CDRX

White Paper

Ver 0.92

31 July 2018

"Crypto is no longer an idea looking for a purpose,
CDRs now replace traditional equities,
democratising both ownership and execution"

$27.6 billion

Annual Equities Revenue at the Top 5 US Investment Banks -- Forbes

$77.7 trillion

Total Value of Stocks Traded in 2017 – World Bank

$542 trillion

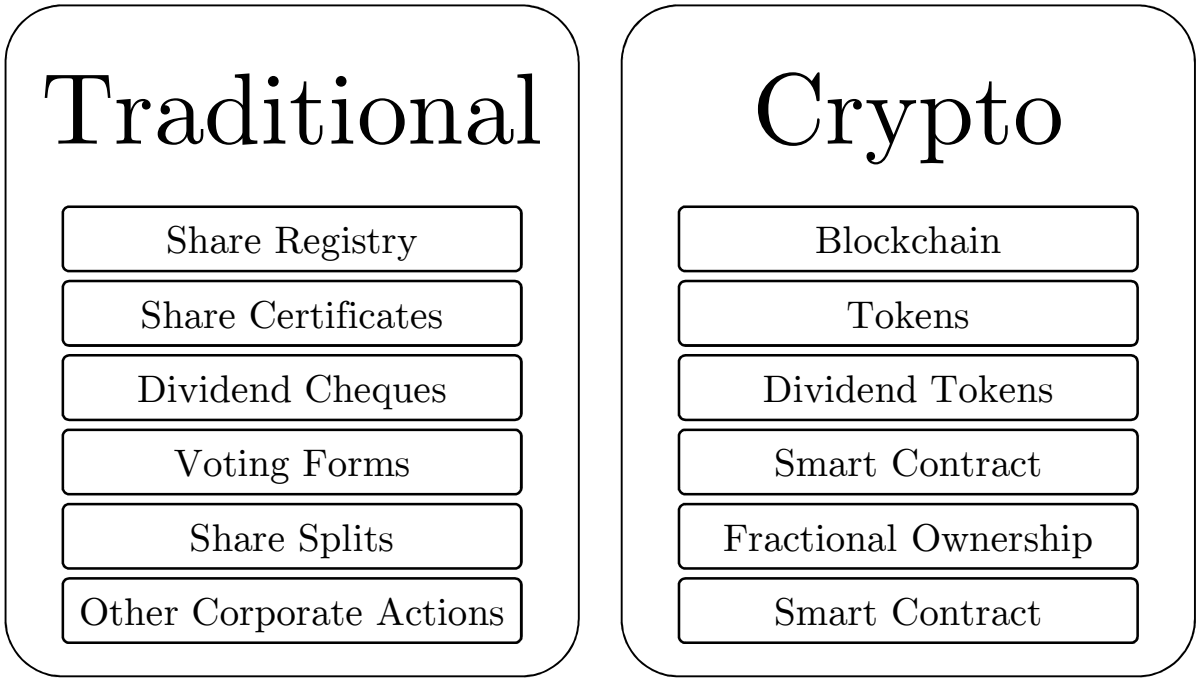
Total Value of OTC Derivatives in 2017 – Bank of International Settlements (BIS)

Table of Contents

For the purposes of this document the terms 'share', 'equity' and 'stock' shall be used interchangeably and have the same meaning. In different countries one or more of these terms may be used in place of the other(s).

1 Abstract

Crypto Depository Receipts (CDRs) and cryptoshares are the natural evolution of traditional equity ownership – a $77.7 trillion market – providing all the advantages of traditional stock (aka share) ownership and the solution to its inefficiencies. Our solution enables the tokenisation of both existing equity markets and all new equity issuance. More than just a functionally restricted approach, our solution delivers a suite of asset services (eg. dividend payments and voting) directly via the tokens, both faster and at substantially lower cost than existing methods.



To complement the introduction of CDRs and cryptoshares, we will shortly be launching an exchange for listing and trading. Crypto-exchanges are a proven business model, and our global team of investment banking veterans are all experts in their fields, spanning software engineering, ecommerce, electronic cash and derivatives trading, machine learning, structuring, sales, securities law and regulation.

In most regulated jurisdictions, trading of securitised tokens (tokens that grant legal rights to, or ownership of assets) must be conducted via authorised and regulated entities and we are working closely to ensure both regulatory conformance and that the evolving regulatory landscape does not unduly stifle the natural evolution of securities markets. The JOBS Act in the United States in some instances already supports CDR and/or cryptoshare products, allowing qualifying companies to raise up to $50 million each.

Notwithstanding the above, the exchange platform is also purposely designed for the trading of all other crypto-instruments (eg. non-securitised tokens) ensuring a robust revenue model regardless of the regulatory landscape. From there we aim to extend into bonds ($92.2 trillion market[1]) and other cash instruments and then deep into the $542 trillion derivatives industry.

We invite you to join us through our ICO.

2 INTRODUCTION

This white paper lays out the solution to the issues around traditional equity ownership, a solution that in coming months we will also extend to fixed income products. In this white paper we present:

1. the CDR and cryptoshare product, allowing either a structured token or full native cryptoshare issuance depending on the jurisdiction;
2. the platform upon which CDRs, native cryptoshares and other crypto instruments can be launched and/or traded;
3. details of our transaction token ICO which powers the embedded smart contract functionality and (optionally) lower cost platform transactions

Crypto is the natural evolution of the equity asset class, preserving the integral components of ownership – voting rights, dividends and capital growth – while solving its shortcomings.

