulators across the world.

CREATING A NON-COLLATERALISED ASSET OUT OF THIN AIR THAT IS ISSUED ON A PRIVATE BLOCKCHAIN, WHICH IS CONTROLLED AND OPERATED BY A SINGLE ISSUING ENTITY, APPEARS VERY RISKY

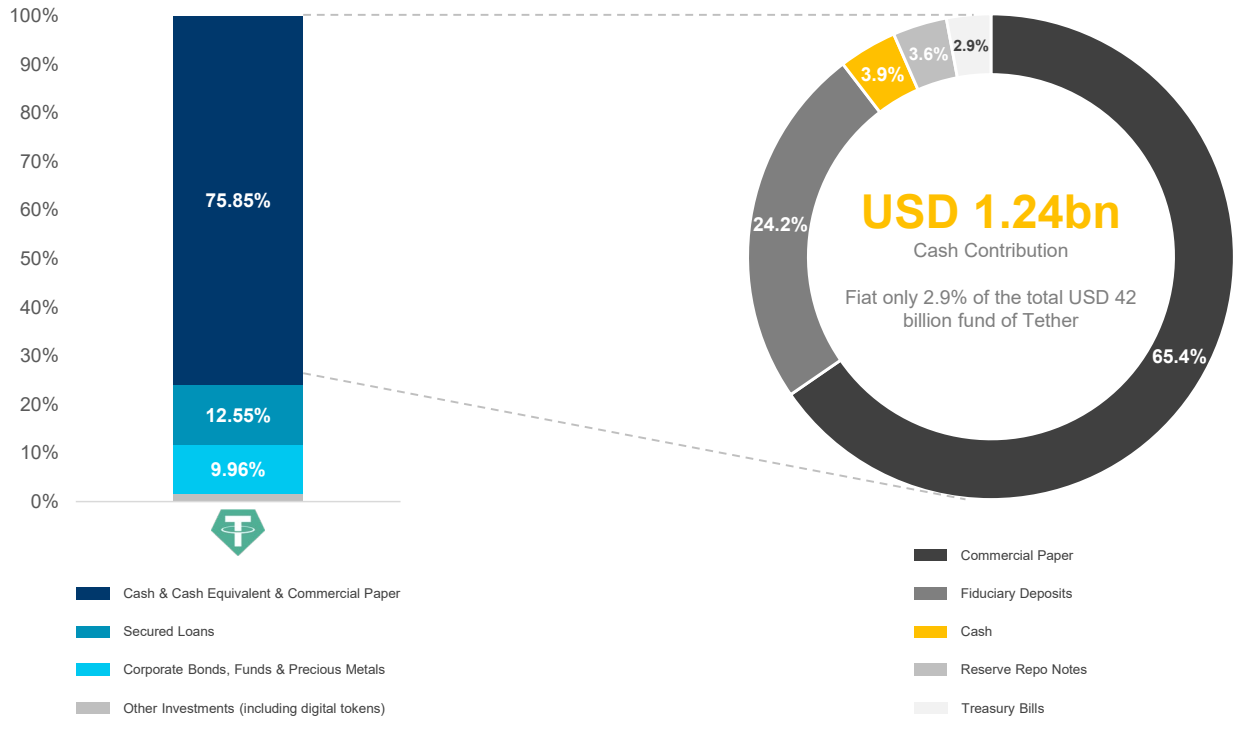
[13] Bloomberg, 'Ripple Labs Can Question Former SEC Official in Suit Over XRP', July 2021, available at: https://www.bloomberg.com/news/articles/2021-07-15/ripple-labs-can-question-former-sec-official-in-suit-over-xrp?sref=ujaNtFBa

FIAT-BASED STABLECOINS

Fiat-based stablecoins may face a clampdown in the years to come, since regulatory bodies such as the US Treasury Department have received authority to permit or prohibit the use of fiat-based stablecoins. This is because such stablecoins have been accused of portraying a misleading value proposition to the market and concealing potential risks of manipulation.

For instance, take the case of Tether ("USDT"), which is the biggest stablecoin operator in the world, with USD 64.1 billion in circulation (as of 18 August 2021). [14] Although many people perceive USDT to be 1:1 tethered to USD fiat, it recently emerged that such is not actually the case. In fact, according to Tether's first reserve breakdown report, cash accounted for only 2.9% of its total reserves (as of 31 March 2021), making it questionable to consider USDT as a tethered version of fiat (see Figure 19). Moreover, Tether has previously been accused by the New York Attorney General of transferring USD 850 million to a Panama entity without publicly disclosing the transaction to clients, which resulted in a USD 18.5 million settlement. [15]

FIGURE 19: TETHER RESERVE BREAKDOWN (MARCH 2021)



Note: fiat refers to cash
Source: Tether, Quinlan & Associates analysis

[14] CoinMarketCap, 'Tether', available at: https://coinmarketcap.com/currencies/tether/
[15] Reuters, Bitfinex, 'Tether owner pays $18.5 million fine to settle NYAG cryptocurrency cover-up charges', February 2021, available at: https://www.reuters.com/article/us-new-york-ifinex-settlement-idUSKBN2AN1NM

More recently, Coinbase attempted to offer an interest-bearing, stablecoin-based lending product without possessing a relevant license or the SEC's approval. However, after facing heat from the SEC, Coinbase was forced to backtrack, leading to concerns over the future of crypto lending products.[16]

NON-FUNGIBLE ASSET TOKEN

Unlike other digital collectible tokens, where proof of ownership and the respective collectible are both wrapped under the same token, NFTs are nothing more than a proof of ownership written on a smart contract.

In fact, an important note that people interested in purchasing NFTs should be aware of is that the information stored on a smart contract is not legally recognised in many jurisdictions yet, other than the likes of Belarus,[17] the U.K.,[18] and some states in the US. This leaves significant room for regulatory arbitrage.

For example, a digital art producer selling art-embedded NFTs in a jurisdiction where smart contracts are not legally binding could easily create identical NFTs to sell to other purchasers, a classic case of the 'double spending' problem that hurts the original purchaser. To prevent such incidents, it is very likely that regulators will revisit their position on smart contracts in future, to provide a safe investment environment for NFT purchasers.

UTILITY TOKENS

Utility tokens have security-like features programmed into them that grant investors certain rights, such as voting rights and dividends. For instance, there exist utility tokens that provide monetary benefits based on the revenue of the token-issuing company.

To give an example, Nexo is a financial services provider that offers crypto-related financial services, such as crypto savings accounts and lending products. Leveraging its utility token with dividend payment functionalities, Nexo has been distributing dividends to its token holders since the inception of its token in 2018. On 16 June 2021, the company distributed 30% of its net profits from fiscal year 2021 in the form of dividends.[19]

We believe these securities-like characteristics will present major red flags to regulators around the world. As a result, many jurisdictions have already banned the offering of utility tokens through ICOs, and regulators in other jurisdictions are likely to follow suit. Consequently, we believe that tokens with securities-like features (e.g. voting rights, dividends, etc.) will increasingly come under the regulatory spotlight in the years to come, and they will be either reclassified as a traditional securities or clamped down as a unauthorised financial asset.

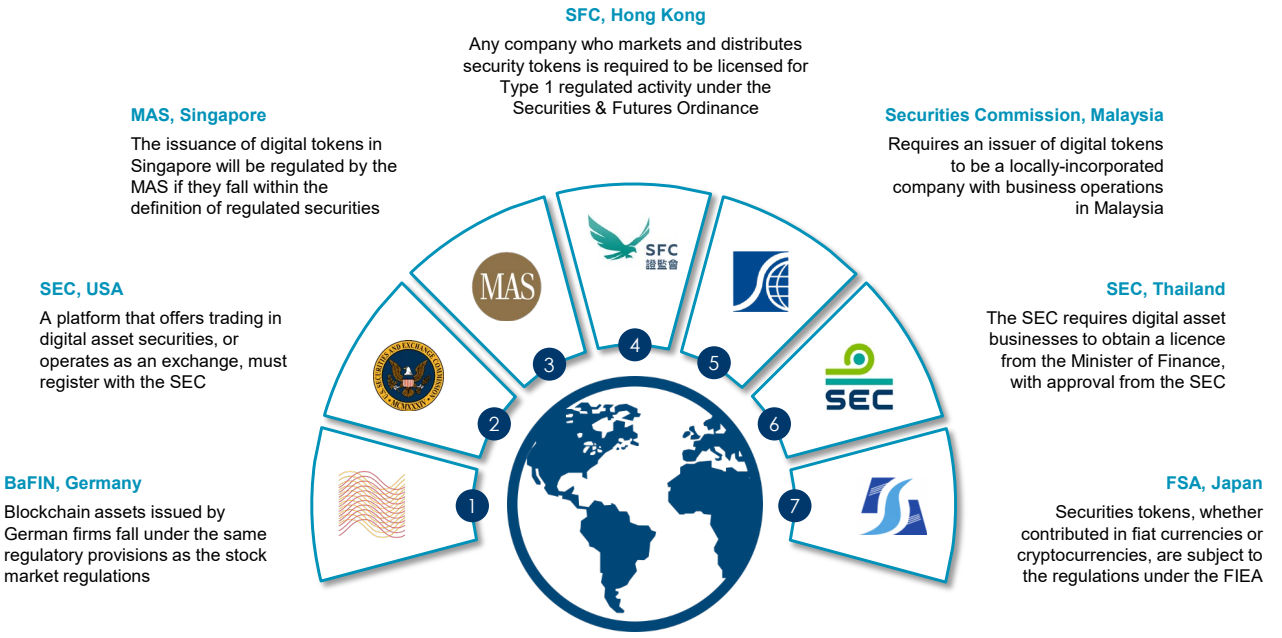
[16] Yahoo, 'Coinbase Drops Crypto Lending Program Plans After SEC Balks', September 2021, available at: https://finance.yahoo.com/news/coinbase-drops-plan-crypto-lending-153837356.html
[17] Deloitte Legal, 'Belarus Enacts Unique Legal Framework for Crypto economy Stakeholders', December 2017, available at: https://www2.deloitte.com/content/dam/Deloitte/ru/Documents/tax/lt-in-focus/english/2017/27-12-en.pdf
[18] Lexology, 'Arbitration of Digital Dispute in Smart Contracts and the release of the digital dispute resolution rules from the U.K. jurisdiction taskforce', April 2021, available at: https://www.lexology.com/library/detail.aspx?g=6ea7c284-0157-4f2c-b330-e2758d1bf7a0
[19] Nexo, 'The Final Dividend Worth $20 Million Has Been Distributed', June 2021, available at: https://nexo.io/blog/the-final-dividend-worth-20-million-has-been-distributed

SECURITY TOKEN

When crypto entrepreneurs realised the liquidity for alternative fund-raising channels such as initial coin offerings ("ICOs") and initial exchange offerings ("IEOs") were drying up, they made their final attempt to issue security-like products through security token offering ("STOs").

Regulators across the world quickly drew a clear line that security tokens fell under the legal definition of regulated securities, with the asset and its associated activities being governed by various global financial regulators (See Figure 20). As a result, security tokens should be subject to the same legal and compliance standards as traditional securities if the asset is listed and traded on a blockchain network in any shape or form.

FIGURE 20: REGULATORS' POSITION ON SECURITY TOKEN OFFERING



Source: Regulators' websites

CONCLUSION

Outside of security tokens, the lack of a proper legal definition and regulatory framework to govern the various digital assets, as well as their associated activities, has long been a major deterrent to their widespread institutional adoption, and such adoption has been heralded by many as a silver bullet. Although some market participants may not be pleased with regulators clamping down on the freedoms that they have enjoyed thus far, we believe that greater regulatory intervention may ultimately serve as the strongest catalyst for institutionalisation, opening up the next chapter for the digital assets universe.

