FUTURE OF FINANCE RESEARCH

'What CSDs Can Do About Tokenisation' Sample copy to review

Future of Finance

Future of Finance has one overriding goal. It is to host meetings (at the moment virtual meetings) that bring together long-established members of the financial services industry (banks, brokers, asset managers, insurers, financial market infrastructures) with entrepreneurs (challenger banks, technology companies and FinTechs) and market authorities (central banks, regulators and policymakers) to explore how the financial services industry can grow faster by being more open, more innovative and more trustworthy. Education is a crucial component of that mission and Future of Finance Research exists to share information and ideas with incumbents, entrepreneurs and regulators

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Why should CSDs care about security tokens?

Yet it is undeniably hard to see why CSDs should care about security tokens now. Consider, for example, the size and growth of the market so far. In 2021, SWIFT in predicted that half of new issues of securities would be in tokenised form within five years. That implied a huge market. In 2020 the total capitalisation of the global debt and equity markets stood at US$229 trillion, while new issuances in the previous year totalled US$28 trillion.[3]

Nobody knows what the market value of outstanding security tokens is today. There is no reliable source of data. Projections remain optimistic about rapid growth. One holds that by 2030 annual security token issuance volume will be US$4.1 trillion and annual trading volumes will be US$162.7 trillion.[4] Another predicted a market worth US$1 billion in 2021 would be worth US$15 trillion by 2025.[5]

A website which tracks issues of security tokens outstanding valued those on its list at US$19.6 billion at end-April 2022, though a single large issue accounted for nearly four fifths of this figure.[6] A third estimate reckons more than US$30 billion in regulated issues is right.[7]

US$50 billion would be a generous figure for the total value of security tokens outstanding today. At that sum, they would be worth just 0.004 per cent of the outstanding market capitalisation of traditional securities and equivalent to 0.04 per cent of the annual issuance of traditional securities.

Even if the value of outstanding security token issues were five times as high as the guesstimates suggest – and they

3 SIFMA, 2021 SIFMA Capital Markets Fact Book, July 2021, page 8.
4 Quinlan & Associates, Cracking the Code: The Evolution of Digital Assets to the Mainstream, page 4.

5 Cointelegraph Research, The Security Token Report 2021, page 11 and Figure 7, page 44.
6 https://stomarket.com/
7 Tokeny Insights, 16 December 2021.

might be, on optimistic assumptions - their value would be little more than one five thousandth of the current value of traditional securities currently outstanding.

At US$50 billion, and after recent sharp declines in the crypto-markets, security tokens would still be one eighteenth the size of the crypto-currency markets. Crypto-currencies attained a peak market capitalisation of US$2.8 trillion in November 2021, though they have since declined to less than US$1 trillion. The Stablecoins used by traders as the base currency for crypto-currency trading were capitalised at end-June 2022 at US$155 billion.[8]
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The volume and value of tokenised securities is undeniably minuscule. Nor is there any prospect of the immense value and volume of outstanding securities transitioning to tokenised form because there is no compelling rationale for them to do so once issued(it will not cut the incurred issuance costs though it might trim servicing costs such as exchange fees and paying dividends).

This means the growth of the security token markets is dependent primarily on new issues. So the growth prospects, as well as the size of the security token markets, scarcely argue for investing in tokenisation now, except as a provider of market infrastructure. The far more active markets in crypto-currency trading, for example, rely on “exchanges” or “Level 2” networks, not the blockchain itself.

However, the blockchain technology which underpins the security token markets scarcely encourages early investment by CSDs. Despite various technical solutions, blockchains still struggle to attain both speed and scale. As a result, even those financial institutions enthusiastic about making use of the technology have had to keep much of the work off the blockchain.

Closed (or “permissioned”) networks make this easier to do. In any event, concerns about sharing confidential information through public blockchain networks means that institutions prefer closed networks where admission is governed by rule-setters and administrators. Attitudes on this issue are changing, among issuers at least,[9] but closed networks remain the default institutional choice.

8 Both figures are from Coinmarketcap.com

9 See pages [**15-16**] below.

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The importance of timing

The important questions are what those risks and opportunities are and when to act upon them. Of the two challenges, timing is the hardest to get right. It is obviously crucial in any business - act too early, or too late, and failure surely follows – but timing is also impossible to control. The only option is to map out the short, medium and long-term possibilities as to how tokenisation will proceed and what its likely impact on CSDs might be.