The fundamental problem of traditional share ownership is one of high costs and inefficiency ('frictions'):

- high transaction costs – eg. brokerage fees and liquidity costs
- slow settlement times – eg. delays in formal exchange and registration of ownership
- high administrative costs – particularly for companies and larger professional investors

These inefficiencies have served to vastly enrich middlemen and brokers – the combined equities revenue at the top 5 US Investment Banks in the 12 months ending Q2 2017 was more than US$27.6bn[2].

An additional problem, partially introduced through well-meaning but perhaps slightly off-target regulation is lack of privacy – in some cases, resulting in the illegal front-running of orders placed by customers, causing significant additional cost.

[1] https://www.sifma.org/wp-content/uploads/2016/10/US-Fact-Book-2017-SIFMA.pdf (page 55)
[2] https://www.forbes.com/sites/greatspeculations/2017/08/21/q2-equity-trading-revenues-for-largest-u-s-banks-highest-since-early-2015/

3 The Problem

Historically equity ownership has been recorded in a central share register[3] which documents the owners name, number/class of shares held and contact details. This share register is the official legal record of ownership and used to determine voting rights, distribute dividends and notify shareholders of corporate actions (eg. share splits, new issuance, dividends).

The share register is in many ways analogous to a private blockchain, it is controlled centrally by the issuer and is the 'golden source' of transactions in a given equity. Every transaction requires an update to this register.

The frictional problems vary by stakeholder, but in almost all circumstances favour middle-men/brokers. These problems, broken down by stakeholder include:

3.1 Retail Investors

- High transaction costs – retail investors can pay US$25+ for a single transaction
- Slow settlement periods – recently 'improved' in 2017 to 2 days[4] and still unnecessarily slow
- Paperwork associated with opening and maintaining a brokerage account, initiating, executing and settling a transaction

3.2 Professional Investors/Asset Managers

- High transaction costs – institutional investors can pay 0.15% or more
- Slow settlement periods – recently 'improved' in 2017 to 2 days and still unnecessarily slow
- Cost of maintaining large back-office / administrative operations – ultimately passed downstream
- Paperwork associated with opening and maintaining a brokerage account, initiating, executing and settling a transaction – inefficient, cumbersome and expensive to manage
- Lack of privacy – large transactions that do not qualify for reporting deferrals, can become visible to the market before they are fully executed

3.3 Equity Issuers

- administration costs of the share register – either directly or outsourced
- administrative costs of corporate actions – such as shares splits, dividends, new issuance etc require substantial amounts of expenditure (eg. notices and filings)

[3] https://www.investopedia.com/terms/s/shareholder-register.asp
[4] http://www.finra.org/investors/highlights/t-plus-two-is-here

- administrative costs of voting – an expensive and unwieldy process which hampers shareholder participation

The status quo is entrenched by laws and regulations nobly designed to protect investors, but which also perpetuate staid and inflexible barriers to entry, grossly enriching middlemen and brokers at the expense of the real stakeholders – the company and its shareholders.

4 Historical Overview

The development of the blockchain[5], documented in an essay by Satoshi Nakamoto in October 2008[6], built upon the work of others in the cryptography space including: Stuart Haber and W. Scott Stornetta in 1991; Tim May in 1994; Nick Szabo's "bit gold" in 1998, published in 2005; and Wei Dai's "b-money" in 1998, published in 2006.

The first release of bitcoin and the underlying blockchain standard on the bitcoin.org website was in January 2009[7]. Since then there has been a rapid and widespread adoption of blockchain architecture among crypto and fintech startups. The issue thus far has been the blockchain is a great idea looking for a purpose – CDRs and cryptoshares are the 'killer app'.

5 Analysis

The value of an equity can be broadly described as the sum of the net present value of all cashflows attributable to that ownership right over the life of the company. Various classes of share (aka stock) come with varying (or no) rights to dividends and/or powers such as voting rights.

Dividends are the distribution of cash or cash equivalents (such as additional equity) to shareholders. Tax treatment varies - in some countries no tax is payable on dividends, in some countries dividends are issued with tax credits attached, in other countries the dividend is taxable.

Voting rights are normally exercised in a structured format at Annual or Extraordinary General Meetings (AGM/EGM) either in person or by proxy, to approve or reject a specific set of resolutions provided by the company.

Corporate actions are anything that change the value of equity or debt issued by the company, including amendments to the share (aka stock) structure or payment of dividends. Arranging

[5] https://en.wikipedia.org/wiki/Blockchain
[6] https://en.bitcoin.it/wiki/Essay:Bitcoin:_A_Peer-to-Peer_Electronic_Cash_System
[7] https://web.archive.org/web/20090131115053/http://bitcoin.org:80/

and administering corporate actions (either directly or outsourced to agents), are expensive activities for a company, as it requires, amongst other things, the issuance of notices, formal filing of company documents and/or shareholder votes.

Smart contracts are automated contracts (embedded functions) in tokens, which once deployed, are immutable (cannot be changed by the issuers) except in very limited ways already pre-programmed into the contract. The only configurable features are typically the token name and the execution cost of the feature. Even if a token issuer ceases business, the tokens and smart contracts within them persist and remain fully operational.

The inefficiencies of traditional equity transactions, broken down by category are:

5.1 High transaction costs

Transaction costs in traditional markets cover a range of administrative and regulatory fees and whilst significant steps have been made to reduce these costs over the last decade, it is not feasible for them to ever approach levels that can be realised using distributed ledger technology. Certain retail services now offer 'zero cost' transactions, but these still include exchange fees, spread and funding costs, along with charges for 'premium' service. The ERC20[8] standard offered by Ethereum prices per transaction, regardless of size. For a retail transaction of say 100 shares at $1 each, at a fixed price of $0.15, this equates to a transaction cost of 15bps. For an institutional transaction of say 1,000,000 shares at $1 each, again at a fixed price of $0.15, this equates to a transaction cost of 0.000015bps.

