The Security Token Report

2021

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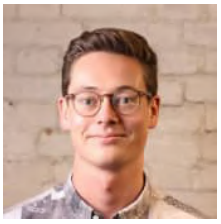

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AlgoTrader AG founded in 2014, Swiss-based Fintech company AlgoTrader AG is the only end-to-end quantitative and algorithmic trading software solution that supports both digital and traditional assets. With it`s product WIRESWARM, AlgoTrader offers institutions and professional traders an automated order and execution platform for digital asset trading. It provides programmable connectivity to a wide range of regulated digital asset liquidly venues including exchanges, brokers, market makers and OTC desks over a single FIX connection, allowing seamless integration with core banking and trading systems.

Foreword

The origin of securities is closely linked to companies' need for financing. From the debt securities of Venetian money lenders to the first companies that sold shares of their trips to East India, different models of financing and exchanging securities have evolved along with technology: from paper to the digital age.

Nowadays, making deals in the securities market requires two steps: the execution, which matches supply and demand, and the clearing and settlement, which guarantees compliance with obligations of the parties involved. There are new trends, however, that have been gradually changing the traditional methods of order execution. The picture of a trader who is furiously talking on a telephone and is surrounded by many computer screens is vanishing in favor of completely automated computer systems. Alternative trading systems have been slowly gaining traction, while new models of financing have also increased in popularity since the success of venture capital firms a few years ago when they started funding early-stage companies, which have already become some of the world's largest companies by market capitalization.

Despite all these advancements, traditional securities markets are still dominated by big players, and it is at this point where blockchain technology comes into play to break the barrier. In recent years, many companies have been funded thanks to these blockchain networks and tokens. This new technology has even allowed ideas to be funded exclusively with cryptocurrencies; for example, Ethereum was financed with Bitcoin contributions. This has opened the doors to the next evolution: the development of smart contracts that allow tokenization and the digital representation of any asset on blockchain networks. With the advent of blockchain networks and smart contracts, it is now possible for anyone with an internet connection to participate in the financing, and even the governance, of ideas or projects of emerging companies.

Blockchain networks offer many improvements over traditional models. One such improvement is universal access to all types of assets, wherever there is an available internet connection. Blockchain offers a new way of exchange, where execution, clearing, and settlement occur at the same time instead of having to wait hours or even days. The disruption in exchange models with the substitution of the bid and ask model for automated market makers, facilitates 24/7 exchange of less liquid assets. Finally, there is no need for pre-funding, thanks to the possibility for third parties to provide tokens for liquidity pools, generating potential business opportunities, such as foreing exchange markets with stablecoins, without fixed funding costs.

However, blockchain technology also raises some new technological and regulatory challenges, such as managing private keys, the robustness of smart contracts, and the scalability necessary for greater adoption. What's more, certain types of assets, like securities, fall under several regulations. Adapting to these new technologies and market models represents a challenge for everyone: regulators, companies, and users.

Finally, we must not forget that the fundamentals of any kind of security are rights to companies, which may or may not be profitable in the future. The elimination of entry barriers on both sides, projects and financing, has enabled the proliferation of a vast number of different assets that still have much to prove. In the end, the purpose and rationale of an investment must always be the same: to choose the correct businesses to invest in, and the profitable ones will offer a generous amount of interest, give dividends, or increase the value of its shares, much like the Venetian money lenders and investors in East India did many centuries ago.

Pablo Romero Alfonso
Blockchain & Digital Assets Discipline at BBVA

BBVA
Creating Opportunities

Demelza Hays

Head of Research at Cointelegraph

Demelza Hays is the director of research at Cointelegraph, Forbes 30 Under 30, U.S. Department of State Fulbright Scholar, and former fund manager of two regulated crypto funds.

Dear Partners, Investors and Friends,

Cointelegraph Research proudly presents the Security Token 2021 Report. To gain a deeper understanding of how blockchain is changing the way we trade securities, this 90+ page research report highlights how investors can trade tokenized stocks and why the ability to self-custody stocks will reduce selling pressure and increase global demand for stocks from a worldwide base of investors.

In this report, we piece together the big picture of the security token ecosystem and answer common questions held by asset issuers and investors. There is an important distinction between security tokens that are issued by blockchain-native startups such as Mt Pelerin and RealT and tokenized stocks such as Apple (AAPL), Gamestop (GME), and Tesla (TSLA) The global daily trading volume on secondary markets of the former category is still low, at roughly $100,000 per day. However, within one month of launching the latter category, daily trading volume surpassed $4 million per day. There is strong and growing market demand for the latter. This report examines how cryptocurrency exchanges such as Binance and FTX are able to offer tokenized stocks, why not all regulators are too happy about this, and what this means for traditional stock markets.

The report carefully curates industry expertise from 13 authors in six countries who all work at the forefront of the capital markets evolution. Insights from PricewaterhouseCoopers in Switzerland, Raiffeisen Bank International in Austria, Block.one's general council in the US, and many other esteemed authors shed light on this revolutionary application of the blockchain technology. Please enjoy reading Cointelegraph's second research report published in 2021 after the highly regarded Blockchain Venture Capital Report that came out in April. You can find all seven of our previous research papers on the Cointelegraph website.

Cointelegraph Research helps blockchain companies communicate their cutting-edge research to the world by writing, designing, and publishing professional reports. We help companies gain wider audiences by developing educational materials in the form of in-depth reports. Our team of academics and seasoned blockchain technologists can cover a diverse range of topics including tokenomics, macroeconomics, legal, tax, central bank digital currencies, decentralized finance, supply chain logistics, and venture capital. To work with Cointelegraph Research's team on creating a one-of-a-kind report, contact us at research@cointelegraph.com.

Sincerely, Demelza Hays
Head of Research at Cointelegraph

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Highlights

- By 2030, most securities will be tokenized. In an exclusive Interview with Raiffeisen Bank International, Raiffeisen explains that the way we currently trade securities will be gone within 10 years. Even though Raiffeisen reports that the majority of investors are not currently asking for exposure to security tokens, investors are beginning to demand a trading experience for stocks that is similar to cryptocurrencies. They want transparency, liquidity, and instant settlement. Transitioning to trading all assets on distributed ledger technology is inevitable.
- A large trend is the emergence of self-custody of securities and the re-establishment of bearer financial instruments (Binance and FTX investors trading Tesla stocks). Investors will be able to remove securities from an exchange and send them to a new exchange with a private key. Exchanges will attract investors to deposit securities by offering them interest on their security deposits for lending their securities to the exchange who will in turn lend the shares to others borrowers (i.e. shorts or leveraged longs). Exchanges may also allow investors to use their securities as collateral for loans or margin trading. This will drastically change the demand for securities as less investors will sell and trigger taxable events in order to acquire liquidity. The demand will also increase for attractive securities as a global pool of investors will now be able to easily invest in securities in other countries.
- The daily trading volume on Binance and FTX of tokenized traditional stocks such as Tesla (TSLA), Coinbase (COIN), Gamestop (GME), and Apple (AAPL) is exceeding the monthly trading volume for all security tokens on popular security security token exchanges such as tZERO, MERJ, Open Finance Network, and TokenSoft. The daily trading volume for tokenized traditional stocks surpassed $4 million in one day on Binance and FTX in early May versus $3.9 million for the whole month of April on tZERO, MERJ, Open Finance Network, and TokenSoft. The total security token market's capitalization is hovering around $700 million. We expect this to surpass a billion by the end of Q3, 2021 (excluding tokenized stocks).
- We also predict that issuing a security token instead of going public will be more popular with small and medium-sized enterprises and seed to Series A rounds versus unicorn startups and billion dollar publicly traded companies. The reason for this is twofold. First, security tokens bring down the costs associated with raising capital, and this reduction in transaction costs is critical for smaller companies. Second, security token markets do not have sufficient liquidity for larger funding needs. As we can see with the Coinbase IPO, large blockchain companies that understand the benefits of blockchain still opt to go public the traditional way instead of issuing a security token.
- As for regulations:
  - The US is seeing many security tokens offered to professional investors in the US and foreign retail under exemptions such as Reg. A, D, S. Reg. A+ is a securities law exemption that allows issuers to raise money from a crowd of retailers up to $75 million. However, issuers need to get their offering approved by the SEC. Exodus is the first blockchain company to issue a Reg. A+ security token offering. They are offering equity in their business. In contrast, Reg D only allows professional investors and requires a one-year lock period, then the shares can trade freely on alternative trading systems (ATSs) such as tZERO. Finally, the SEC's increase in crowdfunding equity deals (under Reg. Crowdfunding) from $1 million to $5 million under the JOBS Act may unlock small security token offerings for US-based retail investors without the Reg. D one year lock up. The US currently does not have a sandbox for entrepreneurs in the digital asset industry; however, Hester Pierce's safe harbor may fill the void if approved.
  - In Europe, the Swiss Parliament adopted the Federal Act on the Adaptation of Federal Law to Developments in Distributed Ledger Technology (DLT bill) in September 2020. This bill enables security tokens to be issued on blockchains without traditional intermediaries. The bill also allows security token issuers to create secondary trading venues

for their investors. Also in September 2020, the European Commission adopted several legislative proposals as part of its Digital Finance Strategy. Importantly, security tokens fall under MiFiD II, and not under markets in crypto assets regulation (MiCAR). There is debate over whether decentralized exchanges such as Uniswap fall under MiFiD II's definition of a trading venue or not.

- In Asia, Hong Kong, Japan, and Singapore have already provided legal definitions for security tokens and given licenses to select security token exchanges. Singapore has created a regulatory sandbox where blockchain and fintech projects can develop. For example, the security token platform iSTOX graduated from the program with a greenlight to proceed with operations in June 2020.

- Security tokens can be rated by rating agencies in the same way that traditional securities can. Among the first STOs to be granted a credit rating was the one of Societe Generale, which secured the best possible rating of Aaa/AAA from both Moody's and Fitch respectively.[1]
- One of the main trends in the security token market is tokenized real estate, which became the highest growth segment in 2020. It more than doubled its number of offerings compared to 2019.
- KPMG and WEF project that the security token market will grow to $8 trillion by 2025.[2] The German digital asset platform for institutional investors, Finoa, predicts that the global security token market will have $9.5 trillion in assets under management by 2025.

1 What are Security Tokens?

Welcome to the Security Token Report by Cointelegraph Research. In 6 chapters and 90 pages, this report investigates the current size of the security token market and the growth trend over the next decade.

Security token offerings (STOs) are a hybrid between initial coin offerings (ICO) and the more traditional initial public offering (IPO). Instead of offering a digital share or bond stored in a single company's database, such as the shares held by the Depository Trust Company (DTCC) in New Jersey, a STO involves a security token. A security token is a regulated investment contract hosted on a distributed ledger technology. Two defining features of a security token are that the investment contract is "tokenized", which means that 1.) cryptographic techniques such as hash functions are used to verify the integrity of the data (which wallet address owns the token and how many tokens does that wallet address have) and 2.) asymmetric encryption is used to create public and private key pairs.

[1] https://ico.li/french-bank-issues-aaa-rated-security-token/
[2] https://blockstate.com/global-sto-study-en/

Figure 1

Security Token Market Cap on Secondary Markets Is Expected To Breach $1 Billion By August 1, 2021

Source: *stomarket.com, Cointelegraph Research*

In practice, security tokens often exist in both traditional databases stored by one company and a duplicate, or courtesy copy, lives on a blockchain. This allows investors to have the best of both worlds. On the one hand, one copy exists to outline which investors own which securities in case a problem arises with the blockchain technology, and on the other hand, a tokenized copy exists on a blockchain so that investors can have more control over the use of their security such as 24-hour trading and lending. **We predict a large trend over the next few decades will be the emergence of self-custody of securities and the re-establishment of bearer financial instruments.**

STOs can be for blockchain related investment or non-blockchain related investments. Today, security tokens can already be bought, sold, and traded in regulated and centralized security token exchanges referred to as "digital asset marketplaces" such as tZERO, MERJ, TokenSoft, or on decentralized cryptocurrency exchanges such as Uniswap.

When we first started writing this report, we were not convinced that security tokens would have a disruptive impact on financial markets. This is because the global market cap of security tokens trading on regulated secondary markets is currently only $700 million, and the daily trading volume averaged a little over $100,000 in April 2021.

Learn Tokenization: Security Token

Security tokens are regulated investment contracts hosted on distributed ledgers that are often designated for professional investors. Security tokens can represent an investment contract into an underlying asset, such as stocks, bonds, funds, and real estate investment trusts (REIT).

Learn Tokenization: Security Token Offering

Security token offering (STO) refers to the public offering of tokenized digital securities, known as security tokens.

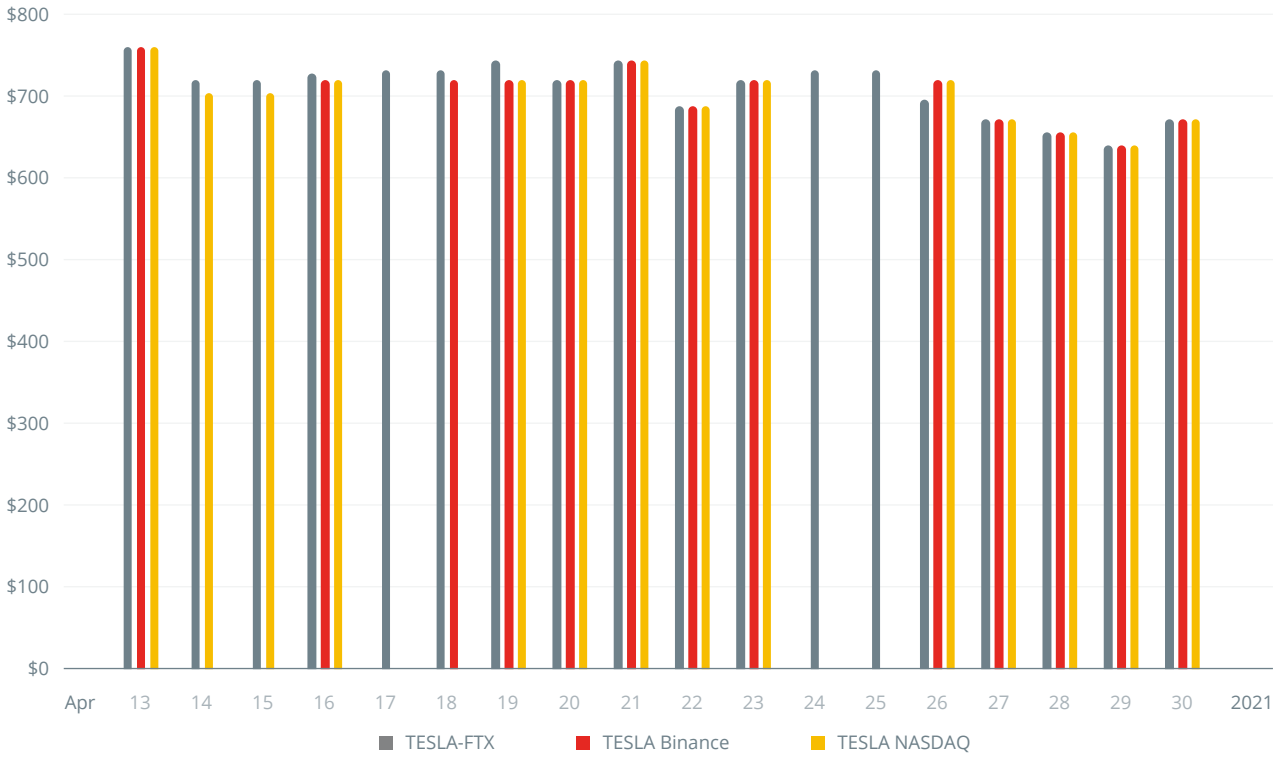
However, our perspective completely changed once we understood the hockey stick in demand for tokenized traditional stocks such as Tesla (TSLA), Coinbase (COIN), Gamestop (GME), and Apple (AAPL). Tokenized stocks are fully backed digital representations of traditional stocks that are traded on a traditional exchange such as the NYSE or an alternative trading system (ATS) such as NASDAQ. Recently, the cryptocurrency exchanges FTX and Binance enabled tokenized stock trading for their users, and the daily trading volume grew from zero to over $4 million within one month. The US-based Uphold exchange also recently acquired JNK Securities and can now use their broker-dealer license in order to enable security token issuance and trading as well.[3] Also, in the US, the newly chartered crypto bank, Anchorage, may become a leader in security token custody. Anchorage recently struck a partnership with Prometheum, a retail platform for trading digital securities.[4]

Many people think the digital representations are derivatives, but they actually aren't. The tokenized stocks can be converted into traditional stocks through a process with the issuer named CM Equity AG in Germany. Although various regulators have questioned the legality of tokenizing traditional stocks, the CEO of CM Equity AG, Michael Kott, upholds that they are fully compliant with all regulations.

Whether the current first movers are shut down or not, we see a wave of demand for tokenized stocks from investors on the horizon. Blockchain-based assets put investors in the driver's seat instead of letting regulators steer. We see a large trend being the self-custody of securities and the re-establishment of bearer financial instruments. In the future, investors will be able to remove securities from an exchange such as Binance and send them to a different exchange such as the NYSE with a private key. Arbitrageurs will seek risk-free returns by trading the same shares on different exchanges. Exchanges will compete with each other in order to attract investors by offering them interest on their security deposits for lending their securities to the exchange who will in turn lend the shares to other borrowers (i.e. shorts or leveraged longs). Exchanges may also allow investors to use their securities as collateral for loans or margin trading. This will drastically change the demand for securities as less investors will sell and trigger taxable events in order to acquire liquidity. The demand will also increase for attractive securities as a global pool of investors will now be able to easily invest in securities in other countries.

Figure 2

Gap in Prices of TESLA Stock on Different Exchanges Leaves Room For Arbitrageurs

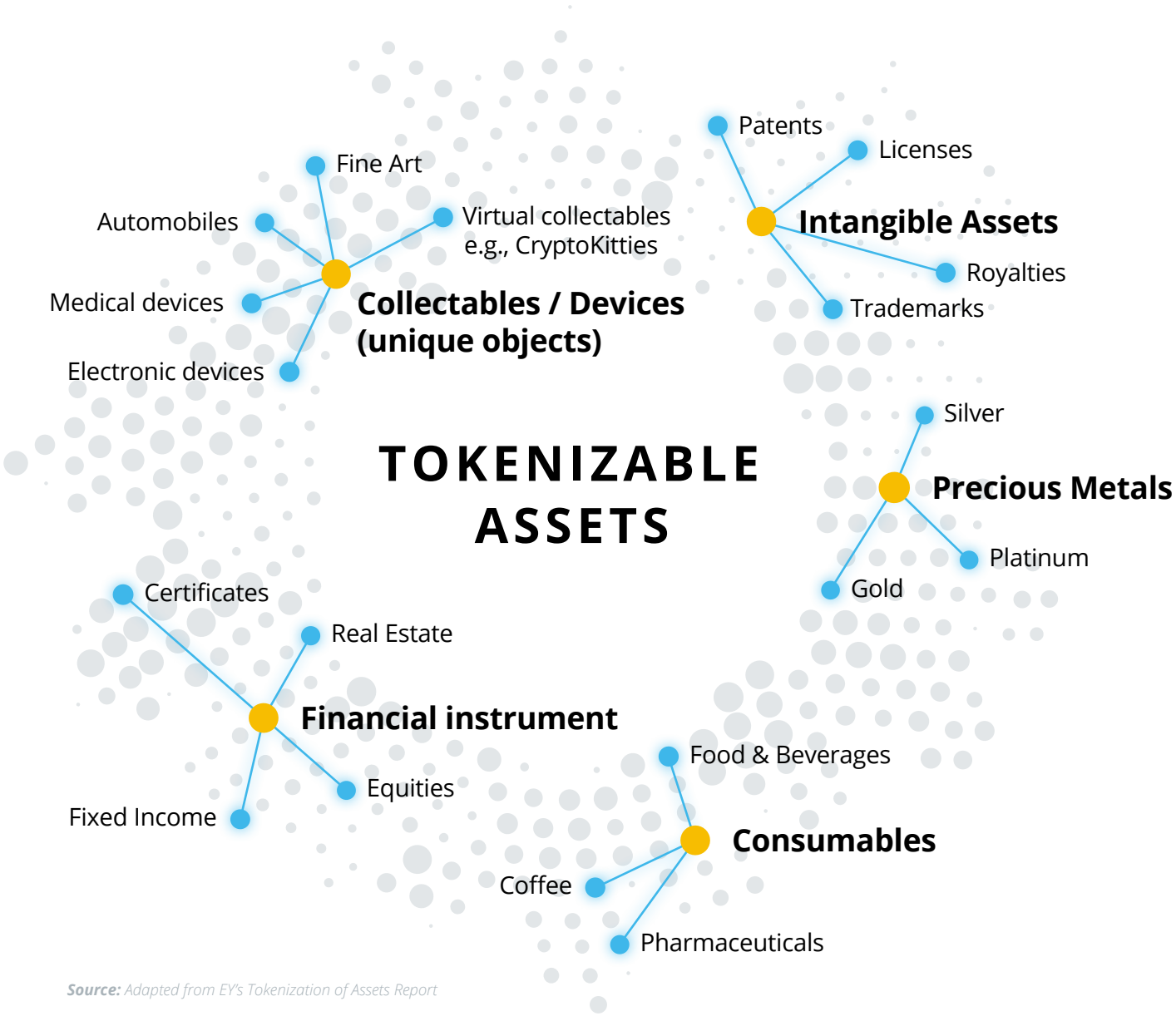


Source: *stomarket.com, Yahoo Finance, Cointelegraph Research*

[3] https://www.prnewswire.com/news-releases/uphold-to-acquire-us-broker-dealer-jnk-securities-after-regulatory-approval-301259582.html

[4] https://medium.com/anchorage/better-trading-ahead-anchorage-and-prometheum-partner-to-launch-first-digital-asset-ats-c9c8ba868417

1.1 What Can Be Tokenized?



Source: *Adapted from EY's Tokenization of Assets Report*

EY's *Tokenization of Assets Report* describes five main categories of assets that are being made into security tokens including collectibles, financial instruments, consumables, precious metals, and intangible assets. However, this list does not describe the most popular ways in which security token issuers extract economic interest from these tangible and intangible assets in practice. The security token can represent one of these four economic interests:

Tokenized Profit Participation Rights

Tokenized profit sharing was originally not very popular for ICO investors, because a firm could hypothetically increase their costs up until the point that the company showed no profit. However, companies with compliant security tokens that follow disclosure requirements and subject themselves to supervision from financial market authorities can garner trust for this type of investment contract.

Republic

The Republic note, structured as a debt instrument, pays out a portion of its profits in the form of a dividend to investors. However, the dividend is only paid out when a startup company that raised capital on their platform has a successful exit by being acquired or going public. This is because Republic charges a 2% commission and 1 – 16% carry interest to the startup. The note managed to raise more than $16 million despite the risks associated with the security token i.e. that the startups may never have a successful exit or the website Republic.co does not stay in business long enough to see the startups have a successful exit, which can take up to 10 – 20 years.

Bitbond | STO

Bitbond Finance GmbH's security token is structured as a subordinate bond/loan/note, and they pay out 60% of their company's pretax profits to token holders over the life of the bond. Bitbond revenue comes from charging 2 – 3% loan origination fees to borrowers and pays out 0.5 – 1.5% to the investors that gave Bitbond the capital to lend out to borrowers.[5]

Tokenized Revenue Participation Rights

Similar to profit sharing rights, revenue sharing rights are often structured as notes (debt instruments) that give the investor a right to receive a share of top line revenue from a company rather than a fixed periodic payment based on a percentage of the monies loaned to a company.[6] Also, similar to profit sharing rights, the investors are not buying the equity of the issuing company. The security token explicitly states the percentage of revenue that investors will receive. However, the dividends each period will be variable as well as the length of the note's maturity.

INX

The Gibraltar-based securities trading platform that recently merged with Open Finance Network, INX Limited, launched an initial public offering in 2020, which recently ended in April 2021.[7] However, the IPO was not really an IPO, because INX was not offering equity. Rather, they offered a revenue share from their operations. Their goal was to raise $10 million in this funding round. INX's revenue share security token offering in the US is for both retail and professional investors. Currently, INX is also using a SPAC to list their equity on the Canadian stock exchange. A public company owned by a private equity firm bought all INX's equity and is now listing the equity on the Canadian Stock exchange.

[5] https://www.bitbondsto.com/files/bitbond-sto-lightpaper.pdf
[6] http://moolapitch.com/revenue-participation-notes/
[7] https://cointelegraph.com/news/sec-registered-crypto-issuer-inx-to-wrap-up-ipo-in-april

Tokenized Commitments to Use or Voucher

A security token issuer can sell tokens that can be redeemed in the future for a certain good or service. This investment type is popular with ICOs and initial exchange offerings (IEOs). The funds collected from investors are used to finance the company in its early stages. However, if this investment type is deemed to be an investment contract by financial market authorities, it becomes an unregistered security. Therefore, it may behoove companies to have legal experts determine if their tokenized commitment to use or voucher is a utility token or a security token prior to doing the sale. A voucher can also be structured to manage accounting and tax consequences or it can be linked to the other instruments presented above, such as a profit participation right in a corporation.[8]

Blockstream

The recently announced Blockstream Bitcoin mining security token Blockstream Mining Unit (BMN) represents the use of Blockstream's mining equipment. The investment contract is structured as a note with a minimum investment of €200,000 that only qualified investors can buy. Each note entitles the security token investor to the BTC mined by up to 2,000 TH/s of hashrate.[9] The bitcoin is paid out at the end of the note, and the note's maturity is set to 36 months. The note is issued by a Luxembourg Securities Vehicle, which is a unique type of fund that can sell shares or issue debt to qualified investors with lighter compliance requirements.[10] Although the structure is not extremely risky, the BMN states that no return is guaranteed due to how fast mining equipment degrades.

Tokenization of the Ownership of Tangible or Intangible Assets

These are often referred to as asset-backed securities and can be tokenized ownership of precious metals, apartment buildings, or royalties from music for example.

BLOCKCHAIN CAPITAL

Blockchain Capital Token is one of the oldest security tokens. Launched in 2017, token holders benefit from exposure to the underlying assets of the fund, which invests in the digital assets and equity securities of some of the most recognized emerging companies building blockchain and digital asset platforms.

22X

22X Fund Token is a security token offering backed by real assets i.e., equity investments in Silicon Valley's top companies.[11]

Learn Tokenization: Special-purpose Acquisition Company

A special purpose acquisition company (SPAC) is a shell corporation that is already listed on a stock exchange. The SPAC can be bought and then used to acquire all of the equity of a private company, which allows the private company to go public without going through the traditional initial public offering process, which can take time, expertise, and incur high costs.

[8] https://www.svlaw.at/en/tokenize-the-world
[9] https://stokr.io/blockstream-mining/pitch
[10] https://www.loyensloeff.com/media/475533/lll-securitisation-vehicles-brochure-small.pdf
[11] https://www.22xfund.com/faq

In addition to the four common ways that economic interest can be pulled from tangible and intangible assets, there are four common ways that the investment contract can be structured from a legal perspective including:

Tokenized Subordinated Loans or Structured Products

A subordinated loan allows the security token issuer to raise capital by issuing a debt instrument that promises to pay an interest rate with principal repayment at the end of a fixed term. Subordinate refers to the loan being inferior to any non-subordinated loans outstanding, because security token investors may only demand payment of the coupon payment after all other non–subordinated creditors have been paid. Also, they are paid out after non-subordinated creditors in the case of bankruptcy, and if the company does not pay out the promised interest payments or principal repayments to the security token holders, insolvency proceedings can not be forced by subordinate creditors. Although this is an extremely high risk type of bond, it is one of the most common bond types used in the crowdfunding industry.[12]

CROWDLITOKEN
THE DIGITAL REAL ESTATE ASSET

The Liechtenstein-based Crowdlitoken is structured as a subordinate bond ("CRT") that has an initial term of 25 years. When traders want to go in and out of their Crowdlitoken investment, they can sell the purchased token to another interested party on secondary markets.[13]

Tokenization of a Special Purpose Vehicle

Many cryptocurrency investment products are structured as notes that are issued by an SPV. However, the shares of an SPV can also be directly tokenized. Regardless of being tokenized shares of an SPV or a note issued by an SPV, there is risk with this structure and it is not sensical for an SPV to go public, although, this is legally possible. SPVs were traditionally set up by larger corporations that wanted to engage in risky investments. The structure of the SPV means that the parent company is protected from the risky investments made by the SPV, because they are different companies. However, the solvency of the SPV depends on the parent company's wellbeing. If the parent company is in trouble, the SPV's investors are in trouble too, because the assets held by the SPV are not ringfenced on the parent company's balance sheet. Another problem is that SPV's often buy assets with lines of credit provided by the parent company. If the SPV loses money, it may draw on the guaranteed liquidity lines offered by the parent company, which can put the parent company in an increasingly precarious position, especially if multiple high risk SPVs are dependent on the capital of the parent.[14]

Brickblock

Brickblock in Germany tokenized the participation shares of an SPV in order to sell a property worth approximately €2 million in Wiesbaden, Germany.[15] Each share entitles the token holder to the economic benefits of the underlying real estate asset (e.g. dividends from rent, interest, principal distributions).

[12] https://www.svlaw.at/en/tokenize-the-world
[13] https://www.area2invest.com/real-estate-tokenisation/
[14] https://medium.com/@blockchainlawyer/special-purpose-vehicles-at-the-intersection-of-blockchain-and-law
[15] https://www.prnewswire.com/news-releases/brickblock-tokenizes-the-first-property-in-europe-300820582.html

Tokenization of a Private Company

The shares of a Delaware LLC in the US can already be tokenized, and those tokens represent what the company holds on its balance sheet. In the German-speaking countries, several firms are working on streamlining the tokenization process for the shares of an AG or GmbH including Amazing Blocks in Liechtenstein.[16]

RealT

Each RealT token represents the tokenized shares of a Delaware-based LLC that holds a specific investment property. This token offers a percent of the rent collected from the property after expenses are paid, and the dividend payment is made daily to each investor in the form of cryptographic assets. RealT has successfully tokenized 75 properties over the last 2 years, and has enabled whitelisted investors to trade security tokens on Uniswap.

tZERO

The tZERO token pays 10% of adjusted gross revenue of the tZERO exchange to token holders on a quarterly basis, subject to board approval and the conditions outlined in the offering memorandum. The token sale collected more than $130 million.