In the short-term – say, the next five years, to 2027 - a CSD could comfortably ignore tokenisation and focus instead on upgrading existing systems and making incremental improvements to existing services, such as compressing the conventional settlement cycle from trade date plus two days (T+2) to trade date plus one day (T+1) or even intra-day settlement (T+0). During those five years, a CSD is unlikely to feel any substantial impact from tokenisation.

In the medium-term – say five to ten years from now, between 2027 and 2032 - the environment is likely to be less comfortable for the inactive CSD. The volume of security tokens being issued is likely to have grown significantly. Legal and regulatory frameworks will have adapted to accommodate the new instruments. Dual systems of trading will co-exist, with securities continuing to be issued and traded as they are today but most newer asset classes (such as private equity) being issued in tokenised form.

In the long-term – say, 15 to 20 years hence, or 2037-2042 – the transition to tokenised forms of issuance and trading is likely to be substantially complete. Some markets will continue to run on legacy infrastructure and systems, especially where the existing processes offer minimal scope for cost-cutting and the asset class is demonstrably ex-growth so the costs of transitioning to a tokenised model are too high (the likeliest instance is publicly listed equities).

At some point between the

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The opportunities for CSDs in tokenisation

After timing, the second important question is to identify the opportunities. These have the benefit of being more controllable than timing, but they are far from static. Since the idea of tokenising securities first emerged during the Crowdfunding boom of 2008-09, and especially from the Initial Coin Offering (ICO) boom of 2017-18, the primary target for tokenisation has shifted repeatedly.

Real estate was an early target, followed by fine art and privately managed assets, chiefly because all three asset classes suffer from an intrinsic illiquidity which tokenisation is sometimes thought to solve. The current favourite is fixed rate debt securities because they are not only illiquid (outside government bond markets) but simple to tokenise by comparison with equity (the issuer risk is measurable and bonds have fixed income and redemption payment schedules).

A variety of Proofs of Concept (PoCs) and benchmark issues have proved tokenisation works for supranational, corporate, asset backed, high yield and "green" bond issuers.[12] Potential savings are especially large in the primary market, because tokenisation simplifies structuring, documentation, distribution, data management and reporting.

The benefits of tokenisation are real and measurable and they will over time accrue in markets other than debt, including equity and real estate. In fact, any asset is capable of being tokenised, and the value of the global real asset markets currently exceeds US$425 trillion (see Table 1), so tokenised securities will not need to accumulate a major share of assets under management to become extremely large.

A 5 per cent share of the global bond and equity markets alone, for example, would be worth US$11.5 trillion. The market could also grow quickly. It would

12 See Table 3, page [28]

Table 1: Asset Values and issuance flows in 2020-21

	Stocks: Market capitalisation, stock value or future spending commitments	**Flows: New issuance, fund-raising, deal volume or net sales**
Global bond markets	US$123.5 trillion	US$ 27.3 trillion
Global equity markets	US$105.8 trillion	US$ 826.8 billion
Of which: Exchange Traded Funds (ETFs)	US$ 8.6 trillion	US$ 359.2 billion
Commercially managed real estate	US$10.5 trillion	US$ 300.0 billion
Global mutual fund markets (CIS)	US$71.05 trillion	US$3.1 trillion
Total invested in public regulated markets	US$ 310.9 trillion	US$ 27.305 trillion
Privately managed assets	US$ 9.8 trillion	US$ 1.2 trillion
Global Real Estate	US$ 326.5 trillion	n/a
Of which: Commercial	US$ 32.6 trillion	n/a
Of which: Agricultural	US$35.4 trillion	n/a
Of which: Residential	US$286.5 trillion	n/a
Global gold holdings (investment and industrial)	US$ 2.7 trillion	n/a
Global infrastructure spending by 2040	US$97.0 trillion	US$3.7 trillion
Total invested in these real assets	US$426.2 trillion	n/a

Sources: SIFMA, 2021 Capital Markets Fact Book; McKinsey Global Private Markets Review 2022; MSCI Real Estate Market Size 2020-21; Deloitte 2021 CRE Outlook; Investment Company Institute, Worldwide Public Tables Fourth Quarter 2021, Total Net Assets Excluding Funds of Funds; ETFGI.com; Savills Impacts; World Gold Council; G20 Global Infrastructure Outlook.