Anticipated regulatory impact: distributed ledger technology is compliant with the regulatory best execution framework that ensures execution on behalf of clients is transacted at the best all-in price.

Summary: transaction costs via blockchain technology are already at levels traditional equity transaction could not ever reach, providing a significant benefit to both retail and institutional investors.

5.2 Slow settlement periods

Recent improvements in settlement periods to 2 days[9] in the USA, pale in comparison to transaction speeds via consensus blockchain validation. Even taking into account a proposed 'accelerated' night-time settlement of 1 day[10], the ERC20 standard offered by Ethereum currently completes low priority transactions[11] in less than 30 minutes and high priority 'fast'

[8] https://theethereum.wiki/w/index.php/ERC20_Token_Standard
[9] http://www.finra.org/investors/highlights/t-plus-two-is-here
[10] https://www.dtcc.com/~/media/Files/pdfs/T2/Equities-Structure-Whitepaper-jan2018.pdf
[11] https://ethgasstation.info/

transactions[12] in less than 2 minutes - 'fast' transactions complete at a ~60% higher transaction cost.

Note: this is the speed taken for the token transaction to be reflected on the blockchain. While any settlement of cash would be subject to the standard banking system, cash equivalents can be transacted via a fiat backed coin such as Goldman Sachs backed USD Coin (USDC) from Circle[13] and rolled into a netted single end-of-day (EOD) fiat settlement instruction into cash. Alternative institutional grade options are also being developed (see clearing and settlement risk below).

Anticipated regulatory impact: compliant with regulatory goals of faster settlement

Summary: settlement periods within 30 minutes via blockchain technology are already well established. In theory traditional equity transactions could compete with these times, but only after significant additional operational commitment and capex.

5.3 Paperwork

Over the past decade, more of the paperwork associated with opening and maintaining a brokerage account, as well as initiating, executing and settling a transaction has moved online – it nevertheless still has a significant overhead (see back office below) in terms of manual input, updates, verification, confirmation, recording and archiving transactions (among others).

The nature of a distributed blockchain requires no middleman or broker, two parties can simply transact directly between themselves (analogous to an OTC transaction) by agreeing and submitting an electronically 'signed' instruction to a registrar - this transaction is then automatically recorded on the blockchain. No manual input or reconciliation is required, no confirmation process is necessary, no broker is needed – processing and recordkeeping occurs automatically and immutably.

Anticipated regulatory impact: compliant with regulatory goals of faster settlement. Execution of securitised transactions required via authorised and licensed brokers. KYC is also being moved onto blockchains but may have a minimal paper requirement.

Summary: physical documentation and storage largely becomes a thing of the past, and the immutability of the blockchain provides regulators with a built-in compliant transaction record.

[12] https://ethgasstation.info/

[13] https://www.bloomberg.com/news/articles/2018-05-15/circle-says-bitcoin-miner-bitmain-leads-110-million-investment

5.4 Cost of maintaining large back-office / administrative operations

The traditional investment process for institutional investors and asset managers typically requires an army of back office and operations staff to: check for booking/entry errors; confirmation errors; payment errors; manipulation of data; update internal records and external records; and reporting to internal trading desks, risk and compliance departments. Despite this, costly mistakes - often referred to as 'breaks' - still occur.

As a common ledger, a blockchain is the equivalent of two counterparties sharing the same internal recordkeeping system, any new record is simply a jointly (sender and receiver) authorised instruction that is automatically rejected if it is not confirmed – in much the same way MarkitWire works in the swaps world, a transaction raised by one party is countersigned (confirmed) by the other. This ensures that trading desks receive near real-time alerts of any mismatch and successful processing of countersigned (confirmed) transactions is guaranteed – eliminating the vast majority of operational risks and thereby the back office.

Anticipated regulatory impact: none, as long as risk and control functions are not compromised, and net positive given the reduction in potential errors and/or data manipulation.

Summary: sharing a common ledger, using countersigned transactions, ensures that errors are quickly identified directly by the trading desk and correct transactions have no reconciliation overhead.

5.5 Lack of privacy

To some extent transparency has been mandated by regulations including Dodd-Frank/Volcker (USA) and MiFID I/II (EU). The regulatory aim has been to ensure market integrity, a level playing field for all participants and transparency to ensure the best possible price. Accompanying this is significant additional reporting overhead to ensure that trades are disseminated to all market participants in a timely manner.

The blockchain is the most transparent trade record there is. As the single, publicly available, immutable trade record, all transaction activity can be observed in near real-time without the need to build aggregators and reporting engines. The fundamental difference is that the blockchain does not report the price of the transaction, only the buyer and sellers wallet address (aka 'book') and transaction quantity. While this currently differs from regulation in major markets, our solution is to offer the trading platform where this information can be published in real-time.

In addition to moving equity trading into the true electronic era, we will also offer the exchange where these instruments can be traded. This exchange allows the public dissemination of

pricing for both CDRs and other crypto-instruments, while we work with regulators to further align regulations with this step-change in financial markets and in the best interests of its investors.

Anticipated regulatory impact: additional disclosure may be required for securitised tokens, other crypto-instruments are not impacted.

Summary: by also providing a fully compliant trading platform we are able to maintain as many of the intrinsic advantages of crypto as possible.