MERJ

The MERJ Exchange is an international securities token exchange. While the tZERO exchange caters to the US, MERJ focuses on non-US investors. Therefore, both exchanges can list the same securities and arbitrage opportunities can arise. The MERJ Exchange token (MERJ-S) is an equity token for the Seychelles-incorporated company, and the token lives on Ethereum as an ERC-20. They hope to raise $4 million and accept accredited investors only. The ERC-20 tokens will be distributed once the security token offering sale closes. The sale is currently still open.

[16] https://my.amazingblocks.io/

Tokenization of a Public Company

The shares of a publicly traded company can be tokenized. The anti-Wall Street renegade Patrick Byrne was behind the first company to do this. His company Overstock.com (OSTKO) tokenized their shares and launched the first ever security token airdrop in 2019. A digital dividend was paid out to each OSTKO investor at a ratio of 1:10, meaning that one share of Series A-1 was issued for every ten shares of common stock, Series A-1 or Voting Series B Preferred Stock.[17] This helped onboard thousands of users to the new security token exchange tZERO, because investors had to make an account on tZERO in order to claim their new digital share.

overstock.com

Overstock.com is a big e-commerce NASDAQ listed company in the US. Their security token OSTKO allows its holders to earn annual dividends. Since the token is listed on both a traditional securities exchange and on a security token exchange (tZero), an arbitrage opportunity exists between the shares.

Figure 3

Overstock's Stock and Security Token Have Traded Together

Source: *stomarket.com, Yahoo Finance, Cointelegraph Research*

[17] https://www.globenewswire.com/... /Overstock-com-Inc-Declares-Dividend-of-One-Digital-Share-for-Every-Ten-Shares-Held.html

1.2 ICO vs. STO

Over the past few years, crowdfunding, private equity, initial coin offerings (ICOs), and security token offerings (STOs) have been some of the ways that investors have provided capital to small and medium-size enterprises (SMEs). Although the concept of crowdfunding goes back to 18th century book sales, the modern conception of crowdfunding is an internet phenomenon. **Crowdfunding typically refers to entrepreneurs raising small amounts of capital from a large pool of investors online.**[18] There are several types of crowdfunding, but **the two relevant ones are donation-based fundraising and equity.** Donation-based equity crowdfunding is where investors give or "donate" capital to a startup in exchange for a future good or service or just to support the idea. Popular sites for donation-based crowdfunding include Kickstarter that has raised over $3.7 billion and Indiegogo, which has raised over $1 billion. In contrast, equity crowdfunding is the crowd-sale of securities such as equity, debt, membership units, and convertible units. Equity crowdfunding has raised approximately $500 million since its inception in the U.S. in 2015.[19] One reason why equity crowdfunding has not garnered more attention is because the JOBS Act's Regulation Crowdfunding (CF) initially allowed issuers to only raise up to $1 million, and the cost to receive approval from the SEC to raise capital with Reg CF often cost startups hundreds of thousands of dollars. However, this year, the SEC increased this amount to $5 million[20], so more firms may use Reg CF in the future; however, this is still a paltry amount given the high costs associated with the regulatory hurdles in the US.

The blockchain technology has enabled six new methods for raising capital including:

1. Launching a free software protocol like Bitcoin (BTC), and then becoming an early miner of the coin when the difficulty is low
2. Doing an initial coin offering (ICO) like Ethereum (ETH)
3. Doing an initial exchange offering (IEO) like Band Protocol (BAND)
4. Garnering venture capital investment like Avalanche (AVAX)
5. Doing an initial decentralized exchange offering like Uniswap (UNI)
6. Launching a regulatory compliant security token like tZERO (TZROP)

However, each method does have unique benefits and disadvantages for issuers and investors. When an investor buys a token in an ICO, IEO, or IDO they are typically entitled to a bundle of digital rights (e.g. rights to use a platform or receive discounts on transaction fees). In contrast, security tokens represent investment contracts with legal protection and shareholder rights that can be enforced in traditional courts. Although ICOs have largely gone by the wayside due to regulatory crackdowns from financial market authorities and investor fatigue from the multitude of scams, there is growing demand for security tokens.

Security tokens combine the best of both the cryptocurrency world and traditional markets. As compared to traditional markets, security tokens allow self-custody, instant settlement, 24/7 trading, higher levels of liquidity via automated market makers, and a reduction in counterparty risk. However, there are some drawbacks that still need to be worked out including compliance with anti-money laundering (AML) regulations as discussed in the practitioner perspective below with Dr. Lewin Boehnke of Crypto Finance Group.

[18] "Definition of Crowdfunding". www.merriam-webster.com. Retrieved 2019-01-23.

[19] Marks, Howard. How Crowdfunding Is Disrupting VCs. 2018. Forbes.

[20] https://republic.co/blog/investor-education/huge-news-sec-raises-regulation-crowdfunding-limit-from-1-07mm-to-5mm

Source: *Adapted from EY's Tokenization of Assets Report, Cointelegraph Research*

Practitioner Perspective with Dr. Lewin Boehnke of the Crypto Finance Group

CRYPTO FINANCE

Plumbing for the future of security tokens: Implementing KYC in bank transaction processes.

Dr. Lewin Boehnke

Decentralized finance is flourishing. With no central parties involved and few regulations in place, tokens are springing up all over. Most commonly, a public blockchain is also the medium of choice when multiple financial intermediaries cooperate to issue a tokenized product. Public smart contract platforms are becoming a sweet spot for a whole class of centrally issued securities. However, tokenized real-world assets offered by centralized and regulated issuers require Anti-money Laundering and Know Your Customer policies, and this form of centralization opposes the decentralized nature of the network.

The precise obligations, which regulated financial institutions have, heavily depend on the details of the token. What is the role of the institution? Is it the issuer of a product? Is it a custodian or co-custodian? In addition, the regulatory situation of the asset itself, as well as the jurisdiction in question, factors in.

Standardizing asset types and the corresponding token functionality will ease the handling significantly, but for the time being, these are mostly customized considerations. Given these inconsistent obligations, it is difficult to build processes that integrate neatly with client wallets, have a familiar user experience for the holder, and enable well-established processes for banks.

Consider the traditional operations when a client initiates a transaction, for example. Some checks are executed immediately and automatically, but if a transaction is flagged, it may be stalled, and may or not be executed after the pending checks.

Although such operations could be mimicked by a token smart contract, there are two drawbacks.

- First, many of the automated checks cannot be completed with a smart contract because e.g. they require confidential internal information. This can limit the approvable transactions immediately to very few cases — e.g., transferring small amounts between users who are both asset holders already.
- The ideal solution is doing checks during the transaction. This process of going from an on-chain & off-chain checks brings us to the second drawback: the user's experience with the wallet will likely break completely. User wallets expect a transaction to either make it to the chain, in which case the balances should be changed to reflect that, or to fail, in which case, this is clearly indicated to the user. If a transaction check is pending off chain, the intermediate on chain state cannot be interpreted by the user's wallet. The balances in the users' wallets only change once a bank's approval has been published on chain.

In other words, the blockchain simply cannot reach out to the bank, so the bank has to make an entry on the blockchain.

Besides such post-checks, two more options exist:

1. Pre-checks improve the situation by feeding information about the transaction or addresses into the contract before the holder attempts the operation.
2. and finally, (2) there is the ideal solution of doing all checks during the transaction. When the holder includes the countersigning by the institution in the operation, the contract can check this and act accordingly. Despite being the best option, in our view, this does require some additional plumbing. An ERC-20 contract, for example, does not allow additional data to be provided. ERC-223 and ERC-777 do allow this, but they have very limited support from wallet software. The additional pre-check between the contract and the bank would ideally be included in the wallet as well.

There are still many challenges to solve before the plumbing is in place for blockchain technology to fully disrupt the financial industry, but we are on it.

Find out more about tokenization in the finance sector from the Crypto Finance Group: cryptofinance.ch

1.3 Security Token Rating Agencies

One of the most important characteristics of a bond (a debt security) in traditional finance is its credit rating, which is a measure of how likely the borrower is to fulfill its obligations. Credit ratings are most often assigned by credit agencies, the most respected and well-known of which are Fitch Ratings, Moody's and Standard & Poor's. The ratings assigned by these companies use letter designations, with the highest credit rating being AAA, followed by AA + (Aa1 in Moody's designations), and so on up to the rating D (C in Moody's variant) , which is assigned to the bonds with an almost inevitable default.[21]

Although credit agencies do not disclose the exact procedure of evaluation and do not reveal what indicators have the most weight in the rating, agencies make key factors that affect the rating publicly available. For instance, Standard and Poor's lists country risks, leverage and management among the most important factors that determine the rating.[22] Creditworthiness measured by an agency has a direct effect on a company, since borrowers with higher credit ratings might attract funding at a lower cost.

Given that the STO concept is relatively new and not very familiar to the general public, it is no wonder that companies are interested in getting high credit ratings for their offerings in order to prove them to be legitimate and safe means of financing. Among the first STOs to be granted a credit rating was the one of Societe Generale, which secured the best possible rating of Aaa/ AAA from both Moody's and Fitch respectively.[23] Since then, multiple companies have got high ratings for their STOs. For instance, Japanese Sumitomo Mitsui Trust Bank got a short-term rating of "a-1" for its STO from Japan's credit rating service, Rating and Investment Information[24], and just over a year ago DBRS Morningstar granted a credit rating to a blockchain-based security for the first time.[25]

1.4 Blockchains for Issuing, Storing, and Trading Security Tokens

When deciding which blockchain to issue a security token on, an important factor is the software protocol used to represent the asset on the blockchain. Different software protocols have different options for the issuer and specific exchanges only work with certain protocol standards. Ethereum remains by far the most popular platform for security token offerings, because it has huge liquidity, simply created smart contracts and well-known standards for token issuing. Moreover, there are lots of wallets, exchanges and platforms that are ERC compatible, where holders and issuers can easily store, transfer, and manage their tokens.[26] Overstock, which is the largest security token project on the market, is made with the ERC-20 standard. Overstock is a large NASDAQ listed internet retailer which specializes in furniture sales. OSTKO token allows its holders to get dividends. Its market cap is more than $280 million and daily trading volume is around $100,000.[27]

Ethereum's dominance is not as large as it was in previous years, and it seems that projects are looking for alternatives. Tezos is the second most popular blockchain for security token issuance and trading. There are now more than $2.5 billion STs announced with the usage of Tezos blockchain. Tezos smart-contracts are more flexible for security token offering needs, having compliance and regulation features built-in. Elevated Returns was a pioneer in the security token industry and issued one of the the first security token backed by a trophy real estate asset, the St Regis Resort in Aspen, in 2018.

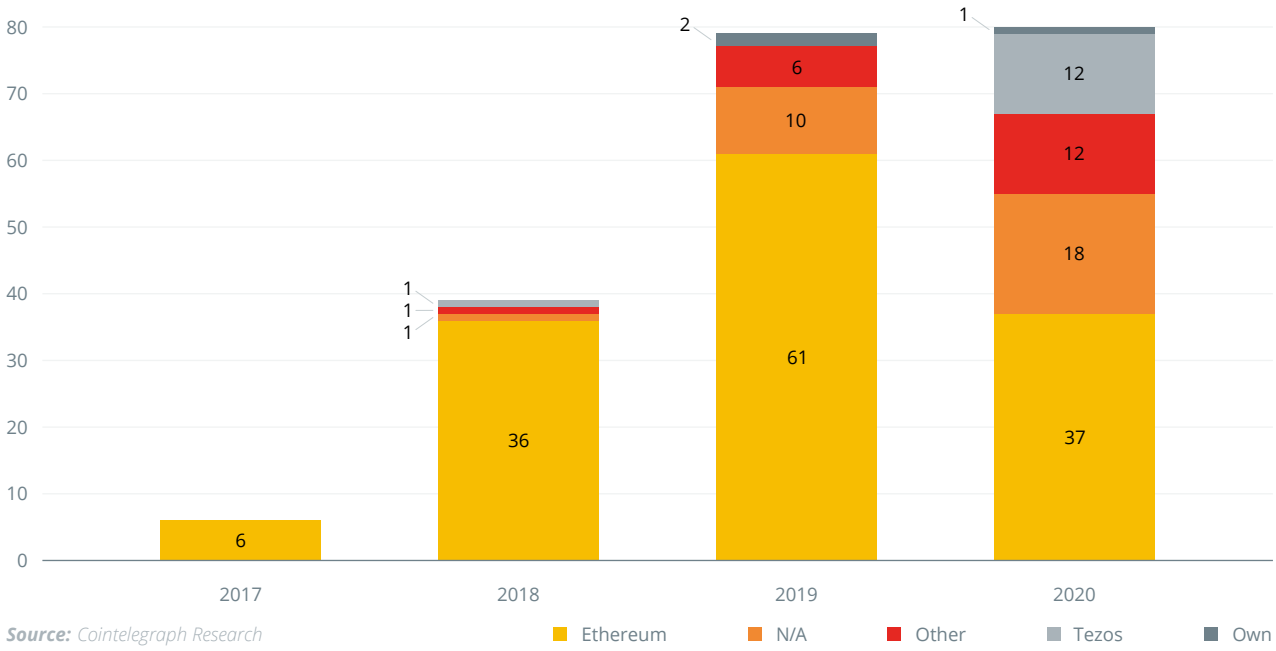
[21] https://www.fidelity.com/learning-center/investment-products/fixed-income-bonds/bond-ratings
[22] https://www.spglobal.com/ratings/_division-assets/pdfs/guide_to_credit_rating_essentials_digital.pdf
[23] https://ico.li/french-bank-issues-aaa-rated-security-token/
[24] https://www.nasdaq.com/articles/sumitomo-mitsui-trust-bank-to-issue-japans-first-security-tokens-2021-03-30
[25] https://www.forbes.com/sites/michaeldelcastillo/2020/03/08/morningstar-rates-first-ethereum-debt-security-in-40-million-fatburger-deal
[26] https://www.leewayhertz.com/launch-sto-security-token-offering/
[27] https://stomarket.com/sto/overstock-ostko

The Aspen Coin, which was initially issued as an ERC20 token, is now hosted on the Tezos blockchain, deemed by Elevated Returns as the best blockchain for STO's. The Aspen Coin is more significant by its structure than by its size. Since inception, a total of 12% have been paid out to token holders as distributions, both in fiat and cryptocurrency. The token is now trading on the tZERO ATS. Furthermore, Aspen Coin offers additional features like perks attached to the ownership of the token. The perks are financial such as up to 50% cash back on a hotel stay as well as access to unique experiences only available to members.

Elevated Returns has recently created a completely regulated digital finance ecosystem, which is going live this summer (July 2021) in South East Asia. The Elevated Returns team has spent 2 years acquiring licenses and made a major investment in Xspring Capital which owns a regulated security token platform in Thailand. This will bring to the market the first unrestricted regulated public offering with simultaneous listings on a regulated exchange. The token is backed by a real estate asset and will be listed on the ERX digital asset exchange. There are several large companies aiming to launch their future STOs using Tezos blockchain — tZERO, BTG Pactual, Dalma Capital, Fundament group and some others.[28]

Figure 4

Number of STO by issuing platform, 2017 – 2020



Source: *Cointelegraph Research*

1.4.1 Ethereum-based Security Tokens

The main standards used to represent security tokens on Ethereum include ERC-20 and ERC-1400. However, there are additional standards such as DS Protocol, R-Token, and T-REX.

[28] https://medium.com/tezoscommons/security-tokens-on-tezos-why-tezos-4a7065f49a06

Table 1

Types of Ethereum-based Tokens

ERC-20 Standard	ERC-1400 Standard	ERC-721 Standard	ERC-1155 Standard
Fungible tokens (e.g. ETH, MKR, UNI)	Security tokens	Non-fungible token standard (e.g. CryptoKitties)	Fungible and Non-fungible token standard (e.g. ENJIN NFTs)
Transfer of value between users	Transfer of value between users without losing the holder's identity	Transfer of rights	Transfer of value or rights
No KYC/AML	In-built KYC and AML	Built-in KYC and AML	Built-in KYC and AML
No recovery mechanism	Recovery mechanism available	Recovery mechanism — when false address — return to the wallet + only 2-step transaction	Recovery mechanism available
	ERC-20 compatible	Partially ERC-20 compatible	Partially ERC-20 compatible, ERC-721 compatible
Minting and burning available	Minting and burning available	No minting/burning	Minting and burning available

Source: *Adapted from E&Y Tokenization of Assets report, Cointelegraph Research*

In order to be compatible with wallets and blockchains, an issuer must use the same standards as the other players. However, the ERC-20 doesn't allow for the enforcement of the rules and regulations that govern private securities. A few of the options that security token issuers are looking for when choosing an appropriate standard include:

1. **Encoded Compliance** — The transfer rules are embedded in the securities and can never be transferred to an ineligible individual in either the primary or secondary markets.
2. **Reduced Costs** — Fees to do with settlement and reconciliation are dramatically reduced with compliant P2P transfers.
3. **Controlled Securities** — Issuers remain in control of the tokens, even with investor self-custody.
4. **Increased Transferability** — the reduction of friction points across the value chain unlocks highly transferable assets.

The ERC-20 protocol is the original and oldest standard for issuing tokens. However, it has its own vulnerabilities and disadvantages. For example, tokens can be drained from the smart contract with no recovery possible, or an investor could not retrieve their tokens if they sent them to a non-ERC-20 wallet or smart contract or if the holder loses his private key. There are also compliance and regulatory issues such as being difficult to set all the necessary KYC and AML procedures inside the ERC-20 standard. For example, you cannot enforce KYC for secondary market trading. In that case, many alternative protocols were developed to help suit the security token market's needs. All those alternatives (ERC-1400, ERC-721, ERC-1155, etc) are compliant with the ERC-20 standard which means that they can be easily stored, exchanged and transferred with ERC-20 infrastructure.[29] [30] [31] [32]

Alternatives to Ethereum's ERC-20 include:

DS Protocol

- DS is an open-source protocol , which was designed by Securitize specifically for securities and supports third-party applications. It has special DS apps, which address relevant events connected to the tokenized economic rights (issuance, trading, cap-table generation, governance events, required pay-outs). This protocol also has integrated compliance and registry

[29] https://micobo.medium.com/security-tokens-an-erc-standards-comparison-919e7c379f37
[30] https://medium.com/ethex-market/the-ethereum-blockchain-and-erc20-tokens-technical-challenges-and-solutions-for-2019-and-beyond
[31] https://www.apriorit.com/dev-blog/555-erc20-token-vulnerability
[32] https://www.youtube.com/watch?v=OZVIMXwOlXM

services. Tokens made with the use of this protocol are user-friendly — it is easy for holders to manage their tokens and they regularly receive various updates related to their tokens.

- Current Media's CRNC token. It is a token of a reward based streaming platform Current, which pays its users for using their service and providing data. The token is aimed at giving users better rewards while engaging the media.
- Blockchain Capital token BCAP is also based on DS protocol. Blockchain Capital is a large venture capital firm specializing in investing in blockchain based projects. Blockchain Capital used DS protocol for their STO due to the compliance, regulations and security features offered by Securitize for their security token.

R-Token

- R-token is an ERC-20 type token made by Harbor with some extra features added: in-built KYC, AML and taxation services as well as some flexible functionality which helps the issuer to make the necessary regulatory configuration. R-token standard allows the creation of tokenized regulated securities.
- Harbor, which created R-token, was acquired by the most popular digital asset custodian BitGo in 2020 and gained broker-dealer and transfer agent licenses. BitGo, in turn, was recently acquired by Galaxy digital — one of the most significant digital asset focused VC. We see those acquisitions as a possibility for BitGo to become a clearing house for the security tokens.
- iCap Equity which is a real estate firm based in Seattle is using Harbor R-token for tokenizing its assets.

T-REX

- T-REX is a protocol built on the public Ethereum blockchain which was created by Tokeny Solutions, which has been recently been renamed Tokeny Sarl. Although T-REX is Based on the ERC-20 standard, it has more than 100 options that can be used by issuers in order to enforce compliance and manage control for the issuer, agents, and investors.
- Tokeny Sarl state that they have more than $8.5 billion of tokenized assets with the help of their T-REX protocol.
- For example, Metalstream — a South-East Asian precious metal company. Their tokens are backed by gold and as it is stated by the token issuers — 1000 MSGLD tokens can be exchanged for 1 kilo of gold. Also, the token holders can get a discount on purchasing gold of up to 40% of market spot price.

SFT

- SFT protocol by Hyperlink Capital uses Solidity programming language which is used by ETH developers, that makes the SFT part of the ETH network. Basically, this protocol is similar to ERC-20 with the same comfy features which allow to easily build a smart contract. However, it is more complex and secure and that is why, allowing to tokenize debt and equity-based securities.

ERC-1404

- ERC-1404 was developed by Tokensoft and based on the ERC-1400 standard and is the ETH based SEC approved standard for security tokens. Which means that it fulfils the necessary security and compliance requirements including in-built KYC and AML (both for primary and secondary market).
- Tokensoft launched its own STO based on their ERC-1404 standard. Tokensoft is one of the most significant security token platforms on the market. It has a platform for launching STOs as well as asset management features. What is also interesting, Tokensoft is permitted to deal with SEC registered securities.

1.4.2 Non-Ethereum Blockchains and Protocol Standards

Tezos

- Tezos is the second most popular blockchain platform after Ethereum for security token primary insurance and secondary trading. Tezos blockchain offers wider opportunities to test transactions and smart contracts off-chain before launching on-chain, which provides a solid security standard. Tezos also offers secure storage solutions for security tokens as well as flexible upgradeability of smart contracts. Tezos also has all the necessary compliance features including built-in KYC and AML compliance.

- Notable uses of Tezos include Societe Generale, which recently issued the first structured product as a security token on the Tezos public blockchain. A large Brazilian investment bank BTG Pactual along with Dubai's asset manager Dalma capital launched a real estate STO on Tezos backed by Brazilian property. Originally, the STO was launched on the ETH blockchain but BTG Pactual sees a potential in Tezos and that is why the STO was then moved to an alternative platform.

Hyperledger

- Hyperledger is an open-source umbrella blockchain project by Linux. It's product Hyperledger Fabric's Fabtoken is a protocol which has a cross-chain ability as well as high code and data security. Also, the Fabtoken allows issuers to make and customize their token as thoroughly as they want to, including all the compliance and security features.
- Metacoin is the first and quite significant coin made on Hyperledger's platform. Metacoin consists of several projects — a block explorer, a wallet and a platform where issuers can create their own token. The Metacoin project is focusing on the development of the digital asset market and aiming to create its own blockchain ecosystem.

tZERO

- Tzero protocol is made for connecting the traditional market with the digital asset market. tZero protocol was developed to build the first SEC approved exchange for tokenized securities. That is why it has high standards for security and compliance (KYC, AML).

Cat-20/Cat-721

- Those 2 token platforms by Seccurency are interesting because they are not tied to the blockchain. It is for the issuer to decide what blockchain he wants to use — Ethereum, Ripple, EoS, GoChain or Stellar. They can also be freely transferred across the blockchains mentioned above. What is more, CAT protocols have in-built KYC, AML, KYB, KYW as well as the validation of investor's accreditation.

ST20 v1/v2

- St20 is a protocol built on Polymath's own blockchain, however it is fully compliant with the ERC standard tokens. It was one of the first security token protocols on the market. ST20 has in-built KYC and AML services as well as various mechanisms for token customization available for issuers.
- Polymath has partnered with several significant blockchain market players including tZero, Minthealth and Blockestate.

SRC-20

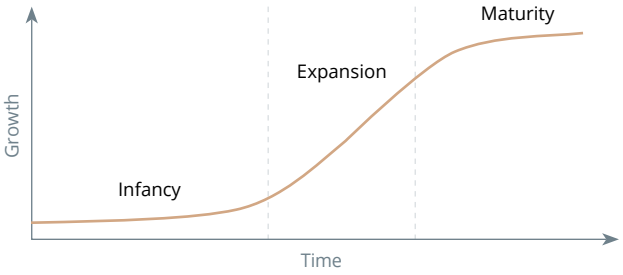
- This protocol is created by Swarm and operates on its own blockchain. SRC-20 standard is quite significant due to its flexibility, integrated governance and a wide range of assets that can be tokenized. The protocol creators claim that almost everything can be tokenized with the use of their protocol including real estate, investment funds, businesses and development projects. The protocol has an in-built mechanism that secures the right for revenue streams of tokenized assets.
- Swarm cooperated with OpenFinance to broaden the usage of SRC-20 protocols. OpenFinance is well-known as a blockchain for private equity and so, there are some collaboration projects based on SRC-20 standard.

How traditional finance can innovate with a challenger technology

Author **Michela Iseli**, from the **Crypto Finance Group**, outlines the opportunity for finance sector incumbents to innovate when they launch trial projects in the field of tokenization.

We have all seen it: successful companies lose their lead or even fail as new competitors come out of nowhere and take over the market. In *The Innovator's Dilemma*, Clayton Christensen describes that early on the effort with new products or technologies is high, despite low customer value and revenues. However, once a base is built, successive iterations are significantly better and value and growth can increase exponentially. Whereas well-established companies tend to focus on existing "cash cow" products and services with a large existing customer base, new market entrants are agile, find niches, and move more easily through the iterations to accelerate growth. By the time the product or technology becomes interesting to big players, the value increase provided by the competitor is unstoppable, and it's too late to compete.

Technology S-Curve



Source: *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail, Clayton M. Christensen.*

Does this sound familiar when thinking about blockchain applications such as security tokens and the financial industry? The technology is in its infancy right now, with many small players going through numerous iterations. However, soon these initial efforts will lead to major improvements, and the value and growth will be substantial.

So what does this mean for established companies in the financial sector? As Christensen concluded in his analysis, it is essential for big players to start experimenting early with disruptive technologies, even when the potential revenue seems it will be lower than their established products. It allows them to climb the S-curve themselves and stay ahead of their future competitors. The Crypto Finance Group offers a sandbox approach allowing this experimentation in a safe and trusted environment.

Consisting of experts from the financial industry and blockchain technology, the Crypto Finance team conducted various successful projects and system integrations over the past years. Banks and other financial institutions use their tokenisation platform and services to solve regulatory, technological, and operational challenges. The underlying secure digital asset infrastructure allows these established players to manage, process, and store digital assets with simplicity, security, and flexibility.

Five signature components of the tokenisation platform:

- Security rooted in every aspect of the infrastructure, e.g. tamper-proof hardware
- Modular design that allows full operational and technological flexibility
- Comprehensive all-in-one platform for simple digital asset management
- Seamless integration into existing environments, such as core banking systems
- A multitude of supported digital assets and functionalities

Besides the secure infrastructure for tokenisation and digital asset storage, the Crypto Finance Group also provides both FINMA-regulated asset management and 24/7 brokerage services for crypto assets.

Learn about the tokenisation sandbox offering from the Crypto Finance Group and how banks and financial institutions are navigating the disruption of blockchain: cryptofinance.ch

CRYPTO FINANCE

2 Security Token Returns and Trading Volume

According to the security token database[33] compiled by the Cointelegraph Research team, there were 80 publicly announced STOs in 2020, just slightly up from the 79 STOs in 2019.[34] Although Polymath claims 2019 had 380 security tokens, they are mistakenly combining the total count for ICOs, IEOs, and STOs in the 6th PwC report on ICOs and STOs.[35]

In 2020, our database reports $4.8 billion was raised by 80 companies, with a major part of the funding coming from two STOs. The first one was Red Swan, a US-based commercial real estate firm that partnered with Polymath and tokenized $2.2 billion in high-end properties. The second notable STO in 2020 was conducted by Thai Central Bank, which sold $1.6 billion worth of savings bonds using blockchain technology.

2.1 What Returns Have Security Tokens Provided?

In 2019, nine security tokens started trading on secondary markets. During their first 18 – 24 months of trading, three of the coins had positive returns (BCAP: +129.01% and two RealT properties: Audubon: +52.93% (+10.38% APY) and Marlowe: +8.59% (+12.39% APY)). Six of the coins had negative returns (SPiCE: −6.04%, RealT property Fullerton: −6.48% (+12.76% APY), 22X: −53.85%, TZROP: −63.75%m PRTS: −66.67%, LDCC: −95.88%. The largest winner since inception of trading on secondary markets has been Blockchain Capital's BCAP token, and the largest loser was tZERO's TZROP token. The market cap of TZROP was bigger than the 8 other tokens listed in 2019, which brought down the entire market capitalization of security tokens between 2019 and 2020 by 50%.[36]

However, 2020 did see some recovery for security tokens. In 2020, the market cap grew 517% from $59 million to $366 million between Jan. 1 and Dec. 31. The daily trading volume grew by over 1,000% between 2019 and 2020 and had an average of $5.8 million in 2020. In 2020, many new coins started trading on secondary markets. The top winners and losers are shown in Figure 5.

