

A Model Crypto-Asset Regulatory Framework (2019)

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A: OVERVIEW:²

A stylized ‘crypto-asset’³ regulatory framework (‘Framework’) is presented⁴ and described below. It is designed to capture the regulatory permutations and implications of the most prevalent and evolving forms of tradable value created through the use of evolving cryptographically-based (‘crypto’) schemes, as well as their stylized position in a financial ecosystem. The most prevalent of these value-based schemes are based on what is now known as distributed ledger technologies (DLTs), with the main type of DLT in use known as ‘blockchain’ technology.⁵

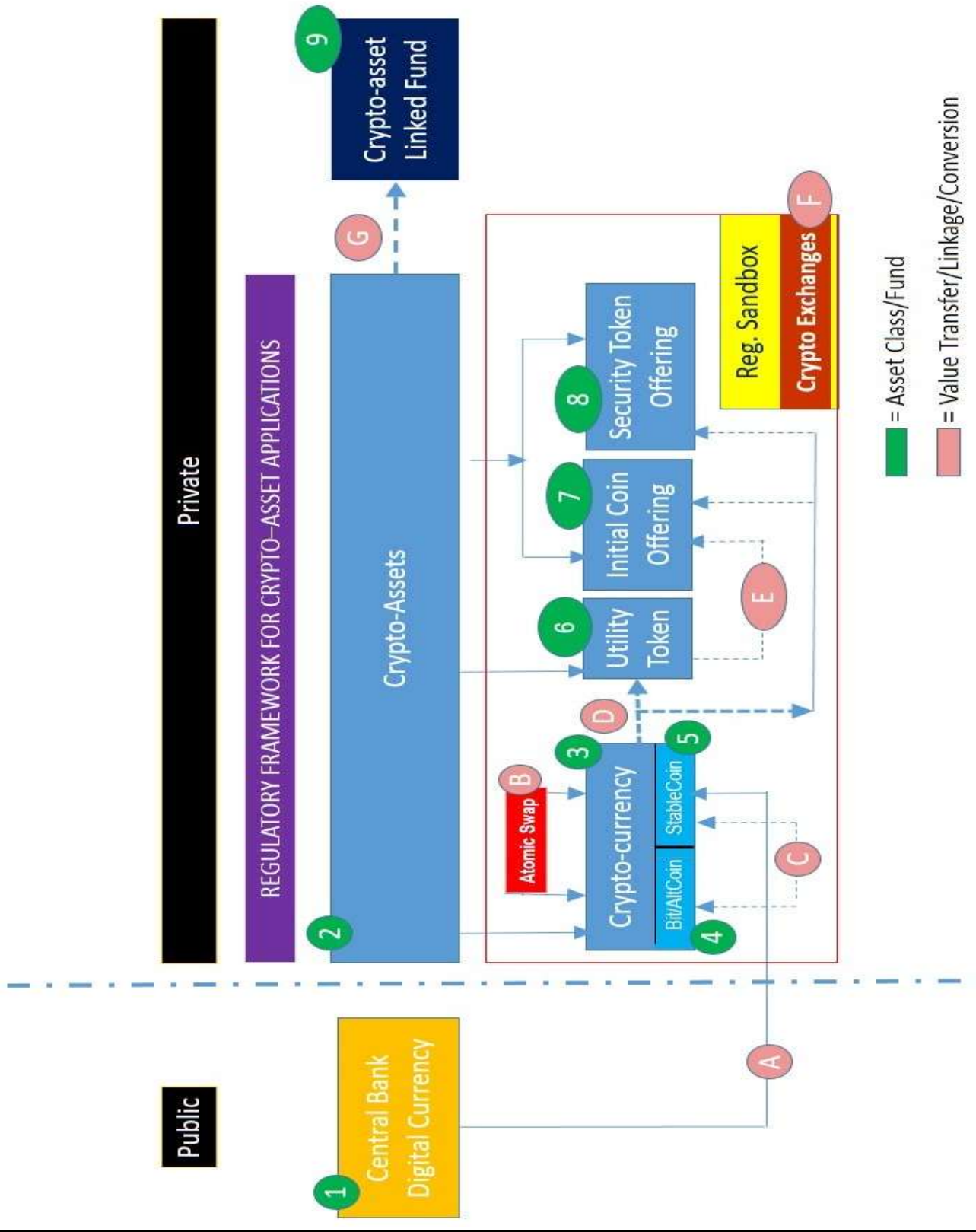
Value-based applications⁶ that can be derived or generated from use of DLTs are known in this Framework as (private) crypto-assets. They can be distinguished⁷ from (public) applications of crypto-based value such as those planned by sovereign states for use as legal tender.⁸