5.6 Administration of the share register and corporate actions

A 2004 study by Oxera[14] sponsored by the The Depository Trust & Clearing Corporation (DTCC) estimated there are close to 1 million corporate actions a year, which cost as much as US$10bn annually across all market participants. A single corporate action failure can have a cost as high as US$10m. The ability to simply eliminate the need for many of these is a considerable cost saving.

Traditional equities must be bought and sold in minimum units of 1 share, they cannot be split and in cases where share prices are high (eg. as at 23-May-18, Berkshire Hathaway trades at $294,400 per share) they reduce accessibility to investors, reducing the number of shareholders and liquidity, ultimately under-pricing their true market value.

Crypto 'coins' or tokens allow fractional ownership, removing the need for share (aka stock) splits. They can be traded in decimal units – why issue 100,000 shares of Berkshire Hathaway for every 1 held, when you can simply buy or sell 0.00001 CDRs – a considerable administrative cost saving (notices, filings, voting etc).

New issuance is likewise simply a matter of issuing additional CDRs either via smart contracts to existing holders, or as a separate CDR. Again, removing the need for cumbersome, wasteful and expensive administrative processes. A smart contract is a fully automated process permanently embedded in the CDR itself, you do not need to know who holds a CDR or how many – authorised instructions are simply broadcast, and then automatically consumed and executed by the embedded functionality in the CDRs. Rights Offers are conducted via a combination of voting (see below) and issuance (above).

Dividends likewise are a considerable administrative cost, having to issue large numbers of small payments is an incredibly costly exercise (eg. US$1.80 per payment credited[15]). Crypto allows any company wishing to make a distribution to automatically issue dividend tokens via smart

[14] www.dtcc.com/~/media/Files/Downloads/WhitePapers/oxera_2004.pdf

[15] https://www.dtcc.com/~/media/Files/Downloads/legal/fee-guides/dtcfeeguide.pdf (page 7)

contract to all holders of CDRs at near zero cost, the value of which is backed by the dividend pool. By then placing the funds as one aggregate payment, combined with a single buy order on a crypto exchange for the dividend tokens (destroying them after they are redeemed), the company can simply and cheaply make distributions at will. CDR holders are also free to trade or redeem dividend tokens at their convenience.

Voting is similarly straightforward, it can also be conducted directly via smart contracts, there is no need for shareholders to attend a meeting, resolutions can be voted on cheaply and easily by the CDR holders in real-time – Brazil[16] is already in the process of implementing nationwide voting using the Ethereum blockchain.

Anticipated regulatory impact: none. Smart contracts combined with an immutable public record of each corporate action are fully compliant with regulatory mandates.

Summary: by moving to crypto as a solution, we estimate a reduction in corporate actions of over 95% and savings of nearly $10bn a year. The gains to the issuer (and consequently shareholders) are considerable.

5.7 Clearing and settlement risk

A transaction is typically an exchange of assets or cashflows between two or more parties. Settlement risk is the possibility that one or more parties may fail to deliver as required by their contractual obligation. This could be due to counterparty default (eg. bankruptcy), operational failures, market liquidity and/or other factors – at its extreme resulting in the loss of the full principal value of the transaction. Traditional markets are typically mandated to clear through Central CounterParty's (CCPs) – well funded intermediaries that underwrite any counterparty default risk, thereby transferring settlement risk to clearing and settlement 'hubs'. In addition to execution and settlement via our exchange platform, we are working to incorporate three Institutional grade settlement options: 1) real-time securitised token settlement (entirely eliminating settlement risk) directly between counterparties via the SWIFT[17] network using the ISO20022 standard, being developed in conjunction with ChainLink[18]; 2) real-time settlement via currency backed tokens, being developed in conjunction with Circle[19] and Clearmatics[20]; and 3) settlement via one or more global regulated and approved CCPs.

[16] https://qz.com/1163660/brazil-may-write-new-laws-based-on-data-stored-on-the-ethereum-blockchain/
[17] https://www.swift.com/
[18] https://www.smartcontract.com/link#chainlink
[19] https://www.circle.com/en-gb/usdc-faq
[20] https://www.clearmatics.com/utility-settlement-coin-pioneering-form-digital-cash/

Interoperability model between securitised tokens and SWIFT payment network using ChainLink:

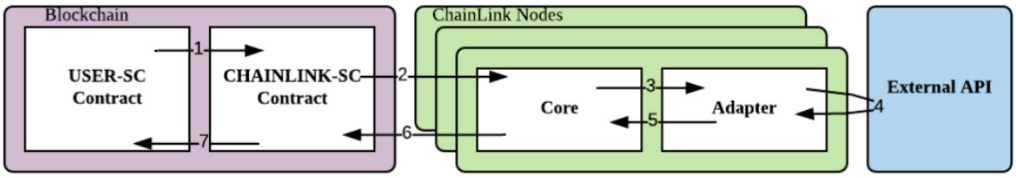


Figure 1: ChainLink workflow: **1)** USER-SC makes an on-chain request; **2)** CHAINLINK-SC logs an event for the oracles; **3)** ChainLink core picks up the event and routes the assignment to an adapter; **4)** ChainLink adapter performs a request to an external API; **5)** ChainLink adapter processes the response and passes it back to the core; **6)** ChainLink core reports the data to CHAINLINK-SC; **7)** CHAINLINK-SC aggregates responses and passes them back as a single response to USER-SC.