[33] To purchase the database, contact research@cointelegraph.com

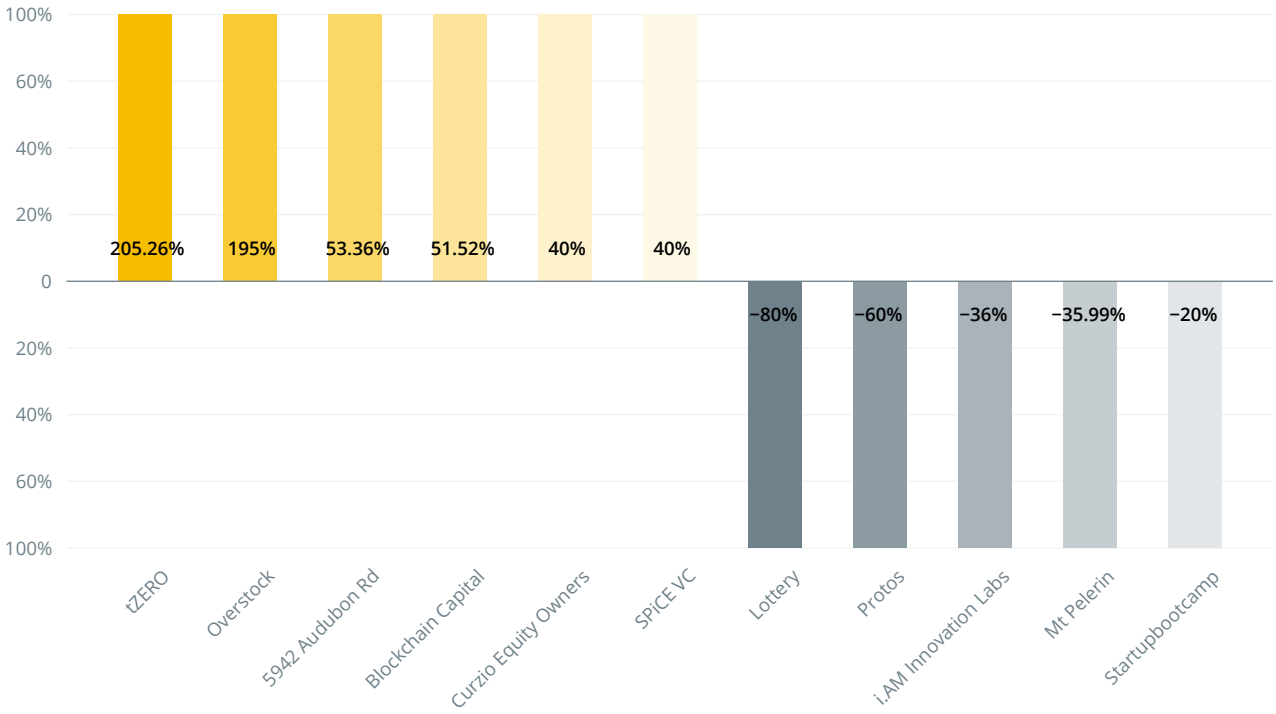
[34] This is not accounting for projects without an announced sale date

[35] https://www.pwc.com/ee/et/publications/pub/Strategy%26_ICO_STO_Study_Version_Spring_2020.pdf

[36] https://blog.stomarket.com/security-token-market-end-of-year-report-2020-59151e0caa1d

Figure 5

2020 Return For Secondary Market Trading of Security Tokens



Source: *stomarket.com, Cointelegraph Research*

Learn Tokenization: How to Calculate the Market Capitalization of a Security Token

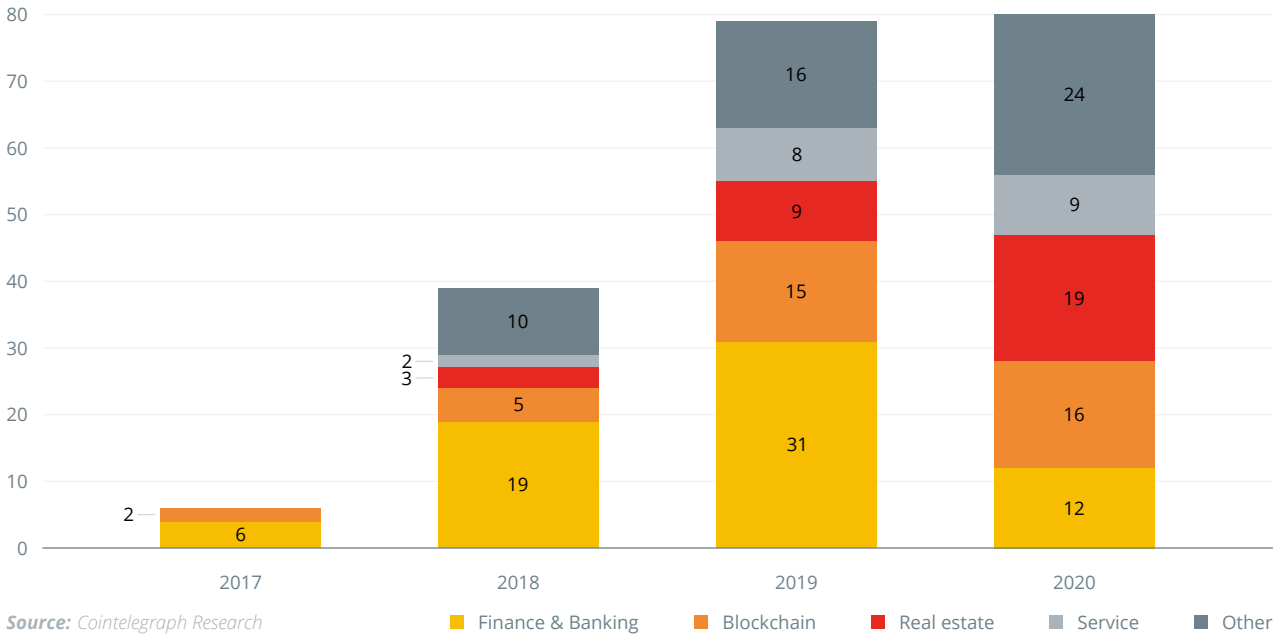
Overstock.com has a traditional stock (Ticker: OSTK) listed on NASDAQ and a security token (Ticker: OSTKO) listed on tZERO. In order to calculate the market capitalization of the security token, the number of shares traded on tZERO (4,370,000) must be multiplied by price listed on tZERO ($66.25), which equals $289,512,500. To calculate the entire market capitalization for Overstock.com, then the $289,512,500 must be added to the market capitalization of the traditional stock listed on NASDAQ, which is equal to $2.878 billion for a grand total of $3.168 billion.

2.2 Real Estate Security Tokens: Highest Number of Offerings and Most Raised

Overall, the number of publicly announced STOs increased in real estate, technology, heavy industries, and consumer services between 2019 to 2020. The highest growth segment in 2020 was real estate. It more than doubled its number of offerings compared to 2019, while finance and banking saw a steep decline to nearly a third of the previous year's figures.

Figure 6

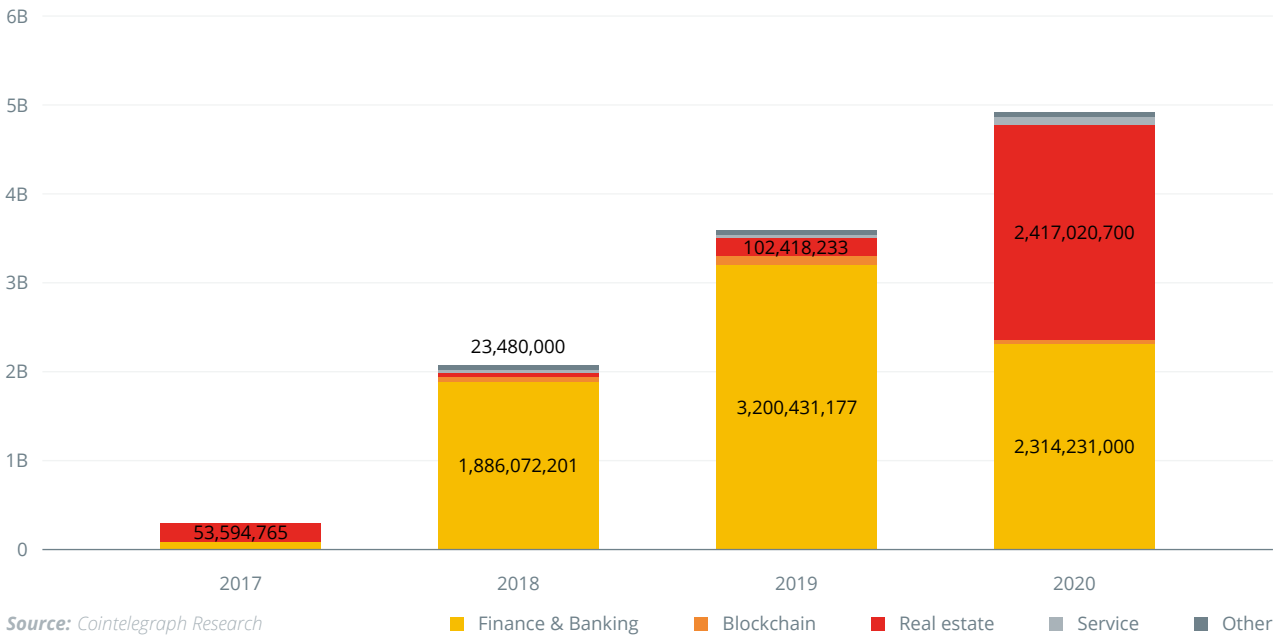
Total Number of STOs by Industry, 2017 – 2020



When it comes to the amount raised, real estate is again at the top with banking and finance taking second place. As mentioned previously, this is mainly due to the Red Swan project accounting for almost all of the capital raised during 2020.

Figure 7

Amount Raised by Industry, 2017 – 2020



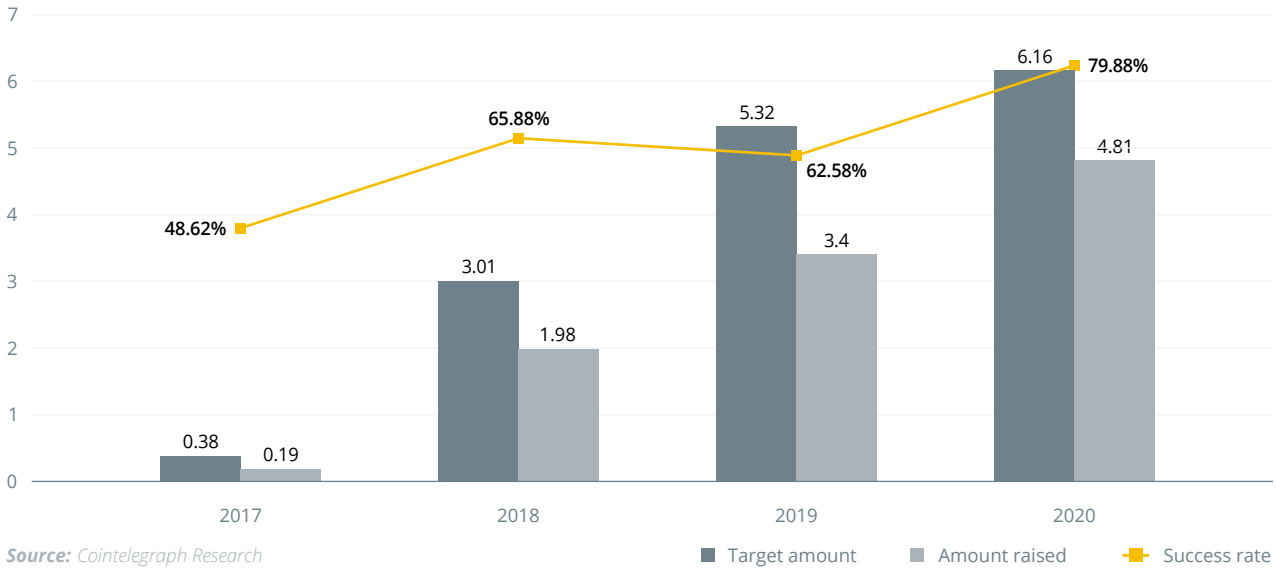
2.3 Security Tokens Raised $5 Billion in 2020

Both the target raise amount and the raise amount saw an increase in 2020, however, the most important trend is the increasing success rate (in terms of % of target raised) which seems to have steadily increased over the past four years, as more and more investors begin to familiarize themselves with STOs. (Figure 8)

The major segments behind the higher success rate are finance and banking and real estate, as all other segments seem to be lacking in this regard. (Figure 9)

Figure 8

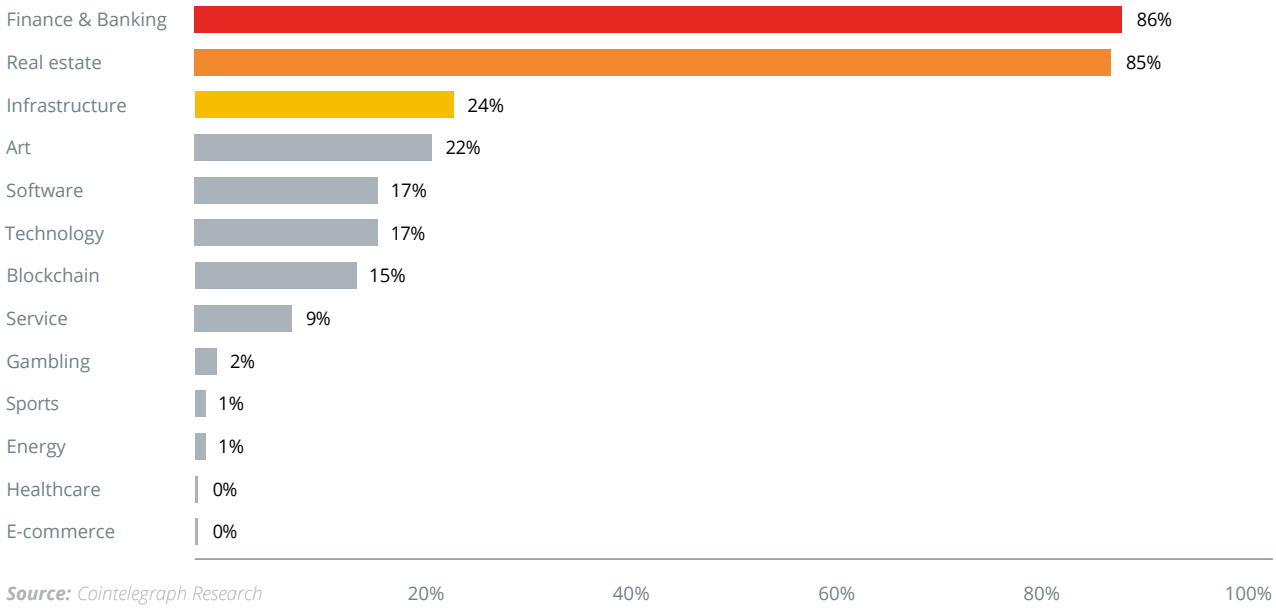
Target Amount vs Amount Raised in STOs, 2017 – 2020, $billion



Source: Cointelegraph Research

Figure 9

Percentage of Funding Goal Reached, 2017 – 2020

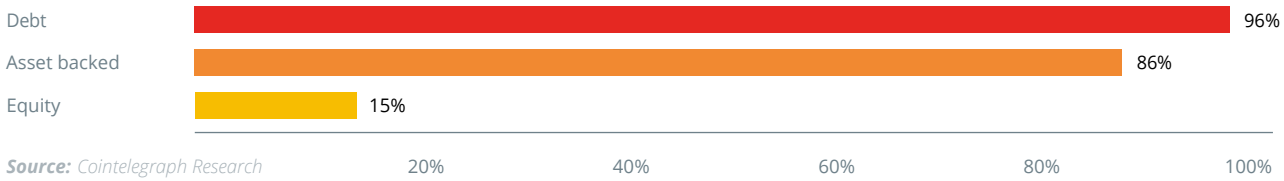


Source: Cointelegraph Research

That being said it is interesting to see that debt is the best performing class in terms of % of the raise target achieved, followed closely by asset backed. Equity lags way behind. This is likely due to the perceived risks across those different kinds of security tokens.

Figure 10

Percentage of Funding Goal Achieved by Underlying Asset Class, 2017 – 2020



Source: *Cointelegraph Research*

2.4 Corporate and Government Debt Are Gaining Momentum

The increasing number of STOs issued by established institutions indicates the potential of this fundraising mechanism. As the mechanism ripens, more countries and corporations tap into piloting STOs for bond issuance. Key efficiencies observed within the pilots include elimination of settlement risk (for issuer, arranger and investors), reduction in primary issuance settlement (from 5 days to 2 days), as well as automation of coupon and redemption payments and registrar functionality.[37] Thanks to the provided benefits in improving liquidity and transparency in the bond markets, debt tokens could disrupt the bond issuance process worldwide. The European digital asset custodian Finoa estimates that $2.65 trillion will be invested in securitized debt tokens by 2025 (see Chapter 3).

> **" The marriage of a digital order taking platform and backend infrastructure driven by tokens is the future of retail bonds. We are keen to see the day when investors can buy and sell bonds, even on the secondary markets at a click of a button on their phones."**
>
> — UnionBank Executive Vice President and Chief Finance Officer, Jose Emmanuel Hilado[38]

[37] https://www.sgx.com/media-centre/20200901-sgx-collaboration-hsbc-and-temasek-completes-pilot-digital-bond-olam

[38] https://av.sc.com/.../SCB_PR-UnionBank-Standard-Chartered-pioneer-blockchain-enabled-bond-issuance-in-the-Philippines-.pdf

Table 2

Most Notable STOs by Institutions, 2017 – 2020

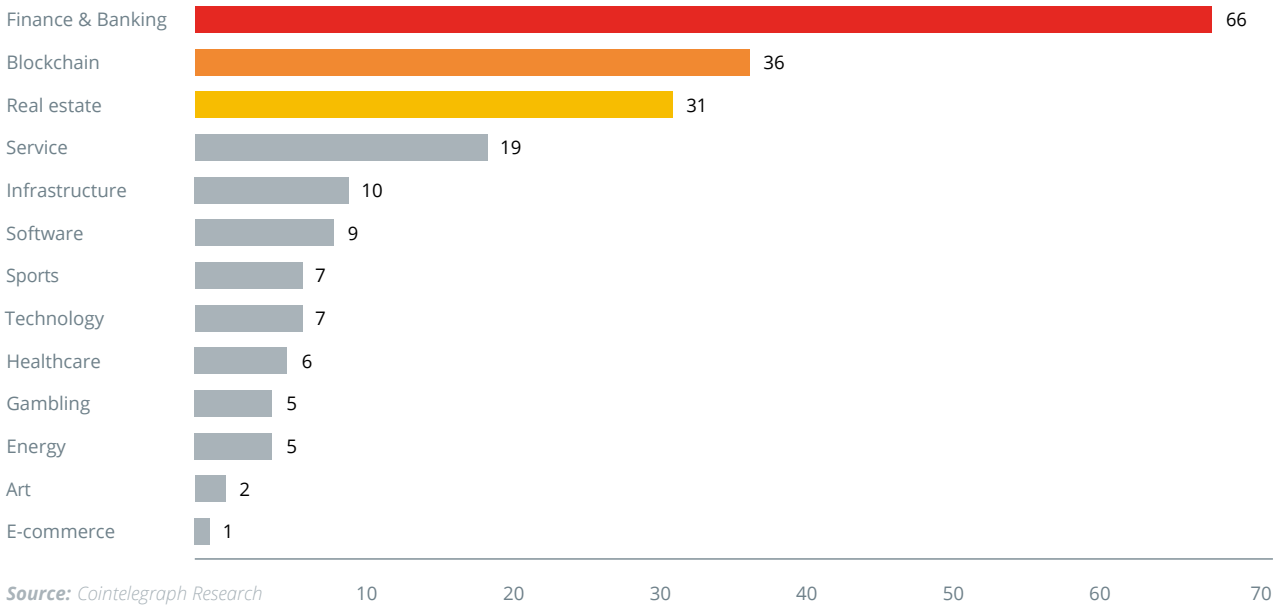
Country	Issuing institution	Amount raised	Date	Type of STO
	Bank of China	USD 2.8 bln	Dec 2019	Issuance / tokenization of a bond for micro-sized and small companies
	Bank of Thailand	USD 1.6 bln	Sep 2020	Issuance / tokenization of a government saving bond
	Austrian government	USD 1.4 bln	Oct 2018	Issuance / tokenization of a government saving bond
	HSBC	USD 367 mln	Aug 2020	Issuance / tokenization of a corporate bond
	Standart Chartered / Union Bank	USD 187 mln	Nov 2020	Issuance / tokenization of a dual tranche of 3 and 5.25 year bonds
	BBVA	EUR 150 mln	Nov 2018	Issuance / tokenization of a syndicated loan
	Daimler	EUR 100 mln	Jun 2017	Issuance / tokenization of a 1-year bond
	Société Générale	EUR 100 mln	Apr 2019	Issuance / tokenization of a 5-year covered bond
	The World Bank	USD 108 mln	Aug 2019	Issuance / tokenization of 2 tranches of AUD-denominated
	Banco Santander	EUR 20 mln	Sep 2019	Issuance / tokenization of a bond

Source: *Cointelegraph Research*

Between 2017 and 2020, STOs were most frequently used for financial services, and this category includes bonds issuance.

Figure 11

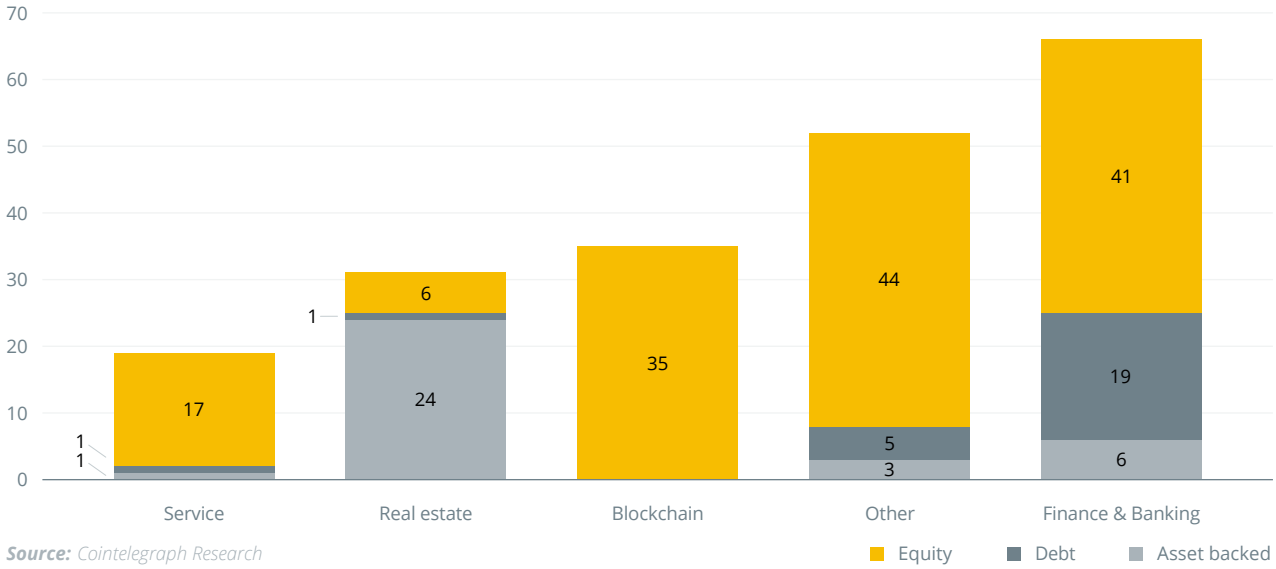
Number of STOs by Sector, 2017 – 2020



Source: *Cointelegraph Research*

Figure 12

Asset Classes Offered in STOs, 2017 – 2020

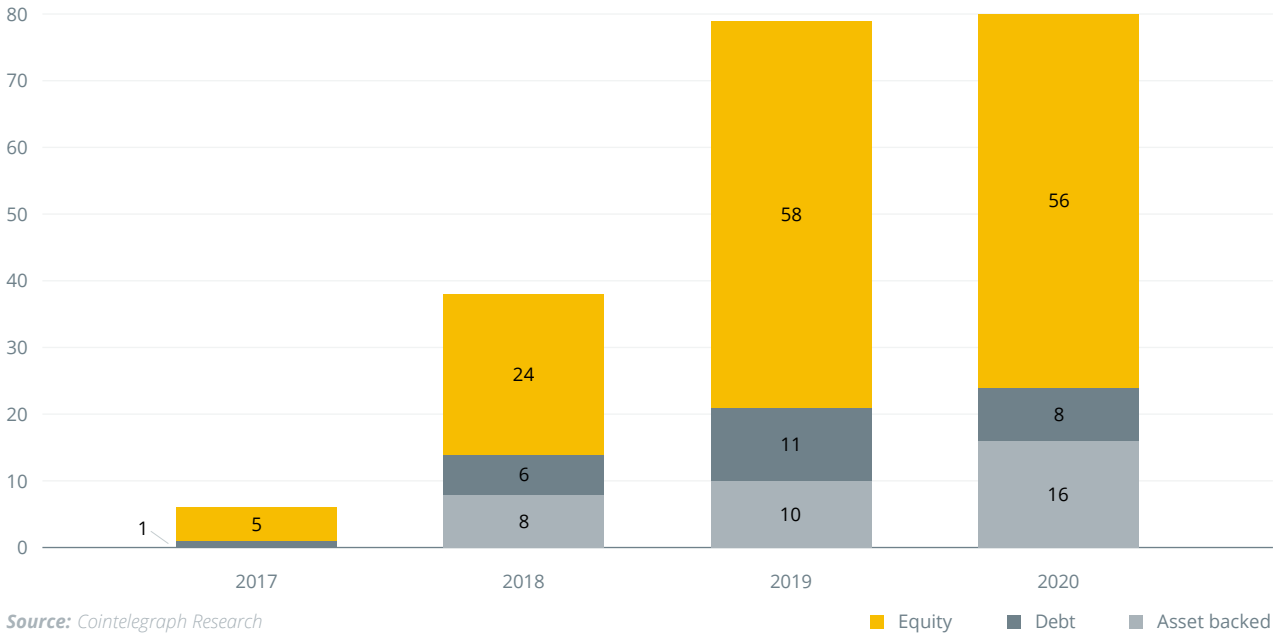


Source: *Cointelegraph Research*

Looking across the asset types that are being tokenized, equity remains king, although asset backed securities saw a steady increase (mainly due to real estate).

Figure 13

Type of Asset offered by the STOs by year, 2017 – 2020



Source: *Cointelegraph Research*

Practitioner Perspective with Dominik Spicher of the Crypto Finance Group

CRYPTO FINANCE

Tokenizing a Bond: Pain or Gain

Dominik Spicher

Tokenized securities are emerging as one of the most promising applications for public blockchains. Within the security universe, interest is strongest in tokenized bond offerings. This investment category is estimated to be worth ~$2.6 trillion by 2025.[39]

It is worth looking into the mechanics of tokenized bonds and the challenges that arise in a blockchain context. Overall, the specific advantages that tokenized bonds offer stakeholders compared to their traditional form outweigh these factors.

The main challenges facing tokenized bond offerings are the rules and regulations that issuers and other participants are subject to. None of these are fundamental by nature, but they require more tooling and standardization. One of the main opportunities is the advent of multiple institutions cooperating on bond issuance in a transparent way without reliance on trust

The Tokenised Bond Lifecycle

Pre-issuance		Post-issuance				Redemption	
Origination	**Distribution**	**Storage**	**Cashflow**	**Trading**	**Operations**	**Maturity**	**Termination**
Bond design and smart contract development	No intermediaries needed. Distribution via blockchain	Online or offline self-storage by owner or storage with third party (custodian)	Coupon payments	Secondary market trading	Emergency handling	Principal repayment	Token reclaim and smart contract destruction

Pre-issuance

In a tokenized bond offering, similar to a traditional bond offering, pertinent loan parameters — the offering volume, coupon rate and duration — need to be set. These parameters are directly expressed in the smart contract logic, typically within a contract template. The trustless execution on a public smart contract platform ensures adherence to these terms.

It is possible to move the entire offering, book-building and subscription process on-chain, but it is more common and practical to apply the same procedures as traditional offerings do. The advent of stablecoins, however, has made it more attractive to move the actual bond purchase on-chain. Final delivery of the bond tokens is then trustless and atomic, alleviating the need for payment agents and escrow services, thus reducing issuing costs. However, fulfilling regulations for Know Your Customer rules in the smart contract functions poses the main challenge here.[40]

Post-issuance

As for almost all digital assets, bond tokens need to be securely storable, transferable, tradable and recoverable during the bond's lifetime. Financial institutions have many options for digital asset custody and storage, and these options are also available for bond tokens. For those purposes, it is an advantage for the smart contract to adhere to standards, such as the ERC-20 specification. Unfortunately, however, the ecosystem is still in a consolidation phase when it comes to standards supporting more complex functionality, such as permissioned transfers.

Tokens that are not classified as securities typically enjoy completely permissionless transfers. Because the issuing institutions for tokenized bonds are subject to various regulations in virtually all jurisdictions, this is typically unfeasible. In response, approaches have emerged to reconcile compliant behavior and the censorship-resistant nature of public blockchains from simple whitelisting to flexible just-in-time transfer approval. Finding the right trade-off between the end-user experience and the scalability of the underlying platform remains a challenge.

[39] Source: "Projection of Tokenized Asset Market 2021 – 2025," Finoa, page 43

[40] Source: "Plumbing for the future of security tokens: Implementing KYC in bank transaction processes." Dr. Lewin Boehnke, Crypto Finance Group, page 20

A fundamental requirement when tokenizing bonds is the ability to price the underlying security and its risks in a secondary market. For many security tokens, this can happen off-chain on centralized exchanges or, more interestingly, on-chain on decentralized exchanges, such as Uniswap. However, avoiding liquidity fragmentation across platforms is even more important with tokenized bond offerings, which typically suffer from a lack of liquidity.

Even though smart contract security has made big advances, bond token contracts typically contain an administrator functionality to allow for reactions to unforeseen circumstances, e.g. pausing all transfers. In addition, it is advisable for issuers to be able to handle private key loss by bond token holders. This is especially relevant when coupon and redemption payments happen on-chain.

Finally, bonds usually exhibit regular coupon payments. The public blockchain as the final source of truth makes it convenient for issuers to determine the ultimate beneficiaries of coupon payments: The very same addresses holding the bond token at a particular date in time, which may be expressed in terms of block height, can receive the appropriate amount of stablecoin tokens or some other suitable means of payment on-chain. The flexible nature of smart contracts allows for corporate calendar events to be integrated into the asset itself.

Redemption

After the bond has expired, the principal is returned to the current token holders. Similar to coupon payments, this can be handled elegantly on-chain with the use of stablecoins, typically after bond token transfers have been disabled.

In order for the on-chain state to reflect the expired bond state, tokens are typically reclaimed by the issuer and subsequently burned — i.e., sent to an address where nobody can spend from — and it could even involve the destruction of the smart contract itself, thus removing all bond artifacts.

Challenges in an On-chain Environment

The main challenge is balancing the manifold possibilities of a public smart contract platform on the one hand and the regulatory environment on the other hand. Today, there is still substantial regulatory uncertainty with respect to the legal status of blockchain-based securities and the legal claims that holders may make, although developments, such as the Swiss DLT bill[41], clarify many previously open questions.

Well-established compliance requirements also apply to tokenized securities and need to be adhered to. Among the most salient ones are KYC rules and Anti-Money Laundering legislation. The inherently open and global nature of blockchains poses an especially pertinent problem here, as legislative details vary across jurisdictions. For example, it is customary to apply specific rules for potential U.S. investors in a security.

Such rules need to be included in a tokenized security offering. Typically, completely on-chain solutions are undesirable for usability, privacy and cost reasons. Instead, most approaches opt for a hybrid on- and off-chain workflow. For example, transfer requests could be required to provide additional associated data that establishes approval by an off-chain entity.

The most important advance needed in this regard is standardization. International bodies, such as the Financial Action Task Force, are starting to propose minimal standards for regulatory requirements in the digital asset space — the Travel Rule being the most well-known example. Technology standardization is also developing for smart contract functionality, enabling a better interplay between end-user wallets, custody solutions and other participants.

Until this standardization and consolidation continues to progress, designers, issuers and users of tokenized security products need to involve legal and compliance experts.

Opportunities: Why Tokenized Bonds

Given the challenges, why involve a public blockchain platform at all in regulated security offerings?