The main focus of the Framework is on these evolving ‘private’ use of crypto-assets and their representation as cryptographically-secure and traceable ‘tokens’ of value. These tokenized assets can be traded – that is transferred or exchanged - within regulated or unregulated exchanges, or directly, securely and independently between parties without the need for a centralized exchange. Together they form what could be termed the ‘crypto-economy.’

All these developments challenge the four corners of existing legal and regulatory frameworks with, as yet, no global unanimity as to which regulators have oversight over all or some components of these crypto-assets. The overall goal of any regulation would be to fasten the activities of the most proximate regulators to particular asset classes or value transfer/exchange mechanisms so as to avoid regulatory arbitrage. Where there are no proximate regulations to do so, regulatory sandboxes by the most proximate regulators could be employed.

The Framework presented below is designed to systematize the evolving asset types – both crypto-based or via linked funds - and their place in a financial ecosystem, assess the most proximate regulators, as well as describe their ostensible interlocking relationships. The stylized framework can then be ‘super-imposed’ onto a particular jurisdictions’ legal and regulatory environment and then used as template for allocating regulatory responsibilities. Laws and regulations as well as an enabling environment⁹ could then be developed to allow these crypto-assets to be further integrated into a financial ecosystem. Some individual components of this stylized Framework are already in use or have been announced in part in a number of jurisdictions.¹⁰

B: STYLIZED CRYPTO-ASSET FRAMEWORK



C: COMPONENT DESCRIPTIONS

C1 PUBLIC

Central Bank Digital Currencies (CBDC) **(1)** - also known as Digital Fiat Currencies (DFCs) – are any products provided by the central bank (as a proxy for the state), particularly when used as a means of payment. CBDCs/DFCs may act as the source of value for private crypto-assets.

C2 PRIVATE

Private crypto-linked ecosystems in this Framework are crypto-assets and crypto-asset-linked investments funds. Although both have roots in the ‘crypto-economy,’ only crypto-assets in their native form are crypto-graphically secured or have DLT-based technology components.

(2) Crypto-assets are private assets – consisting of parts **(3)-(8)** - developed using crypto-graphic and/or distributed ledger technology (DLT) based products and systems are known as **crypto-assets**.

Within these class headings are:

(3) Crypto-currencies (acting as means of payment for goods and services).¹¹

Potential Regulator(s):

- Anti-Money Laundering Regulator
- Commodity Regulators
- Central Bank
- Securities Regulator

(4) As **Bitcoin/Altcoins**, they may be based on Bitcoin or its derivatives, with a free-floating value, but which may not be centrally issued, or ‘mined.’

Potential Regulator(s):

- Anti-Money Laundering Regulator
- Commodity Regulators
- Central Bank
- Securities Regulator

(5) As so-called **stable coins**, their value may be based on/linked-to a free-floating fiat currency; or some other recognizable asset class such as gold or silver.

Potential Regulator(s):

- Anti-Money Laundering Regulator
- Commodity Regulators
- Central Bank
- Securities Regulator

(6) **Utility Tokens** are cryptographically-secured equivalents of tickets or logins for permissioned use a product or service. Their value may be free-floating.

Potential Regulator(s):

- Anti-Money Laundering Regulator
- Consumer Protection Regulator

(7) **Initial coin** offerings are cryptographically-secured equivalents (‘tokens’) of crowd-funding initiatives and may or may be subject to regulations on investments.

Potential Regulator(s):

- Anti-Money Laundering Regulator
- Commodity Regulators

- Central Bank
- Securities Regulator

(8) **Security token offerings** (STOs) are cryptographically-secured equivalents ('tokens') of regulated investments that are subject to regulations on public investments and which are backed by readily identifiable assets (tangible or intangible).