Reproduced with permission. ChainLink white paper, page 8. © 2017 SmartContract

Anticipated regulatory impact: offering settlement via both traditional CCP and real-time directly via smart contract is net regulatory positive.

Summary: by providing regulator approved and native crypto settlement options, we allow regulators time to develop comfort around (and see the benefit of) crypto as a solution.

5.8 Other regulatory considerations

The primary purpose of regulators is to maintain the integrity of the financial system and ensure investor protection – particularly at the retail (small investor) end of the market. Regulations typically focus on transparency of market information, treating customers fairly (offering a level playing field), suitability and transaction costs – all of which are addressed above. Rules around know your customer (KYC), common reporting standard (CRS) and anti-money laundering (AML) likewise are a key part of the regulatory mandate and help ensure that global capital flows are not used in the financing or enabling of illegal activity. Securitised tokens should therefore only allow automated transfer to parties that have achieved minimum regulatory compliance. This is managed through a combination of embedded smart contracts and our transaction tokens – distributed Oracles[21] and permissioned blockchains also provide augmented regulatory options which are under detailed evaluation with leading KYC providers and regulators in this space.

[21] https://blog.ethereum.org/2014/07/22/ethereum-and-oracles/

5.9 Cross block-chain interoperability

There is work underway in the crypto community looking at direct cross block-chain communication – the aim is to allow interoperability between services and protocols. Our view is that near term introduction of this type of functionality would be inappropriately risky to holders of securitised tokens. As we have seen with other technologies, the price of cross-compatibility can be the introduction of unforeseen bugs or security holes[22], in some cases resulting in substantial damage or loss. Furthermore it presents a more tempting target to bad actors (eg. hackers) who benefit from 'economies of scale', reaching all interconnected block-chains by attacking any one of them. For this reason – in a world of immutable and irreversible asset transfer – any solution (and the wider industry) should continue to use segregated asset registers until this nascent standard has been fully and robustly tested in the real world using non-securitised tokens.

6 Solution

A blockchain is an immutable distributed ledger, analogous to a globally distributed share register, the entries for which are validated and ratified through the majority consensus of participant 'registrars' – eliminating the need for trust among participants. It provides a complete lifetime transaction history that can be viewed by anyone. In short it is the evolution of the traditional share register. Transactions become the exchange of securitised tokens, each representing a fixed proportion of and ownership in, an equity issuance – aka CDR or cryptoshare.

6.1 CDRs and Cryptoshares

Crypto Depository Receipts (CDRs) and cryptoshares are the natural evolution of traditional equity ownership, they provide all the advantages of traditional stock (aka share) ownership and the solution to its frictional disadvantages.

Analogous to American Depository Receipts[23] (ADRs), Crypto Depository Receipts (CDRs) are securitised tokens issued on a blockchain (a modern share ledger) and intended to be an intermediary step prior to regulators allowing full native equity issuance directly via a blockchain.

ADRs are typically certificates securitised against a block of shares (aka stocks) held by a domestic depository bank, an ADR can represent a fraction of a share, a single share, or multiple shares.

[22] https://cloudblogs.microsoft.com/microsoftsecure/
[23] https://en.wikipedia.org/wiki/American_depository_receipt

CDRs likewise are dedicated tokens securitised against a class of shares (aka stocks), held by a depository bank or specialised trust. The custodian issues the tokens on a blockchain against the shares held on deposit. Fractional ownership support makes the ratio irrelevant but in the interests of simplicity we have adopted the convention that they are issued on a 1 for 1 basis.

The only difference between CDRs and cryptoshares is that CDRs are securitised against an underlying traditional equity issuance held in custody, whereas cryptoshares are issued directly in pure electronic form. In stark contrast to functionally restricted tokens in the market, our solution provides a suite of innate functions, delivering significant speed and cost savings over traditional methods, benefiting investors and issuers alike:

- Dividends – are distributed via the issuance of dividend tokens through the embedded smart contract in the CDRs. These tokens are underwritten by a dividend pool and tradable between parties.
- Voting – is conducted by the smart contract embedded in the CDRs.
- Corporate Actions – are virtually eliminated, stock splits are redundant due to fractional ownership, administrative costs associated with most corporate actions and maintenance of a share register are eliminated.
- Transaction costs – broker costs are virtually eliminated. Shares can be transferred directly between parties, crypto exchanges supplant traditional equity exchanges.
- Speed – updates to the central share register (blockchain) happen automatically and in near real-time.
- Transparency – the central share register is public and immutable.

Our approach is deliberately designed to enable both existing and new issuance to be converted into securitised tokens, thereby bringing the benefits of lower costs, faster transaction times and a global trading platform, to the entire global financial market.

Regulatory considerations: crypto remains a developing concept to most regulators, disparate jurisdictions classify them differently. We are working closely with regulators to help ensure that investor protection regulations evolve to support rather than undermine crypto as the solution. The JOBS Act in the United States already offers certain companies the ability to raise up to $50 million via CDRs and/or cryptoshares. In the US Regulation D, S, A+ and CF provide scope. The SECs ATS regulation (USA) and MIFID MTF designation (EU) allow further expansion pursuant to regulatory approval. There is a clear willingness among regulators to engage in discussions, provided investor protections are maintained.