[41] https://www.admin.ch/gov/de/start/dokumentation/medienmitteilungen.msg-id-77252.html

One benefit for tokenized securities: more efficient interactions (such as transfers) and consequential cost reductions. These gains can be small if the processes involved are handled through a single financial institution. The public nature of blockchains shines when multiple entities cooperate in the issuance and handling of tokenized securities. Instead of developing ad-hoc integrations between the different parties, it can then be very attractive to lay down the terms of cooperation in a smart contract and subsequently rely on the blockchain to enforce those terms and synchronize between parties.

A good example is a simple whitelisting functionality to enforce permissioned transfers. Before an address may receive tokens, it needs to be explicitly whitelisted. Having a single administrator role that can whitelist addresses would pose a significant bottleneck for day-to-day operations. A recently developed token standard for the Tezos Blockchain[42] introduced a hierarchical system where administrators could nominate addresses that could subsequently whitelist addresses. Thus, the issuing institution can allow an exchange to whitelist customer addresses independently. An audit trail that records who allowed transfers to a particular address is then readily available.

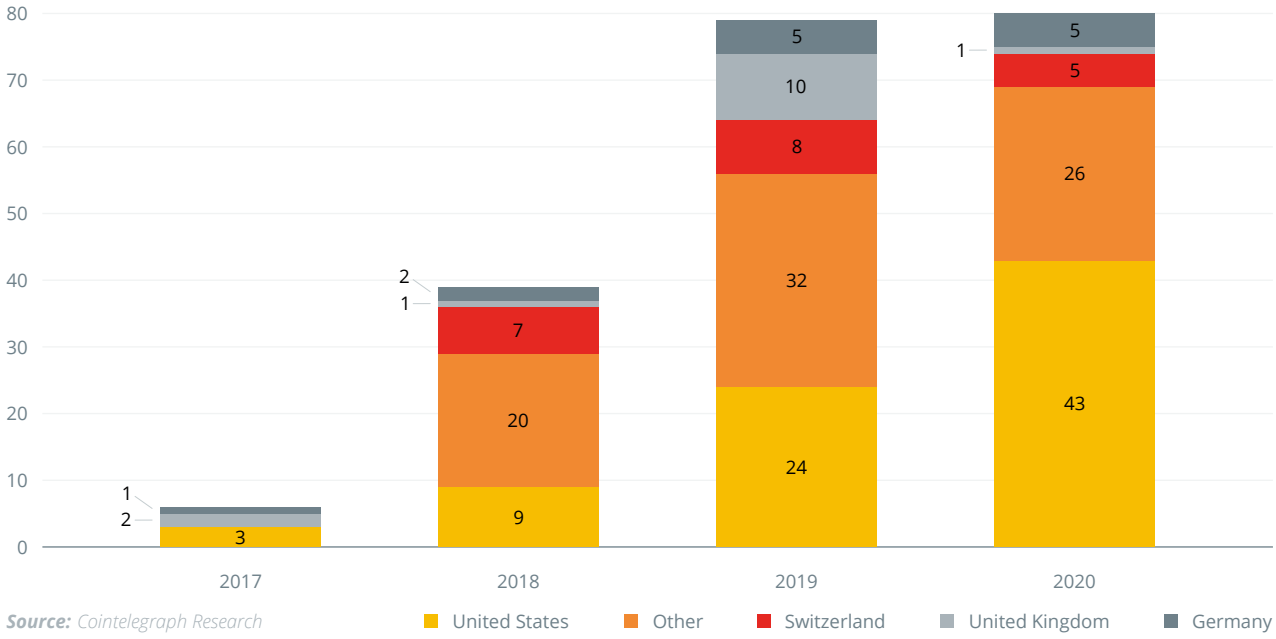
This example demonstrates how public blockchains can enable defining "the rules of engagement" between financial institutions, allowing them to cooperate on a flexible basis and consider a diverse range of securities and institutional arrangements.

2.5 USA: Highest Number of Registered Security Tokens

The United States solidified its position as the most popular jurisdiction for the incorporation of STOs, with Switzerland being a distant second.

Figure 14

STO Count by Country of Incorporation, 2017 – 2020



Source: Cointelegraph Research

[42] https://github.com/rogerdarin/Digital-Asset-Rules/raw/main/Digital_Asset_Rules_S1_v0.3.pdf

> **" In simple words, tokenization can turn almost any asset, either real or virtual, into a digital token and enables the digital transfer, ownership and storage without the necessary need of a central third party / intermediary."**
>
> — E&Y Tokenization of Assets

2.6 Largest Fines for Conducting Unregistered Security Offerings

Looking at the SEC's charges against companies that completed unregistered ICOs, we can say that the Securities and Exchange Commission goes after companies of all stripes. Indeed, while the largest ICO that faced the allegations from the SEC brought in a whopping $4 billion, there are much smaller companies that were also charged with fraudulent ICOs.

A vivid example is the SEC case against B2B blockchain marketplace Opporty. The company completed an ICO in 2018 and raised $600,000.[43] Nevertheless, the company did break the law as it conducted unregistered securities offering by selling OPP tokens in an ICO and misleading the investors, according to the SEC.[44]

Although some cases are still pending, many cases have already finished and some companies have been forced to pay civil fines. However, the fine is a light penalty in comparison to the companies that were forced to return the raised funds to investors. (Table 3)

However, there is a second tool that the SEC uses to punish companies that host illegal security sales: disgorgement. This type of punishment seems to be used by the SEC more often, and it is more severe as the value of disgorgement and prejudgement interest usually outstrips the proceeds from an ICO. (Table 4)

With many surprising plot twists packed into a few months, the SEC versus Ripple lawsuit tends to be the most-talked about of the ongoing litigations. The essence of the SEC claim is that Ripple was conducting an unregistered sale of securities.[45] However, Ripple's position is based on the fact that XRP tokens should be classified as commodities, not securities, like Bitcoin and Ethereum. Ripple seems to be sure of its high chances to win the case as the company announced its plan to go public once the agreement with the SEC is settled.[46]

Another ongoing case is against LBRY, a decentralized video content platform, which is accused of hosting a four-year-long unregistered securities sale. After the SEC complaint in March, 2021, the company tried to raise a wave of publicity to support the project. The advocates for LBRY stressed that the project tokens, LBRY Credits, are not investment contracts, while the SEC highlighted that the company tokens are indeed securities according to the Howey test. The litigation continues, but it seems like the SEC will win the case.

The crypto industry advances, and so does the crypto regulation. The SEC is closely following the development of the industry: Hester Pierce, the SEC's "crypto mom", recently commented on the NFTs gold rush. Potentially subject to speculative activities, NFTs could be easily turned into securities if they are fractionalized.[47] Due to grey areas in the regulation, the companies that offer such investment vehicles could get under the SEC's fire.

[43] https://cointelegraph.com/news/sec-charges-600-000-ico-project-opporty-for-fraudulent-security-offering
[44] https://www.sec.gov/litigation/litreleases/2020/lr24723.htm
[45] https://www.sec.gov/news/press-release/2020-338
[46] https://cointelegraph.com/news/ripple-wants-go-public-after-settling-sec-lawsuit-sbi-ceo-says
[47] https://cointelegraph.com/news/sec-s-crypto-mom-warns-selling-fractionalized-nfts-could-break-the-law

Table 3

Completed Cases Without Disgorgement

Rank by fine value	Company name	ICO value	Civil fine value	Year of the issuance of the order	Funds status
1	Block.One	$4,000,000,000[48]	**$24,000,000**[49]	2019	No obligation to return the funds to investors
2	Bitqyck	$13,000,000[50]	**$8,375,000**[51]	2019	No obligation to return the funds to investors
3	Unikrn	$31,000,000[52]	**$6,100,000**[53]	2020	The penalty to be distributed to investors
4	Kik	$100,000,000[54]	**$5,000,000**[55]	2020	No obligation to return the funds to investors
5	ShipChain	$27,600,000[56]	**$2,050,000**[57]	2020	No obligation to return the funds to investors

Source: *Cointelegraph Research*

** The data presented only includes the fines issued to the companies, and does not include the fines issued to individuals associated with the company.*

Table 4

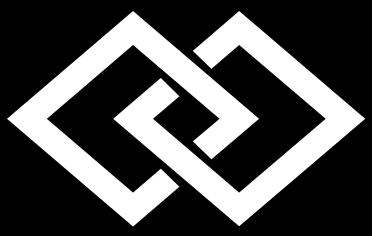
Completed Cases Without Disgorgement

Rank by disgorgement value	Company name	ICO value	Disgorgement + prejudgement interest value	Year of the issuance of the order	Share of the capital raised in an ICO to be paid back	Additional requirements from the SEC
1	Telegram	$1,700,000,000[58]	**$1,200,000,000**	2020	70%	The company must pay more than $18 million in civil penalty
2	BitClave	$25,000,000	**$28,944,000**[59]	2020	115%	The company must pay a civil penalty and disable the CAT tokens permanently
3	ICObox	$14,600,000[60]	**$16,059,000**[61]	2020	110%	Founder has to pay a civil penalty
4	Gladius Network	$12,700,000	**$12,700,000**[62]	2019	100%	The company self-reported to the SEC, so it was exempted from additional penalties.
5	Veritaseum	$14,800,000	**$8,474,000**[63]	2019	57%	Founder has to pay a civil penalty
6	Boon.Tech	$5,000,000	**$5,600,000**[64]	2020	112%	The founder has to pay a civil penalty and destroy the Boon Coins permanently
7	PlexCorp	$15,000,000[65]	**$4,910,000**[66]	2019	33%	The founders have to pay civil penalty

Source: *Cointelegraph Research*

[48] https://www.wsj.com/articles/investors-bet-4-billion-on-a-cryptocurrency-startup-1527591600
[49] https://www.sec.gov/news/press-release/2019-202
[50] https://www.sec.gov/news/press-release/2019-164
[51] https://www.sec.gov/news/press-release/2019-164
[52] https://www.sec.gov/news/press-release/2020-211
[53] https://www.sec.gov/news/press-release/2020-211
[54] https://www.sec.gov/news/press-release/2019-87
[55] https://www.sec.gov/news/press-release/2020-262
[56] https://www.sec.gov/litigation/admin/2020/33-10909.pdf
[57] https://www.sec.gov/litigation/admin/2020/33-10909.pdf
[58] https://www.sec.gov/news/press-release/2019-212
[59] https://www.sec.gov/news/press-release/2020-124
[60] https://www.sec.gov/litigation/litreleases/2020/lr24763.htm
[61] https://www.sec.gov/litigation/litreleases/2020/lr24763.htm
[62] https://www.sec.gov/news/press-release/2019-15
[63] https://www.sec.gov/divisions/enforce/claims/reginald-middleton.htm
[64] https://www.sec.gov/news/press-release/2020-181
[65] https://www.sec.gov/news/press-release/2017-219
[66] https://www.coindesk.com/plexcorps-reaches-settlement-with-sec-following-extended-legal-woes

We have really broken the code and can prove it.



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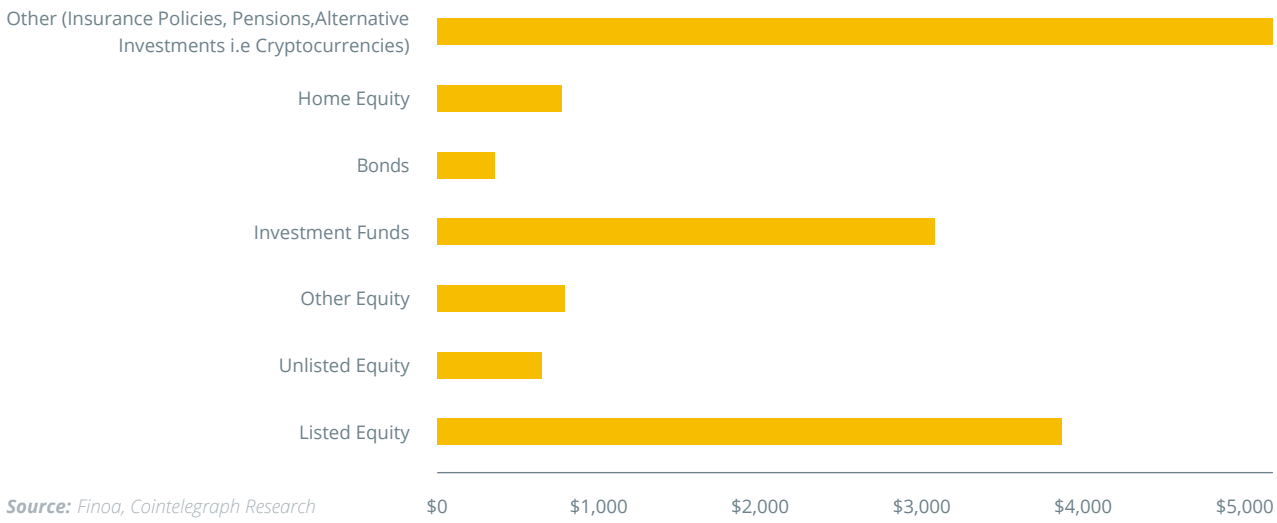
3 How Big Will the Security Token Market Become?

Various estimates of the security token market exist. KPMG and WEF project that the market will grow to $8 trillion by 2025.[67] Benjamin Schaub and Stefan Schmitt of the Frankfurt School Blockchain Center (FSBC) predict the European market will account for $1.5 trillion by 2024.[68] This chapter discusses a new estimate by Finoa, a German digital asset platform for institutional investors. Their calculations estimate that the tokenized asset market will have $14.7 trillion in assets under management by 2025; however, their estimate does include cryptocurrencies such as Bitcoin in addition to security tokens. The not cryptocurrency part of their tokenized asset market estimate is $9.5 trillion by 2025.

Figure 15

Finoa Estimate of Global Tokenized Security Market by 2025, $ billions



Source: *Finoa, Cointelegraph Research*

[67] https://blockstate.com/global-sto-study-en/

[68] https://dailyhodl.com/2020/03/05/tokenization-in-europe-market-size-to-reach-1-5-trillion-in-2024/

Practitioner Perspective with Raiffeisen Bank International

Do you see demand for security tokens from your clients?

Christian Wolf

Gernot Prettenthaler

Vid Hribar

Raiffeisen Bank International's Blockchain Hub team including Head of Strategic Partnerships & Ecosystems Christian Wolf, Senior Partnerships & Ecosystem Manager at RBI Gernot Prettenthaler, and Digital Banking Analyst Vid Hribar joined us for an exclusive interview about security tokens.

With €176 million total assets, 17.4 million customers, and presence in 25 countries[69], RBI's forward thinking corporate culture has a huge impact. In the beginning of our interview with one of Europe's largest banks, we established that RBI is seeing increased demand for cryptocurrencies from both retail and professional clients. RBI's client demand for digital assets ranges from high in politically unstable regions to none in Russia where cryptocurrencies are prohibited. They noted there are regional differences in interest. Slovakia and the Czech Republic are willing to invest more in cryptocurrencies whereas Austria is more conservative when holding variables such as household income constant.

Christian Wolf stated that although clients are not directly asking for security tokens, they are asking for a better trading experience when handling traditional securities like stocks and bonds. Clients want cheaper, faster, and more transparent security trading. Wolf said, "the way we currently trade securities will be gone within 10 years."

However, compliance with the new Anti-Money Laundering Directive (AMLD5) that came into effect on January 10th, 2020, may have made working with cryptocurrencies more difficult for the bank, although, AMLD5 also brought regulatory clarity which is a positive development. AMLD5 says that any business that exchanges fiat currency for a crypto asset (brokers, exchanges) or stores crypto assets on the behalf of customers (custodians, wallets) is required to register with financial market authorities where they are doing business and implement money laundering policies such as collecting and safely storing the identification data of users, monitoring user transactions, and reporting suspicious activity.

The trio mentioned that RBI is rethinking their compliance's approach to digital assets. RBI is currently very cautious, but demand from clients, regulators, and the technology are all maturing, which gives them the impetus to progress as well.

Luckily, AMLD5 is most likely not applicable to security tokens, because they do not constitute a means of exchange. However, this is not the case in all countries. For example, the UK expanded the scope of its regulation by referring to crypto assets instead of virtual currencies and the new term can be interpreted to encompass security tokens. France is following a similar approach.

RBI is emerging from an experimental phase to market ready phase. They are working on a host of white-labeled products and digital asset custody for institutional and professional investors. One of their most exciting products is their tokenization of fund shares.

Gernot Prettenthaler mentioned that RBI has experimented with the tokenization of fund shares, debt, equity, and the euro with their REST (Raiffeisen Euro-backed stable token). "We now understand the technology, we just need to see what is possible from a legal perspective in Austria."

[69] https://www.rbinternational.com/en/who-we-are/facts-figures.html

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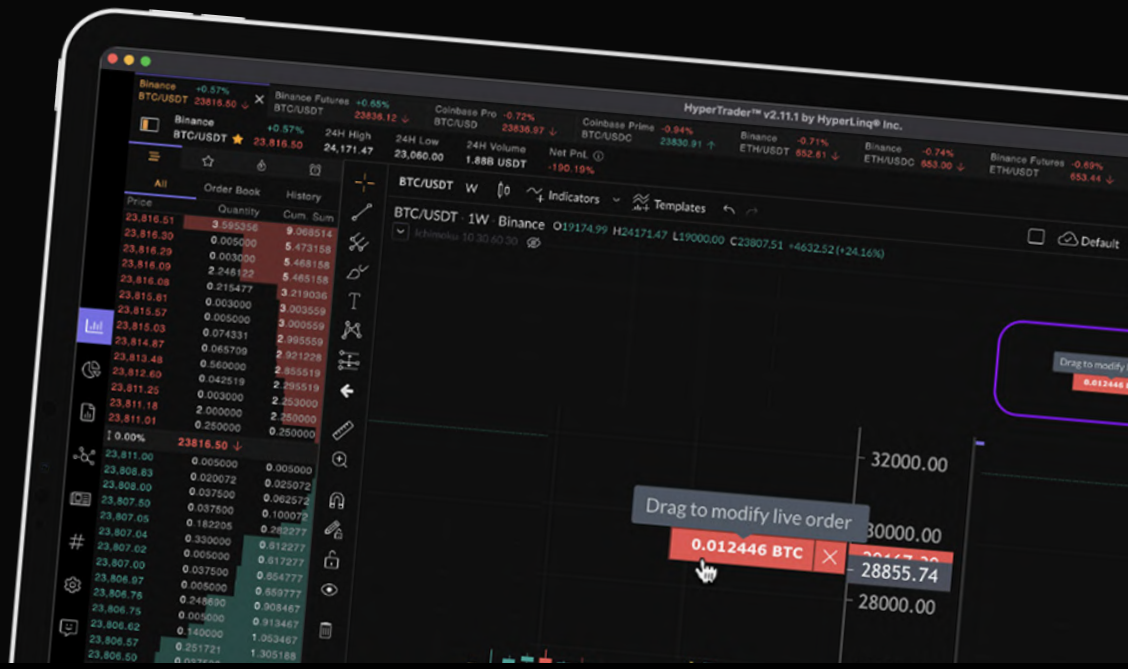

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Practitioner Perspective with Marius Smith of Finoa

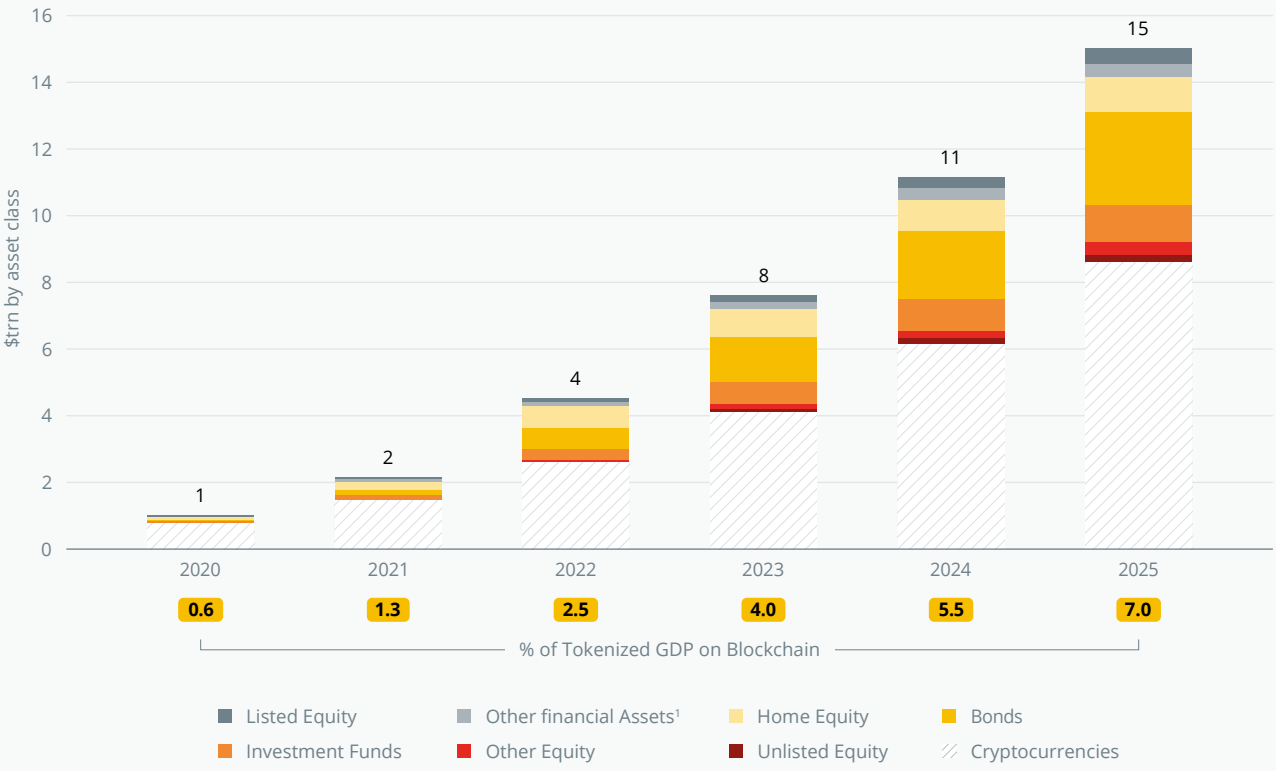
Will the 2020s be defining years in blockchain history where tokenization finally goes mainstream?

Revised projection of tokenized market volume 2020 – 2025

Marius Smith

The benefits of tokenization are inevitable. Efficiency gains, automation, transparency, fractional ownership, increased liquidity, and direct access to investors are some but a few examples of why this emerging blockchain and DLT-enabled wave of innovation is increasingly gaining global traction. Tokenization promises to fundamentally disrupt financial markets as we know them today and is a topic that Finoa has covered and researched extensively since its inception in 2018[70, 71],. Despite its promises, however, mainstream tokenization or "the tokenization of everything" is still in its early days, and the anticipated boom and wide-spread adoption are yet to be seen. With positive developments globally, the market volume is still expected to grow significantly in the coming years, with innovative use cases emerging everywhere and positive regulatory developments forming on both national and international levels. Taking into consideration the developments over the past two years, we have revised our initial tokenization forecast and outlined below findings from an extensive overhaul of our initial computations and models that projects that the tokenized asset market will constitute a **$14.7-trillion** opportunity by **2025**.

Projected Tokenized Market Volume until 2025



Source: World Economic Forum — Global Agenda Council 2015; Deloitte Research; BCG — Global Wealth Report; Oliver Wyman — Personal Financial Assets Report

[70] The Era of Tokenization — market outlook on a $24trn business opportunity

[71] Cost disruption in the issuance market: The case for tokenization

With a $1-trillion market capitalization of blockchain-based assets, and this being predominantly attributed to cryptocurrencies, in 2020 (accounting for approximately 0.6% of the global GDP), we expect a significant increase in projected market volume over the coming years. Overall, we project that the tokenized market volume will reach $2 trillion, or 1.3% of global GDP in 2021, and $4 trillion (2.5% of the global GDP) in 2022. This year, we anticipate an acceleration in mainstream adoption of blockchain technologies, leading to an additional 0.7% of GDP to be stored on the blockchain. Overall, this will trigger a market growth from $4.4 trillion in 2022 to $14.7 trillion in only 3 years (2025) — an average of an additional $3.4 billion per year.

Current developments in more detail

Despite 2020 marking a pivotal year for cryptocurrency growth and adoption, leading up to total market capitalization exceeding 2018 highs, we still observe a lower-than-anticipated growth traction for tokenization. With positive developments in both the fintech and startup ecosystems and also increasing interest from traditional financial institutions, regulatory uncertainty still poses as one of the main obstacles hindering asset take-up and, combined with an ongoing pandemic, has put a spoke in the wheel on the otherwise bullish developments anticipated globally.

We have witnessed many attempts and examples of blueprints and tokenization of different asset classes, with bonds emerging as the most common product thus far. We find this mainly to be correlated with the legal foundations being most developed and fitting for this asset class compared to equities, for instance, and evidently, the case in countries such as Germany. If we consider the wider developments in regulating tokenization going forward, we expect to see positive advancements for other asset classes in the coming years; however, expect some to take a longer time to form and develop. Consequently, we expect that bonds will continue to accelerate and will be preferred over equities initially, as existing legal frameworks will seek to accommodate these first and by 2025, will be the leading tokenized financial asset class (disregarding cryptocurrencies) constituting **18% of the total tokenized financial asset market** on the blockchain. We find recent examples of that both in Germany, where the "Gesetz über elektronische Wertpapiere (eWpG)" — the electronic securities act — was recently passed to provide legal certainty around the issuance of securities, as well as the European Commission's introduction of Market in Crypto Asset (MiCA), both marking important steps for innovation in the capital markets on a national and European level.

While positive developments for tokenization are anticipated in the coming years, we still expect that cryptocurrencies will be the main driving force of growth for tokenized assets. Institutional adoption is on the rise, and we have seen many examples of large corporations and investors recently entering this space to get exposure to, diversify and seek out alpha from emerging asset classes and crypto projects. The interest from large investors, such as Mass Mutual and Tudor Group and platforms like PayPal, are just a few examples of this new wave of institutional adoption that will have a fundamental impact on the future of market development and growth expectations. Combined with a continuous acceleration of innovation in base-layer protocols and layer-two applications as well as ingenious use cases such as decentralized finance, we are particularly bullish on the growth trajectory for cryptocurrencies and conservatively estimate that they will have constituted **57% of the total tokenized financial assets by 2025**. We do believe that these developments will have positive spillovers to some of the other asset classes we considered, and thus remain very positive for the years ahead for tokenization generally.

We delimited ourselves to look at a five-year horizon — an exercise that, with the current level of innovation and uncertainty, is already inherently difficult. We are still in the very early days of tokenization, as well as wider blockchain adoption and application. Extending the forecasted horizon to five, 10, or even 20 years, is, therefore, nearly impossible. What we can say with certainty, however, especially with the very positive developments we are currently seeing on a global level, is that the technology has an immense potential to disrupt, and we have seen only a fraction of its full application yet. We are confident that use cases for tokenization will continue to unfold and are strong advocates of its full realization — an evolution that is not only incredibly exciting but also one that we are very proud to take part in and support. We are just getting started.

Methodology: Projection of tokenized assets 2020 – 2025

As our initial methodology proved to be a very accurate reflection of the market developments, we decided to sophisticate it further by differentiating between different asset classes and including more recent sources.

Research and surveys from institutions, such as the World Economic Forum (WEF), Deloitte and McKinsey (see table of sources for more detail), project that up to **10%** of the global gross domestic product will be stored and transacted with the help of blockchain technology by 2025 – 27. With this in mind, we triangulated and ran a market simulation to determine (a conservative) potential market size of a global tokenized market.

We delimited ourselves to financial assets as well as real assets clustered into: listed equity, unlisted equity, other equity, investment funds, bonds, other financial assets (i.e., insurance policies, pensions and alternative investments), home equity and cryptocurrencies. Currencies and deposits were excluded, and our study thus does not consider potential central bank digital currencies.

Based on factors such as the past performance and future growth expectations per asset class, we projected the market size of the individual assets using a bottom-up methodology. In subsequent steps, we applied different assumptions of the individual rate of tokenization per asset class and finally matched our bottom-up results with the top-down research from the WEF.

Following this methodology, we project a tokenized asset market of **$14.7 trillion** of financial assets by 2025. This does not include currently unmeasured (or nonexistent) asset classes or unidentified tokenization use cases of intangible assets — e.g., patents, usage rights — where we expect significant innovation and growth.

For more details on the methodology, please also refer to our study from 2018.

4 Who Are The Biggest Players?

The STO ecosystem already has robust support from various companies including issuance platforms, exchanges, custodian, infrastructure, and distributors.

Table 5

STO Ecosystem

Primary Issuance Platform	tokeny SOLUTIONS, HARBOR, HighCastle, REINNO, Mt Pelerin, STOKR, crypto, NEUFUND, SECURITIZE, Tokocrypto Digital Exchange, RAVENCOIN, SECURRENCY, DUSK, BLOCK EX Digital Asset Exchange Platform, New Alchemy, VERTALO, FLUIDITY, INDIEGOGO, tbe, POLYMATH, TOKENSOFT, KoreConX, seedinvest, SWARM, start engine
Exchanges (Secondary Markets)	UNISWAP, openfinance, MERJ, VRBex, GBX, ARCHAX, Blocktrade, Orderbook by Ambisafe, Bancor, tZERO, INX, SHARESPOST, BANKORUS, Rialto, SGX, FUSANG, CEZEX, BLOCK EX Digital Asset Exchange Platform, coinbase, SIX Swiss Exchange, CIRCLE, MALTA STOCK EXCHANGE plc
Custodians	CRYPTO FINANCE, Paladin, coinbase, xapo, PrimeTrust, Ledger, BitGo, dealbox, KINGDOM TRUST, Fidelity, copper, SWISS CRYPTO VAULT, koine, itBit by PAXOS, DACC, BEQUANT
Infrastructure	CRYPTO STORAGE, smartlands, TEMPLUM, THE ELEPHANT, InvestaCrowd, JD.COM
Distributors	BLACK MANTA, STO Filter, STOCheck, issuance, daneel, STO Analytics, TokenMarket, STOscope
Issuers	digibrixx, we invest, BAKARI, RealT, Mt Pelerin

4.1 Primary Issuance Platforms

Practitioner Perspective with Ivor Colson of Tokeny Sarl in Luxembourg

4.1.1 What is a DAM?

Ivor Colson

The first types of DAMs (Digital Asset Marketplaces) to emerge were centralized cryptocurrency exchanges. Binance, Coinbase, and Kraken are examples of these. They now mostly concentrate on the development of their audiences, having already successfully delivered easy-to-use and optimized web platforms for buyers and sellers of crypto tokens. Decentralized exchanges offering cryptocurrencies also began to emerge in 2020, manifesting in platforms such as Uniswap, Pancake Swap, and Sushi Swap. DeFi protocols such as Aave and Compound can also be considered decentralized marketplaces.