Potential Regulator(s):

- Anti-Money Laundering Regulator
- Commodity Regulators
- Central Bank
- Securities Regulator

(9) **Crypto-asset Linked Funds** may operate like any other non-crypto-based fund that tracks baskets of assets or a single asset and which would be subject to changes in price throughout the day as investors buy and sell. The former though is based on, or tracks, one or more liquid digital tokens and depending on the design, the fund may own some digital tokens or a derivative thereof. Investors would receive a proportion of the profits generated by those underlying assets or from bets on movements on the underlying assets. They can also track multiple digital tokens at the same time. The funds' assets may be traded through an exchange.

C3 VALUE TRANSFER/LINKAGE/CONVERSION METHODS

(A) CDBC's (1) could be exchanged/concerted to use as stable coins (3)

(B) Crypto-currencies (3) can be exchanged between persons without the need for a centralized crypto-exchange (F) through the technical process of atomization.

(C) Bitcoin/AltCoins (4) could be linked to stable coins (5) to decrease volatility. Both types are crypto-currencies (3)

(D) Crypto-currencies (3) can be used to pay for Utility Tokens (6); ICO tokens (7); and STO tokens (8).

(E) Depending on regulations and the warranties of their creators, unregulated UT (7) may assume the characteristics of ICOs and thus may fall under securities law.¹²

(F) Crypto-currencies (3) can be exchanged between one another via a regulated or unregulated centralized crypto-exchanges (F).

(G) The value of crypto-assets (2) can be linked to regulated crypto-asset linked funds (10).

C4 REGULATORY SANDBOXES

Because crypto-currency platforms are a relatively new phenomenon, with asset classes that are not necessarily tradable on conventional securities-type exchanges, they may not be able to match the current requirements for 'conventional' exchange.¹³ These exchanges could rather be part of regulatory 'sandboxes,' an interim regulatory state that allows them to continue to trade while negotiating with a securities regulator on their licensing requirements before being approved.¹⁴

D: DEFINITIONS

Altcoin

Altcoin is a combination of two words: 'alt' and 'coin'; alt signifying 'alternative' and coin signifying (in essence) 'crypto-currency.' Thus together they imply a category of crypto-currency that is alternative to the digital currency Bitcoin.¹⁵

Bitcoin

Bitcoin is a crypto-currency, a form of electronic cash. It is a decentralized digital currency without a central bank or single administrator that can be sent from user-to-user on the peer-to-peer bitcoin network without the need for intermediaries. A number of alternatives/derivatives of Bitcoin are in existence, including Bitcoin Cash, Bitcoin Gold; Bitcoin XT; and Bitcoin Unlimited

Blockchain

A blockchain is a type of distributed ledger technology. It is updated in groups of transactions called blocks. Blocks are then chained sequentially via the use of cryptography to form the blockchain.¹⁶ They are tamper evident and tamper resistant implemented in a distributed fashion without a central repository and usually without a central authority. At their basic level, they enable a community of users to record transactions in a shared ledger within that community, such that under normal operation of the blockchain network no transaction can be changed once published.¹⁷ The process of verifying that the data can be added to the chain is known as consensus. The blockchain as a ledger, points to external data and will not store this external data on a block itself.¹⁸

Central Bank Digital Currency (CBDC)

Also known as a Digital Fiat Currency (DFSC), a CBDC is a digital representation of value generated through cryptographic techniques, and issued by state entities which may be used as a means of payment or value transfer and which may confer claims against the issuer.¹⁹ This can be distinguished from reserves or settlement balances held by commercial banks at central banks.²⁰

Coin

Coin refers to a representation of value that may be used as a means of payment, usually associated with crypto-assets. It is derived from BitCoin, but the varieties of use that have evolved in the 'crypto-economy' now use the moniker 'token' to refer to the type of usages, for example 'payment token' or 'utility token.'

Consensus

The process of verifying that new data in a blockchain block can be added to the existing chain is known as consensus.