6.2 Exchange

Already in progress, we will be launching our exchange (version 0.9) this year. Starting with a non-securitised token-to-token trading platform – a proven model, not requiring regulatory approval – which will be expanded to include securitised tokens and token-to-fiat currencies for

registered participants, subject to regulatory approval (as required). In addition to standard crypto-exchange functionality, we include the ability for approved equity issuers to easily convert existing equity issuance into CDRs, as well as issue new CDRs or cryptoshares. A rating service, announcement and document repository is also included. The exchange features include:

- Security model conforming to both Crypto Currency Security Standard (CCSS) and ISO 27001:2013 standards
- Support for and coverage of all major crypto-instruments
- High-speed matching engine
- Institutional grade uptime and API
- Optional settlement via CCP (securitised tokens)
- Optional settlement via currency-backed tokens
- Global liquidity sourcing, ensuring deep markets to meet the needs of all clients
- Various order type support (market, limit, stop, day, GTC etc)
- Periodic auction service for extended regulatory conformance
- Listing process for new and existing equity issuers looking to move to CDRs, including a rating service
- Notice and document repository for issuers
- Multi-language support (English, Korean, Chinese, Italian, Japanese, Bahasa etc)

6.3 Our ICO: Transaction Token

We are issuing 400,000,000 permanently fixed non-securitised transaction tokens using the Ethereum ERC20 standard that will never be increased or destroyed and used to fund ongoing development. These tokens will be used for powering exchange transactions, conformance and embedded smart contracts in the CDRs/cryptoshares – eg. powering dividend or coupon payments, voting and other corporate actions. These transaction tokens are not physical assets or securities, and are not registered with any regulatory body or government agency.

Additionally (as outlined below), the company aims to keep employee and token holder incentives tightly aligned, which will result in purchases of tokens, by the business, from time-to-time in the open market.

Other advantages of token ownership, based on minimum average balance over trailing 12 month period (or since launch date if issued less than 12 months ago), include[24]:

[24] Terms and conditions apply

Additional token ownership benefits

10,000 tokens	• Vote on release priorities for exchange rollouts, functionality and token listings • 25% discount on all exchange transaction fees in year 1
100,000 tokens	• 100% discount on all exchange transaction fees in year 1 • 50% in year 2 • 25% in year 3
1,000,000 tokens	•Transact on exchange at no cost* •Custom connection override for lowest latency and no throttling •Pre-release access to new listings and issuance (book-building)
10,000,000 tokens	•Execute all corporate actions and asset servicing functionality at no cost* •Re-use market data and indices for internal purposes at no cost •Face to face meetings with senior staff to discuss priorities/functional requests

** (reasonable usage limits apply)*Note: that these are the initial tier levels and may be revised.

The ICO will be denominated in Bitcoin (BTC) and Ethereum (ETH), interested parties can subscribe directly on our site (cdrx.io) or on various token-exchanges around the world – a full list and ICO details will be published there.

If you are interested in CDRs or cryptoshares, as a solution for your needs or in joining or using an institutional grade exchange, your participation in this ICO would help.

Token allocation will be as follows:

- 50% pre-ICO and ICO subscribers
    - 35% Technology – software development, hardware and licensing
    - 14% Operating expenditure – including support and maintenance
    - 3% Community management and engagement
    - 6% Sponsorship and research programme
    - 8% Business development
    - 12% Legal and regulatory
    - 22% Financing and marketing of CDR issuance, stakes in complementary businesses (bank, exchange, fintech)
- 40% Founding team and second round investors, subject to lockup's and clawbacks (vesting largely linearly over 10 years – approximately 16,000,000 tokens released per

year). Our aim is to keep staff incentives tightly aligned with token holders – by ensuring a majority of compensation is paid in tokens rather than cash, staff are incentivised to ensure that token value is maintained at all times. Cash should primarily be allocated to external suppliers and service providers rather than internal staff.

- 10% First round investors and ICO costs

7 Revenue Model

7.1 CDRs and Cryptoshares

- listing fee (including setup, legal, depository and custody fees where applicable)
- rating fee
- smart contract transactions (corporate actions, voting, dividends)
- other fees (document store, smart notifications, reporting, voting and dividend)

7.2 Exchange

- transaction/settlement fee
- liquidity (taker) fee
- index licensing (institutional)
- liquidity licensing (institutional)
- custody (institutional)
- other fees (professional order book market data, automated algo/arbitrage fees)

8 Executive Team

David Ward – CEO. Former Asia Pacific Head of Trading at one of the world's top two commodity firms. Two decades experience as a quantitative programmer and then derivatives trader (equities and credit) at investment banks including Goldman Sachs, Merrill Lynch and JP Morgan in NYC, London and Asia. Experience includes development of high frequency trading systems, machine learning and delivery of a global bond issuance and trading platform, integrated with the London Stock Exchange, which launched the world's first offshore CNY bond in 2012. Serial entrepreneur, involved in fintech startups since 2010 and crypto since 2013. Studied at Victoria University and London Business School.

Matthew Spittle – CTO. Former Global Head of Markets Development and Global Head of eCommerce Technology. Two decades technology experience at banks including American Express Bank, JP Morgan and Standard Chartered in London and Asia. Concurrently responsible for significant numbers of business critical dealer platforms and ecommerce systems

spanning pre and post-trade, ultra-high frequency messaging, infrastructure and architecture design, market data, pricing, execution, risk management and automated hedging, across the largest trading businesses in the world. Studied Computer Science at Warwick University.

Mohammed Hakeem – Head of eCommerce. Former Global Head of eCommerce Support at Standard Chartered. Two decades experience at banks including JP Morgan, Merrill Lynch and HSBC in London and Asia. Responsible for infrastructure and architecture design, development and support of high speed trading and market data systems, including multi-billion dollar real-time FX trading platforms. Studied Computer Science at Glasgow University.