These types of venues are now beginning to emerge within the security token industry, driven by investors who want:

- Lower trading and custody fees
- Ability to earn interest from lending digital assets to other traders, such as shorters
- Transparency with number of shares outstanding, fees, and orderbook liquidity in order to reduce manipulation such as naked short selling
- Ability to use digital assets as collateral for margin trading accounts or loans
- Faster settlement
- Diversified liquidity from traders around the world
- 24/7 trading

4.1.2 Why are DAMs emerging?

Naturally, the security token market will always innovate at a slower pace than the purely retail markets due to the heavy regulation requirements. In that light, it was not a surprise that we firstly saw the rise of unregulated cryptocurrency-based DAMs. However, interest in DAMs for privately issued security tokens is currently on the rise. We see three reasons why they have accelerated recently:

1. Private markets are currently dysfunctional. This is an extremely fragmented industry that is still reliant on paper-based processes. Old technology such as fax machines are still being used and Excel is the norm. As a consequence, investors have to deal with long lock up periods or pay premiums to liquidate their portfolios. Investors are now seeing DAMs as venues whereby they can find and transfer their assets to others, P2P, and for a few Euros/Dollars per transfer.
2. The regulation for security tokens has moved quickly recently, especially in Europe. Tokenized securities now fall under the same rules and regulations as traditional financial instruments in many other European countries including France, Germany, Italy, the Netherlands, Romania, Spain and the UK. This has given market actors the confidence to start experimenting and implementing blockchain technology operationally.
3. Blockchain technology has officially gone mainstream this year. The foundations were laid in 2020 with many users utilising smart contracts and custody solutions. At the break of 2021, FinTechs such as Paypal and Square adopted Bitcoin for their millions of users, institutions such as Microstrategy and Ruffer have announced over nearly $2bn

in combined Bitcoin purchases. Financial institutions have also joined. The FT asked whether Bitcoin has gone mainstream on its front cover. As one of the world's most respected financial publishers, the FT actually answered its own question by asking it. Blockchain technology is now normalised and accepted.

4.1.3 Benefits for Stakeholders

There would be no emergence of DAMs if there were not any benefits and improvements to the current state of affairs. So, what are these benefits?

Issuer

Issuers of financial securities seek investors by offering them shares in their asset. For this they need to describe their value proposition, detail the financial perspectives and legal structure of their project, distribute this information to eligible investors and provide the mechanisms for the transfer of funds in exchange for shares.

A DAM realizes two key benefits for issuers:

A. Digital administration of shares
Issuers can quickly issue and allocate shares to investors via a self-service and user-friendly interface. The compliance is coded into the security tokens and all investors need to satisfy the legal obligations of the offering. These checks are performed in seconds in conjunction with KYC/AML checks. Once administered, cap tables are automatically updated, and issuers benefit from efficiency gains with the digital administration of shares.

B. Access new segments of investors
Due to a digital-first issuance and allocation of shares, issuers can easily, and cost efficiently target investors around the world. New types of investors can also be opened up, as efficiency gains translate into better opportunities to fractionalize and reduce the investment ticket size, allowing issuers to potentially target retail investors. The prospect of a more liquid secondary market also opens up a greater band of investors.

Investor

On the buy-side, investors are concerned about whether they can free themselves from an investment easily, and the types of investment opportunities available on the DAM. For this, they need to have an interface where they can access the documents that satisfy their due diligence requirements. After this, they need the mechanisms to easily subscribe and then transfer/free themselves from that investment should they wish.

A DAM offers two key benefits for investors:

A. Greater access to opportunities
Investors can also discover more opportunities via one marketplace across both the primary and secondary markets. All the necessary documentation is available on demand and investors can log in to a marketplace and filter opportunities based on their investment mandates. Issuer contact information is accessible for further information.

B. Increase in liquidity
Investors that hold a share in a company can also utilize the DAM to discover other investors to interact with. They can act as a 'maker' or 'taker', i.e., selling or buying respectively. They can firstly discover other investors on the DAM and interact by connecting with and making buying and selling offers. The transfer is then made P2P. By offering a venue and the needed functionality, investors are more likely to meet each other and free themselves from their positions when they want to, offering a significant benefit to how current private markets operate.

DAM Operator

The DAM operator provides these digital and compliant services to enable issuers and investors to meet with the least amount of friction possible. They provide clearly defined rules and responsibilities that apply to the marketplace. They will conduct its due diligence on the projects listed on the platform. Not only that, but they need to prove they are trustworthy for both investors and issuers. The core benefits are:

A. Monetize customer base

By migrating their issuers and investors over to a DAM, they will be in a better position to monetize their audience at scale. For the issuers, they can monetize the setup of their offerings, onboarding of investors and management services that are needed for asset owners. On the buy-side, they can monetize investors via a SaaS model and/or a transaction based model.

B. Automate and digitize operations

Many operations today are manual, and a DAM operating on top of a blockchain has the ability to automate many tiresome operations. Faxes will be a thing of the past, so will manual cap table updates, duplicated KYC checks and long investor onboarding times. DAMs can utilise automation across all of these currently laborious processes and realise a highly automated and efficient operation. They can offer a seamless experience for their clients, one that is truly digital from the ground up.

4.1.4 Services Available on a DAM

In order for the DAM to be used, there are some essential services it needs to offer. These services can be broken down into the primary market, and those required for both issuers and investors and the secondary market, which is a venue for investors.

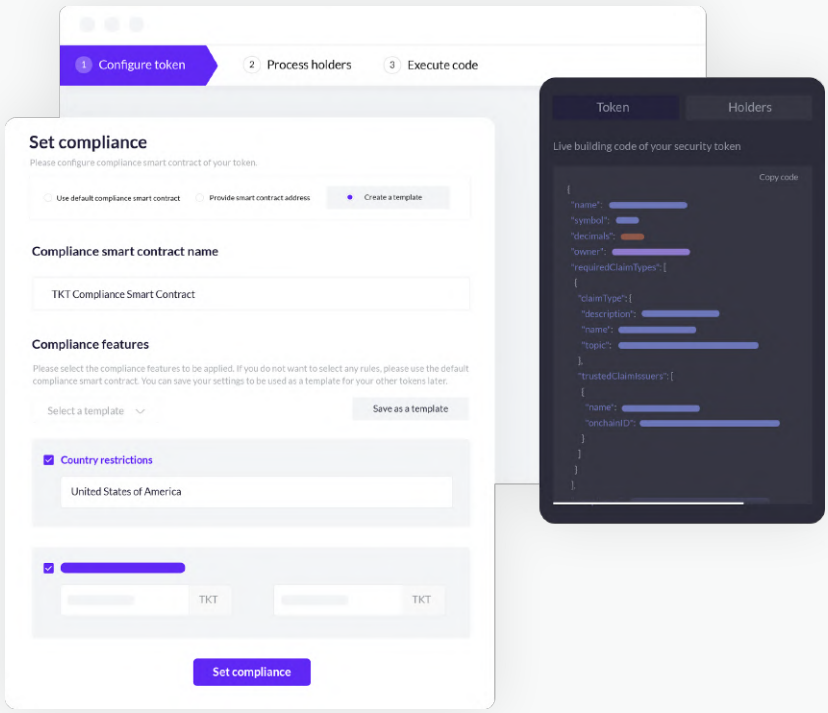
A. Primary market

The primary market is where the company releases shares from its entity to investors, so it is from the company to the investors. The company needs to go through various steps to issue its shares to eligible investors.

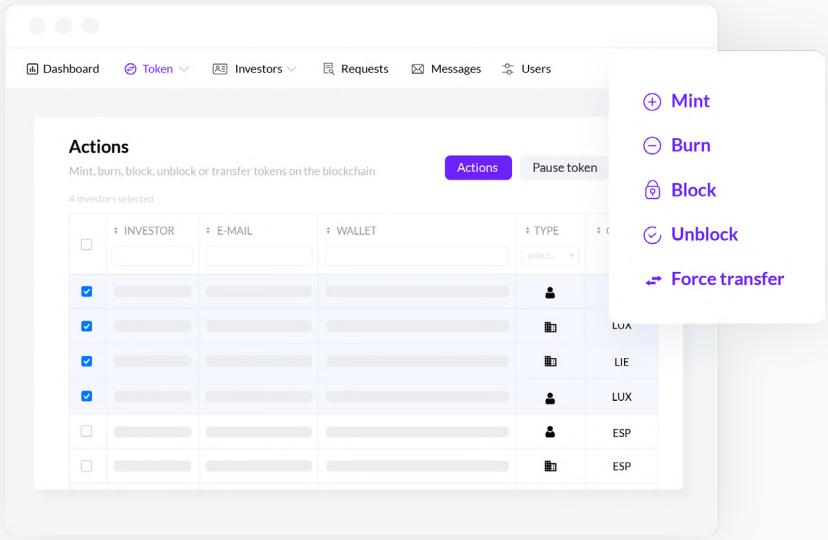
- **For the issuer**

  Issuers need a platform that allows them to create, deploy and issue compliant security tokens to its investors. To satisfy the compliance obligations, issuers need to be able to create/upload smart contracts and integrate KYC/AML services in order for them to approve or reject participating investors. Once the issuer has whitelisted its investors, it can go ahead and allocate the tokens in return for funds from investors.

  After the issuer has allocated shares to their investors they need to be able to report and perform post-issuance actions on the securities. Actions like capital calls, buybacks and share splits are functions issuers or their agents need to perform. They can do this directly through the platform. Issuers also need to keep control of their assets by being able to block and unlock tokens, mint and burn, along with forcing transfers between investors. Cap tables are automatically updated when share transfers are executed as the blockchain is used as the source of truth. Reporting functionality is also required, and issuers can easily schedule the delivery of position and transaction reports.

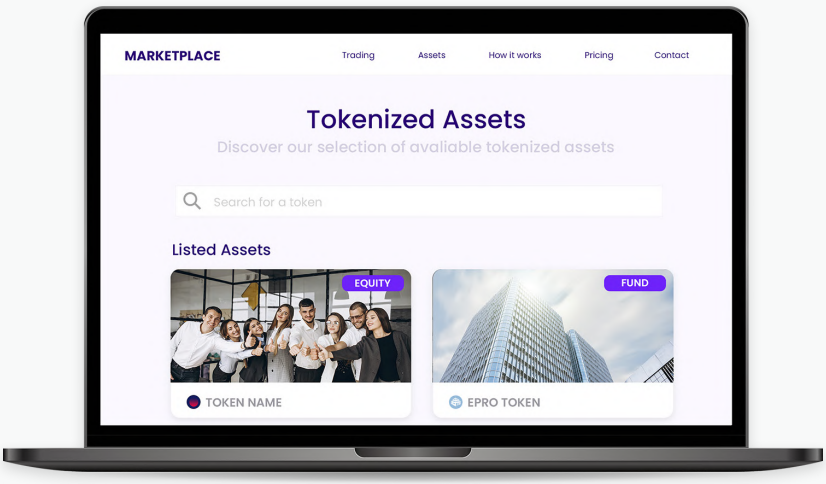


Issuers can easily set up their security token's compliance rules

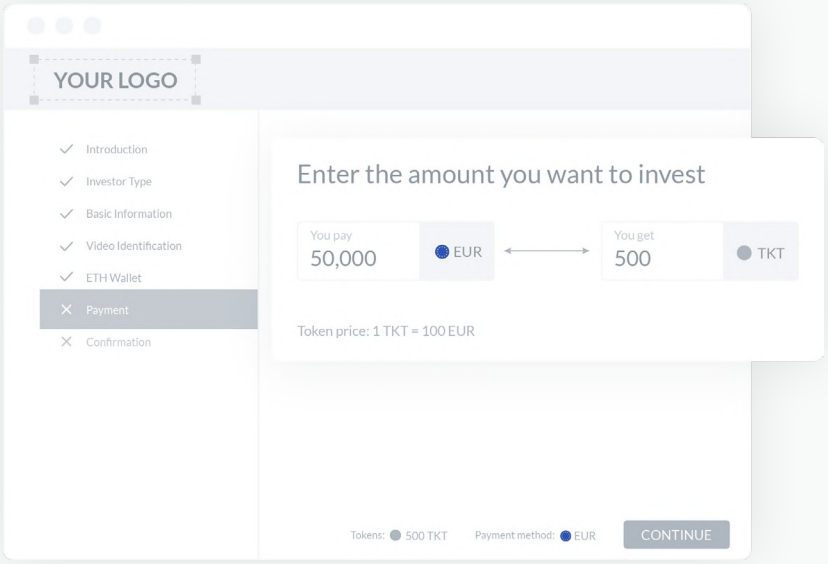


Issuers can digitally perform actions directly on the securities via one interface

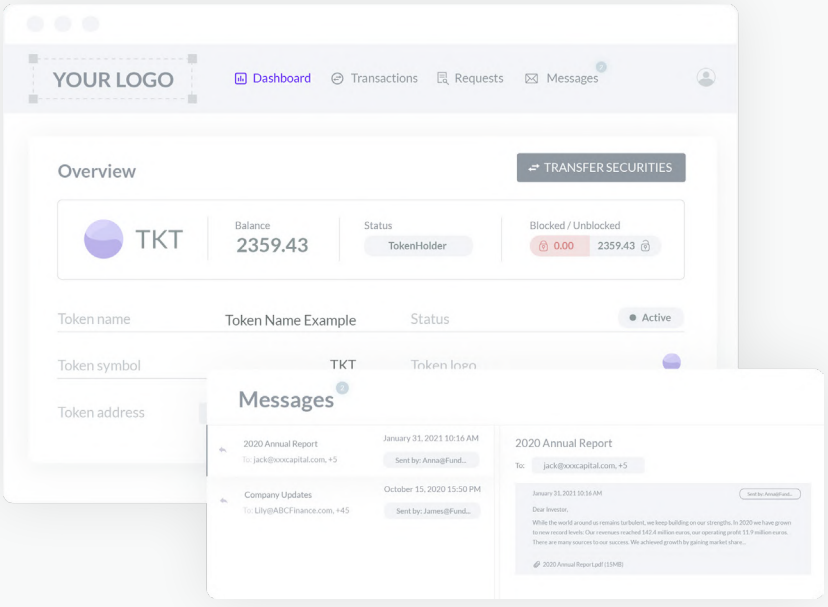
– **For the investor**
On the buy side, investors need an easy-to-use service to firstly view offerings and their documentation in the primary market. Secondly, when they want to invest they need an easy-to-use service that allows them to enter their personal information and upload their documentation to prove their claims and finally execute the investment by transferring funds from their wallet.



Investors can browse the primary market assets and find all the information they need



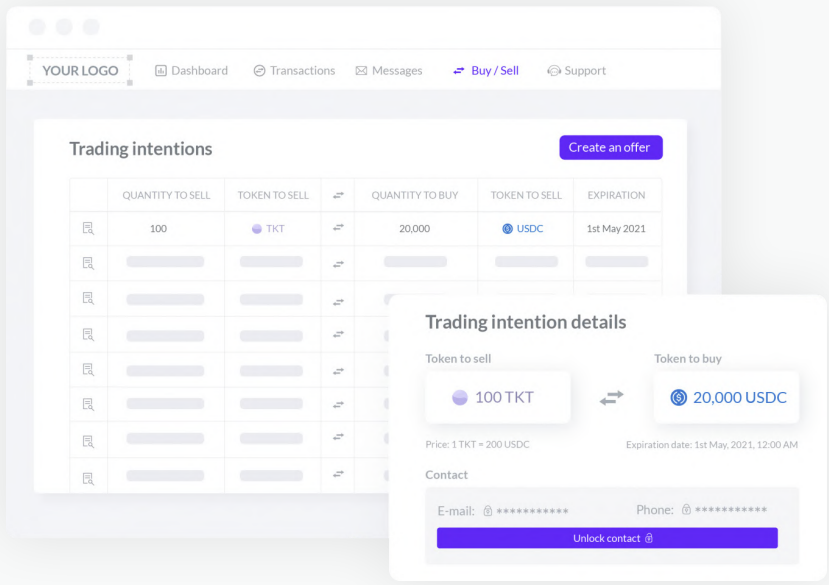
Once they select the asset, investors can easily calculate the tokens they will receive and transfer the funds



Investors can view their balances for security token holdings, perform transfers and view reports

B. Secondary market

The secondary market is where security token investors can meet, interact and exchange their shares with one another. For security tokens, this is normally a P2P (peer-to-peer) marketplace in practice.



Investors need to be able to access bulletin boards where they can find other investors and then use the blockchain to transfer securities in minutes

4.2 Exchanges and Secondary Markets

Right now there is an unspoken race being waged over who will win the world's demand for security token trading.[72] The five main candidates include:

1	2	3	4	5
Banks	**Traditional licensed exchanges**	**Startup Security Token Exchanges**	**Cryptocurrency Exchanges**	**Decentralized Exchanges**
SOCIETE GENERALE	SIX Swiss Exchange	tZERO	BINANCE	UNISWAP
HSBC	Digital Exchange Börse Stuttgart	MERJ	FTX	

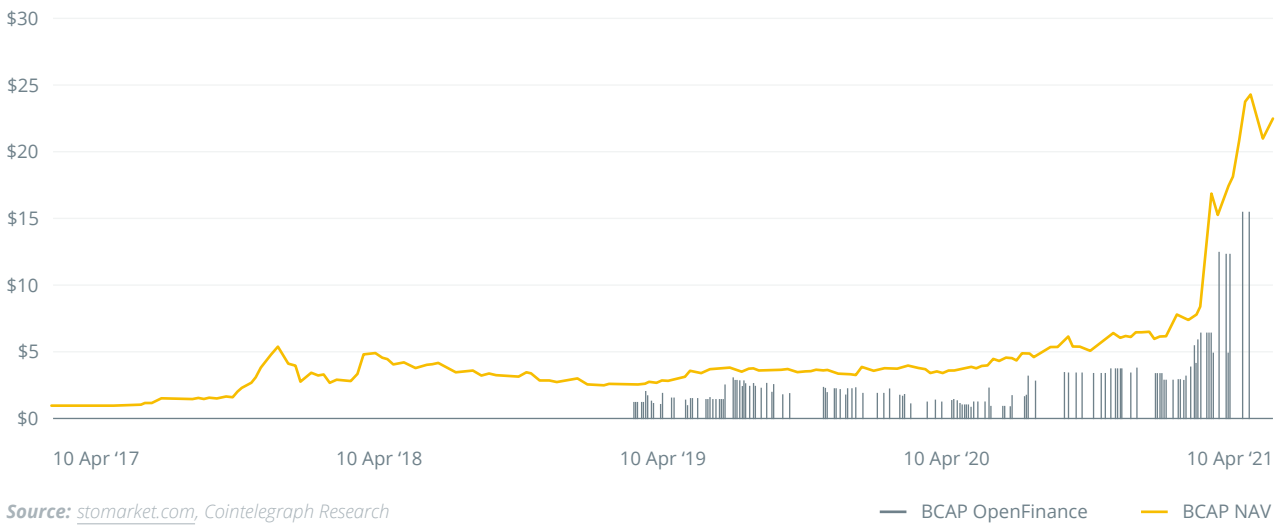
[72] https://blog.stomarket.com/complete-list-of-security-token-exchanges-marketplaces-1615fde71645

Currently, cryptocurrency exchanges and startup security token exchanges are in the lead of this race; however, decentralized exchanges are gaining traction. The status quo banks and traditional licensed exchanges are slow to move. Each category may specialize in different segments as well. Banks for example may specialize in segregated markets for a specific company's private equity that can only be traded by a whitelist of professional investors.

Security token issuers will be able to list their security on multiple trading venues in multiple jurisdictions, and traders will be able to arbitrage across trading venues. However, price gaps will still exist due to perceived risks associated with different venues and jurisdictions. For example, Blockchain Capital's BCAP token has been trading significantly below its net asset value since inception.

Figure 16

BCAP's Price on Secondary Markets Trades Below NAV



Source: *stomarket.com, Cointelegraph Research*

Practitioner Perspective with Andy Flury, Founder & Chief Executive Officer of AlgoTrader AG

Secondary Market Trading for Tokenized Assets

Andy Flury

To some observers, trading security tokens on centralized exchanges might seem contradictory. After all, one of the most vaunted benefits of the distributed ledger technology (DLT) that underpins digital assets is its ability to reduce the role of intermediaries, thereby lowering transaction costs. So why do we need anything more, you might ask?

Firstly, it's important to recognize that different types of security token investors will have different needs. For private individuals who are investing smaller amounts and are comfortable with managing their own wallet, a fully decentralized exchange like Uniswap could be a convenient option. On the other hand, a professional investor or institution would be likely investing on a far larger scale, requiring ironclad security, operating under far more regulatory scrutiny, and potentially managing assets on behalf of multiple clients.

The role of the secondary market is to build the linkages between the traditional and digital asset worlds — providing the support infrastructure and services that make it possible for institutions to embrace tokenization with confidence. This will involve building tools to manage custody, trading, settlement and compliance, while establishing connectivity to a wide range of liquidity venues including issuance bodies, token exchanges, brokers, and OTC desks. Ultimately, this will be good for the entire security token market, introducing much larger trading volumes and greater liquidity.

STOs — Great for Issuance, but What About Liquidity?

While DLT presents a highly efficient, secure and unbureaucratic way to issue securities, the question is: after a token is minted and issued, what happens next? Unfortunately, many early pioneering projects suffered from a lack of token liquidity, even after being listed on an exchange. Although progress has been made since then, this is an issue that persists to this day. For example, in January 2021, the most active security token exchange was tZero, with a total combined monthly volume of $6,298,096 or around $203,164 per day. Even highly prominent assets such as tZero's equity and revenue-sharing token TZROP only attract daily volume in the order of $30,000 – $40,000 a day on average.

The reasons for the relative scarcity of liquidity are multifaceted. In some respects, security token marketplaces face a "chicken-and-egg" dilemma. On the one hand, institutional investors want a platform with a wide selection of quality tokens which they can trade. On the other hand, the leaders of tokenization projects often do not want to pay the exchange listing fees until they can see evidence of liquidity on the platform.

On the other side of the equation, institutions tend to be cautious about the potential cryptosecurity risks associated with an unfamiliar technology and want a trading solution that is similar or ideally, interoperable, with their existing back-end systems. The secondary market will have a key role to play in addressing these concerns in order to bring more institutions into the fold and end the liquidity stalemate described above. By far the biggest obstacle to a secondary market thus far, however, has been the burden of regulatory requirements, but in both Switzerland and on a wider European level, this is about to change.

The emerging security token product portfolio

Given the progress in building a regulatory foundation discussed in Section 5 of this report, what type of developments will we see in the coming years? It has been well documented that an increasing number of traditional banks are seeking to provide crypto custody services to their clients, with recent high-profile examples including BNY Mellon, Goldman, JPMorgan and Citi. The logical extension of this trend would be banks offering tokenized assets to their clients.

For banks and financial market infrastructure providers, tokenization is an obvious fit. It increases the scope of diversification for clients by opening up asset classes that were traditionally illiquid such as real estate, fine art, jewelry, antiques, classic cars and other collectibles. Private banks, which are primarily engaged in wealth management, will be in pole position to capitalize here but when you consider that WEF estimates that up to 10% of GDP will be secured on the blockchain by 2027, the potential market extends far wider.

The ability to easily fractionalize less fungible assets will also result in some spin-off benefits. For example, a client could use a fraction of a tokenized property portfolio to serve as collateral for a loan. This will not only make it easier to find appropriate collateral to match the size of each loan, it also greatly reduces credit risk for the bank, as tokens are far easier and less costly to liquify in the event of default.

In addition, tokenization will make the trading of equity and bonds far more efficient by simplifying settlement, automating processes through smart contracts, and deepening the digitization of compliance procedures thanks to the transparency provided by the underlying DLT ledger.

A key success factor for these products will be the degree to which they are integrated with existing industry norms and frameworks, expanding rather than replacing existing financial services at first. This point was underlined by Markus Abbassi, Head of Tokenization at Sygnum, a licensed Swiss bank which specializes in digital assets:

"Tokenized assets require both a sound technical and legal implementation to ensure the enforceability of all associated rights and obligations, in the same way as traditional assets. In order to unlock the full potential of tokenization and ensure mass adoption, having an integrated, regulated and standardized end-to-end solution for the primary as well as the secondary market is an important step-forward for the industry."

As we can see above, tokenization offers clear benefits for both banks and their clients. But what type of services are they likely to develop in the near future?

In addition to large national exchanges and some smaller, specialized newcomers, there will be a compelling business case for banks to create a marketplace for tokenized assets in the form of an organized trading facility (OTF) or multilateral trading facility (MTF) as defined in MiFID 2 regulations. The potential approaches for banks can be divided into four categories, depending on whether it is acting as a principal or agent and what types of assets are being traded.

	Principal Model (bilateral exchange)	Agency Model (multilateral exchange)	
		Liquid Assets	Less Liquid Assets
Existing Instruments	**Approach 1** Bank acts as a market for tokens based on existing financial instruments	**Approach 3** Bank facilitates security token transactions by matching client orders against each other	**Approach 4** Bank sets up an online auction platform for security tokens
New Instruments	**Approach 2** Bank acts as a market maker for security tokens that were issued exclusively using DLT		

Source: *WIRESWARM / AlgoTrader*

Security token business cases for banks.

Potential Business Cases

A. Bank as Principal

Banks adopting Approach 1 will act as the principal, executing trades against their own balance sheet and thus becoming a market maker for security tokens based on traditional financial instruments such as equities, bonds or futures. Take S&P futures, for example, which typically involve maintenance margins in the region of $55,000. Such minimum capital requirements will price many out of the market. By offering tokenized futures, banks could greatly lower the barriers of entry to such markets, offering more fine-grained diversification possibilities to their customers. Of course, the potential extends far beyond futures — from shares and ETFs to bonds, the possibilities are broad.

From an operational perspective, Approach 1 is probably one of the most straightforward strategies. Banks buy and sell tokens to create the market, calculating prices based on the value of the underlying asset on traditional markets. In addition, the bank could easily hedge its positions by trading equities on traditional exchanges.

Moving to Approach 2, the bank would also act as the principal, but this time trading security tokens that are not based on existing instruments. This would include any tokenized assets that are legally classified as securities but were issued exclusively using DLT. Examples include companies who raised capital using equity-based security tokens, debt-based tokens such as bonds, and asset-backed tokens.

Both the potential risks and rewards are quite high with this approach. On the one hand, banks moving into this space would gain first-mover advantage in their jurisdiction. However, the big challenge and flip side of this advantage would be how to price the tokens, particularly early on when the volumes being traded through other liquidity venues remain light. As a result, this approach would inevitably require either the development of proprietary pricing methodology or the use of an external market maker.

B. Bank as Agent

In the first two approaches, the bank executes trades against its own balance sheet, acting as the market maker, buying and selling shares to provide liquidity. However, for particularly liquid assets, the bank could also simply create an order book and match the buy and sell orders of clients against each other. Given a large enough

consumer base and liquid assets, Approach 3 is certainly a low-risk strategy from the bank's perspective. Services like Robinhood have shown that there is a market for fractionalized ownership of traditional stocks, which would have a good degree of name recognition among consumers, so a selection of tokenized high-profile assets might be a good way to test the water and establish the market early on.

However, other types of security tokens, such as tokenized real estate for example, will be less liquid. By their very nature, investors are likely to hold alternative assets over a longer period of time and trade them less frequently. This is where Approach 4 would be a prudent option: Rather than offering continuous trading, the bank could instead provide an auction platform where users could place bids to buy or sell tokens. These auctions could be conducted over standard time intervals, such as once a week, in order to pool demand. At the designated auction time, the buy and sell orders of clients would be matched against each other. In principle, this system would function very similarly to the opening and closing auctions on national exchanges. The goal of such mechanisms is to establish the auction price such that the largest possible number of buy and sell orders can be executed. Any remaining unmatched orders stay in the system until they are cancelled or until the next auction date. Thus, Approach 4 is also a relatively low-risk strategy and could be a good way to overcome light liquidity early on while clients gain familiarity and begin to feel comfortable with the asset class.

Conclusion

Due to its ability to make the transfer of value far more efficient, tokenization remains DLT's most promising financial use case. The regulatory hurdles that have thus far hampered the growth of secondary markets will be overcome, which is likely to catalyze a huge injection of liquidity. This provides a number of opportunities for banks and financial institutions to facilitate new markets, bringing tokenized assets to a much wider range of clients.

5 Regulation

Which investment contracts can be tokenized may vary from country to country (and even between regions within a country) based on which country the issuer is in, which country the investors are in, what type of investment contract is being tokenized, and what class of investors is being targeted. Some companies issuing security tokens prefer to call the offering a "regulatory compliant token offering" rather than security token offering, because the latter can be a legal admission by the company that the assets being sold are securities. Different jurisdictions define tokens in different ways, and a popular approach is to let the tokens be treated as needed in each given jurisdiction instead of a uniform classification for the whole world. For example, In the US, a token can be a security where in another country it is a utility token (see XRP in U.S. vs. Japan[73]).

STOs are already regulated in major financial jurisdictions such as the U.S., the U.K., Hong Kong, Singapore, and Japan. Most regions allow retail investors to invest in security tokens if the issuer has an approved prospectus. However, there are regions such as Hong Kong that only allow security tokens to be sold to professional investors and other regions such as China that have outlawed security tokens. In continental Europe, STOs are not currently regulated at an EU level, but a draft proposal for regulation of the use of distributed ledger technologies in financial services was published in September 2020. A few countries in Europe have designed new legislation for security tokens including Liechtenstein's Blockchain Act, Switzerland's DLT Act, Luxembourg's Bill 7637[74], and the German ministerial draft law for the introduction of securities in electronic form.[75] Overall, all the EU countries have similar rules. If an STO qualifies as a transferable security, then EU securities laws apply to the token. Basically, if the project has an approved prospectus then it can publicly offer the tokens and anyone can purchase them regardless if they are retail or professional. Otherwise, only qualified investors can participate.