SECTION 4
THE OUTLOOK FOR DIGITAL ASSETS

With regulatory scrutiny of digital assets on the rise, we anticipate the regulatory arbitrage window to narrow in coming years, causing a shakeup in the broader digital asset universe. As a result, we foresee three possible scenarios for the various types of digital assets: (1) bearish; (2) neutral; and (3) bullish outlook (see Figure 21).

FIGURE 21: LONG-TERM OUTLOOK

	Digital Asset	Description	Regulatory Outlook	Adoption Outlook	Overall Outlook
CRYPTO CURRENCY	Public Native Cryptocurrencies	Cryptocurrencies like BTC, etc. will remain attractive as alternative investment avenues	→	↑	BULLISH
	Private Native Cryptocurrencies	Use cases will likely be limited to enhancing internal business operations	→	→	NEUTRAL
	Tethered Stablecoins	Stablecoins will likely fall out of favour and be replaced by CBDCs	↓	↓	BEARISH
	Central Bank Digital Currencies	We foresee growing adoption of CBDCs by central banks to support digital payments	↑	↑	BULLISH
OTHER DIGITAL ASSETS	Benefits Tokens	Unregulated tokens with security-like benefits (e.g. dividends) will see a crackdown	↓	↓	BEARISH
	Platform Access Tokens	Value proposition of pure platform access tokens will decline with adoption of CBDCs	→	↓	BEARISH
	Collectible Tokens	Demand for digital collectibles (e.g. digital art, etc.) is expected to surge significantly	→	↑	BULLISH
	Real Estate Tokens	With limited use cases, real estate tokens are unlikely to be widely adopted	→	→	NEUTRAL
SECURITY TOKEN	Equity Tokens	Large-scale institutional adoption is expected after successful market testing	→	↑	BULLISH
	Debt Tokens	Large-scale institutional adoption is expected after successful market testing	→	↑	BULLISH
	Fund / Trust Tokens	Large-scale institutional adoption is expected after successful market testing	→	↑	BULLISH
	Derivatives Tokens	Large-scale institutional adoption is expected after successful market testing	→	↑	BULLISH

Security tokens are expected to emerge as key winners

Favourable ↑ → ↓ Unfavourable

Source: Quinlan & Associates estimates

BEARISH OUTLOOK

We have a bearish outlook on three types of digital assets, including: (1) tethered stablecoins; (2) benefits tokens; and (3) platform access tokens.

While most digital asset transactions today are still largely settled by tethered stablecoins, such as USDT, their questionable track record of maintaining 1:1 reserves of fiat and inability to be recognised as legal tender will likely see them falling out of favour with regulators, especially with the expected adoption of CBDCs, which can act as a perfect substitute for fiat.

Benefits tokens that purport to provide certain rights to token holders, such as discounts, voting abilities, and dividends, without the associated legal obligations are expected to either be re-classified as securities (to face the same legal standards) or be clamped down by regulators, with the latter appearing more likely.

Platform access tokens, however, could remain relevant if they embrace a role as virtual money within an ecosystem. However, with little-to-no benefits of leveraging blockchain to facilitate the internal circulation of money and the prospect of CBDCs assuming the same role, we have a bearish outlook on platform access tokens as well.

NEUTRAL OUTLOOK

We see two digital assets experiencing moderate levels of growth in the long run: (1) real estate tokens and (2) private native cryptocurrencies.

Real estate tokens, although likely to remain relevant, could be pigeonholed into serving a more niche market, such as for keeping and tracking ownership certificate information, while the jury remains out on agreement-based real estate tokens, which are yet to display any meaningful use case. Moreover, real estate is arguably the most difficult market to tokenise, as it may require national level backing. However, it should be noted that a sizeable macro push, such as a government-led drive to standardise recording and tracking of land ownership across registries through tokenisation, could lead to a bullish outcome.

Private native cryptocurrencies, although not expected to make a big splash in the mass market, will likely continue to support the internal infrastructure of financial institutions that are looking to make their business operations more efficient.

BULLISH OUTLOOK

Given that they enjoy a high level of popularity as alternative investment assets, public native cryptocurrencies, such as BTC and ETH, are expected to continue to see robust market adoption.

In order to fully utilise the capabilities of blockchain in their respective capital markets, we anticipate that most countries will eventually adopt CBDCs. The introduction of a digital asset as legal tender for financial settlements could prove to be an ‘inflection point’ in legitimising digital assets in the eyes of the broader public, further accelerating their adoption.

We expect digital collectible tokens to not only become a new sub-segment of art investments, but to also experience widespread retail adoption, as a digital alternative to physical collectibles like trading cards. Take the example of professional football player Lionel Messi, who recently launched ‘Messiverse’, a collection of digital artworks featuring him. Similarly, several sports clubs have started introducing “fan tokens”, while major brands like Warner Bros, Coca-Cola, and Budweiser have also recently

jumped onto the bandwagon.[20] We anticipate more launches of such non-physical collectible tokens from popular brands and celebrities to continue, with demand being driven by their fans and followers On the other hand, other non-fungible asset tokens, real estate tokens in particular, may be restricted to being used for maintaining ownership information.

Given their relatively strict investment mandates / remits and underlying fiduciary duties, current institutional investor activity in the digital asset space remains somewhat muted, especially due to the lack of clearly visible fundamentals in many digital asset classes. However, we see a sizeable appetite for exposure to digital assets that receive a thumbs up from regulators and align with existing fund manager mandates – namely, security tokens.

Moreover, as unregulated players move to become licensed and fully-regulated entities, they are likely to hold greater appeal to the institutional investor community as credible counterparties. In order to attract institutional capital, we believe these participants will increasingly explore how to issue digital assets that align with the investment mandates of global fund managers, and therefore look towards security tokens as a silver bullet.

Take the case of Coinbase's direct listing, which has seen almost 30% of shares being snapped up by institutional investors such as BlackRock, Goldman Sachs, and Morgan Stanley.[21] In short, these firms were investing in Coinbase's shares (i.e. an asset class they could readily digest and understand) rather than the underlying digital assets that Coinbase lists and trades (i.e. assets they are not freely permitted to directly invest in).

In the case of Singapore, which provides robust regulatory support and a more mature market landscape, we have seen large institutional players making bold moves in the security tokens space. For instance, security tokens platform ADDX, which is backed by traditional securities exchange – Singapore Exchange ("SGX"), recently tokenised a US private real estate fund, while Singapore's largest bank, DBS, has issued an SGD 15 million digital bond, followed by its peer United Overseas Bank's ("UOB's") SGD 600 million digital bond offering.[22] We believe such examples send a clear signal to institutional players across the world about the benefits of security tokens and their vast potential in the years to come.

[20] Marketing Interactive, 'Lionel Messi kicks off NFT ambitions with "Messiverse" art collection', August 2021, available at: https://www.marketing-interactive.com/lionel-messi-kicks-off-nft-ambitions-with-messiverse-art-collection
[21] Nasdaq, 'COIN Institutional Holdings', available at: https://www.nasdaq.com/market-activity/stocks/coin/institutional-holdings
[22] Finews.asia, 'Singapore: Digital Securities on the Rise', August 2021, available at: https://www.finews.asia/finance/35201-singapore-digital-securities-on-the-rise

SECTION 5
SECURITY TOKEN BENEFITS

SECURITY TOKEN VS TRADITIONAL SECURITY

As outlined in Section 1, we see four major benefits that Blockchain 2.0 provides, including: (1) data integrity; (2) cybersecurity; (3) divisibility; and (4) programmability. These benefits become even more apparent when blockchain is used to optimise capital markets operations, showcasing the advantage of security tokens over traditional securities, and laying the foundation for their growing adoption in years to come.

DATA INTEGRITY & CYBERSECURITY

TRANSPARENCY

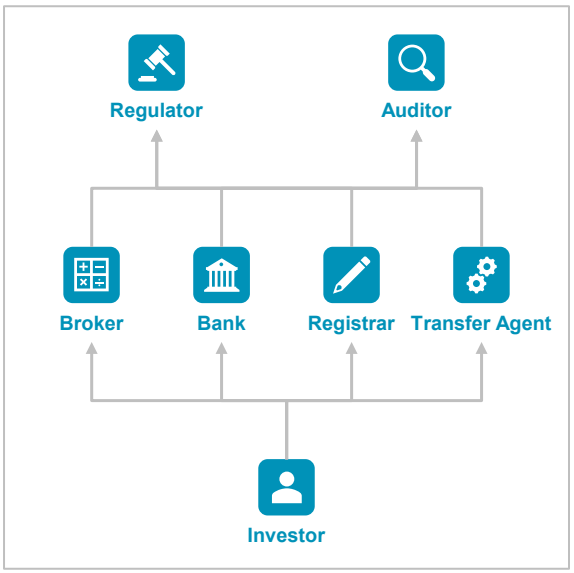
Financial institutions typically manage their information in silos, under different types of data architecture. This can stem, for instance, from using different templates for record keeping and differing cybersecurity risk standards. For regulatory reporting however, information templates must become more standardised, as regulators require specific points of information to be submitted for review.

WE SEE THREE KEY BENEFITS THAT BLOCKCHAIN TECHNOLOGY CAN DELIVER VIA DECENTRALISATION AND TOKENISATION: NAMELY, (1) IMPROVED DATA INTEGRITY; (2) ENHANCED CYBERSECURITY; AND (3) FRACTIONALISATION (I.E. DIVISIBILITY)

For example, during a typical compliance process for traditional securities, regulators and auditors aggregate and reconcile transaction information from brokers, banks, registrars, and transfer agents, that are each individually managed. With adoption of blockchain, relevant data can be centrally recorded on a single trustworthy ledger, with regulators and auditors reviewing this information through pre-approved access rights. This can help minimise time and resources spent on data reconciliation, making the regulatory reporting process much more efficient for every market participant involved (see Figure 22).

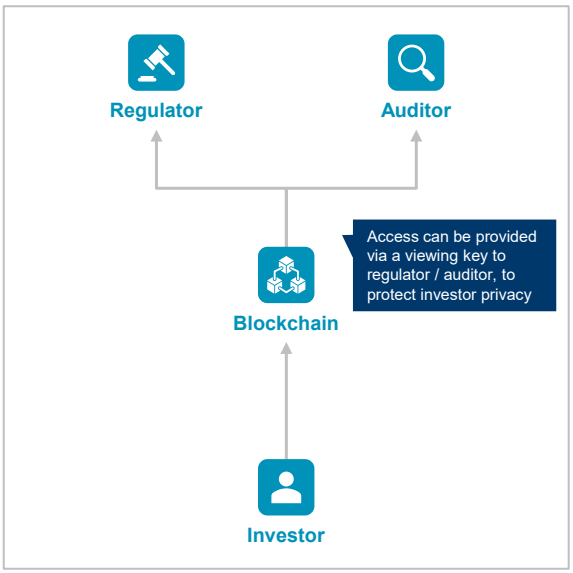
FIGURE 22: STREAMLINED REGULATORY REPORTING PROCESS

Compliance Process
Traditional Securities



Investors may invest in shares via different intermediaries with fragmented records; information from multiple third-parties needs to be collected, validated, and reconciled for compliance and reporting purposes

Compliance Process
Security Tokens



All holdings are recorded on the blockchain in an immutable manner, creating a single source of truth which can be accessed by a regulator / auditor via a viewing key (for privacy and confidentiality purposes)

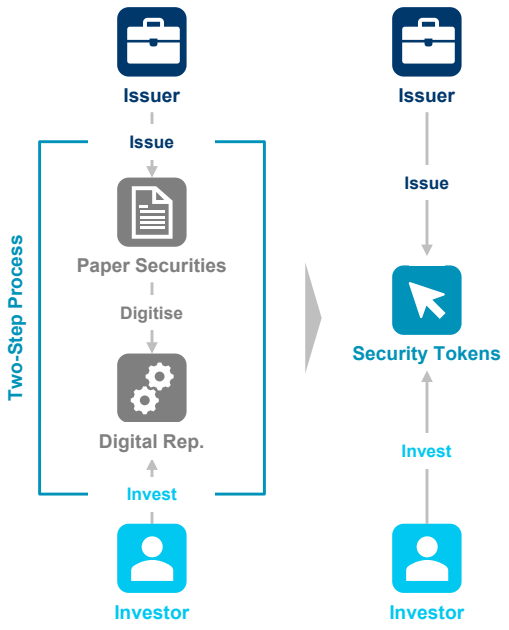
Source: Quinlan & Associates analysis

DEMATERIALISATION

Traditional securities are physically native, meaning that they are ultimately kept in paper form. In most jurisdictions, the paper security is then digitised to be used in the digitalised securities markets. We see such practices as outdated, resulting in unnecessary economic wastage of physical space and resources. As a result, we are seeing a growing trend of dematerialisation of physical securities across the world.