Thanh Nguyen – Head of Software Engineering. Former Head of Software Engineering for a fintech company, and experienced crypto-developer. 6 years working on high volume messaging platforms across web and mobile, with memberships of more than 40 million members and peak messaging rates exceeding 1 billion messages per day. Studied Computer Science and Computer Software Engineering at the Information and Technology College, P&T Institute of Technology and FPT-Aptech in HCMC, Vietnam.

Zung Le – Head of Market Microstructure. More than a decade of development experience with networks and ultra-high frequency messaging, handling billions of instructions per second. Former network and firmware developer for Broadcom and Ericsson, architect and developer of ultra-high frequency messaging protocols for ARM chips and data networks. Moved into financial markets specialising in high frequency trading, tick data, optimised order management and machine learning at quantitative trading firms and brokers. Studied Master in Engineering and PhD (3 of 5 years) in Computer Science at the Technical University of Budapest.

Thomas Sandberg – Head of Sales and Structuring. More than 15 years financial markets experience designing, structuring and distributing derivatives and cash solutions at international investment banks including JP Morgan, Citigroup and Bank of America Merrill Lynch. Experience spans all major asset classes and product types. Thomas has a Master in Physics from Gothenburg University and a Master in Finance from London Business School.

Ethan Low – General Counsel. A decade of experience in in-house retail, corporate and investment banking at Citibank and Standard Chartered, and in top-tier law firms including White & Case and Freshfields. Experience in securities law, including transaction financing and regulatory work across a broad range of products and sectors. Graduated from Law Schools at the National University of Singapore (NUS) and University of Edinburgh, and studied at Oxford University (Saïd Business School).

Wei Bing Lee – Head of Regulatory. Two decades experience in Regulation and financial markets. Formerly held senior capital markets regulatory roles at the Monetary Authority of Singapore (awarded MAS Scholarship twice) and in Private Equity / Advisory. Studied at the

National University of Singapore, UCLA, Columbia University, Columbia Business School and London Business School. CFA Charterholder.

9 Initial Investors

Proprietary Trading House – a global trading house with activities spanning all major financial markets, including crypto investments. First crypto investment was in 2016 and in 2017 it launched a dedicated crypto trading desk.

Asian Family Office – established fintech investor since 2010, expanded into crypto investments in 2014. Crypto investments include crypto currencies, two crypto exchanges and four crypto start-ups.

Private Investors – private investors who have contributed and support our vision.

10 Risks

- Security – high profile hacks have emphasised the need for institutional grade security across the entire architecture. Hackers have becoming increasingly more sophisticated, hijacking DNS traffic, engaging in denial of service, smurfing, spoofing, 'mining' and consensus attacks (among others). Attacks can be directed at platforms, users, networks and third-parties.
- Keys – theft or loss of private keys exposes the owner of crypto instruments to irreversible loss. 'Cold storage' has been one way of reducing loss, and wider industry adoption of sharding (splitting and distributing key pieces) is also underway. Crypto wallet owners should never share or disclose private keys to anyone.
- Competition – the crypto-exchange market is highly competitive, while our product offering and added functionality offer first-mover advantage, we anticipate strong competition from established, well resourced incumbents. It's worth noting that there are a number of incumbents in the securitised token space, but these focus on one of three areas:
    1. Primary issuance: facilitation of 'simple token' launches
    2. Physical asset registers: real-estate, art etc, again in 'simple token' format
    3. Investment schemes: investing in other businesses as a collective, PE or VC style

  'simple tokens' refer to tokens without functionality specifically designed to facilitate compliance and asset servicing for example.

- Ethereum ERC20 Standard – while this standard is well established and used extensively and reliably by thousands of companies, tokens issued using the ERC20 standard are subject to risk of malfunction, abandonment or failure of the Ethereum protocol.
- Regulatory – we have already seen different interpretations of 'crypto' published by regulators across varying jurisdictions and anticipate accelerated convergence as the technology matures. Certain characteristics have been better received than others, with reporting and anonymity of ownership (for example 'bearer shares') being common regulatory concerns. Restrictions, law changes or differing regulatory interpretations may slow or limit functionality in one or more jurisdictions.
- Technology – by its nature it is an iterative process of improvement, it is inevitable that changes in technology standards and design, can result in bugs which may impact functionality, data or security. Industry groups frequently review and enhance technology standards to minimise these risks. Advances in quantum computing may create dangers to cryptography based technology which necessitate additional cryptographic hardening.

11 SUMMARY

CDRs are the crypto equivalent of ADRs, the precursor to widespread regulatory approval of native cryptoshare issuance. A public blockchain recording each CDR or cryptoshare is the share register. Acting as an immutable public record of ownership, the blockchain and embedded CDR/cryptoshare smart contract combine to drastically lower transaction and administration costs, settlement times and eliminate the majority of corporate actions. Voting and announcements will be handled via smart contracts, and fractional ownership democratises equity markets, which have previously been out of reach of many smaller would-be investors.

Our crypto-exchange is being launched offering full support for all crypto-instruments – a proven revenue model – along with notification, documentation and market announcement services. Combining all of the above with our team's extensive financial services experience – spanning technology, products, sales, structuring, trading, regulation and legal – we expect crypto-securities to become the 'killer app' in a combined financial services market worth more than $600 trillion.