Jurisdiction	Does the usual regulatory framework for securities apply to STOs?	Are retail investors allowed to invest in STOs?	Is there specific local regulation or guidance relevant to STOs?
Australia	Yes, if certain conditions are met	Generally no, but will depend on the nature of the investor and whether on-selling is contemplated	ASIC has issued specific guidance on STOs and when security tokens will constitute securities
Hong Kong	Yes, if certain conditions are met	License is necessary for issuers and intermediaries. The STOs must be offered only to professional investors.[76]	The SFC has issued circulars, statements, position papers and guidelines on virtual assets that would apply to STOs
Japan	Yes, if certain conditions are met	Yes. Issuers are required to file a security registration statement and issue a prospectus. A company that sells, trades, handles the security tokens will need to register as a "Type I Financial Instruments Business Operator". The prospectus must be delivered to investors by any intermediary that markets the security token offering to the public. To be exempt from disclosure requirements, tokens can be offered to qualified investors or a maximum of 50-non qualified investors in a private placement.[77]	The Japanese securities law FIEA has been specifically amended to regulate STOs The Japan STO Association has issued Security Token Offering Guidelines
People's Repuplic of China	No, STOs are prohibited in China	Not applicable	Not applicable

[73] https://finance.yahoo.com/news/japan-fsa-says-xrp-not-215640563.html
[74] https://blackmanta.capital/bill-7637-luxembourg-takes-the-next-step-towards-a-decentralized-future/
[75] https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/audit/deloitte-cn-audit-security-token-offering-en-201009.pdf
[76] https://www.sfc.hk/en/News-and-announcements/Policy-statements-and-announcements/Statement-on-Security-Token-Offerings
[77] https://www.globallegalinsights.com/practice-areas/blockchain-laws-and-regulations/japan#chaptercontent3

Jurisdiction	Does the usual regulatory framework for securities apply to STOs?	Are retail investors allowed to invest in STOs?	Is there specific local regulation or guidance relevant to STOs?
Singapore	Yes, if certain conditions are met	Yes, if the prospectus is filed with the SFA. However, many STO issuers opt to not file a prospectus with the SFA and instead file for an exemption by prohibiting Singaporeans or putting a cap of SGD 5 million on the raise, or making a private placement to qualified investors only.[78]	The MAS has issued general guidance on digital token offerings Offers of digital tokens which constitute securities or securities-based derivatives contracts are subject to the same regulatory regime as offers of securities, or securities-based derivatives contracts made through traditional means
UK	Yes, if certain conditions are met	Yes, if the issuer has an approved prospectus by the FCA. If the project does not have an approved prospectus, then only qualified investors can participate.[79]	The FCA has published guidance on crypto assets. Security tokens constitute property

Source: *Adapted from Security Token Offerings — A European Perspective on Regulation by Clifford Chance, Cointelegraph Research*

Practitioner Perspective with Andy Flury, CEO of AlgoTrader AG

AlgoTrader

What Progress Has Been Made on the Regulatory Front?

Andy Flury

Unlike the utility and hybrid tokens created through initial coin offerings (ICOs), security tokens are designed to fall within existing regulatory frameworks, and offer the associated legal safeguards to investors. Up until recently, therefore, it would only have been possible to set up security token exchanges with licenses that were designed for the exchange of traditional securities. But the differences in structure between the two markets meant that it was never a good fit.

Take Switzerland, for example. The existing system for regulating traditional securities aims to create a degree of competition and separation of power in a centralized system. As a result, Swiss regulations prescribe the maintenance of **separate, licensed legal entities to operate various functions of the securities system such as the exchange(s), the securities depository, the clearing system and the registry**. This structure is designed to provide clear accountability and avoid any single entity acquiring too much market power. Part of the thinking is that aspiring market entrants that want to set up a new exchange can make use of the same underlying infrastructure as incumbents, thereby lowering the barriers of entry to the market. You can think of it as being akin to the telecommunications market, where new entrants are allowed to use some of the same basic communications infrastructure as their competitors. However, given that 7 of the 8 licenses in Switzerland are held by entities owned by the same parent, the effectiveness of this approach is certainly open to debate.

Now consider how tokenized assets would fit into this system. One of the key advantages of DLT is that it allows for greater efficiency and automation by enabling trading and settlement to take place in the same transaction. **If the law were to insist that these functions are controlled by separate legal entities, it would negate the central benefit of tokenized assets**. Furthermore, as existing traditional institutions are not equipped to deal with tokenized assets on a technical level, any new security token exchange would need an array of separately licensed entities to be established first. Thus, what was designed to stimulate competition in the traditional securities market served as a major barrier to development of a secondary market for tokenized assets.

Thankfully, this contradiction has now been recognized and corrected by Swiss lawmakers. **The new DLT Act, which comes into full force in August 2021, creates a new type of authorized body for trading DLT-based assets**. This

[78] https://ressos.com/downloads/Ressos%20-%20How%20to%20do%20an%20STO%20in%20Singapore.pdf
[79] https://cms.law/en/int/expert-guides/cms-expert-guide-to-security-token-offerings/united-kingdom

will make it a lot easier to establish exchanges for security tokens, allowing functions to be combined under one roof. AlgoTrader board member and digital asset expert, Luzius Meisser, who was involved in the consultation process during the drafting of the law, describes the implications as follows:

"Swiss lawmakers have recognized that crypto markets are structured differently than traditional securities markets. ***Consequently, they have decided to allow security token exchanges to integrate vertically: offering the full set of services necessary to operate an exchange.*** *This enables them to be independent of traditional entities such as banks, settlement systems, and centralized securities depositories."*

Furthermore, in order to further reduce barriers to entry, **Swiss law exempts small, non-commercially run exchanges from requiring a license, for example when a company organizes a free blockchain-based market for its own shares as a service to its investors.** Meisser's latest venture, Aktionariat, specializes in enabling such markets.

On the wider European level, although plans are considerably less advanced, the direction of travel appears to be similar. In September 2020, the European Commission (EC) published a proposal for a DLT Pilot Regime as part of its Digital Finance Package. Like Switzerland, the EC recognized that digital assets do not fit well into the existing regulatory structure and that a legal foundation will be required to support secondary markets.

Industry watchers view the DLT Pilot regime as a flexible, regulatory sandbox from which a fitting framework for digital assets can evolve. Indeed, the EC's stated objective is to "create an EU framework that both enables markets in crypto-assets as well as the tokenization of traditional financial assets and wider use of DLT in financial services".

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The State of Security Tokens Under US Law[80]

The state of security tokens under US law is fraught.[81] It has been that way since at least 2016, and the situation became particularly acute in 2017 with the rise of so-called initial coin offerings or ICO, which are a form of capital raising for start-up companies. While the staff of the US Securities and Exchange Commission (SEC) has sought to provide guidance on the question of when a token is a security, and a few trial courts have issued opinions discussing the issue, there remains a significant lack of clarity not only on that important question but also on the implications in other areas of the federal securities laws when a token issued as a "utility" or "network" token is treated as a security under the now-famous Howey test for investment contracts ("Howey security tokens").

This article highlights certain key matters in this regard. It first focuses on understanding when a token is a security, drawing a distinction between tokenization of traditional securities (i.e., stocks and bonds) and Howey security tokens. Next, we discuss significant practical implications for security tokens under the Securities Act of 1933, the Securities Exchange Act of 1934, the Investment Advisers Act of 1940, and the Investment Company Act of 1940. The article leaves for others a discussion of state law.

The nature of this article is not to provide an in-depth discussion for the expert but an overview of the issues. For those interested in more detailed information, we have included selected resources at the end for reference. This broad-scope approach should not lead readers to believe that these issues are not significant. In fact, if the matters raised herein do not receive greater clarity, the US cannot in any real sense make progress toward achieving the promise that blockchain brings to capital markets.

Security Tokens Generally

This article focuses on two classes of security tokens: traditional securities that have been tokenized on a blockchain or other distributed ledger technology (DLT) and Howey security tokens, a form of "investment contract" under federal securities laws.[82]

Since the benchmark "DAO report"[83] and the Munchee cease-and-desist order, the SEC's position on token sales in the US has been virtually unshakeable:[84] digital assets created and distributed by an entity or group are securities under the Howey test. In Howey, the US Supreme Court defined "investment contract" as any "contract, transaction, or scheme" whereby (a) a person invests money (or, in later interpretations, anything else of value), (b) in a common enterprise, (c) and is led to expect profits, (d) solely (or, in later interpretations, predominantly) from the efforts of others.[85]

Since the DAO report, two types of security tokens emerged: those that will always remain a security (tokenized traditional securities) and those that are sold as part of a "contract, transaction or scheme" at the time of fundraising but are meant to serve a certain purpose within a blockchain network, for example, as a payment mechanism and/or as a way to incentivize developers and/or users.

[80] ©December 2020. Rika Khurdayan is a lawyer and strategist, with a particular focus on blockchain and DLT. She is the founding partner of KS-TechLaw and regularly provides transactional and regulatory advice to both established and emerging participants in the blockchain space. Lee A. Schneider is a financial services and technology lawyer with extensive experience in blockchain. Lee co-hosts the Appetite for Disruption podcast with Troy Paredes and is the contributing editor for the Chambers and Partners Fintech Practice Guide. Contributors included: Nisa Amoils, John Ho, and Greg Murphy.

[81] What are securities and why are they regulated?

[82] 2020 OECD Report on asset tokenization; 2020 Article explaining the difference between technology wrappers and legal classification

[83] 2017 SEC DAO report

[84] With the exception of three extremely narrow no-action letters: 2019 TurnKey Jet; 2019 Pocketful of Quarters; 2020 IMVU.

[85] Supreme Court cases on investment contracts — Howey and Edwards; court decisions on investment contract analysis of digital assets — Telegram and Kik

Tokenized Traditional Securities

Tokenizing traditional securities—in other words, issuing and maintaining stocks, bonds and other securities in a digital form on a blockchain—offers various benefits ranging from increased transparency and security to ease of transfer, cap table administration, and investor management. These advantages, coupled with access to global capital and the promise of increased liquidity, make tokenization of securities an innovative way to raise capital for both emerging and established companies.

In the US, primary issuance of tokenized securities should be a fast, straightforward, and cost-efficient process due to the existence of a robust framework for exempt offerings, which applies equally to tokenized and normally-issued securities. Registered offerings, however, require SEC approval and therefore are not easily accomplished. We discuss both exempt and registered offerings in the next section.

An issuer may tokenize common or preferred shares, limited partnership interests, membership interests in a limited liability company, debt instruments, or convertible instruments. The nature of the interest being tokenized, as well as the corporate structure of the offering, may impact specific regulations that apply to token creation and to the offering of such token.

Legal and technical considerations go hand-in-hand during the process of tokenizing traditional securities to ensure compliance and a smooth path to secondary trading. Various regulatory restrictions, as well as tax and KYC/AML considerations, need to be addressed and implemented on a technical level and perhaps built into the token through the underlying technology. Corporate and governance structure, jurisdiction, and token features all affect regulatory compliance, a situation which differs from that of non-tokenized traditional securities. Such compliance requirements should be discussed with a knowledgeable attorney before undertaking tokenization of traditional securities.

For exempt offerings, the broad definition of "security" under federal securities laws has allowed issuers to use the existing US framework to tokenize traditional securities without the need for legislative or regulatory amendments. Issuers in many other countries, with more rigid lists of instruments that are considered securities,[86] have found themselves in regulatory limbo, without a workable framework for issuing tokenized securities, even when new regulations covered cryptocurrencies and "utility" tokens. In many other aspects, however, application of US securities regulations has not been smooth due to lack of regulatory guidance and leadership, as discussed throughout the remainder of this article.

Howey Security Tokens

Our discussion now turns to the question of whether a token ("digital asset" in SEC parlance) is a security. Unlike tokenized traditional securities, so-called "utility" or "network" tokens remain subject to regulatory uncertainty, largely due to (a) their design, functions, and features, which typically bear little resemblance to traditional securities and (b) their method of creation and distribution.

Network tokens, often though not always issued at a fundraising stage, are treated by the SEC as investment contracts. However, they often are meant to serve a certain purpose within a blockchain network, either as a payment mechanism, as a way to incentivize developers and users to secure the network, as a means to allocate resources, or for governance purposes (or a combination of some or all of these roles). Thus, if the network tokens themselves are treated as securities, every single transfer of such tokens would trigger securities regulations and compliance, essentially making any network inoperable.

The SEC has yet to address the important question of when network tokens are securities. Rather, it has relied on indirect means to provide information and even then has not provided much clarity around the issues discussed in later sections of this article.

For example, during a 2018 speech[87], Director Bill Hinman of the SEC Division of Corporation Finance discussed his view of the application of Howey to network tokens,

[86] For example, many European jurisdictions have very specific lists of what constitutes a security that are limited to stocks, bonds, and other items specifically part of a legal entity's capital stack as well as "collective investment schemes" to cover pooled investment vehicles or funds.

[87] Director Hinman's speech during the Yahoo Finance All Markets Summit

stressing that a digital asset itself is not a security, just like the oranges and orange groves in Howey were not securities. According to Hinman, it is the way in which such assets are packaged and sold to purchasers along with the purchasers' reasonable expectations that make a distribution of network tokens a securities transaction. Hinman also discussed two instances in which a network token transaction will no longer be treated as involving a security: (1) upon achieving "sufficient decentralization," or (2) "where the digital asset is sold only to be used to purchase a good or service available through the network." It remained unclear whether and when the SEC believes either condition is satisfied.

In 2019, the SEC staff released a Framework for "Investment Contract" Analysis of Digital Assets (the "Framework")[88] as well as its first no-action letter in connection with a proposed offer and sale of tokens by Turkey Jet, Inc.

Instead of focusing on the "contract, transaction or scheme" discussed in Howey, the Framework focused on the supposed dual nature and mutability of digital assets, setting forth a long, non-exclusive list of factors for when a token might or might not be an investment contract.

Under this framing, the Framework overlooks the main point: it is the investment contract itself, not the object of the contract, that is a security. In order to properly address the challenges of applying US regulation to network tokens, it is not the mutability of the asset itself (blockchain makes them immutable) but changes in the arrangement (i.e., Howey's contract, transaction or scheme) under which such asset is being sold that determines whether that arrangement is a security. Just as the oranges in Howey or the barrels of whiskey in Bourbon Sales Corp. were never securities, neither are network tokens. Thus, the question asked by many industry participants—"When does a token transition to non-security?"—is inherently misguided. A token's state does not transition.

Thus, notwithstanding the Framework, the critical question remains unaddressed: will subsequent use of tokens for their intended purpose within the network implicate securities regulations if such tokens were initially sold as part of "investment contracts," whether in a registered or exempt offering? Applying securities regulations to all such transfers would surely prevent the network from maturing.

SEC Commissioner Peirce sought to address this regulatory conundrum in her proposal to create a new safe harbor rule for blockchain projects. The proposed safe harbor would exempt the offer and sale of network tokens from requirements under the Securities Act, the tokens themselves from requirements of the Exchange Act, and the persons participating in certain transactions from application of the broker-dealer regulations. The rest of the SEC has not acted on her proposal.[89]

One project, Blockstack, recently published a memo prepared by their counsel outlining an argument as to why STX tokens shall no longer be securities upon launch of a more decentralized network, Stacks 2.0. The new version of the network will be "sufficiently decentralized" according to Blockstack, as no single entity will play a controlling or essential managerial role within the network, thus failing the Howey test. The SEC has not confirmed or commented on Blockstack's reasoning.

Creating a framework and a path forward for network tokens in the US is critical to widespread adoption and further advancement of blockchain technology.

The Securities Act of 1933: Registration Requirements for Token Sales

The Securities Act of 1933, colloquially referred to as the "Securities Act" or the "33 Act," regulates securities offerings in the US. All offerings must be registered under Section 5 of the Securities Act or meet a pre-established exemption from registration. Any issuer offering or selling security tokens in the US must abide by the requirements of the Securities Act.[90]

Practically speaking, registering an offering means a significant commitment of time and resources, including SEC approval and ongoing compliance obligations under the Securities Exchange Act of 1934, discussed next. A full public offering is done pursuant to a registration statement on Form S-1 (or Form F-1 for foreign issuers). There is also a form of limited public offering under Reg-

[88] SEC Framework: 2019 SEC; see also Coinbase's original framework for securities law analysis of blockchain tokens from 2016 Coinbase

[89] 2020 Commissioner Peirce's proposal of safe harbor for digital assets; article supporting the proposal

[90] Securities Act of 1933

ulation A (known colloquially as "A+" because Congress several years ago increased the maximum offering size), which has an offering circular requirement similar to, but less comprehensive than, a registration statement and that results in certain disclosure and filing requirements that resemble a lighter version of the public offering. To date, two companies have been allowed to utilize Regulation A+ for blockchain tokens, which requires an SEC declaration that the company's offering circular is "qualified."[91]

Exempt offerings[92] come in many flavors besides Regulation A, with security token issuers often relying on Regulation D (private offerings) and Regulation S (non-US offerings). A single offering may rely on both exemptions simultaneously, Reg D for US purchasers and Reg S for non-US investors. Because they are exempt, these offering types do not have formal disclosure requirements imposed by statute or rule, but informal practices have arisen that vary with the type of security token, the target investors, and other factors. When doing a series of offerings that rely on one or more exemptions, issuers need to be careful that their offerings are not collapsed into a single offering that might require registration. This is known as "integration" of the offerings and requires careful analysis.

A few other matters to keep in mind for offerings that rely on Reg D:

1. They are limited to sophisticated investors, which are subject to evolving standards but usually focus on the investor's net worth or income (so-called "accredited investors").
2. Reg D issuers can be disqualified under the "bad actor" provisions, which prohibit issuers from using Reg D if they or their officers, directors, or shareholders have engaged in wrongful conduct. (A waiver process is available through the SEC.)
3. The issuer must file a notice on Form D with the SEC and various states to provide information about the offering to regulators.
4. The securities sold will be subject to significant resale restrictions, often for at least one year.

Reg S offerings have various requirements to ensure that the offering is truly non-US in nature and that prevent securities sold offshore from being purchased by US investors. Issuers relying on this exemption need to pay careful attention to the detailed requirements.

In the next section we discuss the few projects that have used full registration or Reg A offerings, and we consider the ongoing requirements of a public company. Reg D and Reg S offerings have been much more numerous and used under varied circumstances. It is important to have sophisticated legal counsel to advise on either a public offering or an exempt offering.

The Securities Exchange Act of 1934: Public Companies with Security Tokens; Trading of Security Tokens by Licensed Entities

The affectionately called "Exchange Act" or "34 Act" packs two broad regulatory mandates into its sections.[93] Neither addresses standards relating to Howey security tokens, and the SEC had done little to rectify this situation. Without such guidance, security tokens cannot truly become part of the fabric of financial services in the US.

One category concerns the requirements for **public reporting companies**, which are defined as companies that either (a) have done an initial public offering or (b) under Exchange Act Section 12(g) have more than 2000 equity security holders (which could be stock or, under some interpretations, Howey security tokens, although this question remains outstanding), notwithstanding that all such equity securities were privately placed. Mergers with a public company also can result in a formerly private company becoming public, including through the newly popular special purpose acquisition company or "SPAC."

[91] Full registered token offering: INX registration statement; Regulation A+ token offerings: YouNow offering circular; Blockstack offering circular

[92] SEC information on exempt offerings

[93] Securities Exchange Act of 1934.

The second category concerns the **licensing and activities of broker-dealer**s and other entities involved in trading securities on either an agency or principal basis. This portion of the Exchange Act also creates the foundational laws related to securities trading and authorizes the SEC and Financial Industry Regulatory Association (FINRA), the self-regulatory organization that oversees broker-dealers.

The **public company requirements** essentially set forth the disclosure and reporting regime applicable to both newly public entities and those long-standing companies with public stock. Rules and regulations adopted by the SEC flesh out what is required, including the well-known 10-Q and 10-K quarterly and annual reports as well as periodic reports, proxy statements, and the contents of each. There are also requirements for financial statements and pro forma financial information along with procedures for distributing all of this material to shareholders, whether they hold directly (as blockchain-based stock would allow) or through an intermediary (usually a broker-dealer or a bank and commonly referred to as "held in street name").

As of this writing, only one security token has received SEC approval for public offering and sale, although several blockchain companies have become public reporting companies under the Exchange Act as a result of enforcement settlements with the SEC. Companies that become public due to a settlement or because they exceed the 2000 holder requirement both need SEC approval of their initial reports and filings. Public company reports and filings are available on the SEC website through the "EDGAR" service, a technology that allows multiple means of access. These filings provide the only guidance of how the SEC thinks Howey security tokens should be treated under these rules and disclosure requirements. Because Howey security tokens often are not part of an issuer's capital table, more clarity is needed. Moreover, for all security tokens, the required disclosures about the blockchain network on which they are created and maintained remain uncertain. These are just two examples of the continuing uncertainty.

As our cursory discussion shows, the public company requirements are extensive, and no company becomes public without SEC approval. No issuer of security tokens should take the requirements lightly, and the process to obtain SEC assent has thus far not been easy, as evidenced by the small number of successful applicants.

The 34 Act's **regulation of broker-dealers** applies both to securities issued by public companies and those that come into investor hands through private placements or other exempt offerings. A broker acts as the agent for others who trade securities. A classic type of intermediary in the execution of trades, a broker may also hold custody on behalf of its clients and take responsibility for the settlement of transactions by delivering either the cash or securities.

A dealer acts as principal when trading securities and holds itself out as regularly willing to buy and sell securities. Market makers and other liquidity providers are classic examples of a dealer and, like brokers, also may hold custody and be responsible for settlement. Some entities act as both a broker and a dealer, depending on the circumstances, and for this reason the colloquialism "broker-dealer" has arisen. A broker-dealer that operates an electronic system to automatically match buy-and-sell interest must either register as a national securities exchange or as an alternative trading system (ATS). Exchanges have extensive licensing and ongoing requirements because they have the power to list public companies and have protection for their orders, whereas an ATS has fewer requirements, especially when its orders are not protected.[94]

Until the SEC's December 23, 2020 statement (the "Custody Statement")[95] on custody of digital asset securities (a holiday gift while we were writing this article), both the SEC and FINRA had been reluctant to allow broker-dealers to engage in security token trading and custody. SEC Rule 15c3-3[96] governs the custody and related requirements for broker-dealers. The Custody Statement offers a 5-year no-action position that would allow broker-dealers to custody "digital asset securities" (all types of security tokens, as used herein) so long as the broker-dealer's only business involves security tokens. This limitation purportedly is designed to stop problems arising with security tokens from infecting a broker-dealer's traditional securities activities. The Custody Statement includes other requirements primarily focused on having internal policies/procedures and customer disclosures/agreements covering relevant matters. As with many releases in this area, the Custody Statement includes both positive elements and challenges for those who wish to engage in custody of security tokens. Much will be written in the coming months in response to the request for comments accompanying the Custody Statement.

[94] 2020 SEC response to Wyoming qualified custodian pronouncement; 2020 SEC letter to FINRA on ATS trading and settlement of digital asset transactions; 2019 SEC-FINRA joint staff statement on digital asset custody; 2018 SEC statement on unregistered trading platforms.

[95] 2020 SEC interpretation permitting limited custody of digital asset securities.

[96] SEC Rule 15c3-3

FINRA identified the custody issue and many others in a report at the beginning of 2017. Custody can either involve possession (the broker-dealer holds the asset itself) or control (the broker-dealer relies on a good control location, usually another broker-dealer or a bank). In the Custody Statement, the SEC did not clarify what they believe is acceptable for either possession or control (indeed, control might not even be acceptable under the Custody Statement) but asked the industry to experiment and develop appropriate methodologies based on a study of blockchain generally and of specific blockchains for specific security tokens. As discussed in the next section, the SEC also needs to sort out the custody issue for investment advisers.[97]

While the blockchain ethos includes dispensing with intermediaries, as a practical matter broker-dealers will aid liquidity, create markets, and otherwise facilitate the arrival of less technically sophisticated players into the trading world. Custody is one important issue for broker-dealers, but there is also a lack of clarity around the treatment of blockchain assets, including Howey security tokens, under the broker-dealer regulatory capital requirements (Rule 15c3-1).[98]

The Exchange Act covers a lot of ground and the lack of guidance on the treatment of securities tokens in general and Howey security tokens in particular will continue to limit US participation in these important developments for the securities industry.

Investment Advisers Act of 1940: The Qualified Custodian

Investment advisers are a different type of regulated entity under SEC jurisdiction. Simply put, they provide advice on investments and in that context are permitted to maintain custody of, or otherwise exercise control over, the funds and/or securities of their customers. The rule governing custody for investment advisers requires, among other things, that an investment adviser utilize a "qualified custodian" with respect to many types of securities, mostly those for which either the issuer or its transfer agent maintains the securities.[99]

The SEC has yet to issue guidance on several aspects of the custody rule, including whether security tokens maintained on blockchain by the issuer or its transfer agent meet the exemptions and, more importantly, whether it will accept banks and broker-dealers as qualified custodians. In October 2020, the State of Wyoming's Division of Banking issued a no-action letter indicating that various types of banks subject to its regulation met the definition of qualified custodian, but the SEC rejected this interpretation, noting that only it had the power to determine who met the definition of qualified custodian.

The Office of the Comptroller of the Currency, a US regulator of national banks, has issued some helpful interpretation to allow national banks to provide custody in connection with certain blockchain assets, but without the SEC's blessing it will remain unclear who an investment adviser can rely upon as a qualified custodian. This lack of certainty inhibits investment advisers not only with respect to Howey security tokens but all other types of security tokens, as well as other blockchain assets.

Investment Company Act of 1940: Tokens as Investment Securities

In addition to the Securities Act and the Exchange Act, both US issuers and foreign issuers that offer security tokens to US investors may inadvertently find themselves subject to the Investment Company Act of 1940 (ICA).

If a company's business substantially consists of holding securities of other entities, such company may be considered an investment company under the ICA. Investment companies must register with the SEC or qualify

[97] 2017 FINRA report on distributed ledger technology; see also DTCC initiatives on distributed ledger technology; 2019 Paxos no-action letter allowing securities settlement on blockchain.

[98] SEC Rule 15c3-1

[99] 2003 Adopting release of investment adviser custody rule

for an exemption from registration. Registration as an investment company is an onerous and costly process that comes with extensive ongoing compliance obligations.[100]

ICA requirements can be triggered by pooled investment entities but also by operating issuers of security, depending on the corporate structure and whether an SPV is used to issue network tokens for an operating business. Just like other securities regulations, the ICA contains several exemptions that can be utilized by both U.S. and foreign issuers to avoid burdensome registration requirements.

The most commonly used exemptions from registration under the ICA can be found in Sections 3(c)(1) and 3(c)(7). Under the 3(c)(1) exemption, the issuer can only undertake a private offering, and the number of accredited investors cannot exceed 100 people. Under the 3(c)(7) section, the number of investors is unlimited; however, all of them must be "qualified purchasers," which is a much higher standard than "accredited investors." These limitations make the common exemptions unworkable in the context of token sales.

Conclusion

As indicated throughout this article, while the issuance of tokenized traditional securities is a fairly settled process in the US, there remains a fair amount of uncertainty about many issues for Howey security tokens. This lack of clarity has been cited as one of the reasons for the stunted markets for digital assets in the US and for the willingness of many blockchain companies to locate elsewhere. It stands in sharp contrast to other jurisdictions, where regulators have embraced blockchain technology and the companies who are building with it and facilitating usage of digital assets. Singapore, Switzerland, Japan, and the EU, for example, show how a different regulatory approach has sought to yield a more conducive environment for the creativity and empowerment associated with blockchains. The US Financial Stability Oversight Council has, in its 2020 annual report, encouraged continued coordination among federal and state financial regulators to support responsible financial innovation such as in digital assets and to promote consistent regulatory approaches. We hope this ethos will prevail so that blockchain technology will become the next generation infrastructure for financial services and beyond.

[100] 2019 SEC staff letter finding that an investment fund that invested solely in bitcoin does not meet the definition of investment company

Riddle & Code®

THE BLOCKCHAIN INTERFACE COMPANY

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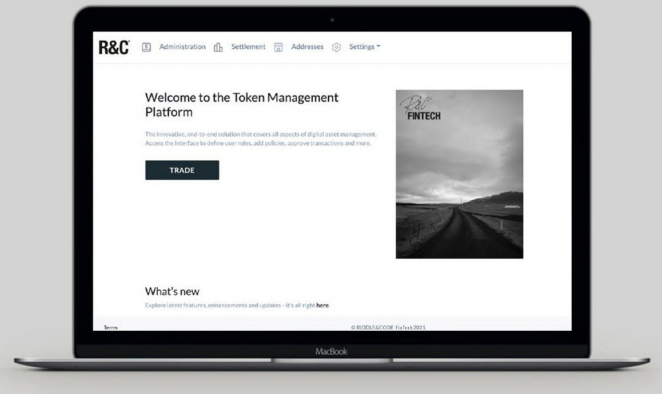

In Europe, Security Token Offerings (STOs) are becoming a widespread form of blockchain-based (crowd) funding. However, in order to issue tokens in a regulatory compliant and scalable way, the automation of processes, secure identities and wallets and the storage of relevant metadata in an immutable manner are required. And this is what RIDDLE&CODE's Token Management Platform enables.

RIDDLE&CODE is an award-winning blockchain interface company that builds hardware & software stacks and creates a trusted connection between data, humans and machines. Headquartered in Austria but working with its tier-one clients and partners worldwide, the company continues to enable tokenization of financial/non-bankable assets and develop new business models to financial markets, energy distribution, mobility and materials solutions. RIDDLE&CODE FinTech Solutions, a subsidiary company of RIDDLE&CODE, empowers funds, crypto exchanges and regulated financial institutions to securely store and manage digital assets.

The cornerstone of these efforts is the Token Management Platform (TMP), the next generation of RIDDLE&CODE's institutional-grade digital asset management solution. The cloud-based platform securely stores digital assets for funds, exchanges and financial institutions and manages all aspects of key generation, custody and regulatory compliance in various jurisdictions. The TMP is fully auditable, allowing clients to fulfill all transparency requirements in line with financial regulations and internal compliance policies. With the support of staking, DeFi, numerous protocols and flexible integration of off-chain business logic, the platform can manage the full lifecycle of asset tokens.

riddleandcode.com

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5.3 The European Union

STADLER VÖLKEL
RECHTSANWÄLTE - ATTORNEYS AT LAW

Tokenize the World

The buzzword "tokenization" has been circulating through the ether for several years now. It is not only the crypto community that has recognized that the use of blockchain-based tokens makes a digital representation of almost all assets at least within the realm of possibility. In our legal practice, we have advised on a large number of such projects. With this article, we would like to provide an overview of which tokenization models are common in practice, which alternatives exist beyond that, and which legal as well as tax considerations need to be taken into account.[101]

What is tokenization?

At the risk of carrying owls to Athens, we would like to briefly summarize what tokenization actually means for those readers who may be looking into it for the first time. In general, tokenization is the process of creating a digital representation of certain real assets on the blockchain. Often these are securities, means of payment, company or project participations, loans, precious metals or even shares in real estate.

Tokenization generally fulfills two different functions. On the one hand, the need for certain intermediaries is eliminated, which helps to save transaction costs. On the other hand, illiquid assets can be made easily tradable in this way.