Crypto-assets

Crypto-assets are digital representations of value, made possible by advances in cryptography and distributed ledger technology. Depending on the jurisdictional Framework, they may be classed as a means of payments (as a crypto-currency); a utility token, an ICO; a STO. They may form the basis of institutional exchange tradable funds such as derivatives and futures. For the most part, unlike the value of fiat currencies, which is anchored by monetary policy and their status as legal tender, the value of crypto assets rests solely on the expectation that others will also value and use them. Since valuation is largely based on beliefs that are not well anchored, price volatility has been high.²¹

Crypto-currency

A digital representation of value generated through cryptographic techniques by non-state entities or persons, and which may or may not be used as a means of payment or value transfer; which may or may not be issued; and which may or may not confer claims against an issuer. In some jurisdictions, they may be known as 'payment tokens.' Crypto-currencies are not e-money, which instead are digital representation of fiat currency used to electronically transfer value denominated in fiat currency and facilitated and controlled by a prudential regime.

Crypto Exchanges

Crypto exchanges are trading platforms where crypto-assets are traded.²² These may include trading in crypto-currencies (as Bitcoin, Bitcoin derivatives; and Altcoins); Utility Tokens; Initial Coin Offerings; as well as Security Coin Offerings). While they may continue to be unregulated in environments where regulation is not possible or where the political economy is such that is not desired, to decrease volatility in crypto-asset value, to enhance consumer protection; and to mitigate in advance any systemic effects of crypto-asset-linked funds being linked to unregulated, volatile assets, regulation may be needed. This regulation may take the form of full regulation equivalent to a public, regulated exchanges of securities and funds, or as part of an exploratory, interim sets of regulations as part of a regulatory sandbox.²³ Exchanges though have been shown to be very

susceptible to hacks and thefts, with little collateral to insure investors that tokens stored with an exchange for eventual trading would not be lost.

Digital

Using, or storing data or information in the form of digital signals involving or relating to the use of computer technology.²⁴

Distributed Ledger Technology/Technologies

‘DLT,’ or ‘distributed ledger technology,’ or ‘decentralized ledger technology’ means a database system in which information is recorded, consensually shared, and synchronized across a network of multiple nodes, or any variations thereof.²⁵

Fiat Currency:

Government issued currency that is designated as legal tender in its country of issuance through government decree, regulation or law.²⁶

Initial Coin Offering²⁷

Project financing by the issuance of tokens against payment predominantly in the form of crypto-currencies. ICOs are often directed at a broader public requiring each investor to accept identical, non-negotiable terms. The project may not yet have an identifiable or available product. In this respect, ICOs may resemble crowd-funding projects.²⁸

Mining

Mining is a record-keeping service done through the use of computer processing power as is usually associated with blockchain technology. Miners keep a blockchain consistent, complete, and unalterable by repeatedly grouping newly broadcast transactions into a block on a blockchain.²⁹ This is then broadcast to the network and verified by nodes on that blockchain. In most cases, miners who successfully verify a block will be rewarded with some token or tradable crypto currency.

Node:

Node means a device and data point on a computer network.

Payment Tokens (PT)

Primarily known as crypto-currencies, payment tokens may be used to acquire goods or services or as a means for money or value transfer; which may or may not be issued, and which may or may not confer claims against an issuer.

Regulatory Sandboxes:

Regulatory sandboxes are designed to incubate innovation in the financial sector in a relaxed, but safeguarded regulatory environment. They also provides a symbiotic environment for innovators to test new technologies and for regulators to understand their implications for the financial sector and consumer protection. Because crypto-currency platforms are a relatively new phenomenon, with asset classes that are not necessarily tradable on conventional securities-type exchanges, they may not be able to match the current requirements for ‘conventional’ exchange.³⁰ These exchanges could rather be part of regulatory ‘sandboxes,’ an interim regulatory state that allows them to continue to trade while negotiating with a securities regulator on their licensing requirements before being approved.³¹

Security Token Offering (STO)

A Security Token Offering (STO) is the issuance of tokens against an identifiable or available product or some physical assets that underpin the token’s value.³² These ‘tokens’ enable transformation of real-world assets into Crypto Assets. Thus if a crypto token derives its value from an external, tradable asset, it is classified as a security token and becomes subject to securities regulations. Payment for security tokens may be predominantly, but not exclusively via crypto-currencies. The introduction of a legal construct for the token law may require that the legal consequences, such as ownership, possession and transfer, must also be defined by law.³³ In most cases, the STO will be provided and/or traded in operating primary/secondary markets through licensed market intermediaries and market operators dealing or managing investments in Security Tokens. Shares can be

directly represented as a token through a physical certificate, creating an interface between securities law and any crypto asset laws.