For example, the Securities and Exchange Board of India ("SEBI") announced in March 2019 that no transaction or transfer of securities of a listed company can occur in a physical certificate form. In the European Union ("EU"), the Central Securities Depositories Regulation ("CSDR") has mandated that all issuances after January 2023 need to be fully digital and that all securities need to be dematerialised by 2025. Despite the United Kingdom ("U.K.") leaving the EU, it has also been preparing for the implementation of the CSDR's directives (see Figure 23).

FIGURE 23: DEMATERIALISATION OF PAPER-BASED SECURITIES



Market	Target Date	Regulation / Initiative
	March 2019	**Securities and Exchange Board of India** SEBI announced that no transaction or transfer of securities of a listed company can occur in physical certificate form, rendering physical securities illiquid
	January 2025	**European Securities and Markets Authority** The Central Securities Depositories Regulation ("CSDR") mandates all issuances after January 2023 to be digital and all securities to be dematerialised by January 2025
	January 2025	**Financial Conduct Authority** Despite the U.K. heaving left the EU, it has been preparing for the implementation of CSDR and intends to continue following the implementation of dematerialisation

Source: Regulators' websites, Economic Times, Charltons, BNY Mellon, Linklaters, Quinlan & Associates analysis

A potential method for dematerialisation of physical securities is tokenisation. When a security is issued on a blockchain instead of on paper, issuers can provide detailed information for each token, including issuer details, time of issuance, authentication key, and much more. In addition, tokenisation would also assign the security with a unique identifier that can serve as the ultimate evidence of authenticity. Therefore, we see blockchain-based tokenisation as an ideal option for implementing dematerialisation efforts in coming years.

DIVISIBILITY

ENHANCED ASSET LIQUIDITY AND CAPITAL ACCESSIBILITY

One of the key limitations of paper-based shares is that they cannot be traded in fractions – for example, investors cannot buy 0.3 shares of a company's stock. For companies with extremely high share prices, this heightens access barriers and reduces market liquidity, especially for retail investors. In response to this, traditional securities markets offer stock splits, whereby the issuing company increases the number of shares in circulation whilst maintaining the same market capitalisation.

Although some brokers have recently introduced "fractional trading" as an alternative to stock splits, since they have to accumulate a considerable amount of whole or fractional shares before allowing investors to buy or sell, this concept has multiple drawbacks, including:

- limited stock selection (e.g. Charles Schwab only provides fractional shares for S&P500 companies);
- liquidity concerns (i.e. the speed at which orders are filled may be slow);
- lack of shareholder rights (e.g. Stash does not allow investors to vote unless they own at least one whole share);
- unintended tax consequences (i.e. since a broker may not allow transfer to another broker, one may have to sell and repurchase, resulting in tax liabilities); and
- expensive fees (e.g. if a person diversifies by purchasing fractional shares of multiple companies, then fees may add up significantly and eat into returns generated).[23]

ONE OF THE KEY LIMITATIONS OF PAPER-BASED SHARES IS THAT THEY CANNOT BE TRADED IN FRACTIONS, FOR EXAMPLE, INVESTORS CANNOT BUY 0.3 SHARES OF A COMPANY'S STOCK

[23] Forbes, 'How Do Fractional Shares Work?', April 2021, available at: https://www.forbes.com/advisor/investing/fractional-shares/

On the other hand, security tokens leverage the same technology as blockchain native cryptocurrencies (e.g. ETH and BTC) and are inherently less vulnerable to such challenges. Depending on the how the security token is configured, it can be traded at a fraction of its price, just as how cryptocurrency can be traded – to as small as 0.000000000000000001 shares.

If such denominations are applied to traditional securities, then investors can purchase shares of an originally inaccessible company that is trading at daunting price points, such as Berkshire Hathaway, which was priced at USD 491,962 (as of 5 August 2021). If fractionalised to the limit, the price of the most expensive share in the world could be purchased for as little as USD 0.0000000000005 in the world of security tokens, making it much more accessible to retail investors (see Figure 24).

FIGURE 24: DIVISIBILITY FROM A SECURITIES PERSPECTIVE

	ethereum		BERKSHIRE HATHAWAY INC.
Denomination (Breakdown Unit)	**Unit** (in Wei)	**ETH Price** (in USD)	**BRK.A Share Price** (in USD)
Wei	1	0.000000000000002	0.00000000000049
Kwei	1,000	0.00000000000231	0.000000000492
Mwei	1,000,000	0.000000002301	0.00000049197
Gwei	1,000,000,000	0.0000023079	0.000491962
Twei	1,000,000,000,000	0.0023079	0.4919621
Pwei	1,000,000,000,000,000	2.3	492.0
Ether	1,000,000,000,000,000,000	2,307.9	491,962.1

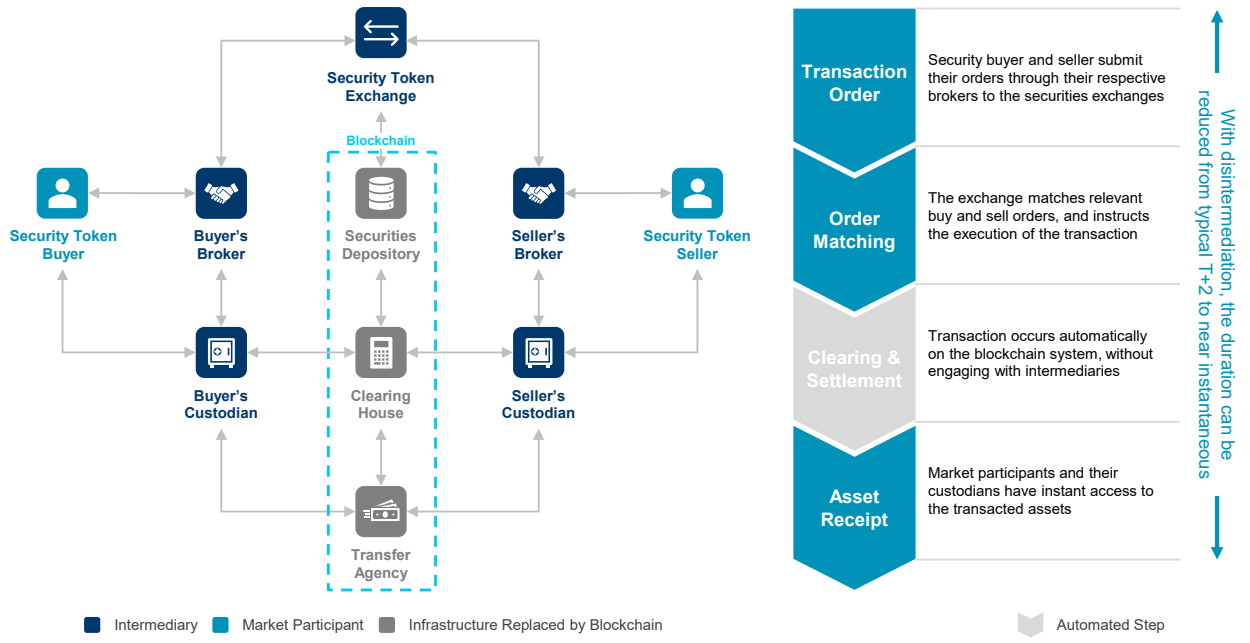
Source: Coinmarketcap (5 August 2021), Bloomberg (5 August 2021), Investopedia, Quinlan & Associates analysis

PROGRAMMABLE

DISINTERMEDIATION

By leveraging the programmability characteristic of Blockchain 2.0, security tokens can be programmed to enhance operational efficiency, like robotic process automation ("RPA") tools. The most notable implication of the adoption of blockchain by the securities world is the potential removal of intermediaries, particularly in the post-trading process. In fact, with the right adoption of blockchain technology, the typical T+2 (i.e. two business days) clearing and settlement timeframe could be reduced to T+0 (i.e. near instant settlement) (see Figure 25).

FIGURE 25: SECURITY TOKEN TRADING LIFECYCLE



Source: Quinlan & Associates analysis

CONCLUSION

We believe that security tokens, supported by blockchain technology, have the potential to enhance many processes in the traditional securities lifecycle, from contract drafting to clearing and settlement (see Figure 26). With such benefits, we expect a surge in market interest and adoption of security tokens across capital markets in the coming decade.

FIGURE 26: KEY DIFFERENCES IN SECURITIES LIFECYCLE

TRADITIONAL SECURITIES		SECURITY TOKENS
A new contract needs to be drafted with the legal and compliance team whenever counterparties want to conduct a customised trade	Contract Drafting	Smart contract generators provide audited programs, and compliant contracts can be codified in a relatively intuitive manner
Depending on the transaction condition, additional resources may be deployed to monitor movements of the underlying	Condition Monitoring	The smart contract automatically tracks underlying movement and can be extended to the movements of a basket of underlyings
If condition is met, counterparties have to initiate a transaction, which typically involves a third-party intermediary / clearinghouse	Security Transaction	Once condition is met, the smart contract automatically executes the transaction as programmed, without further instructions
Asset / security transactions are cleared and settled via a range of financial intermediaries, which takes time and may be costly	Clearing & Settlement	Transactions are executed through the blockchain system without engaging with any third-party intermediaries / service providers

Source: Quinlan & Associates analysis

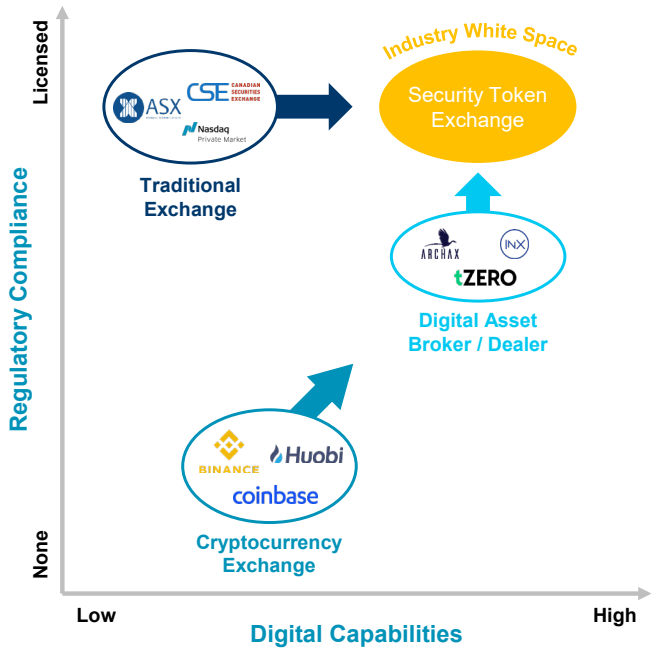
SECTION 6
THE RISE OF SECURITY TOKEN EXCHANGES

POTENTIAL CONVERGENCE

Taking stock of the salient benefits of blockchain technology and the opportunities on offer from security tokens, exchanges across the globe, including: (1) traditional exchanges; (2) cryptocurrency exchanges; and (3) digital asset broker / dealers, are augmenting their business models to transform into security token exchanges.