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The risks for CSDs in tokenisation

The rationale for action is not driven by opportunity alone. There is risk at work too, in the actions of others. For example, a recent survey by the Official Monetary and Financial Institutions Forum (OMFIF) found that 40 per cent of 21 sovereign, supranational and government agency bond issuers favoured public blockchain networks, against 45 per cent that still favoured permissioned networks.[20]

Already, high profile, regulated issuers have issued tokenised debt on to public blockchain networks. The European Investment Bank (EIB), a benchmark issuer, issued bonds on to public blockchain networks in both April and December 2021. The issues proved CSDs were not needed.

This has opened a possibility that was until recently considered unthinkable: that national securities issuance, trading and settlement systems might not require blockchain networks to be permissioned after all. It follows that the proposed governance role of CSDs in permissioned blockchain networks is also less secure than it once appeared.

True, the survey was of a small group of major bond issuers. The acknowledged weaknesses of public blockchain networks in terms of speed and capacity are less important to such issuers than they are to secondary market traders turning over a high volume of transactions. Investors might also take a different view.

It is also possible that regulators in particular jurisdictions will disagree with the 40 per cent. They will certainly require records of asset ownership and transaction settlement to take place somewhere within their purview, which means they are unlikely to encourage proliferation of privately owned but public blockchain networks in their jurisdiction. They might

20 OMFIF, Future of Capital Markets 2022, page 5

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Lessons from peers

In an ideal world, CSDs would proceed on the basis of perfect knowledge about the future evolution of securities token markets. But in reality it is impossible to know whether the tokenisation of securities will disrupt the securities markets or not. The uncertainty is irremovable. The prudent CSD must act anyway, using what knowledge and what powers of reason are available to plan for the future.

The first place to search for a guide to action is the behaviour of other CSDs. As the ISSA survey found, the blockchain investments of the securities services industry are concentrated in fixed income, unlisted equities, funds and crypto-currencies.[76] A Future of Finance survey also found securities tokens are the priority for CSDs.[77]

Following the projects of other CSDs certainly helps to normalise the idea, among managers, employees and user-shareholders, of using blockchain to issue, trade, settle and safekeep securities in tokenised form. If large and high profile CSDs are experimenting successfully with tokens in PoCs and pilot tests, and especially live products and services, it helps to educate decision-makers and highlight the distinction between security tokens and crypto-currencies.

The temptation that must be resisted is imitation. It is always reassuring for a business to keep the company of its peers. But imitation is a capricious master, partly because an obsession with the behaviour of others easily degenerates into an insidious bias against innovation. But the main reason imitation is an unsound basis for a tokenisation strategy is that the predicament of every CSD is different.

Each CSD inhabits its own legal and regulatory jurisdiction; relies on operational systems and processes designed to comply with local requirements; delivers a different combination of services to a particular range of

76 See Chart 1, page [22] above.
77 Future of Finance Research survey.

Table 5: A Sample of Blockchain Projects Affecting CSDs

CSDs	Blockchain project	Useful learnings
ASX	Replacement of CHESS clearing and settlement system; ASX also used the opportunity to offer blockchain infrastructure as a service (ASX Synfini)	Launch delays (September 2018 July 2020, and November 2020 and March 2022) indicate pioneering a technology at scale is difficult. A second lesson is that users are reluctant to invest in adapting their systems to infrastructural changes even if the new system is an improvement on the old.
Barbados Stock Exchange (BSE)	Building a token issuance and trading platform	The BSE plan to trade crypto-currencies and tokens is part of a comprehensive national strategy pursued since 2018 that encompasses a CBDC and an embassy in the Metaverse (Decentraland).
Canadian Securities Exchange (CSE)	Announced in 2018 it was building a security token issuance, trading, clearing and settlement platform, which is now in testing.	The CSE positions itself as the regulated exchange for "entrepreneurs" to cut the cost of raising capital in public markets.
Clearstream	Built the D7 post-trade infrastructure for digital securities in Germany; sponsored the HQLAx tokenised collateral management service and the FundsDLT tokenised funds business in Luxembourg; and launched a regulated platform (360X) to tokenise fine art and a separate venture (Tectrex) to issue real estate tokens to investors.	The Clearstream strategy focuses on projects that deliver immediate value to market participants, use collaboration to generate transaction volumes, and position the CSD to play a major role in new institutional-quality asset classes that might grow through the adoption of tokenisation.
DCV	Exploring with the Central Bank of Chile the issuance of bonds in tokenised form, with a view to adding settlement and custody services as well.	DCV is using a phased approach to tokenisation, starting with issuance before adding settlement and custody, so matching services to the likely pace of the transition of the market.
DTCC	Building an infrastructure (Digital Securities Management, or DSM) that can support privately managed assets in tokenised form.	The DTCC hopes the DSM issuance, distribution, trading and settlement platform will become the default infrastructure for tokenised privately managed assets.