Smart Contract

'Smart Contract' means a form of innovative technology arrangement consisting of: ³⁴

- (a) a computer protocol; and, or
- (b) an agreement concluded wholly or partly in an electronic form, creating obligations, which is automatable and enforceable by execution of computer code, although some parts may require human input and control and which may be also enforceable, subject to and be guided by conventional legal methods or by a mixture of both. ³⁵

Stable Coin

A 'stable coin' is a crypto-currency that is pegged to another stable asset, like gold or the U.S. dollar. It's a currency that is global, but is not tied to a central bank and has low volatility unlike other crypto-currencies.³⁶ Its relative stability allows for practical usage of using crypto-currency as a means of payment for every-day goods and services.

Tokens

Tokens are used to represent digital assets that are fungible and tradable, including everything from commodities to voting rights. These tokens, which can be transferred across the network and traded on crypto-currency exchanges, can serve a multitude of different functions, from granting holders access to a service to entitling them to company dividends. Tokens may be created and distributed to the general public through ICOs; may also qualify as a security, depending on the jurisdiction; and as a means of payment (crypto-currency); or as a utility token that confers rights of usage to something; or as security tokens.³⁷ Most tokens do not operate independently but may be hosted for trading by a crypto-asset trading platform or exchange. Newer tokens types may act to transfer rights or value between two parties independent of any third party exchange or technology platform.

Utility Tokens (UT)

Utility tokens- also known as app coins or user tokens - provide users with future access to a product or service.³⁸ Unless they are caught under the definition of a security, spot trading and transactions in Utility Tokens do not generally constitute regulated activities. To avoid the appearance of being associated with ICOs (and thus by proximity, to regulated IPOs), utility token creators will term their offerings of tokens to as 'token generation events' (TGEs) or token distribution events (TDEs).³⁹ In some jurisdictions, UTs may be classed as securities, but may qualify in some cases for an exemption to any registration requirements.⁴⁰

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² This research was funded through a grant from the Bill and Melinda Gates Foundation, which facilitated the creation of the Digital Financial Services Observatory, a DFS policy and regulatory research project of the Columbia Institute for Tele-information at Columbia University in New York. See www.dfsobservatory.com

³ Definitions relating to aspects of the framework are presented in **Section D**.

⁴ See **Section B**.

⁵ Since this framework uses a principles-based, technology neutral approach, any specific technology definitions used in this framework are for interpretive purposes only, and not for incorporation into any framework.

⁶ Other applications based on DLTs are numerous, and include for identity on-boarding and verification; trade finance, intellectual property rights; and insurance contracts.

⁷ Components of each type are described in **Section C**.

⁸ See thereto, Central Bank Digital Currencies (CBDCs)

⁹ For example with a regulatory sandbox.

¹⁰ See published blockchain/DLT/crypto-asset regulatory frameworks from Abu Dhabi; Malta; Switzerland; and Lichtenstein: FSRA - Abu Dhabi Global Market (2018) *Guidance – Regulation of Crypto Asset Activities in ADGM*, available at <https://bit.ly/2DEkc69>; *Virtual Financial Assets Act 2018*, available at <https://bit.ly/2LqdLoG>; Finma (2018) *Guidelines*, available at <https://bit.ly/2BzA88M>; and *Lichtenstein Blockchain Act (Act on Transaction Systems based on Trustworthy Technologies (VT) (Blockchain Act; VT Act; VTG)) 2018*, available at <https://bit.ly/2P1gCVA>

¹¹ These could be the values for payment referred to in ‘smart contracts.’

¹² If properly structured, the defining characteristic of utility tokens is that they are not designed as investments. This feature usually exempts them from laws governing securities. See Strategic Coin (2018) *ICO 101: Utility Tokens vs. Security Tokens*, available at <https://bit.ly/2GKR6T>

¹³ Uschnews (2018) *Crypto-currency rules to be unveiled by SFC as Hong Kong aims to become major trading hub*, available at <https://bit.ly/2P3cMey>

¹⁴ Those that do not meet the criteria will be shut down

¹⁵ Investopedia (2018) *Altcoin*, available at <https://www.investopedia.com/terms/a/altcoin.asp>

¹⁶ BIS (2018) *BIS Annual Economic Report*, available at <https://www.bis.org/publ/arpdf/ar2018e5.pdf>

¹⁷ NIST (2018) *Blockchain Technology Overview*, available at <https://csrc.nist.gov/publications/detail/nistir/8202/final>

¹⁸ Many blockchain definitions still use the concept of immutability to indicate that data on a blockchain cannot be removed. This feature however has been proven to be inaccurate, and is generally no longer used in current definitions of blockchains. The US NIST removed ‘immutability’ from its list of blockchain features in October 2018.