In order for these exchanges to successfully transition to the security token space, they need to take into consideration not only the increasing regulatory scrutiny being felt across the security token universe, but also the need to adopt new technologies to support a blockchain-based asset lifecycle. As a result, given their contrasting propositions and licensing statuses, we are noticing each of the three types of exchanges adopting a differentiated journey towards becoming a security token exchange (see Figure 27).

FIGURE 27: THE RACE TO BECOME A SECURITY TOKEN EXCHANGE



1 TRADITIONAL EXCHANGE

Securities exchanges, especially in developed markets, are digitally transforming towards blockchain-based back end operations

2 CRYPTOCURRENCY EXCHANGE

Cryptocurrency exchanges are acquiring relevant regulatory licenses to transition from crypto specialists to digital asset generalists

3 DIGITAL ASSET BROKER / DEALER

Players with broker-dealer or ATS / MTS licenses have been set up to support the issuance and trading venues of security tokens

Source: Quinlan & Associates analysis

TRADITIONAL EXCHANGES

Several traditional exchanges have already been exploring the potential of blockchain technology at a relatively early stage, with many implementing it to support their back-end clearing and settlement procedures. We note that three traditional exchanges in particular have proven to be especially adventurous in the security token space, namely: (1) Nasdaq; (2) the Canadian Securities Exchange ("CSE"); and (3) the Australian Securities Exchange ("ASX") (see Figure 28).

FIGURE 28: THE ADVENTUROUS TRADITIONAL EXCHANGES

	Nasdaq Private Market	CSE CANADIAN SECURITIES EXCHANGE	ASX
Description	Used its Nasdaq Linq blockchain ledger technology to successfully complete and record a private securities transaction	Launched an innovative securities clearing and settlement platform, promoting the use of Security Token Offerings	Released its new equities clearing and settlement system that will replace the legacy Clearing House Electronic Sub-register System
Founded Year	• 1971 (Nasdaq)	• 2003	• 1987
Headquarters	• United States	• Canada	• Australia
Tech Partner (If any)	• Chain.com	• -	• Digital Asset Group
Blockchain Adoption	• 30 Dec 2015	• 13 Feb 2018	• 7 May 2019 – 2023E

Source: Exchange websites, Quinlan & Associates analysis

While the Nasdaq has been experimenting with the use of blockchain technology in its private securities markets, the New York Stock Exchange ("NYSE") has established a subsidiary, called Bakkt, which possesses digital asset dealing capabilities. Elsewhere, ASX is currently revamping its settlement system by adopting blockchain, and although the project appears to be progressing slowly, full adoption is expected to take place by 2023.[24] In addition, the CSE has managed to quickly develop and implement its own blockchain-based settlement system.

In Asia, the Hong Kong Exchange and Clearing Limited ("HKEX") recently announced the launch of 'Synapse', a new post-trade infrastructure for Northbound Stock Connect that aims to provide not only same day trade settlement, but also communicate reliable, real-time transaction data to stakeholders. Furthermore, Singapore's SGX is presently experimenting with blockchain in its fixed income market in an effort to automate corporate actions and reduce settlement times from T+5 to T+2 days.[25] We see this global push by traditional exchanges as part of a broader, secular trend that is likely to accelerate in the years to come.

[24] Reuters, 'ASX delays blockchain transition until 2023', October 2020, available at: https://www.reuters.com/article/asx-blockchain-int-idUSKBN27D07V
[25] BNP Paribas, 'Blockchain technologies: a quiet revolution for securities exchange', June 2021, available at: https://securities.cib.bnpparibas/blockchain-technologies-a-quiet-revolution-for-securities-exchanges/

CRYPTOCURRENCY EXCHANGES

Cryptocurrency exchanges, such as Binance, Huobi, and Coinbase are not securities exchanges, but operate more as broker-dealer-style entities, dealing cryptocurrencies through advanced transactional platforms that connect buyers and sellers. Given the low bar of regulatory oversight for many digital assets, they have enjoyed a certain degree of freedom, especially in jurisdictions that do not regulate the trading and dealing of cryptocurrencies, thereby not requiring these exchanges to acquire any licences.

However, after recognising that they could potentially disrupt traditional capital markets by harnessing the vast potential of blockchain technology, many cryptocurrency exchanges have been acquiring traditional licences (e.g. broker-dealer licences, alternative trading system licences, etc.) and appear to be slowly shifting from a crypto-only proposition to becoming regulated blockchain-based security token exchanges (see Figure 29).

FIGURE 29: INCUMBENT CRYPTOCURRENCY EXCHANGES

	BINANCE	Huobi	coinbase
Description	Binance is an online centralized exchange, and is the largest cryptocurrency exchange platform by volume	Huobi is the world's leading Bitcoin and Ethereum trading platform offering trading services for over 100 digital assets	Coinbase is a fully licensed cryptocurrency exchange based in the US for buying, storing and selling cryptocurrency
Founded Year	• 2017	• 2013	• 2012
Headquarters	• Cayman Islands	• Seychelles	• United States

Source: Company websites, Quinlan & Associates analysis

Recently, Binance was caught attempting to sidestep securities regulations with a new product called “Stock Tokens”, which offered synthetic exposure to equity, such as shares of Apple and Tesla. These Stock Tokens appeared to have the characteristics of delta-one securities, i.e. derivatives contracts that provide 1:1 exposure to an underlying.

Binance’s actions immediately caught the attention of financial regulators, such as the U.K. Financial Conduct Authority (“FCA”), the German Federal Financial Supervisory Authority (“BaFin”), and the Hong Kong SFC, as the company was dealing in securities without being appropriately licensed to do so. BaFin has been particularly vocal about the Stock Tokens, stating that the nature of the product violates the European Prospectus Regulation and that Binance is subject to a fine of up to USD 6 million if found guilty. As a result of this regulatory controversy, the exchange officially terminated its Stock Token offering on 16 July 2021. [26] Two weeks after the termination, Binance CEO, Changpeng Zhao, announced that the company would seek to become a regulated financial institution. [27]

Huobi and Coinbase, on the other hand, have already secured a broker-dealer licence that is regulated by both the SEC and the Financial Industry Regulatory Authority (“FINRA”), which allows them to offer private placements of security tokens. Slowly, but surely, it appears that a growing number of cryptocurrency exchanges are moving towards dealing security tokens in a more well-regulated manner.

SLOWLY, BUT SURELY, IT APPEARS THAT A GROWING NUMBER OF CRYPTOCURRENCY EXCHANGES ARE MOVING TOWARDS DEALING SECURITY TOKENS IN A MORE WELL-REGULATED MANNER

[26] Reuters, “Binance ditches 'stock tokens' as global crackdown widens”, July 2021, available at: https://www.reuters.com/world/china/binance-stops-selling-stock-tokens-after-regulatory-scrutiny-2021-07-16/
[27] CNBC, ‘Binance CEO says he’s willing to step down as world’s biggest crypto exchange welcomes regulation’, July 2021, available at: https://www.cnbc.com/2021/07/27/binance-ceo-says-willing-to-step-down-amid-crypto-crackdown.html

DIGITAL ASSET BROKER-DEALERS

While both traditional and cryptocurrency exchanges have made significant strides in their efforts to become security token exchanges, they each possess their own set of limitations. In the case of traditional exchanges, a high level of interdependency with intermediaries, together with challenges around legacy technology, have constrained their ability to move towards full blockchain adoption. In the case of cryptocurrency exchanges on the other hand, changing their brand perception from cryptocurrency specialists to digital asset generalists and covering a wide range of digital assets will be a difficult task to accomplish, given their strong crypto-focused colour.

As a result, there have been a slew of new entrants that are aiming to surpass the limitations faced by both traditional and cryptocurrency exchanges, by setting up as 'security token exchanges' from scratch (see Figure 30).

FIGURE 30: DIGITAL ASSET BROKER-DEALERS WITH TRADING PLATFORMS

	ARCHAX	tZERO	INX
Description	The first ever security token exchange regulated by the Financial Conduct Authority ("FCA") in London	An alternative trading system regulated by the SEC and FINRA that offers digital asset trading platform	Building a cloud-based system for trading digital asset securities and cryptocurrencies that is regulated by the US SEC
Founded Year	• 2018	• 2014	• 2017
Headquarters	• United Kingdom	• United States	• Gibraltar

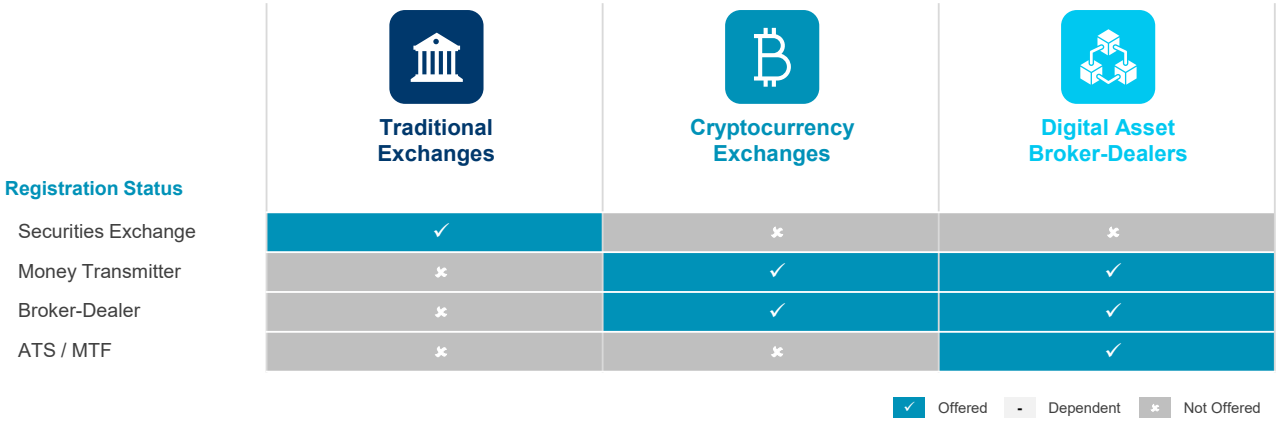
Source: Company websites, Quinlan & Associates analysis

The proposition offered by these participants, however, remains questionable. Many of these so-called "exchanges" possess only non-exchange licenses, such as an ATS, multilateral trading facility ("MTF"), broker-dealer, and/or money transmitter licence. As a result, they act as more of a digital asset broker-dealer than as a security token exchange, possessing limited product and service offerings in both primary as well as secondary markets.

KEY TAKEAWAY

While more and more traditional exchanges are announcing their intention to explore the digital asset space and digital asset broker-dealers and cryptocurrency exchanges are claiming to be "fully-licenced" to deal "security tokens", none of them possess a securities exchange licence that permits listing of public security tokens (see Figure 31).

FIGURE 31: LICENSING STATUS



Source: Quinlan & Associates analysis

The exchanges that are participating in the race to become a security token exchange are legally registered as one or more of the following: (1) securities exchange; (2) money transmitter; (3) broker-dealer; and/or (4) alternative trading system (also known as a multi-lateral trading facility in Europe), which are all well-regulated by financial authorities but do not permit listing of public security tokens.