Functions of tokenization

1. Reduction of necessary intermediaries
2. Increased liquidity of assets

The first function of tokenization thus concerns the reduction of necessary intermediaries. This is a particularly important aspect in the issuance of tokenized securities. Unlike traditional issues on the capital market, neither a paying agent bank, nor a depository, nor other intermediaries are required. The company raising capital issues the tokenized securities (or 'security tokens') directly to the investor. The investor holds the tokens in their own wallet.

The second function of tokenization relates to the possibility of making illiquid assets liquid, i.e., preparing them for simple and rapid trading. A physical gold bar or shares in an apartment building are more difficult to trade than a token, for example.

The limits of what is possible in tokenization are essentially determined by economic, tax and accounting considerations. Once it has been determined which asset is to be tokenized and tax and accounting issues have also been clarified, there is generally nothing to prevent implementation. Two things are required for this.

In a first step, the digital representation of the asset is created in technical terms: A smart contract is published on any blockchain, which produces and manages the desired number of tokens. In practice, the Ethereum blockchain is most frequently used for this purpose. The tokens created in this way will later digitally represent the desired asset.

The second step is to link this digital representation with the real asset. This second step — the interface between the digital and real worlds — is the real challenge. As a result, the holder of a token should be placed in such a position that they have a claim to the tokenized asset that can be enforced in the real world. The legal protection of the token holder must be given top priority in the structuring of the project if the current trend toward tokenization is to pave the way for long–term and sustainable development.

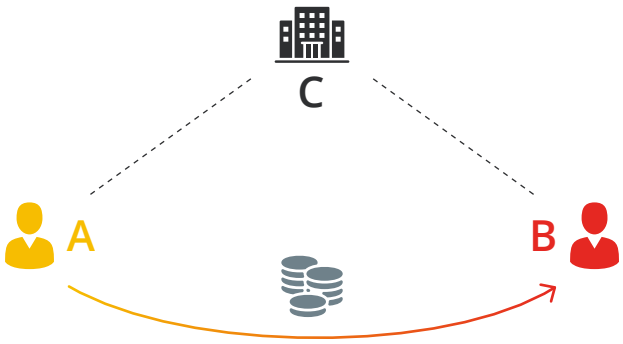
[101] As Austrian lawyers, we deal in this article with the practice and the legal situation in Austria. The legal situation in other countries may differ. Furthermore, this article is only intended to provide an initial overview. It cannot replace individual legal advice

Steps to tokenization

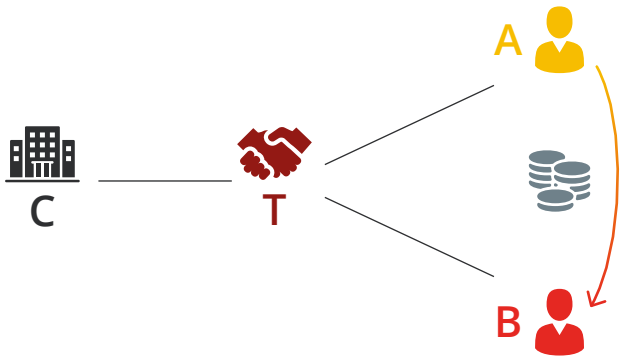
1. Generation of the tokens on a blockchain
2. Linking with the asset

How is an asset linked to a token?

The legally secure link between a digital token and its real asset is, therefore, the core of tokenization. How this is implemented depends on the specific asset in question and the law under which the tokenization is carried out. So, it makes a difference whether the law of Austria, or, for example, Liechtenstein, Germany, Switzerland or another jurisdiction is chosen. Since our expertise is in Austrian law, we present the approaches under Austrian law.



Model 1: Direct transfer of a legal claim by transferring a token on the blockchain that represents the claim. (C: Company, A: Previous creditor of the Company, B: New creditor after taking possession or assignment of the claim via token transfer).



Model 2A: Trust structure where tokenized ownership is exercised by a trustee on behalf of token holders. (C: Company, T: Trustee, A: Previous owner, B: New owner after taking possession via token transfer).

Model 1: Direct link between right and token

If the right is a legal claim — as is the case with securities, means of payment or loans — the right can usually be directly linked to the token. The ownership of the token is then necessary for the exercise of the right. To transfer the legal claim, the token is transferred to another person on the blockchain. Whoever owns the token is the creditor of the security, payment or loan claim. This is achieved through corresponding clauses in the contractual agreement between the parties.

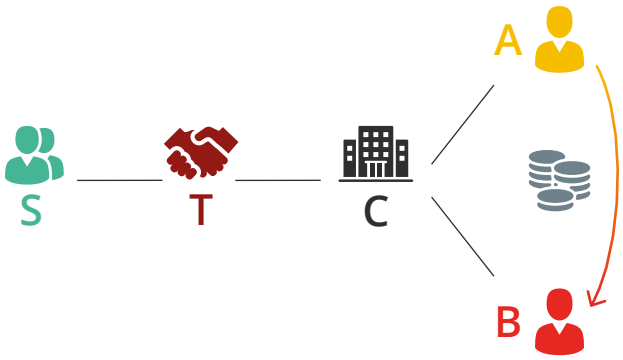
Whether existing debt can be tokenized depends on the prior agreement reached between the parties. If the debtor wishes to tokenize existing liabilities — i.e., its own debts — this generally requires the consent of all creditors. If, on the other hand, a creditor wishes to tokenize an existing claim, this may be possible under certain circumstances without the debtor's involvement.

Model 2: Interposition of a trustee

If not only simple rights to receivables are to be tokenized, but a real ownership position, or if a stricter form is prescribed for the transfer of the right — e.g., if a written contract is required — then one must dig a little deeper into the legal bag of tricks. Tokenizing tangible objects such as stocks of goods, precious metals,

"A digital token can thereby be described as a piece of software with a unique asset reference, properties and / or legal rights attached."

— E&Y Tokenization of Assets



Model 2B: Trust structure in which a trust shareholder (T) ensures that the Company (C) can fulfill promises relating to its own shares that would actually have to be fulfilled by the owners (S). By transferring the token from A to B, these so-called efforts obligations are transferred.

shares in real estate or even participations in companies should be considered.

In these cases, it may be necessary to choose a trustee structure, whereby two different variants can be considered here as well — depending on the requirements. In the first option (Model 2.A), a trustee directly mediates the ownership position. The trustee owns, for example, physical gold bars for the token holders. In connection with an example of tokenization of real assets such as precious metals or apartment buildings, we will discuss this construction in more detail below.

In the second option (Model 2.B), the trustee only indirectly ensures that the company can actually keep its promise. This option is particularly relevant in the tokenization of usage promises (see also below). Indeed, as a rule, the participation of the owners is necessary for the fulfillment of this promise. In such cases, the trustee is appointed as a shareholder of the company. This is particularly interesting in the case of corporate forms that do not have authorized capital.

Caution:

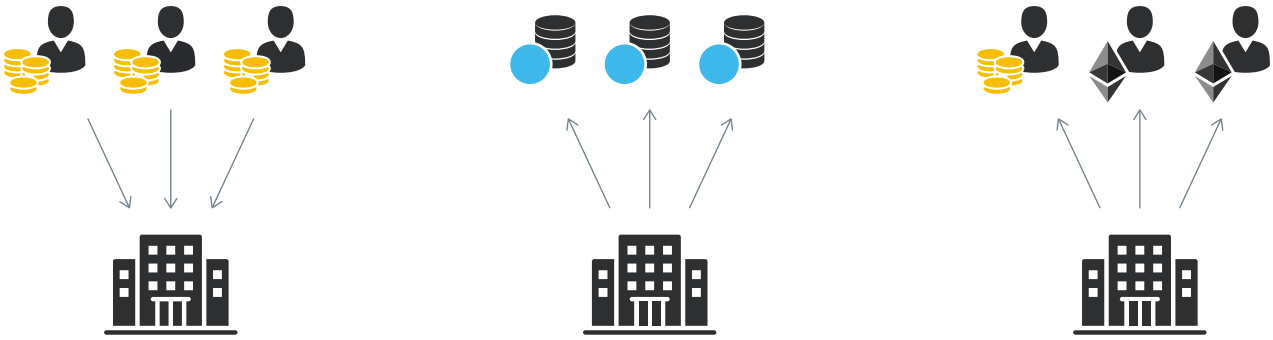
Not every legal system is the same. While Austrian law, for example, is well equipped for the types of tokenization presented, and Liechtenstein has even created its own law on asset tokenization, the legal situation in other countries may differ. In many cases, however, Austrian or even Liechtenstein law can be made applicable with a choice of law clause in order to take advantage of these favorable legal systems for oneself, even if the company is not domiciled in Austria or Liechtenstein.

Which assets can be tokenized?

Just about any asset can be tokenized. To offer an idea of the possibilities, we will give some concrete examples below. Practical cases exist for all of these examples.

Tokenized profit participation rights

According to our observation, profit participation rights are currently the most popular instrument that is tokenized. Participation rights are used for corporate financing. A company raises capital from investors and, in return, promises a share in the profit and loss of the company as well as in the company value. A profit participation right can be repayable or non-repayable. Persons subscribing to profit participation rights thus have a position similar to that of shareholders in the company, except for the right to a say in the company's affairs. Their position is similar to that of limited partners in a limited partnership. The payment of the profit participation can be made in euros or a digital currency, such as Ether. In such a case, the payment is made to those addresses on the Ethereum blockchain that are in possession of the tokens. Tokenization turns the capital participation right into a transferable security under EU law.



The profit participation right is very popular due to its flexibility. It can be used for a wide variety of purposes. The funds raised can be shown in the company's balance sheet — depending on the structure — either as equity or debt. If the company opts for equity, this can strengthen its appearance vis-à-vis other potential providers of debt capital.

Tokenized revenue participation rights

Profit participation rights are not the only common instrument. Other types of participation rights are also popular, such as revenue participation rights. These are similar to profit participation rights insofar as they both involve a promise by a company to make payments that are dependent on a specific measure. Whereas this measure for profit participation rights is the profit or loss of the company, in the case of revenue participation rights, the reference point is specifically the revenue. Profit and loss can be influenced by the company to a certain extent, for example, by bringing forward investments. This is not the case with sales, which can be emphasized to potential investors.

The revenue participation rights can also be structured quite flexibly. It can be repayable or non-repayable. Certain minimum and maximum participation thresholds can be set, or the revenue share can be made dependent on other factors. Tokenization turns the revenue sharing into a transferable security under EU law.

Tokenized subordinated loans

The qualified subordinated loan is currently the most popular instrument in the crowdfunding sector. In a subordinated loan, the company raises funds and usually promises an interest rate commensurate with the risk and repayment at the end of a fixed term. Qualified subordination means that the lenders may only demand payment after all other non-subordinated creditors.

If promised interest payments or repayments cannot be made, insolvency proceedings do not have to be initiated due to qualified subordination. The subordinated loan also becomes a transferable security under EU law through the process of tokenization.

Excursus: Opportunities for tokenizing debt instruments

The three tokenized instruments presented above have in common that they serve corporate financing and that they involve the issuance of debt instruments, i.e. ultimately promises by the capital-raising company. The main advantages of raising funds in this way are as follows:

- The possibility of adaptation to the needs of the company
- The possible externalization of corporate risks
- Greater flexibility in the use of the company's assets.

Adaptation to requirements of the company

When issuing tokenized debt instruments, capital is not lent by lenders, but the promised interest and repayments are sold as a product. Unlike a bank loan, the company determines the terms on which money is to be borrowed. This means that special financial and tax considerations can be taken into account when structuring the token terms and conditions.

First and foremost, the interest arrangements are of central importance. Interest can be fixed or variable; it can be paid on an ongoing basis or there can be no interest at all during the term of the instrument, with a higher repayment at the end of the term. In the case of variable interest, the interest rate can be linked to external parameters (EURIBOR, inflation index, commodity prices, exchange rates, etc.) or to internal indicators (EBIT, sales, internal indicators).

The repayment arrangement is equally flexible. Repayment can either be made in regular installments — e.g., per quarter or year — or there can be no repayment during the term. In this case, the instrument is usually repaid in full at the end of the term. If repayments are to be made during the term, the respective amount can also be structured differently. As explained above, instruments can also be issued that are not repayable at all.

Externalization of corporate risks

Because of the flexibility in the design of payments, tokenized instruments can also serve as a tool for (partial) risk hedging in addition to financing. In some cases, the potential is obvious; in other cases, it requires a detailed examination.

Example 1: Company A's earnings are significantly dependent on the price of steel. The company bears the risk of rising raw material costs. The interest could be structured in such a way that the interest increases when steel prices fall and decrease when steel prices rise.

Example 2: A customer of Company B wants to conclude a major contract in Saudi riyal. The company thus bears the exchange rate risk. The repayment of the instrument could be structured in such a way that it can be made in riyal at a certain rate.

Example 3: Company C finances the construction of a residential building and would like to finance the construction and maintenance costs from the rental income. The company bears the long-term refinancing risk. The instrument could be designed for the long term, and the interest and repayment could be linked to the inflation index (also provided for in the rental agreements).

Flexibility in the use of assets

Since the stricter capital adequacy requirements came into force, banks generally require a high level of collateralization when granting loans. The granting of a lien on real estate and pledging of operating assets and receivables are common practice. This deprives companies of the freedom to manage these assets.

Borrowing with the above-discussed (and also other) instruments usually takes place without the provision of collateral. However, it is also possible to order collateral and, in this way, obtain a more favorable interest rate on the market.

Tokenized commitments to use

Tokenization of commitments to use is the latest development of tokenized instruments. Commitments to use are promises by a company to obtain performance from a third party. The company "uses" itself to get a third party to perform. Usage commitments are most often used when the company makes a promise that can only be fulfilled by someone else. In the context of corporate financing, commitments to use can be structured in various ways. Examples from practice include:

- **Pledges regarding own shares in the business:** If a company does not have authorized capital, only the owners of the company can make effective promises regarding their shares in the company. However, the company itself can, for example, make a promise of use that, if certain conditions are met, the token holder will participate in the company by way of a share transfer or capital increase.
- **Commitments on the appropriation of profits:** Just as only the owners of the company are entitled to the shares in the company, only they are entitled to the profits. However, by way of a promise of use, the company can promise to guarantee that the distributed profit will be used in a certain way by its owners. In this way, for example, the promise can be made that profits will be passed on to token holders.
- **Agreements under company law:** A large number of agreements can be replicated by way of a commitment to use, which could otherwise only be agreed between shareholders of the company. This includes co-sale rights, pre-emptive rights or co-determination rights. These usage commitments can also be used in combination with the other instruments presented above. For example, a tokenized profit participation right can also contain a commitment of use to acquire shares in the company under certain conditions.

Promises made at the expense of third parties cannot, of course, effectively bind these third parties. This always requires the consent of the obligated person. In order to give weight to the company's promise, it must therefore ensure that the third party actually performs what has been promised, even if the third party may not wish to do so. In the examples presented above, the obligation of the company must therefore be transferred to its owner.

In practice, this is carried out in two different ways. Either the company's articles of association are amended

to include appropriate clauses ensuring that the company's owners must fulfill these promises made by the company, or a trustee takes over the company shares and, in this way, ensures that the promises made are fulfilled after a corresponding request by the company (see Model 2.B above for tokenization).

Tokenization of a limited liability company (GmbH)

Shares in limited liability companies have been "immobilized" on purpose (at least in Austria). In order to transfer shares in a limited liability company, an assignment agreement must be concluded in the form of a notarial deed. Even the mere offer to transfer must already be made in the form of a notarial deed in order to be effective. If this formal requirement is not complied with, the offer or transfer is void.

Because of these formal requirements, the share in a GmbH cannot be tokenized directly. However, the above-mentioned instrument of a commitment of use can be used. A transfer commitment, together with a commitment to use the profit and, if necessary, a commitment to co-determination rights, can be effectively tokenized. These promises can be transferred without any formalities. Compliance with the pledges can be ensured by the company itself using the trust model B. In this way, the company can effectively make promises regarding its own shares, even if it does not have already authorized capital (as may be the case with stock corporations, for example).

Tokenization of a stock corporation

In Austria, only registered shares may be issued by unlisted stock corporations. The names of the shareholders are to be entered in a share register. Tokenization brings the share register onto the blockchain. Transfers of shares are made by notifying the company, which records the transfer in the share register on the blockchain.

Bearer shares may also be issued in the case of listed stock corporations. In this case, however, the shares may only be securitized in the form of a global certificate. This global certificate must be deposited with a central securities depository. In order to enable the tokenization of bearer shares, it is therefore still up to the legislator (at least in Austria). However, a stock corporation could also issue tokenized use commitments with regard to its own authorized capital. This would be comparable to the model presented above for the tokenization of use commitments with regard to GmbH shares, but in this case (provided authorized capital is available) the appointment of a trustee could be omitted.

Tokenization of real assets such as precious metals or apartment buildings

Not only promises (claims) or entire objects such as companies can be accessible to tokenization. In particular, interest in the tokenization of real goods such as precious metals, precious stones or even shares in apartment buildings has been growing recently. The focus is not on the idea of financing, but on the desire to transform these relatively illiquid resources into easily tradable goods.

The linking of the real world with the tokenized representation usually succeeds with trust variant A. A trustee is appointed to take custody of the tokenized real goods. The trustee initially warrants that the tokenized goods actually exist. The further relationship between trustee and token holder can be structured differently. For example, the trustee can act as an intermediary for real (co-)ownership positions for the respective token holder, as is the case with securities deposits on the traditional capital market. However, it is also possible to grant the trustee only a succession claim under the law of obligations. Which variant is preferred depends on the circumstances of the individual case.

Tokenization of voucher entitlements

The so–called voucher model should not go unmentioned. This first established itself as a suitable instrument in the course of the ICO wave in 2017. And although the ICO boom is long over, the voucher model still has its justification in certain areas. **In this instrument, the company promises to exchange a token for a certain service in the future.** The funds collected are used to finance the company. Depending on how the voucher is structured, it can be used to manage accounting and tax consequences. The voucher property can be linked to the other instruments presented above, so that a token can simultaneously have aspects of, for example, a profit participation right, a commitment to use and a voucher.

What should be considered when tokenizing?

Legal, tax and accounting structuring

The first step on the way to successful tokenization is always to consider which goals are to be achieved with it. The types of tokenization presented above can have very different tax effects and also effects on the company's balance sheet, depending on the specific design. These effects can be used specifically for the company. If, for example, loss carryforwards are to be utilized, an instrument can be chosen that leads to an income in the company. If the equity capitalization is to be strengthened without an income tax burden, this can be realized with tokenized profit participation rights, for example. The possible tax burden with sales and corporate income taxes must always be kept in mind, especially in the case of non-repayable instruments. To avoid unexpectedly triggering a tax liability, we therefore recommend involving a tax advisor or auditor in the structuring at an early stage.

The tokenized instrument should be structured depending on the aforementioned tax and accounting considerations. To that end, either the corresponding security token conditions are worked out or other necessary contracts are drawn up. If necessary, the company's articles of association will be amended. If required, the trusteeship will be set up.

Public offering of security tokens

The preparation of the necessary contracts, and if necessary, the amendment of the articles of association are the first steps. The second step in many cases is the sale of the tokenized assets in a public offering. In this process, a capital-raising company offers the tokenized securities or investments to the general public for subscription.

For this purpose, the company usually creates a dedicated landing page for handling the issue on its website. The landing page is initially intended to ensure that only persons to whom the offer is addressed are given access to it. Interested investors thereby confirm, for example, that they are from the EU. In addition, the landing page primarily serves to provide investors with information. It contains those documents and records that are required by law to be given to interested investors. Finally, the landing page can be used to map the subscription process: In this case, interested investors subscribe to the securities directly with the issuer.

The documents and information to be included on the landing page essentially depend on the minimum subscription amount per investor and the total amount of funds that the company wishes to raise. If the minimum subscription amount per investor is at least EUR 100,000, then as a rule no further information is required apart from the value token conditions and a subscription form.

If, on the other hand, the minimum subscription amount per investor is less than EUR 100,000, for example, if a subscription is to be possible for just a few hundred euros, more information is usually required on the landing page. What exactly is required depends on the total volume:

- **Volume < EUR 250,000**
  For very small placements, a general risk disclosure with the key characteristics of the instrument is sufficient.
- **Volume < EUR 5 Million**[102]
  For small placements, an information sheet is sufficient.
- **Volume ≥ EUR 5 Million**
  For larger placements, a capital market prospectus must be drawn up in accordance with the EU Prospectus Regulation and approved by a regulator in the EEA (FMA, BaFin, CSSF, etc.)

The drawing up of a capital market prospectus is time-consuming. Companies should allow for a lead time of at least three months. The advantage is that an offering can be made in several EEA member states without having to worry about national law. If, on the other hand, a capital market prospectus is not prepared and the offer is to be made in several countries, the respective national regulations must be observed.

[102] More precisely: placements of less than EUR 5 million over a period of 7 years, whereby less than EUR 2 million may be raised in a 12-month calculation period

TEN31 BANK

Connecting the Dots between DeFi and Conventional Banking.

About TEN31 Bank

"Always one step ahead." With this mission, the German WEG Bank AG initially devoted itself to the housing industry and secured a role as a leading institute for WEGs and property managers. With the establishment of the "TEN31" division and a planned renaming of the bank to "TEN31 Bank AG" for summer 2021, the institute remains true to its innovative spirit and has been establishing a second product line since 2019: banking services in innovative payment transactions. The TEN31 Bank focuses in particular on the everyday usability of digital currencies with the aim of offering everyone involved real added value. The TEN31 Bank is the bridge between conventional banking and the blockchain world.

What are Blockchain Listed Shares?

Any company whose capital is denominated in registered shares is required to maintain a shareholder register. Such a register provides the required transparency and proof regarding the ownership of the shares in the company and must be safeguarded against manipulation or loss of data. Traditionally, this register is maintained in an ordinary database.

TEN31 Bank has pioneered in developing a technological revolution by being the first bank to maintain its shares in a blockchain environment. Under the name "BLS", which stands for "Blockchain Listed Shares", all corporate actions regarding the ownership and transfer of shares can be executed.

What is the advantage of using BLS technology?

By maintaining the shareholder register on a blockchain, TEN31 Bank is leveraging some of the key technological advantages of this emerging technology: transparency, immediacy, auditability, censorship resistance and data security.

However, the advantage of BLS technology goes well beyond the mere data storage of the shareholder register: It opens the potential for any company to allow their shares to be traded on a crypto exchange, making investment in the company accessible to the masses. Particularly for medium sized businesses, this opens the opportunity to make shares available globally without having to maintain a complex and costly internal infrastructure.

Using BLS technology can therefore be considered to be the junior equivalent of a public listing, at a fraction of the cost involved.

When will TEN31 Bank make BLS technology available?

The bank is currently planning to bring its own shareholder register on blockchain by the end of Q2 2021. Once this is completed, it will make the BLS technology available for other interested companies.

What is the difference between an STO and BLS?

There is a fundamental difference. An STO which tokenizes shares creates a security token which is a digital representation of a right to a share. In essence, a traditional STO is an indirect representation of the shares in question.

In contrast, a BLS token represents the actual proof of ownership, so it can be considered to be the actual share itself. BLS is the first blockchain based technology which grants a direct access to the shares. This allows for a much higher level of legal security to the investor.

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5.4

Switzerland

Security Tokens:
Issuance and trading platforms according to Swiss and EEA regulatory initiatives[103]

Introduction

This contribution summarises the recent developments of the regulation with regards to the issuance of security tokens and trading platforms for security tokens in Switzerland and the European Economic Area (EEA), which includes in particular also Liechtenstein.

In September 2020, the Swiss Parliament adopted the Federal Act on the Adaptation of Federal Law to Developments in Distributed Ledger Technology (DLT bill). In the same month, the European Commission adopted several legislative proposals as part of its Digital Finance Strategy. Both regulatory initiatives aim at improving the framework conditions for DLT by increasing legal certainty whilst minimising risks for investors and the financial system.

The Swiss DLT bill will amend existing legislation. For the purpose of this contribution the amendments to securities law and to the regulation of trading platforms and post trading infrastructures are of interest. **Switzerland will introduce ledger-based securities and DLT trading facilities. Whilst the provisions enabling the introduction of ledger-based securities entered into force on 1 February 2021, the ones introducing the DLT trading facility are expected to enter into force on 1 August 2021.** The DLT bill will be complemented by the Blanket Ordinance in the Area of DLT (DLT ordinance), which will contain implementing provisions.

The European Commission adopted four proposals: The Market in Crypto-Assets Regulation (MiCA), the Pilot DLT Market Infrastructure Regulation (PDMIR), the Digital Operational Resilience Regulation (DORA), and a directive to amend existing financial services legislation. **These proposals do not govern whether securities may be issued validly based on DLT but leave this to the national law of the EEA member states.** For the purpose of this contribution namely the PDMIR is of relevance, which introduces a pilot regime for DLT market infrastructures. The proposed legislation still needs to pass the legislative process, which could take 12 to 24 months and may entail significant changes.

DLT-based securities

The Swiss DLT bill explicitly introduces the possibility to issue securities using DLT. This new form of securities is named "ledger-based security".

The legislation proposed by the European Commission does not include such a new type of DLT-based security. **It clarifies though that financial instruments, including transferable securities, issued using DLT will be subject to MiFID II and, as a consequence, other financial market regulations will apply as well, namely the Market Abuse Regulation, Prospectus Regulation, Transparency Directive, Short Selling Regulation, Settlement Finality Directive and the Central Securities Depository Regulation.** Transferable securities based on the DLT will, however, not be in scope of MiCA. The proposed MiCA is largely intended to be a subsidiary regulation and carves out from its scope several types of crypto-assets that are already governed by other regulations, such as crypto-assets qualifying as transferable securities and other financial instruments.

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Switzerland

The Swiss ledger-based security (Registerwertrecht) is a new type of uncertificated security, which can serve as an alternative to the existing intermediated securities (Bucheffekten). Both types are immaterialised securities, but the latter require, unlike the new ledger-based securities, a regulated institution such as a bank, securities firm, or a Central Securities Depository (CSD) for creation and transfer. To create ledger-based securities the parties involved must enter into a registration agreement or agree on a registration clause, and the securities ledger has to fulfil certain requirements.

The registration agreement or registration clause must set-out that the rights reflected by the securities are entered into a securities ledger (Wertrechteregister) and may only be claimed and transferred via this ledger.

The securities ledger must ensure (i) that creditors, but not the obligor, have the power of disposal over the rights reflected on the register, (ii) its integrity by technical and organisational means, such as joint management by several independent participants, to protect it from unauthorised modification, (iii) recording of the content of the rights, the functioning of the ledger and the registration agreement, (iv) that creditors can view relevant information and ledger entries, and check the integrity of the ledger contents relating to themselves without intervention of a third party.

After being duly created, the ledger-based securities will have the same traits as traditional securities. The registered rights can be created and transferred on the ledger only, a party entered as creditor in the register is assumed to be entitled to the right, and third parties may rely on the ownership of right as reflected in the ledger.

The Swiss legislator also included a link between the traditional securities market and the new register uncertificated securities. The new type of securities can be used as a basis to create traditional intermediated securities. Thereby the rights reflected in the register uncertificated securities can be fed into the system of the traditional securities market. To this end, the ledger-based securities must be transferred to a traditional, regulated custodian, credited to a securities account, and immobilised on the securities ledger. This possibility could for example be useful to list the rights reflected on the securities ledger on a traditional stock exchange or to make the rights bankable and credit these to a traditional securities account.

If the entity's articles of association foresee this possibility, shares may also be created as ledger-based securities. The issuing entity will be responsible for selecting the technology of the register on which its shares are created, its quality, and security. It must also ensure that conditions for certain types of shares are adhered to, e.g. for shares with limited transferability, the option to transfer should be limited by the securities ledger.

European Economic Area

The European Commission did not propose to introduce a new type of securities based on DLT. Instead, the form in which securities may be validly issued is governed by the laws of the relevant EEA member state. The following paragraphs summarise some of the legislative initiatives in EEA member states to this regard.

France introduced a DLT ordinance and a DLT decree. The DLT ordinance allows for the issuance, registration and transfer of unlisted equity, debt securities and units in funds, using DLT instead of traditional securities accounts. The DLT decree sets out the technical conditions that must be met by the distributed ledger used to register the securities. The distributed ledger must (i) ensure the integrity of the recorded information, (ii) allow the identification of the owner of the securities as well as the nature and number of securities held, (iii) include a business continuity plan which includes an external data recording system, and (iv) enable the owner of securities to access their transaction statements. Securities within the scope of the DLT order and not traded on a trading venue according to MiFID II may already be issued and traded on a distributed ledger in France today.

On 6 May 2021, the German legislator adopted the Electronic Securities Act, which introduces, inter alia, the possibility to issue electronic bearer bonds. The electronic bearer bonds can be issued by using either a central electronic securities register or a cryptosecurities register. The act also addresses the most urgent civil law questions. Most notably by defining electronic securities as "goods" under German property law, existing civil law principles apply. Further legislative action is expected to introduce DLT-based shares and units in funds at a later stage.

In January 2021, the Luxembourg legislator adopted a law that allows for the issuance of dematerialised securities using DLT-based issuance accounts. This issuance account is used to record the type and amount of securities issued and are maintained by a "central account keeper", which is subject to a financial market license requirement. Transferring DLT-based securities is already possible today, since licensed account keeping institutions may offer securities accounts operated on a distributed ledger.

Trading platforms for DLT-based securities

Switzerland and the EEA follow a different approach in their legislative initiatives with regards to trading platforms of DLT-based securities. The Swiss DLT bill introduces a new type of financial market infrastructure license for trading platforms of DLT-based securities. Entities without a pre-existing financial market license may apply for this new type of license. Applicants expecting a business volume below certain thresholds qualify for a sandbox solution and benefit from less strict requirements. In contrast, the European Commission proposes a pilot regime to test the waters before introducing wide-ranging changes to the EEA financial market regulation. Under this pilot regime MiFID II investment firms, market operators or CSDs may apply for a permission to operate a DLT financial market infrastructure. Experiences gathered during this pilot regime will be analysed and reported to the EU Council and Parliament at the latest after a five-year period. Subsequently, more permanent and extensive legislative action will be taken.

Despite the different approaches, both legislative initiatives aim at grasping the opportunities brought by DLT related to activities traditionally reserved for CSDs and trading platform operators. Both Switzerland and the EEA introduce a possibility to combine these activities under one financial market infrastructure, that keeps DLT-based securities in central custody, enables multilateral trading, and settles transactions.