Eastern Caribbean Securities Exchange	Building a tokenised securities marketplace.	Like Barbados, the Eastern Caribbean is pursuing a comprehensive digital strategy that includes a CBDC launched in March 2021.
HKEX	Using smart contracts to accelerate settlement of foreign equity transactions via Stock Connect (HK Synapse)	HK Synapse delivers immediate value to foreign institutions trading mainland China securities.
ID2S	New CSD to settle money market instruments in real-time that closed on 7 October 2021.	Even if the technology works and gets issuer and investor support, market conditions, regulatory stipulations and incumbent hostility can still defeat a project.
Jamaica Stock Exchange	Built and launched a securities token platform.	The CSD has retained control of the clearing, settlement and custody of cash, cryptocurrencies and tokens.
KDPW	Introduced a blockchain platform for capital markets, on which the first service was digital voting of proxies.	The KDPW strategy is to provide a blockchain infrastructure, and proxy voting provides immediate value to users.
NSD	Built a prototype of a blockchain-based proxy voting system; and experimented with bond issuance on a blockchain, tri-party repo, a decentralised digital depository and the use of smart contracts in the commercial paper market.	The NSD experiments proved that although blockchain technology can cut complexity and costs, it cannot generate demand from issuers and investors or produce liquidity unaided by other factors.
SDX	Built a fully regulated, blockchain-based security token platform that integrates trading, settlement and custody and recently launched a crypto-currency staking service.	A fully integrated and regulated tokenisation platform in a major financial services jurisdiction is not enough to guarantee rapid success in attracting issuers and investors but provides a powerful hedge against being outflanked in the future by well-funded digital asset competitors and creates opportunities in other markets.
SGX	Sponsored and invested in the ADDX equity and fund tokenisation platform and the Marketnode bond platform.	Works closely with the State (in the shape of MAS and Temasek) and collaborates with third parties to build momentum.
STRATE	Co-developed with Nasdaq a blockchain-based electronic proxy voting system.	e-voting is a service to which blockchain technology is well-suited and it delivers immediate value to issuers and investors.

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Looking within

The fourth and final place for CSDs to search for guidance on a tokenisation strategy is within. In every country, the CSDs are trusted intermediaries with a robust, failure-not-an-option culture. This makes CSDs natural candidates to operate (and even build) a blockchain as a national market infrastructure for security tokens, just as they provide a national market infrastructure for securities today.

Tokenisation of assets on blockchain-based networks is rich in possibilities but has struggled so far to realise its potential. This is partly because a general-purpose technology is being diverted to private purposes. Vendors and platforms are seeking to privatise the gains from the application of blockchain technology, rather than building applications on a blockchain infrastructure, in the way that countless products and services make use of the electricity infrastructure or the Internet.

A true infrastructure is a shared means to many ends, and a CSD could, by operating a blockchain open to all-comers, enable securities market participants to take part in tokenised markets without having to rebuild their internal systems.

That saving alone could accelerate the adoption of security tokens. It would also lower the barriers to entry to token markets for innovators and put CSDs in a position to recruit as clients all the FinTechs which are building applications to support the token markets.

Examples of blockchain-as-infrastructure are emerging. One is the LACChain Alliance led by the Inter-American Development Bank (IDB). It provides a secure, open, transparent, zero-fee, public-permissioned blockchain infrastructure for Latin America and the Caribbean.

Alastria, a non-profit established in Spain in October 2017 also runs an open blockchain network infrastructure used by


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