A money transmitter licence allows the licensee to carry out simple money related businesses, such as transferring money from one party to another.[28] A broker-dealer licence on the other hand allows the licensee to handle securities related operations, and most notably, rights to deal in unlisted private securities, which opens up the door to provide a limited version of a "security token offering".[29] Broker-dealers in contrast are agents facilitating trade on behalf of clients, which is strictly different from a securities exchange that provides a listing platform with matching and clearing capabilities. An ATS / MTF licence too falls short, only allowing a licensee to facilitate a matching service for buyers and sellers of financial assets and not as a securities exchange that can bring companies public.[30]

[28] FinCEN, 'FIN-2019-G001', May 2019, available at: https://www.fincen.gov/sites/default/files/2019-05/FinCEN%20Guidance%20CVC%20FINAL%20508.pdf
[29] The US SEC, 'Guide to Broker-Dealer Registration', April 2008, available at: https://www.sec.gov/reportspubs/investor-publications/divisionsmarketregbdguidehtm.html
[30] The US SEC, 'Alternative Trading Systems (ATSs)', available at: https://www.investor.gov/introduction-investing/investing-basics/glossary/alternative-trading-systems-atss

CONCLUSION

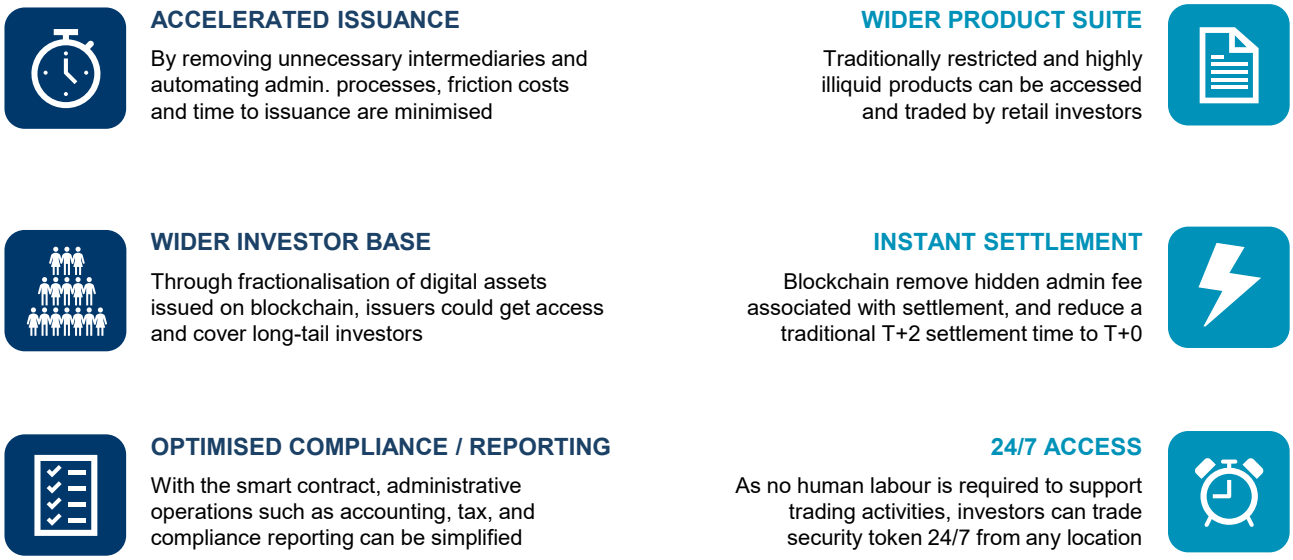
According to our research, none of the above types of exchanges has successfully tapped into the industry white space and become a true security token exchange. While traditional exchanges appear to be getting bogged down by varying vested interests of exchange participants that they have a longstanding relationship with, cryptocurrency exchanges and digital asset broker-dealers on the other hand are struggling at attaining a securities exchange licence. Therefore, we expect licensing to play an important role in opening the door for exchanges to offer a full suite of security token offerings in years to come.

IN ORDER FOR THESE EXCHANGES TO SUCCESSFULLY TRANSITION TO THE SECURITY TOKEN SPACE, THEY NEED TO TAKE INTO CONSIDERATION NOT ONLY THE INCREASING REGULATORY SCRUTINY BEING FELT ACROSS THE SECURITY TOKEN UNIVERSE, BUT ALSO THE NEED TO ADOPT NEW TECHNOLOGIES TO SUPPORT A BLOCKCHAIN-BASED ASSET LIFECYCLE

SECTION 7
THE ULTIMATE BENEFICIARIES

With blockchain technology possessing immense potential to optimise operations throughout the end-to-end asset trading lifecycle, we believe that the adoption of security tokens will ultimately benefit two key groups of stakeholders: (1) issuers and (2) investors (see Figure 32).

FIGURE 32: ISSUERS & INVESTOR IMPLICATIONS



Source: Quinlan & Associates analysis

IMPLICATIONS FOR ISSUERS

ACCELERATED ISSUANCE (PROGRAMMABILITY DRIVEN)

By leveraging smart contract capabilities to optimise labour intensive administrative processes, such as regulatory filing and corporate actions associated with the security, the issuance process can be greatly accelerated. This holds especially true for secondary issuances, as the number of shares in circulation could simply be adjusted and re-distributed, by altering the configurations embedded within the securities being traded.

WIDER INVESTOR BASE (LIQUIDITY DRIVEN)

As discussed earlier in the report, by allowing investors who were previously priced out of the market to invest in smaller fractions, fractionalisation can allow issuers to access a greater number of long-tail investors – namely, retail investors – who may have otherwise been discouraged by the traditionally high minimum investment size requirements.

AUDITABLE COMPLIANCE / REPORTING (DATA INTEGRITY / CYBERSECURITY DRIVEN)

In line with the aforementioned benefits of blockchain, transaction-related information in a security token can leave a trustworthy and transparent digital record for regulatory compliance purposes. This can help lift the operational burden on issuers, particularly with regard to regulatory reporting / filing efforts.

WITH BLOCKCHAIN TECHNOLOGY POSSESSING IMMENSE POTENTIAL TO OPTIMISE OPERATIONS THROUGHOUT THE END-TO-END ASSET TRADING LIFECYCLE, WE BELIEVE THAT THE ADOPTION OF SECURITY TOKENS WILL ULTIMATELY BENEFIT TWO KEY GROUPS OF STAKEHOLDERS: (1) ISSUERS AND (2) INVESTORS

IMPLICATIONS FOR INVESTORS

WIDER PRODUCT ACCESS (PROGRAMMABILITY / LIQUIDITY DRIVEN)

While blockchain technology is currently supporting broadly six types of digital assets, these are presently not accessible to investors in a safe and well-regulated environment. However, the holistic regulation of digital assets and convergence towards security token exchanges in the coming years should help investors gain access to a wider range of alternative investments. Moreover, the earlier outlined concept of fractionalisation should also serve to make previously out-of-reach investments more affordable and thereby more accessible.

24/7 MARKET ACCESS (DIRECT MARKET ACCESS MODEL DRIVEN)

Although pre-market and post-market trading hours are available for retail investors at certain traditional exchanges, the limited liquidity and high levels of volatility during non-market hours are more favourable for professional investors. In fact, inexperienced traders are more likely to be hit by sudden fluctuations in share prices during these hours, when there may be major company announcements without prior notice.

The adoption of a direct market access model by security token exchanges could eliminate the restrictions posed by opening and closing times, making the market not only 24/7 accessible for investors, but also arguably providing a fairer investment environment (see Figure 33).

FIGURE 33: TRADING HOURS

TRADITIONAL EXCHANGE

Exchange Name	Trading Days (Per Year)	Trading Hours (Per Day)
NYSE	253 days	6.5 hours
Nasdaq	253 days	6.5 hours
London Stock Exchange	255 days	8.5 hours
SGX	252 days	7.0 hours
HKEX	248 days	5.5 hours
ASX	255 days	6.0 hours
CSE Canadian Securities Exchange	244 days	6.5 hours

CRYPTOCURRENCY EXCHANGE

Exchange Name	Trading Days (Per Year)	Trading Hours (Per Day)
Huobi	365 days	24 hours
BINANCE	365 days	24 hours
coinbase	365 days	24 hours
kraken	365 days	24 hours
BITFINEX	365 days	24 hours
GEMINI	365 days	24 hours
OKEX	365 days	24 hours

DIGITAL ASSETS BROKER-DEALER

Exchange Name	Trading Days (Per Year)	Trading Hours (Per Day)
ARCHAX	365 days	24 hours
INX	365 days	24 hours
tZERO	365 days	24 hours
Blocktrade	365 days	24 hours
openfinance	365 days	24 hours
STOGLOBAL	365 days	24 hours
VNX EXCHANGE	365 days	24 hours

Highlight

1,672 hours Traditional Exchange Average → **8,760 hours** Blockchain-based Exchange Average = **5.24x** Annualised Difference Multiple

Source: Quinlan & Associates analysis

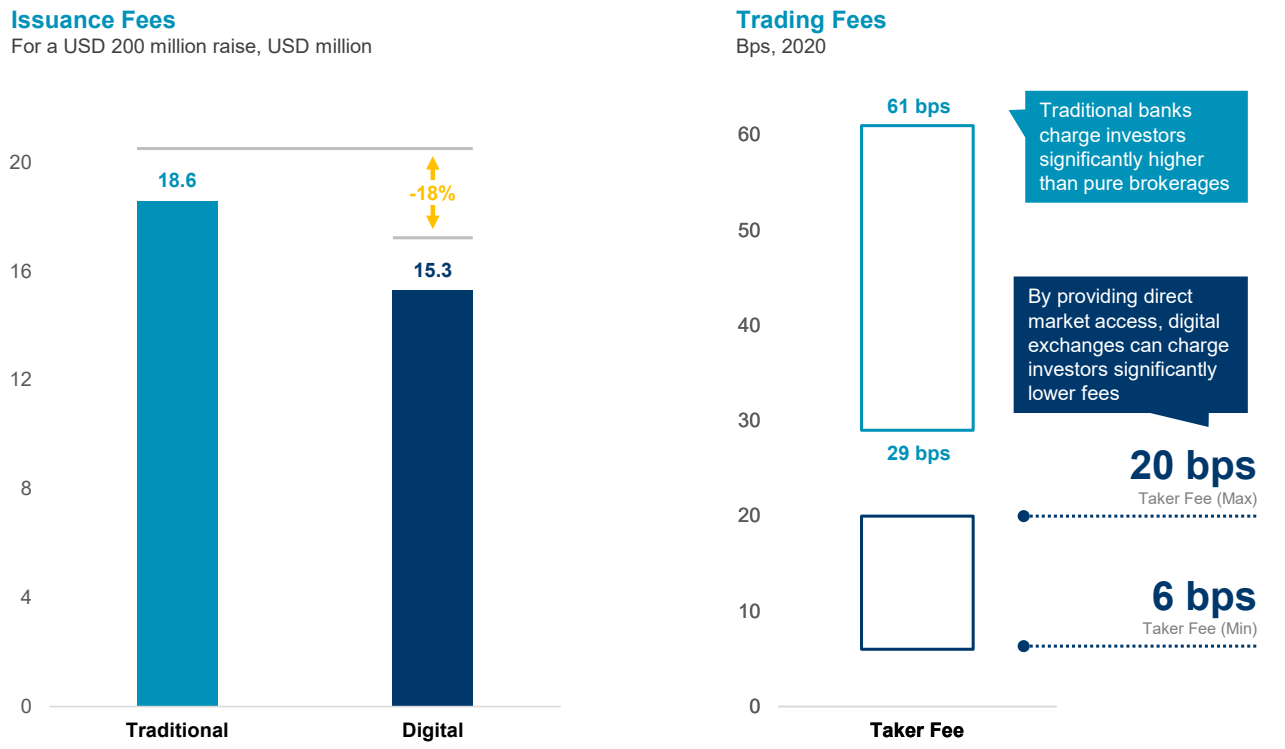
INSTANT TRADE SETTLEMENT (PROGRAMMABILITY DRIVEN)

Traditionally, buyers and sellers have had to wait T+2 (i.e. two business days) to get their transaction settled on their respective accounts. Conversely, by disintermediating unnecessary middlemen through the use of blockchain, the settlement time can be reduced to near instantaneous, thereby giving investors immediate access to their assets and funds.