Switzerland

The new type of financial market infrastructure introduced by the Swiss DLT bill is named "DLT trading facility" (DLT-Handelssystem). A DLT trading facility is a commercially operated institution for multilateral trading of DLT securities. Its purpose is the simultaneous exchange of bids between several participants and the conclusion of contracts based on nondiscretionary rules. To clearly differentiate the DLT trading facility from the multilateral trading facility (MTF), one of the following requirements must be met in addition: (i) Admission of legal entities other than supervised financial institutions or private clients as participants; (ii) provision of central custody of DLT securities based on uniform rules and procedures; (iii) provision of clearing and settlement for transactions in DLT securities based on uniform rules and procedures.

In addition to multilateral trading of DLT securities, the DLT trading facility may also offer trading of instruments not qualifying as securities, such as cryptocurrencies. However, according to the draft DLT ordinance, derivatives in the form DLT securities, instruments which impede compliance with anti-money laundering provisions (e.g. privacy coins), or instruments that could impact the integrity or the stability of the financial system are not eligible for being admitted to trading.

Compared to a traditional stock exchange or MTF, a DLT trading facility has two major regulatory advantages:

First, a DLT trading facility will be allowed to admit not only regulated financial intermediaries as participants but also other legal entities and private clients. The latter two, however, can only be admitted, if they trade in their own name and on their own account. This is to facilitate the combat against money laundering and terrorist financing. To enable the Swiss Financial Markets Supervisor Authority (FINMA) to fulfil its duties, all participants, whether subject to FINMA supervision or not, will have to provide it with information or documentation upon request.

Second, a DLT trading facility will be allowed to provide central custody, clearing and settlement services for DLT securities, e.g. on a blockchain. This is a major innovation since MTFs and stock exchanges are currently dependent on a CSD to fulfil these functions. A DLT trading facility will, however, not be allowed to centrally clear DLT securities, to avoid a risk concentration. This activity remains reserved to central counterparties.

The requirements to obtain an authorisation as a DLT trading facility will be similar to the ones for obtaining authorisation as a stock exchange or MTF. Additional requirements, similar to the ones imposed on CSDs, apply if the DLT trading facility is not only enabling multilateral trading, but also keeps DLT securities in central custody or clears and settles transactions.

DLT trading facilities must be operated by a Swiss entity, save for the possibility to outsource certain services. In other words, a completely decentralised trading platform will not be licensed as a DLT trading facility in Switzerland. Other noteworthy requirements are for example the establishment of a self-regulation and supervisory organisation that is independent from the business functions. This organisation has to ensure,

inter alia, fair and open access to the DLT trading facility as well as orderly and transparent trading. The minimum capital requirement is CHF 1 million.

DLT trading facilities providing central custody, clearing or settlement services on top of enabling multilateral trading are subject additional requirements. These include for example requirements related to the segregation of assets, establishing procedures for the case of a participant default, risk diversification, liquidity and collateral requirements. The minimum capital requirement for DLT trading facilities with such additional CSD functionalities is CHF 5 million.

To encourage start-ups and smaller institutions to advance innovation, the DLT bill includes a sandbox regime for small DLT trading facilities. According to the draft DLT ordinance, a DLT trading facility qualifies as small if its trading volume in DLT securities is less than CHF 250 Million p.a., the volume of DLT securities kept in custody is less than CHF 100 million, and the clearing and settlement volume is less than CHF 250 million p.a. Small DLT trading facilities can benefit from several eased requirements. These eased requirements namely aim at reducing the required headcount and organisational burden. The draft ordinance sets the minimum capital requirement for small DLT trading facilities at CHF 500'000 and for small DLT trading facilities providing custody, clearing and settlement services at 5 % of the DLT securities kept in custody, but at least CHF 500'000.

European Economic Area

The proposed PDMIR pilot regime for market infrastructures based on DLT aims at gathering evidence and experience before introducing wide-ranging and permanent changes to the existing financial services legislation. Thus, operators of DLT market infrastructures will need to provide the European Securities and Markets Authority (ESMA) and the national competent authority every six months with a report on their activity, including the difficulties and issues encountered. ESMA will fulfil a coordination role between the national competent authorities and evaluate the outcome of the pilot regime on a yearly basis. ESMA and the European Commission will report to the Council and the Parliament at the latest after a five-year period, whereupon further legislative action will be taken.

A DLT market infrastructure according to the PDMIR is either a DLT multilateral trading facility or a DLT securities settlement system. The permissions to operate either type of DLT market infrastructure are granted by the national competent authority, which is required to consult ESMA before deciding on an application. A permission is valid for no longer than six years. Only investment firms or market operators according to MiFID II are eligible to operate a DLT multilateral trading facility, while only CSDs according to the CSD Regulation can operate a DLT securities settlement system. In other words, for now the DLT market infrastructures are expected to be largely operated by incumbents, which are already licensed as investment firm, market operator, or CSD today.

The investment firms, market operators or CSDs applying for a permission to operate a DLT market infrastructure need to submit to their national competent authority, inter alia, a detailed business plan describing how they intend to carry out their services and activities, describe the use of DLT, describe their IT and cyber arrangements, and establish a transition strategy. The latter must describe the operator's strategy to transition or wind down its business activity in case the DLT market infrastructure cannot operate as intended, for example if the permission is withdrawn.

As a matter of principle, the requirements for operating a traditional MTF or CSDs apply to operators of a DLT market infrastructures as well, but the national competent authorities can grant exemptions upon request. Such exemptions will enable operators of DLT market infrastructures to make use of the opportunities brought by DLT. Most notably the operator of a DLT multilateral trading facility may request an exemption from the requirement to record DLT transferable securities in book entry form, and to only admit to trading DLT transferable securities that are registered with a CSD. These exemptions may only be granted, if the DLT multilateral trading facility (i) ensures the recording of DLT transferable securities in a way that allows for a prompt segregation of assets, (ii) settles transactions in DLT transferable securities against payment, (iii) provides timely settlement information and transaction confirmations, and (iv) guarantees safekeeping of the DLT transferable securities, related payments and collateral. A CSD operating a DLT securities settlement system may apply for exemptions from requirements of the CSD Regulation, such as the requirement to enter dematerialised financial instruments in book entry form, maintain securities accounts, and segregate participant assets in the way set-out in the CSD Regulation. Exemptions will only be granted if the operator of the DLT securities settlement system

will demonstrate that the distributed ledger used is able to compensate non-compliance with the CSD Regulation requirements. Moreover, the operator of a DLT securities settlement system may also apply for being allowed not only to admit regulated entities as participants, but all types of legal and natural persons. Such persons may, however, only be admitted, if they are fit and proper, of good repute, and understand post-trading and the functioning of DLT well enough.

The PDMIR proposal furthermore puts in place safeguards to ensure that the pilot regime does not pose a threat to the financial stability. Operators of DLT multilateral trading facilities can only admit to trading and operators of DLT securities settlement systems can only record DLT transferable securities that are either (i) shares of an issuer with a market capitalisation of less than EUR 200 million or (ii) bonds with an issuance size of less than EUR 500 million. Sovereign bonds may not be admitted to trading or recorded at all. Furthermore, the total market value of DLT transferable securities recorded on the DLT securities settlement system or the DLT multilateral trading facility must be lower than EUR 2.5 billion. Operators of DLT market infrastructures will need to submit a monthly report on the adherence to these restrictions to the national competent authority.

Conclusion

The Swiss DLT bill and the draft EEA PDMIR provide a remarkable opportunity to improve efficiency of multilateral trading, central custody, and transaction settlement.

The draft status and the pilot regime approach of the EEA PDMIR will for now deter some market participants from taking action to become a DLT market infrastructure. Moreover, incumbents have a substantial advantage over challengers under the EEA PDMIR, since they already passed the hurdle of being licensed as a MiFID II investment firm, market operator or CSD, which is a requirement to be eligible for applying for the permission to operate a DLT trading facility. Switzerland's DLT bill, in contrast, is finalised and the complementing ordinance is well advanced. This already provides enough regulatory certainty to plan and execute the first steps to become a DLT trading facility. Moreover, the sandbox solution for small DLT trading facilities is a sensible approach to reduce entry barriers for challengers.

The introduction of ledger-based securities in Switzerland provides legal certainty and allows for more efficiency in recording and transferring securities. In the EEA issuers will need to assess whether securities may be validly issued using DLT based on the laws of the relevant member state.

Whilst the regulatory initiatives provide the legal basis for innovation using DLT, it remains to be seen which requirements will pose challenges in practice and whether market standards on how to use DLT in this area will be developed soon. Furthermore, it is uncertain at this point whether regulation on DLT-based securities and DLT trading platforms will be internationally coordinated at some point by international standards or regulatory guidance. Namely the work of the International Organization of Securities Commissions (IOSCO) on this topic will need to be monitored.

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5.5 Asia-Pacific[104]

As one of the most dynamic fintech regions in the world, APAC continues to expand, adapt and evolve in relation to virtual asset adoption. It is also one of the most diverse – spanning multiple jurisdictions without any general "passporting".

In the security token arena — comprising both digitalised traditional securities and more novel assets that amount to "securities" — APAC is proving an important testing ground, particularly as the pace of more widespread digitalisation increases. Key to this is government digitalisation itself — many emerging markets see this as the crux of leapfrogging traditional phases of development: why waste resources with legacy systems when you can dive straight into the 21st Century?

State of play

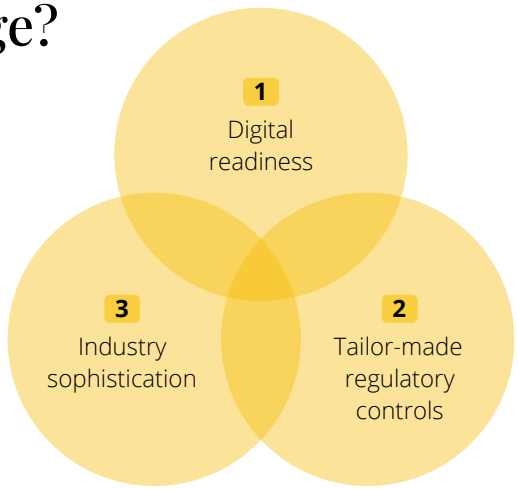
To cut to the chase, most jurisdictions across APAC have securities laws. Broadly, they capture shares, bonds, notes, funds and a range of other instruments. In some markets (like Hong Kong), retail structured products also dovetail into the securities regime post-financial crisis reforms. That can capture things like perpetuals/CFDs and certain stablecoins.

When lawyers look at a virtual asset from a securities law angle, we're often thinking about the same things as most markets — besides considering traditional securities, does it tip into the investment scheme category? Each jurisdiction has its own concept and tests — collective investment scheme in Hong Kong, management investment scheme in Australia etc. At a high level, we're looking for passive rewards (actual or promised), which can flow from things like profit-enhanced utility tokens and fractionalised asset-backed tokens. In my experience, the tests are a lot clearer in most APAC markets than the brutally elastic Howey Test in the US.

Of course, security tokens can be far more evidently securities — digital shares, digital bonds etc — DLT-based at a fundamental architectural level or represented by a mirror token (or "digital twin") on a DLT-based ledger.

Where do jurisdictions diverge?

So if most jurisdictions already regulate securities, where do they diverge? In three key areas:



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1. Digital readiness

This refers to three essential elements:

- **digital equivalence legislation** — recognising digital signatures, contracts and information. Without this, digital transactions do not have legal recognition. This is in place in multiple jurisdictions already (Singapore, Hong Kong, Australia), but it is also rapidly expanding beyond the core minimum, with jurisdictions like Thailand launching modernised laws and others like Vietnam in the pipeline. Express statutory recognition of smart contracts is still an outlier but gaining traction;
- **minimal / no paper-based requirements** — the efficiencies of a security token offering are greatly diminished when a transaction needs to split into a paper-based workflow. For shares, for example, three key items we look for in any jurisdiction are (i) register formalities; (ii) mandatory share certificates; and (iii) stamp duty / other tax procedures on assignment; and
- **ancillary "plug-ins"** — technologies such as digital identity, open API channels to "golden source" government data and even central bank digital currencies (CBDCs) can help make the case that security tokens provide a genuine uplift over a traditional securities regime. In this respect, APAC is galloping ahead — on CBDC projects alone, Mainland China, Hong Kong, Thailand, Japan and Cambodia are already in pilot phase or launch, with others such as Australia revisiting it again. This also ties into industry considerations below.

Of course, we also look for any other deal breakers in relation to issuance and trading — for example, data localisation requirements, assignment formalities, underlying asset (eg gold, real estate) controls etc. To be clear, not all of this is relevant to transactions alone — some are more relevant to issuance, meaning if you can find a good "digital domicile" for the security, the issues can be more streamlined in other places.

2. Tailor-made regulatory controls

This is where certain APAC jurisdictions are pulling ahead, designing properly bespoke regimes that tackle the novel prudential controls that DLT-based assets require to achieve market integrity and investor protection aims. These tend to leverage existing securities law licensing and conduct requirements, but apply an additional lens to compliance.

This is an enormously important thing. Why? Because despite often loud protestations to the contrary, regulated financial institutions don't really like to be left to their own devices in designing controls. Principles-based approaches don't work when they are too high level, because we all know firms are judged with 20-20 hindsight when things go wrong. Those in Asia recall this all too well in the ashes of the Lehman Brothers structured products debacle in 2007/08 and in subsequent rate-setting, FX and algorithmic trading scandals that embroiled them and global counterparts.

And yet, security token platforms and wallet technologies are relatively young, so a blend of principles-based and prescriptive requirements is essential, with latitude for future flex. This helps achieve balanced and proportionate rules than can bend and change.

A few examples of this more bespoke approach include the following:

- **Hong Kong** — the Securities and Futures Commission (SFC) has multiple initiatives to support the security token ecosystem, ranging from guidance to brokers and fund managers, through to a bespoke regime for exchanges that offer at least one security token (often called an "Opt-in Regime"). A more broad-based virtual asset regulatory regime beyond security tokens is currently under consultation by the Financial Services and the Treasury Bureau (FSTB). The current SFC regime for exchanges carries a sophisticated level of requirements from minimum financial and personnel requirements, through to custody, market surveillance and conduct rules. The SFC granted its first licence for a security token exchange in December 2020 to OSL Limited, a member of the Hong Kong-listed BC Technology Group. The FSTB proposals signal an expectation to keep retail out by applying a professional investor-only condition, mirroring the current SFC Opt-in Regime for security tokens. This is under significant debate.
- **Japan** — Over the past year, the Financial Services Agency has implemented specific rules relating to security token offerings and virtual asset derivatives

under the Financial Instruments and Exchange Act and related instruments. Additional rules for exchanges have also been implemented. A key aspect of the security token-related rules is a clarification of how these fit into Japan's "Paragraph I" vs "Paragraph II" securities regime that impacts how they are offered and sold. Market manipulation and other prudential rules have also been implemented.

- **Singapore** — Singapore has been actively building a sophisticated virtual asset framework that encompasses everything from payment tokens (within the Payment Services Act) through to security tokens (under the Securities and Futures Act), with a lot in between. In mid-July 2020, a Monetary Authority of Singapore-approved exchange called 1x was launched. Since then other players such as incumbent behemoth DBS Bank have announced their own plans to enter the space.
- **Taiwan** — The Financial Supervisory Commission of Taiwan clarified that security tokens fall within the existing Securities and Exchange Act in 2019. Like a number of other jurisdictions, retail is out. Other requirements such as NT$ denomination and maximum offer size for certain security token offerings, information standards, plus high minimum financial resource requirements for exchanges apply.
- **Labuan (Malaysia)** — Labuan is a special Malaysian territory and "international business and financial centre" that has developed a large-scale framework for the virtual asset sector. The Labuan Financial Securities Authority has actively pursued a digital strategy, including licensing two digital securities exchanges (within the Fusang Group and GSX Group). An array of conduct, financial resources and risk management requirements apply.
- **Thailand** — The Securities and Exchange Commission has regulated digital asset businesses since 2018, with several licences issued for more "classic" virtual asset brokers, exchanges and dealers with various requirements imposed on issuance and prudential standards. More recent regulatory developments focus on blockchain-based securities and providing a pathway to tokenisation, depositary activities and exchange. Reports suggest the Stock Exchange of Thailand is setting up a security token exchange.

Clarity of tax and accounting treatment is also a critical feature, but generally significantly behind. The same applies in relation to other issues such as data privacy.

3. Industry readiness

Finally, at the heart of security token development is industry readiness — for example —

Willing issures	Market appetite	Technology	Advisers	Custodians
Exchanges	Market makers	Analytics and compliance	Other — brokers, sponsors, banks, registrars etc	

Across APAC, this ecosystem is growing and often leveraging global offerings by providers such as analytics firms. However, industry sophistication and size varies across different markets. For example, institutional appetite varies — key examples being:

- **Australia** — product development is well underway, including at an institutional level. This includes the World Bank's digital bond managed by Commonwealth Bank of Australia (among others) — the first created, allocated, transferred and managed with DLT. There is on the other hand limited roll-out of security token platforms on a public scale at this stage, although it is worth noting that the Australian Stock Exchange is expected to implement DLT as part of its proposed new clearing and settlement system for shares.
- **Labuan (Malaysia)** — one of the world's largest digital bond offerings involving China Construction Bank and the Fusang Group was tipped for a USD 3 billion raise, although it was paused shortly before launch with further news to be announced.

- **Japan** — two key market developments of note include the establishment of a self-regulatory body for security tokens — the Japan Security Token Association — involving the likes of local heavyweights Nomura, SBI Securities, Rakuten and Daiwa Securities; and secondly, Announcement of SBI Digital Asset Holdings institutional-grade digital wallet solution integrated with Securitize's digital securities platform. SBI has also announced a Singapore digital asset joint venture, with an exchange planned for 2022 including digital bonds, equities and securitised loans.

Concluding remarks

Digital economies across APAC are expanding swiftly. Regulators have attuned perspectives on shaping their securities markets amidst rapid digitalisation. There is a strong degree of directional harmony to ensure issues such as the FATF Recommendations and investor protection are covered, but different views on issues such as financial resources, market participation, prudential controls, security token structuring and retail access — as well as adjacent technology availability and regulation — make a close assessment of each target market important.

The author would like to thank Jo Dodd, Kendal McCarthy and Ken Kawai for their valuable input.

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6 Outlook

In 2020, the market for security tokens grew by 517% to $366 million total and the daily trading volume grew by over 1,000%. Real estate produced the greatest number of STOs and raised the highest amount of money. Recent notable institutional STOs include the Bank of China, the Bank of Thailand, the Austrian government, and HSBC. To date the United States has led the world with the highest number of STOs followed by Switzerland. Growth in the STO market has continued during 2021 with the total market cap now at $700 million.

Currently, the market for security token trading is a competitive one with banks, traditional exchanges, startup token exchanges, cryptocurrency exchanges, and decentralized exchanges all vying to capture market share. Unfortunately, liquidity for tokens is low with the most active exchange transacting just under $6.3 million in monthly volume as of January 2021. Thus far institutional investors have been reluctant to participate due to lack of liquidity. In spite of this current predicament, there's optimism the secondary market will substantially improve in the near future as the regulatory framework surrounding security tokens becomes more robust.

Practitioner Perspective with Katharina Gehra of Immutable Insight, GmbH

BLOCKCHAIN FONDS BY IMMUTABLE INSIGHT

Tokens will do to contracts, what email did to letters

Katharina Gehra

Today, it seems normal that most business conversations are done via email. When it was first invented in 1971 or even when it was made available via a webmail service in 1994, very few would have expected it to be the norm for communication rather than letters.

Today, very few expect tokens to be the norm for binding agreements rather than contracts. However, we are convinced that the plethora of advantages of tokens versus contracting today, such as vastly increased security, lower cost, higher speed, easier and cheaper scalability, cross-border availability will undoubtedly lead to this paradigm shift.

Tokens will also develop into new scenarios that are not even thought of yet. Token design is open to exploit different approaches to business – in terms of services being offered, pricing models being adopted and ownership being defined. We are now seeing crypto tokens in the categories of utility, payment, and security token. There are at least four different sets of tokens that will be used in the near to mid-term future. The one that should be in the focus today are the ones that are neither crypto tokens, nor security tokens, nor tokenized existing assets such as bonds, but the ones that are hardest to describe because they are the least known and conceptualized yet. We'll attempt to push into uncharted territory.

To start, let us have a look at what contracts mostly do today. When two or more parties want to interact reliably today, they are using elaborate contracts mostly written up by a specialized occupational group such as lawyers to define the matter, the scope, what happens if something that we can already imagine happening, happens and how we resolve a conflict if it may occur and has not been covered in this agreement yet. We also need to rely on the contractual party being the very contractual party and the signatory being able to make what the signature entails. In short, there is a lot of construction of eventualities and trying to mitigate execution risks in the process of the business itself.

What formal codified law or case law try to provide as a framework for such contracts, can be substituted by a framework for coding. Many lawyers and policymakers will disagree, some of them strongly, but while I am not saying it is there yet, I am still saying one form or the other, this will take precedence over our current system.

Why? The strongest force behind is the underlying economic logic. Today, most businesses act according to Price × Quantity = Revenue. And the quantity is directly or indirectly deduced from the number of people on the planet and the market needs they create. Tomorrow, token allow businesses where the multiplying quantity can entail not only human-related clients, but also machines and business processes that are entirely human free. If the number of potential clients is so much higher and for example by an automatization of a process the repetition of usage of a service is easier to predict for the future, even a minor fraction of price can lead to substantially more profitable new business models. It will create new types of platform business models, that make Google or Amazon's platform scale look small.

Tokens will enable tokenization as a business logic that substitutes complex processes for the standardized version. Those new processes are by design very slim, straightforward, highly standardized, real-time actions with reliably proven identities for both the contractual parties and their respective signatories. Delivery, payment and record-keeping will all take place simultaneously and will be automated in the execution in order to decrease human involvement to the highest possible degree. This will lead to offerings so radically cheaper and more reliable, that it will outcompete the current offerings.

This change of execution reduces complexity dramatically to an extent where the cost effects and the speed of business will be so superior, that de facto the existing business modus operandi will fade out to a large extent.

And just as we still write letters under certain circumstances, so will single contracts still be produced and executed the old-fashioned way. If for now we assume that is the case in the future, the undeniable next question is: how do we get there most likely and maybe a little faster?

When Ethereum began to play a part in the blockchain universe in 2015 the whole notion of "the new internet" was introduced alongside it. It created the 2017 Initial Coin Offering ("ICO") hype, but then this bubble burst and Ether and all tokens crashed subsequently.

After a cooling off period in 2018 and 2019, the models that were being initiated then started to show a higher level of seriousness and industrial grade application level. In 2019 security tokens ("STO") were thought of being the new answer with some early issuances of prototypes, e.g., Bitbond in Germany. Before that model took off, in 2020 the wave of Decentralized Finance ("DeFi") washed through the crypto scene and simply showed a stronger growth trajectory for Ethereum's application landscape at this point in time.

However, both security tokens and DeFi center around some form of cryptocurrency or financial use case. And those are certainly good starting points. They show how to provide value-creating business models that are only possible for the fact that there is a blockchain as a platform that enables unique digital assets. Right now, most of the DeFi applications are still showing a strong resemblance to traditional finance. As soon as the Decentralized Finance model will develop and expand in somewhat unchartered territories with products and services being conceptually more advanced than traditional finance, we'll be embarking on the journey to smarter and more competitive levels of tokens.

On the other side of the spectrum, traditional financial institutions are slowly but surely adopting security tokens. While Decentralized Finance develops products without a centralized issuer in the shape of tokens, traditional finance wraps their products in decentrally tradable security tokens. Bonds have been a very early version of it, but unfortunately those were more picture perfect, than below the surface perfect. The second round of security tokens, often originating from a real estate financing perspective, learned the lesson, but still rely on a quite traditional approach. Real estate today is defined by bigger ticket sizes, relatively little liquidity and high transaction cost. Beyond the two aspects where a token can immediately compete, i.e. potential fractionalization of ownership and easier tradability of the token itself, we also need an adoption of underlying registries. That will at this time create friction and thereby lessen the advantages of the standardized, scale approach which the tokens represent.

Rather than the real-estate or bond sectors, other areas have been discussed before and they might be easier tokenized at first. That might be rare special goods, such as fine art or old timer cars that usually are traded with low liquidity, little transparency and a strong dependency on a few reputable market makers such as specialized car dealers or art galleries. These assets are not so much hinged on existing registrar systems and are potentially also more open to the gamification aspect that tokens also can entail by design.

There might be some features of tokenization that have a stronger USP in more liquid markets. For example, in stock or commodity trading, the local time zone and opening hours of an exchange still play a significant role. Here a tokenized asset could build momentum on the fact that trading is possible 24 hours per day, 365 days per year. The higher availability can be superior to trading strategies that more and more are focusing on speed and higher turn-over, where also the transaction cost plays a role. Also, traditional patterns will be broken up – endangering some investors, enabling others at the same time.

While the former examples are still a little bit like training a horse to be faster, they all remain a horse with its innate limitations. The game changes as soon as from the mindset of "breeding a faster horse" we innovate into a "horse-power engine" that will jump start and exceed any horse-like limitations and whose speed is outcompeting any existing model.

So what is the engine going to look like? In my perspective, the tokenization will start by understanding the demand of the new client category: machines. Most of our business thinking has centered around catering human needs (aka "breeding a horse"). Our thinking needs to put the machines, servers, cars, utilities into our client focus. How machines produced cheaper and faster are serving their purpose longer and more cost effective, and how in the end are they being recycled more sustainably? How is the financing determined cheaper in light of the new cash flow projections of machines having machines as their client for a pre-determined demand? What type of real estate, logistics, supply chain implications will that have? What about legal ownership? At this point in time, we certainly have more questions than answers to these topics. Yet, in an age of the emergence of knowledge, of the frequent interdisciplinary application of solutions -the combination of network effects, biomechanics, power efficiency, Internet of Things, blockchain and a new way of thinking about business models in combination with token design to name only a few will create innovation faster than most people expect today. And tokens will have substituted contracts, much faster than it took email to replace contracts.

Regulation has been a challenge both for the regulators and the STO industry. The global regulatory position on STOs varies considerably from country to country ranging from illegal in China to supportive in nations such as Switzerland. Meanwhile, regulations have also been a challenge for STO industry players. The primary challenge for them has been ambiguity in regulatory requirements. Understandably, ambiguity in the rules has been a hindrance on the industry since companies have been reluctant to invest heavily while the precise rules they're supposed to operate under are unknown. New legislation, such as the Swiss DLT Act, seeks to provide a framework for both regulators and the STO industry to operate under. Additionally, as time goes by judicial rulings will provide further clarity for both regulators and industry participants.

Due to the numerous advantages tokenization offers, an improved regulatory environment, and robust interest from industry players the future looks very bright for the STO market. It is estimated that the tokenized asset market may grow to as much as $9.5 trillion by 2025. In the long-run, it's not difficult to envision STOs fully replacing the current securities market. As typewriters yielded to computers, the natural evolution of this industry points to STOs being the way of the future.

Where can you find out more about security tokens?

While writing this report, we realized that few resources exist for investors who wish to learn more about issuing security tokens investing in security tokens. We found the following immensely helpful in our quest for information on the security token industry:

- Stomarket.com. Data on active securities tokens including market capitalization, price, and trading volume.
- Security Token Show with Kyle Sonlin and Herwig Konings. New video every week with most important news.
- Clubhouse with the Security Token Show every Thursday. Really important movers and shakers from the industry join in an open discussion every week.
- Tokenize This with Peter Gaffney. New example of how to tokenize a business model every week.
- Crowdfund's Omar Faridi gives great coverage of the security token industry.

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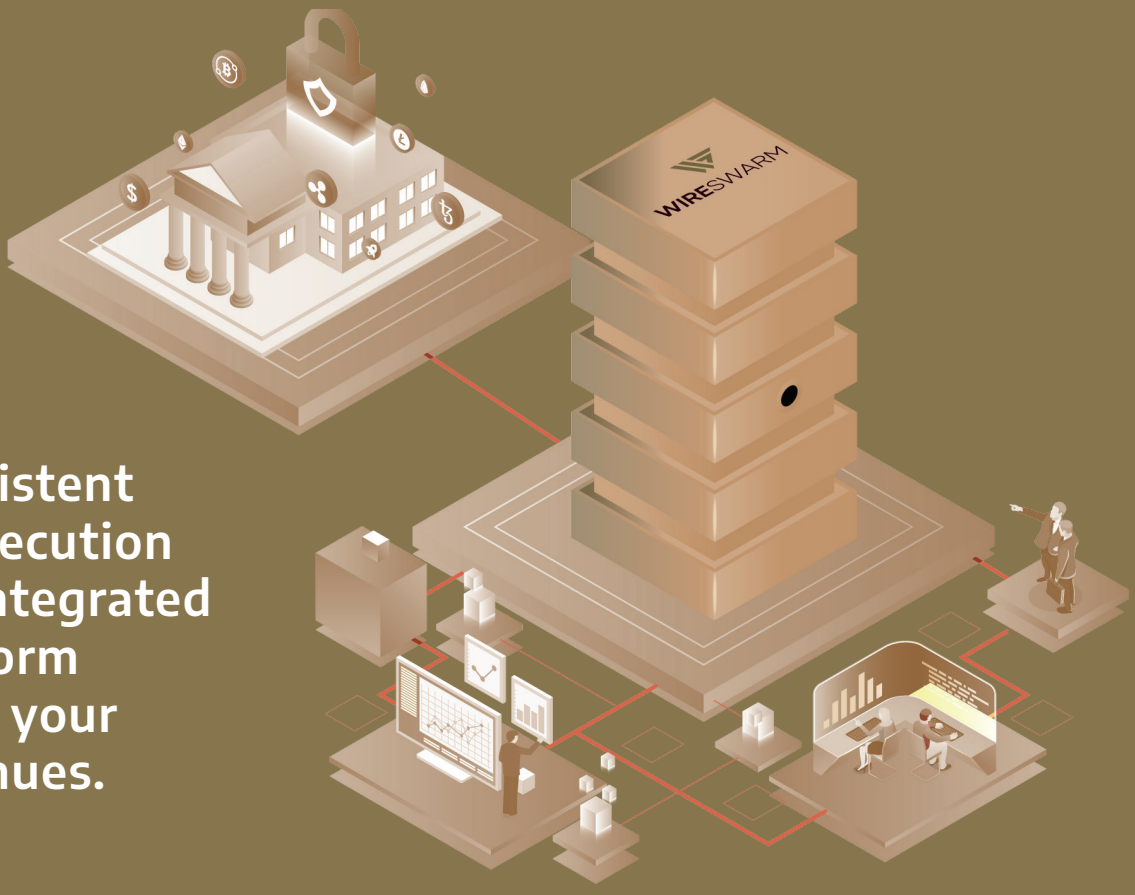

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