11.1 TIMELINE

01-Feb-18 CDR testing began with a closed set of clients

05-Mar-18 Roadmap for regulator engagement laid out

07-May-18 Development of Exchange started

22-Jun-18	Agreement to use (and right to buy) sharemarket.com for Exchange
15-Jul-18	White paper released to the public
05-Nov-18	pre-ICO subscription begins
19-Nov-18	Start of ICO (200,000,000 transaction tokens)
23-Dec-18	Completion of ICO (or whenever transaction tokens are fully allocated)

Subject to successful ICO our rollout timeline is as follows:

Q4 2018	Audit and penetration testing of Exchange begins (weekly)
	Launch of Exchange (ver 0.9) - closed beta
	Indices defined
	Non-securitised market makers onboarded
	Listing service provider agreements signed
	Algo toolkit (ver 0.9 beta) launches
Q1 2019	Release of Exchange (ver 1.0)
	Rating agency agreement for new issuance signed
	Launch of industry think tank – tier 1 banks and brokers, business and technology
	Algo toolkit (ver 1.0) released
	CCP agreement signed
	CDR market makers onboarded
	Regulator approvals received (small jurisdictions)
	Equity CDRs open to the market in approved jurisdictions
	Exchange trading of CDRs begins among approved investors
	Extension into cash bond CDRs
Q2 2019	Indices launch and licensing (including 6 months of history)
	Sponsorship of collaborative R&D programme across industry and universities
	Custody service (ver 0.9 beta) launches
	Launch of institutional OTC desk

Q3 2019	Custody service (ver 1.0) released
	Extension into derivative CDRs and native issuance
	Licensing of liquidity to brokers and banks
	Purchase of stake in an authorised and regulated exchange
	Release of decentralised Exchange (ver 2.0), non-securitised
Q4 2019	Regulator approvals received (mid-sized jurisdictions)
Q4 2020	Regulator approvals received (large jurisdictions)
Q2 2021	Purchase of stake in traditional bank enabling improved 'real-world' integration

12 References

[1] Nakamoto, Satoshi. *Bitcoin: A Peer-to-Peer Electronic Cash System.* (2008, October). Retrieved from https://www.bitcoin.org/bitcoin.pdf

[2] Dai, Wei. *'b-money'.* (1998, November). Retrieved from http://www.weidai.com/bmoney.txt

[3] Szabo, Nick. *'Bit gold'.* (1998). Retrieved from http://unenumerated.blogspot.com/2005/12/bit-gold.html

[4] Wikipedia. *Blockchain.* Retrieved from https://en.wikipedia.org/wiki/Blockchain

[5] Szabo, Nick. *Secure Property Titles with Owner Authority.* (1998). Retrieved from https://nakamotoinstitute.org/secure-property-titles/

[6] Financial Industry Regulatory Authority (FINRA). *T+2 Is Here.* (2017, September). Retrieved from http://www.finra.org/investors/highlights/t-plus-two-is-here

[7] Bank of International Settlements (BIS). *OTC derivatives statistics at end-June 2017.* (2017, November). Retrieved from https://www.bis.org/publ/otc_hy1711.htm

[8] The Depository Trust & Clearing Corporation (DTCC) and Oxera. *Corporate action processing: what are the risks?* (2004, May). Retrieved from https://www.dtcc.com/~/media/Files/Downloads/WhitePapers/oxera_2004.pdf

[9] Securities Industry and Financial Markets Association (SIFMA). *2017 Factbook.* (2017). Page 55. Retrieved from https://www.sifma.org/wp-content/uploads/2016/10/US-Fact-Book-2017-SIFMA.pdf

[10] The Depository Trust & Clearing Corporation (DTCC). *Modernizing the U.S. Equity Markets Post-trade Infrastructure* (2018, January). Retrieved from https://www.dtcc.com/~/media/Files/pdfs/T2/Equities-Structure-Whitepaper-jan2018.pdf

[11] The Depository Trust & Clearing Corporation (DTCC). *Guide to the 2018 DTCC Fee Schedule* (2018, January). Retrieved from www.dtcc.com/~/media/Files/Downloads/legal/fee-guides/dtcfeeguide.pdf

[12] Wikipedia. *American depository receipt*. Retrieved from https://en.wikipedia.org/wiki/American_depository_receipt

[13] The World Bank, World Federation of Exchanges database. *Stocks traded, total value (current US$)*. Retrieved from https://data.worldbank.org/indicator/CM.MKT.TRAD.CD

[14] The Depository Trust & Clearing Corporation (DTCC). *Lifecycle of a Security*. (2010). Lightbulb Press Inc. ISBN 978-0982907528

[15] Szabo, Nick. *A Formal Language for Analyzing Contracts*. (2002). Retrieved from https://nakamotoinstitute.org/contract-language/

[16] The Ethereum Wiki. *ERC20 Token Standard*. Retrieved from https://theethereum.wiki/w/index.php/ERC20_Token_Standard

[17] Vogelsteller, Fabian and Buterin, Vitalik. *ERC-20 Token Standard*. (2015, November). Retrieved from https://github.com/ethereum/EIPs/blob/master/EIPS/eip-20.md

[18] Ellis, Steve; Juels, Ari and Nazarov, Sergey. *A Decentralized Oracle Network* (2017, September). Retrieved from https://link.smartcontract.com/whitepaper

[19] Ray, James. *Decentralized apps (dapps)*. (2018). Retrieved from https://github.com/ethereum/wiki/wiki/Decentralized-apps-(dapps)

[20] Buterin, Vitalik. *A Next-Generation Smart Contract and Decentralized Application Platform ('Ethereum White Paper')*. (2014). Retrieved from https://github.com/ethereum/wiki/wiki/White-Paper

[21] Buterin, Vitalik. *Ethereum and Oracles*. (2014, July). Retrieved from https://blog.ethereum.org/2014/07/22/ethereum-and-oracles/