HOLISTIC IMPLICATIONS

From a financial perspective, the overall cost borne by both issuers as well as investors should become cheaper. In the case of issuers, through minimising labour-intensive administrative processes, such as printing, registration, regulatory filing, etc., the cost of issuance could decrease by as much as 18%. For investors, the disintermediation of several market players will help remove unnecessary costs, such as brokerage and settlement fees, resulting in the average fees reducing significantly from 45 bps (median point) to 13 bps (median point) (see Figure 34).

FIGURE 34: COST IMPLICATIONS FOR ISSUERS & INVESTORS



Note: The issuance fee on the left includes the followings: underwriting fee, legal fees, accounting fees, printing fees, registration fees, exchange listing fee, and other miscellaneous fees
Source: PwC, exchange websites, Quinlan & Associates estimates

SECTION 8
CASE STUDY: FUSANG

Fusang is the first fully regulated securities exchange in Asia for digital assets and security tokens. Fusang provides an end-to-end blockchain-based securities issuance, public listing and trading platform – enabling all stakeholders to reap the benefits of blockchain technology in properly regulated security tokens. Through the use of blockchain, the Exchange offers a 24/7 trading platform to both issuers and investors (see Figure 35).

FIGURE 35: FUSANG VALUE PROPOSITION

1	FULLY-LICENSED AND COMPLIANT WITH…	**Digital Regulations** …supporting strong growth of next generation digital assets	✓
		Traditional Regulations …streamlining the issuance and trading of traditional securities	✓
2	END-TO-END SERVICE PROPOSITION FOR…	**Issuers** …supporting issuers along their capital raising journey	✓
		Investors …providing a comprehensive and seamless investor experience	✓
3	UNMATCHED DIGITAL PLATFORM ENABLING…	**End-to-End Fulfilment** …for issuers and investors across the entire value chain	✓
		Streamlined User Journey …by removing intermediaries to optimise the client experience	✓

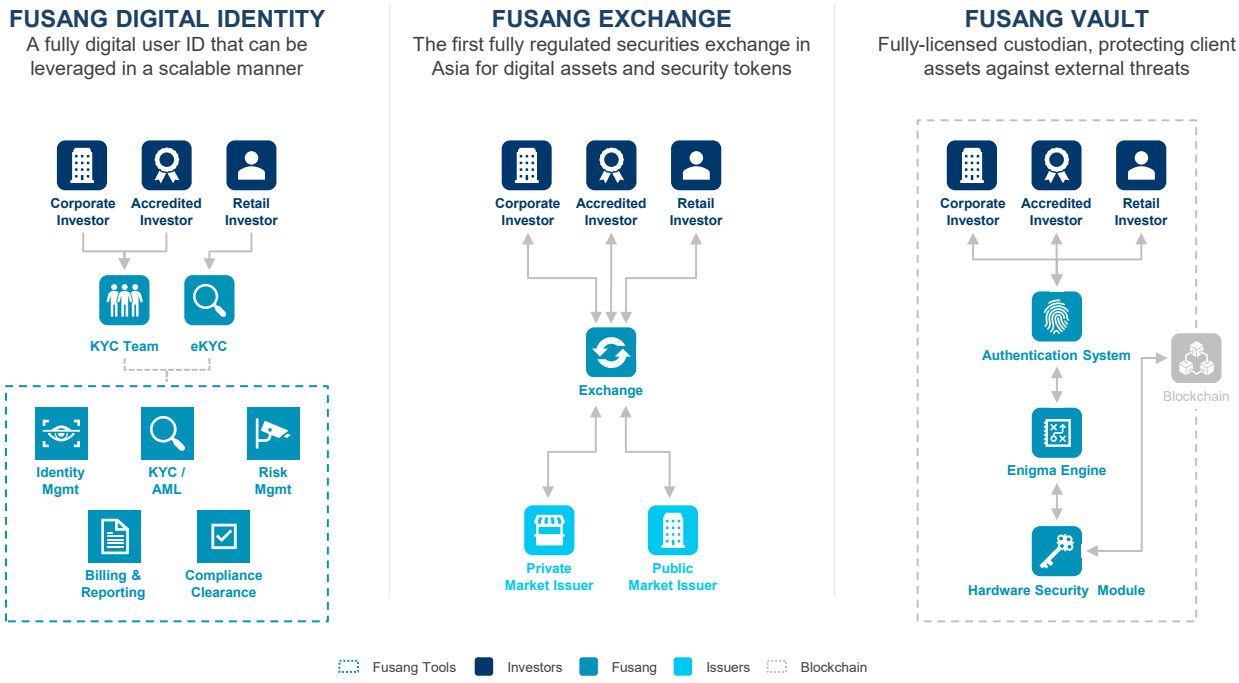
Source: Fusang, Quinlan & Associates analysis

The Exchange is licensed as a securities exchange in Labuan, Malaysia, and all products and services offered by it are fully regulated and protected by the Financial Services Authority, as per both digital and traditional regulatory standards. Thus, both issuers and investors can safely issue and invest their assets within a protected environment. The Exchange supports the public listing of companies, and direct market access by retail traders.

PRODUCT / SERVICE OFFERINGS

Fusang offers three core products to support its issuer and investor services: (1) Fusang Digital Identity; (2) Fusang Exchange; and (3) Fusang Vault (see Figure 36).

FIGURE 36: FUSANG OFFERINGS



Source: Fusang, Quinlan & Associates analysis

1. FUSANG DIGITAL IDENTITY ("FDI")

FDI is a fully digital user ID that can be leveraged in a modularised and scalable manner. Fusang leverages FDI to provide a seamless client onboarding service (e.g. KYC, AML, and a risk-based client assessment), to speedily onboard retail and corporate clients with minimal friction. The onboarding process is fast, easy, comprehensive, and compliant.

FDI leverages advanced technologies throughout the entire customer onboarding process. Pre-onboarding tools include facial recognition and optical character recognition, and post-onboarding tools consist of a suite of intelligent software for risk management and regulatory reporting purposes. Through the use of these technologies, FDI allows clients to be onboarded in a matter of minutes.

2. FUSANG EXCHANGE

Fusang Exchange is the core platform connecting issuers and investors. The Exchange offers both public and private securities market platforms with comprehensive quantitative and qualitative listing requirements (e.g. minimum shareholder capital requirements, submission of audit reports, maintenance of relevant licenses, etc.), ensuring that only the highest-quality companies are listed on both platforms.

Leveraging various best-in-class technology solutions, together with in-depth expertise, Fusang Exchange offers a full suite of services to issuers, supporting clients across their entire journey towards a public offering: (1) issuer onboarding; (2) deal structuring; (3) market testing; and (4) asset issuance.

Leveraging smart contacts powered by blockchain technology, the exchange offers issuers automated audit and compliance clearance, together with an issuance process that comes with minimal floatation costs when compared to a traditional public offering, which allows the exchange to deliver 24/7 market access with ample liquidity, near instant trading settlement, access to a global investor network, and direct market access (see Figure 37).

FIGURE 37: PRODUCT / SERVICE BENCHMARKING

		Traditional Exchanges		Exploratory Exchanges		Digital Asset Brokers		Cryptocurrency Exchanges		
		NYSE	HKEX	ASX	CSE	ARCHAX	tZERO	coinbase	BINANCE	
DIGITAL ASSETS	Security Tokens	×	×	✓	✓	✓	✓	×	×	✓
	Cryptocurrencies	×	×	×	×	✓	✓	✓	✓	✓
	Other Digital Assets	×	×	×	×	×	×	✓	✓	✓
ISSUANCE CAPABILITY	Public Issuance	✓	✓	✓	✓	-	-	×	×	✓
	Private Placement	×	×	×	×	✓	✓	×	×	✓
INFRASTRUCTURE DISINTERMEDIATION	Clearing House	×	×	✓	✓	-	-	✓	✓	✓
	Central Depository	×	×	✓	✓	-	-	✓	✓	✓
	Transfer Agency	×	×	✓	✓	-	-	✓	✓	✓
	Transaction Aggregators	×	×	×	×	-	-	✓	✓	✓

Highlight ✓ Applicable - Dependent × Inapplicable

Source: Fusang, Quinlan & Associates analysis

Relative to traditional exchanges and crypto exchanges, Fusang offers investors comprehensive market access and a wide range of products, while its high level of disintermediation results in low handling fees for all exchange participants under a fully regulated and compliant environment.

3. FUSANG VAULT

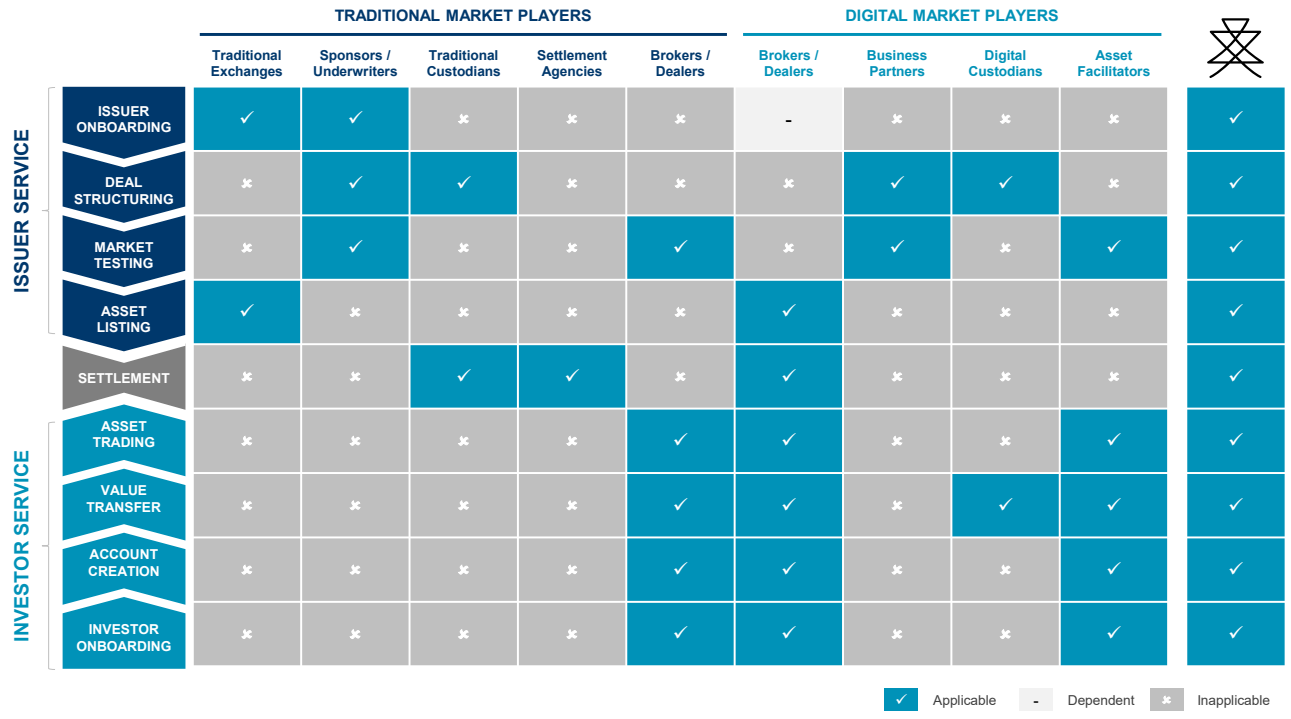
Fusang Vault is a licensed digital assets custodian, providing an additional layer of security for customers for a wide-variety of digital assets, ranging from cryptocurrencies to security tokens, and including fiat currencies. The custody service is equipped with an authentication system, a hardware security module for encrypting private keys, and leverages blockchain for network security.

The custody service aims to provide security and assurance across client assets against any potential risk of attack, ranging from external cyber-attacks to internal theft. The vault is compatible with major digital assets, accessible 24/7, and customisable to clients' needs to provide the best experience for users.