¹⁹ Two main CBDC variants are a wholesale and general purpose. The former would limit access to a pre-defined group of users, while the latter one would be widely accessible. Wholesale CBDCs may be combined with the use of distributed ledger technology may enhance settlement efficiency for transactions involving securities and derivatives. BIS (2018) *BIS Annual Economic Report*, available at <https://www.bis.org/publ/arpdf/ar2018e5.pdf>

²⁰ CPMI (2018) *Central bank Digital Currencies*, available at <https://www.bis.org/cpmi/publ/d174.pdf>

²¹ IMF (2018) *World Economic Outlook, October 2018: Challenges to Steady Growth*, available at <https://bit.ly/2OeIoT8>

²² Malta describe these exchanges as ‘any trading and, or exchange platform or facility, whether in-country or in another jurisdiction, on which any form of crypto-asset may be transacted in accordance with the rules of the platform or facility.’ See *Virtual Financial Assets Act 2018*, available at <https://bit.ly/2LqdLoG>

²³ Uschnews (2018) *Crypto-currency rules to be unveiled by SFC as Hong Kong aims to become major trading hub*, available at <https://bit.ly/2P3cMey>

²⁴ Oxford Dictionaries (2018) *Digital*, available at <https://en.oxforddictionaries.com/definition/digital>

²⁵ *Virtual Financial Assets Act 2018*, available at <https://bit.ly/2LqdLoG>

²⁶ NYSDFS (2015) *Regulations Of The Superintendent Of Financial Services: Part 200. Virtual Currencies*, available at <https://on.ny.gov/2QkyPCa>

²⁷ The term ‘ICO’ is derived from the term ‘initial public offering’ (ICO) used in securities and share listings

²⁸ Finma (2018) *Guidelines*, available at <https://bit.ly/2BzA88M>

²⁹ Imran, S; Afroz, A; Azhar, S *et al* (2018) *Bitcoin*, available at <http://www.ijnrd.org/papers/IJNRD1810008.pdf>

³⁰ Uschnews (2018) *Crypto-currency rules to be unveiled by SFC as Hong Kong aims to become major trading hub*, available at <https://bit.ly/2P3cMey>

³¹ Those that do not meet the criteria will be shut down

³² Finma (2018) *Guidelines*, available at <https://bit.ly/2BzA88M>

³³ *Lichtenstein Blockchain Act (Act on Transaction Systems based on Trustworthy Technologies (VT) (Blockchain Act; VT Act; VTG)) 2018*, available at <https://bit.ly/2P1gCVA>

³⁴ EBRD (2018) *Smart Contracts, Blockchain And Crowdfunding: How The Law Is Getting To Grips With Technology*, available at <https://bit.ly/2RaX9Ut>

³⁵ A smart contract could also be drafted exclusively in natural language but include an agreement between the parties to use specific software to perform and/or enforce (the whole or parts of) the contract or to conclude contracts EBRD (2018)

³⁶ Forbes (2018) *Explaining Stable Coins, The Holy Grail Of Cryptocurrency*, available at <https://bit.ly/2DLq5za>

³⁷ Strategic Coin (2018) *ICO 101: Utility Tokens vs. Security Tokens*, available at <https://bit.ly/2GKR6T>

³⁸ Strategic Coin (2018) *The Difference Between Utility Tokens and Equity Tokens*, available at <https://bit.ly/2TIbiKy>

³⁹ Strategic Coin (2018) *ICO 101: Utility Tokens vs. Security Tokens*, available at <https://bit.ly/2GKR6T>

⁴⁰ US SEC (2018) *Two ICO Issuers Settle SEC Registration Charges, Agree to Register Tokens as Securities*, available at <https://www.sec.gov/news/press-release/2018-264>