CONCLUSION

Unlike traditional securities markets with highly fragmented service fulfilment across both issuer and investor lifecycles, Fusang offers an end-to-end fulfilment journey to both issuers and investors with its operational ownership throughout both value chains (see Figure 38).

FIGURE 38: END-TO-END FULFILLMENT



Source: Fusang, Quinlan & Associates analysis

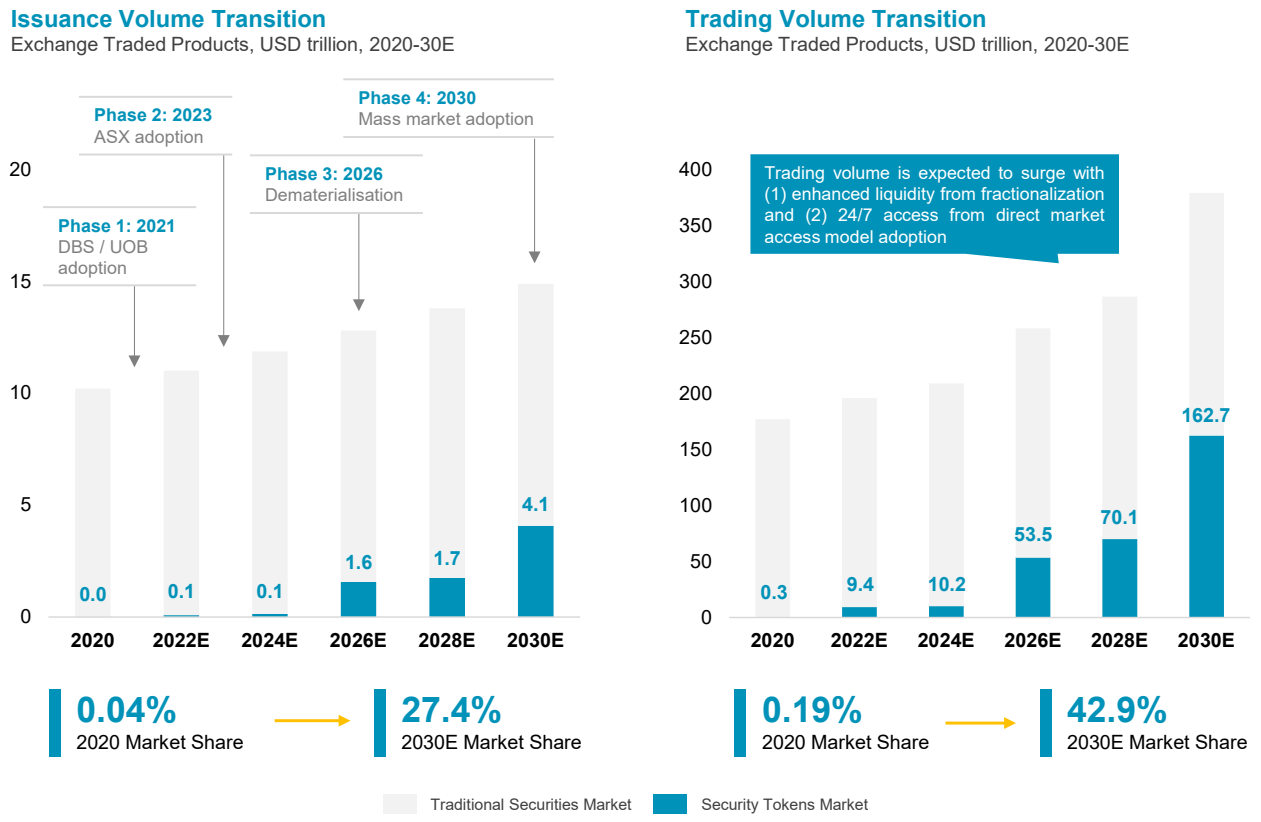
Fusang aims to provide both issuers and investors a faster, cheaper, and better client experience, by adopting all the right technologies and executing them under a properly licensed regime.

SECTION 9
PREPARING FOR CHANGE

TRANSITION TOWARDS SECURITY TOKEN

Although security tokens may not have experienced widespread adoption to date, we see tremendous growth potential in the coming decade, with a number of key milestones on the horizon to propel institutional and mass market adoption (see Figure 39).

FIGURE 39: VOLUME TRANSITION (2020-30E)



Note: issuance and trading volume do not include over-the-counter products
Source: Dealogic, World Federation of Exchanges, Quinlan & Associates estimates

In addition to a spate of new players such as Fusang and DDEx entering the market, we see the ASX's adoption of blockchain technology to support securities settlement processes in 2023 as a key inflection point, laying the foundation for many other traditional exchanges to follow suit. Furthermore, as regulators in multiple jurisdictions push for dematerialisation, we anticipate 2026 to be a 'watershed moment' for the industry, marking the beginning of the end for paper-based securities worldwide. In addition, with cryptocurrency exchanges facing increasing scrutiny from financial regulators across the globe, we also expect a growing number of these players to transition to licensed security token exchanges that are capable of supporting security token issuances.

With prominent players in the market expected to gravitate towards security token and showcase the resulting benefits, we anticipate mass market players to follow suit as well, leading to widespread market adoption by 2030. As such, we expect approximately 27.4% of the issuance volume to shift to the security token market, reaching approximately USD 4.1 trillion by the end of 2030.

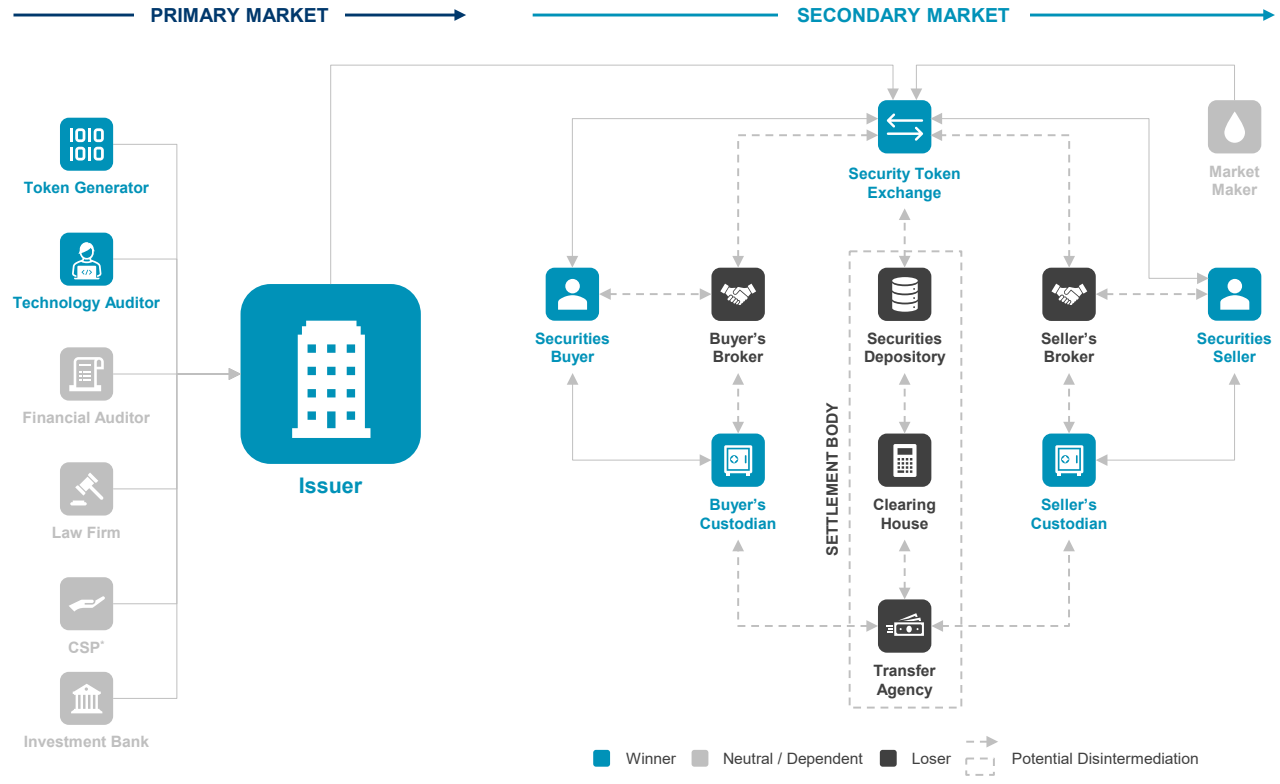
With blockchain offering enhanced liquidity through divisibility and security token exchanges expected to adopt the direct market access model to provide 24/7 market access, we also expect listed trading volumes to surge at a rapid pace, reaching USD 162.7 trillion by the end of 2030.

ALTHOUGH SECURITY TOKENS MAY NOT HAVE EXPERIENCED WIDESPREAD ADOPTION TO DATE, WE SEE TREMENDOUS GROWTH POTENTIAL IN THE COMING DECADE, WITH A NUMBER OF KEY MILESTONES ON THE HORIZON TO PROPEL INSTITUTIONAL AND MASS MARKET ADOPTION

MARKET OPPORTUNITY

With a sizeable shift expected to take place in the capital markets universe, from traditional securities to security tokens, it is interesting to note how the role performed by various players in the securities market could evolve as well, especially given the possible disintermediation of select players and the potential adoption of the direct market access model (see Figure 40).

FIGURE 40: LANDSCAPE OF SECURITY TOKEN MARKET PLAYERS



Note: *Corporate Service Provider
Source: Quinlan & Associates analysis

With stakeholders expected to gravitate away from the traditional securities ecosystem and towards a maturing security token ecosystem, we estimate a significant shakeup in the industry and foresee a number of potential winners and losers in this equation (see Figure 41).

FIGURE 41: POTENTIAL WINNERS AND LOSERS

	Security Token Market Player	Revenue Impact	Level of Impact	Description	Key Consideration
PRIMARY MARKET	Token Generators	↑	■■□□□	Expected to benefit with a growth in token issuance volumes	Potential tie-up with security token exchanges
	Technology Auditors	↑	■□□□□	Growth of security token exchanges should help technology auditors	Brand building towards being recognised for strong audit quality
	Financial Auditors	→	■□□□□	Not expected to experience significant impact	Develop relevant expertise in security token financial auditing
	Corporate Service Providers	→	■□□□□	Not expected to experience significant impact	Develop relevant expertise in security token issuance needs
	Law Firms	→	■□□□□	Not expected to experience significant impact	Develop relevant expertise in security token issuance needs
	Sponsors / Underwriters	→	■□□□□	Not expected to experience significant impact	Develop relevant expertise in security token issuance needs
SECONDARY MARKET	Security Token Exchanges	↑	■■■■■	May emerge as the big winners in the impending shift to security token	Attempt to become early to market, in terms of mainstream reach
	Custodians	↑	■■□□□	Revenue growth potential from the growth in digital asset market cap	Develop capabilities to service a broad variety of digital assets
	Market Makers	→	■■□□□	May be driven towards niche pockets with low levels of liquidity	Explore various digital asset instruments to build capability
	Brokers	↓	■■■■■	Retail mass market may cut out brokers to capitalise on lower fees	Focus on institutions and professional investors
	Settlement Bodies	↓	■■■■■	Settlement bodies may be disintermediated via blockchain	Try to either carve out an alternative value proposition or pivot
	Transfer Agencies	↓	■■■■■	Transfer agencies may be disintermediated via blockchain	Try to either carve out an alternative value proposition or pivot

Favourable ↑ → ↓ Unfavourable Low ■■■□□ High

Source: Quinlan & Associates analysis

WINNERS

As more companies embrace the security token route to raise capital, token generators may see an uplift in demand. Institutional-grade custodians that are quick on the uptake of digital assets and can accumulate sizeable assets under custody ("AuC") may also prove to be major beneficiaries, given the astronomical growth rates in the market capitalisation of the digital assets universe. Technology auditing firms, which are responsible for verifying the smart contract or underlying blockchain, are likely to see new revenue opportunities come to the table as well.

However, over and above these groups of market players, security token exchanges are expected to emerge as the biggest winners. In addition to the benefits outlined earlier in this report, we may also see several security token exchanges offering in-house token generation and digital asset custody services, providing competition to specialist token generators and standalone digital asset custodians.

NEUTRAL / DEPENDENT

In the case of players such as corporate service providers ("CSPs"), law firms, sponsors / underwriters, and financial auditing firms, security token may prove to be a double-edged sword. While the use of blockchain may lead to a reduction in the time and therefore costs associated with issuances, resulting in a drop in fees for these players, it could also lead to a rise in the number of issuers cropping up. As a result, we expect there to be a net-zero impact on these players as a whole. However, there remains a lucrative opportunity for players that are able to achieve institutional-grade expertise in the security token arena at an early stage, to be able to wrestle away market share from their relatively passive peers.

With respect to brokers that deal with institutions and professional investors (e.g. high and ultra-high net worth individuals, etc.) in particular, these clients may continue to pass through them, relying on them as a trusted third-party entity to manage their vast funds through.

LOSERS

The tectonic shift from traditional securities to security tokens is expected to result in 'creative destruction', which could see fortunes turn sour for some market players. As highlighted previously, the direct market access model and the case for disintermediation could result in a highly negative impact on retail customer-oriented brokers, settlement bodies, market makers, and transfer agencies, potentially taking them out of the equation, entirely. In the case of brokers that target the mass market, retail investors may choose the direct route by leveraging the direct market access model, to save fees, thereby leaving retail-oriented brokers disintermediated. Market makers may also be disintermediated from certain areas of the digital assets universe that are already enjoying vast swathes of liquidity, and instead be relegated to niche parts of the market that suffer from low levels of liquidity.

SECTION 10
CONCLUSION

The advent of blockchain technology and its ongoing evolution has led to the introduction of a myriad of digital assets. While the space is still in its relatively infancy, it is entering a period of regulatory harmonisation, which will likely lead to a shakeup in the fortunes of the various types of digital assets. We are bearish on the likes of tethered stablecoins, benefits tokens, and platform access tokens, while we expect moderate levels of growth for private native cryptocurrencies and real estate tokens. However, we anticipate tremendous growth prospects for public native cryptocurrencies, CBDCs, and security tokens.

With more and more unregulated players in the digital asset space coming under the ambit of regulators, we expect to see a growing shift towards licensed and fully regulated business practices by market participants, opening the floodgates for presently untapped institutional pools of capital. We believe security tokens will emerge as a key winner of this transition, given their closer alignment to institutional investment mandates and fiduciary obligations, spurring a wave of new issuance and trading opportunities for players in traditional capital markets.

With the rise of a well-regulated global security token regime firmly on the cards, market participants are gearing up to battle it out for a piece of an estimated USD 4.1 trillion listed security token issuance (and USD 162.7 trillion listed security token trading volume) by 2030. Chief amongst these participants are aspiring security token exchanges, which are aiming to disrupt the traditional capital markets ecosystem, disintermediate middlemen, and emerge as a new dominant force in the up-and-coming digital asset landscape.

However, the transition from traditional securities to security tokens is not expected to be smooth sailing. For those entities that have thus far been focusing primarily on cryptocurrencies, the regulatory engagement and licensing journey may prove to be somewhat arduous. At the same time, traditional securities exchanges, although licensed, continue to struggle with their broader digital transformation efforts. In the case of other market participants that are sitting on the fence, waiting for others to take the plunge and provide them with a proof-of-concept (“PoC”), it may prove too late for them to dip their own toes into the security token space, if their peers are ready to support mass market adoption.

The divergence in attitudes between players that are actively innovating and those that remain on the sidelines could see new national security token exchanges crop up and form monopolies, along with other players such as security token custodians and token generators. While market participants such as law firms, sponsors, and financial auditors are expected to remain relevant, those that can carve out expertise in the security token space at an early stage will be well positioned to capitalise on a first-mover advantage in this space. However, a number of traditional intermediaries, including brokers, settlement bodies, market makers, and transfer agencies, are likely to face being disintermediated, being removed from the equation altogether.

While still early days, we believe security tokens are at a major turning point and are set to fundamentally reshape the traditional capital markets ecosystem as we know it. For market participants who can successfully pivot their business models to capitalise on this immense growth potential, the future remains bright in cracking the code.

SECTION 11
HOW CAN WE HELP?

Our consultants have extensive experience working with financial institutions in developing their digital assets strategies. Our project work typically involves supporting our clients across their full strategy and implementation needs, including:

1. STRATEGY DEVELOPMENT

- Review industry, market, and regulatory developments to identify key opportunities and gaps in the digital assets market, including market sizing of specific revenue opportunities
- Conduct detailed competitor analysis, with benchmarking against relevant peers and industry best practices, to identify capability gaps (e.g. product differentiation, technological sophistication, etc.)
- Establish company vision and mission, based on internal capabilities and core strengths
- Identify appropriate product development opportunities and expansion pathways (i.e. organic growth vs. acquisition), based on financial, strategic, and operational fit
- Develop a detailed business case outlining revenue potential and cost implications

2. REGULATORY APPROVAL & OPERATING MODEL DEVELOPMENT

- Help prepare the required application documents (including post-approval documentation) to acquire relevant licences (e.g. ATS, MTF, broker-dealer licence, etc.)
- Provide ongoing execution support around the design and implementation of compliance processes, regulatory engagement, and refinements to overall operations
- Identify required policies, processes, and systems to support the client's growth strategy, including people / organisation, operations / processes, risk / compliance, and IT / infrastructure
- Establish and oversee an appropriate Project Management Office ("PMO") team to support initial business entity set-up and ongoing operations
- Establish a robust execution plan, including outlining key workstreams, roll-out prioritisation, project owners / sponsors, and project deliverables, along with supporting timelines and key milestones

3. CORPORATE TRAINING

- Provide world-class corporate training programmes focused on developing employees' soft and technical skills through tailored learning and development solutions, including leadership & management, sales & marketing, communication and engagement, creativity & innovation, cultural change, and strategic thinking

QUINLAN
&ASSOCIATES

STRATEGY WITH A DIFFERENCE

The information and opinions in this report were prepared by Quinlan & Associates. This report is not financial or investment advice and should not be relied upon for such advice or as a substitute for professional accounting, tax, legal or financial advice. Quinlan & Associates has made every effort to use reliable, up-to-date and comprehensive information and analysis in this report, but all information is provided without warranty of any kind, express or implied. Quinlan & Associates disclaims any responsibility to update the information or conclusions in this report. Quinlan & Associates accepts no liability for any loss arising from any action taken or refrained from as a result of information contained in this report or any reports or sources of information referred to herein, or for any consequential, special or similar damages even if advised of the possibility of such damages. This report is not an offer to buy or sell securities or a solicitation of an offer to buy or sell securities.

Quinlan & Associates currently or may in the future engage with, seek to do business with, or hold positions in, some of the companies mentioned in its reports, which may give rise to potential conflicts of interest. Quinlan & Associates will actively manage any conflicts of interest that may arise (including by implementing appropriate information barriers and other conflicts management procedures and safeguards), in order to preserve confidentiality and to ensure that Quinlan & Associates remains objective and independent with regards to the contents of its reports.

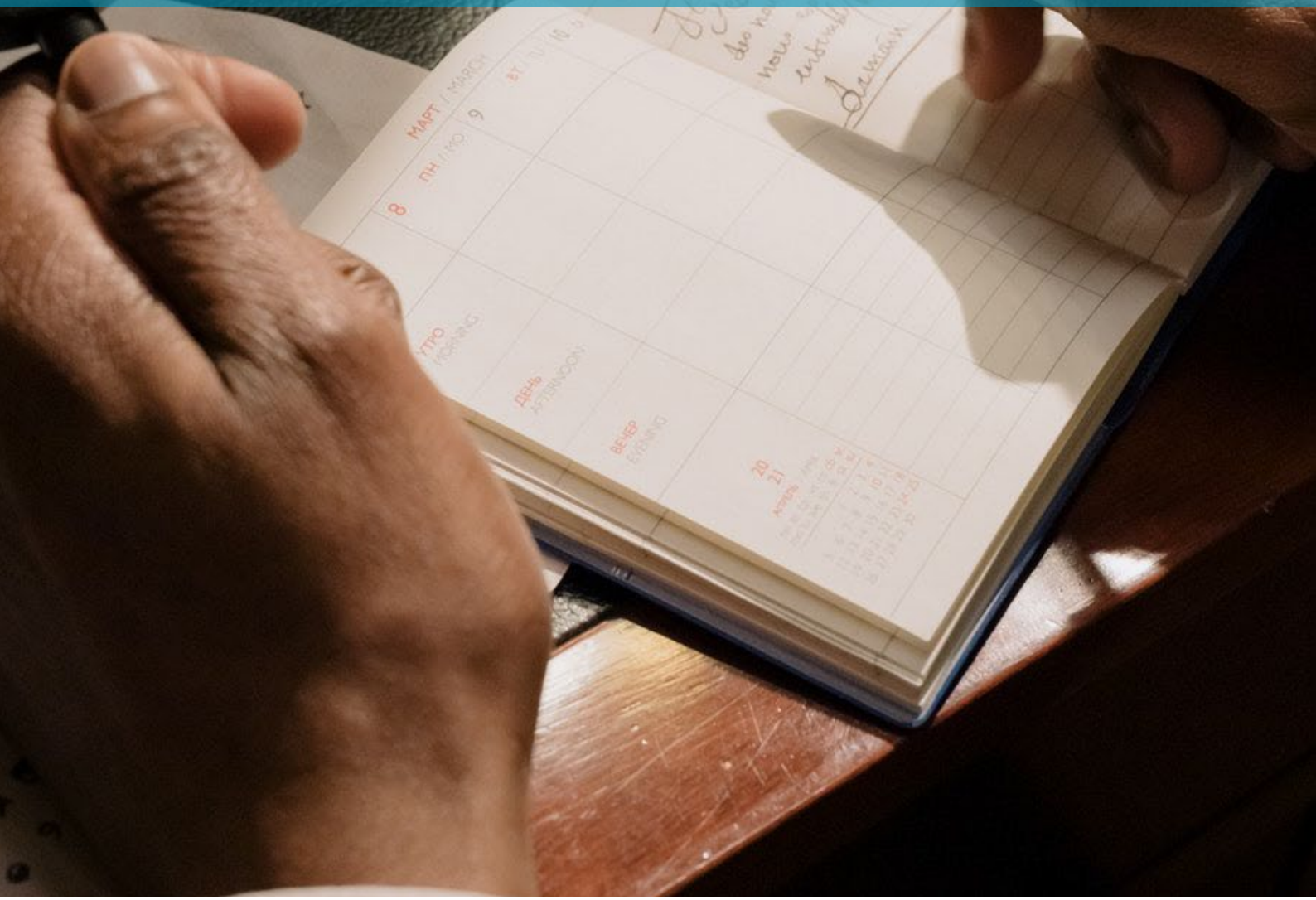
ABOUT US

Quinlan & Associates is a leading independent strategy consulting firm specialising in the financial services industry.

We are the first firm to offer end-to-end strategy consulting services. From strategy formulation to execution, to ongoing reporting, communications, and employee training, we translate cutting-edge advice into commercially executable solutions.

With our team of top-tier financial services and strategy consulting professionals and our global network of alliance partners, we give you the most up-to-date industry insights from around the world, putting you an essential step ahead of your competitors.

Quinlan & Associates. Strategy with a Difference.



@ enquiries@quinlanandassociates.com | www.quinlanandassociates.com | +852 2618 5000
Level 19, Two International Finance Centre, 8 Finance Street, Central, Hong Kong SAR